

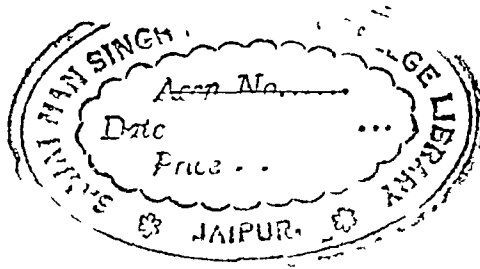




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MORRIS FISHBEIN, M D

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## DRUG THERAPY IN CORONARY DISEASE

HARRY GOLD, M D  
NEW YORK

The use of drugs in coronary disease resolves itself into the treatment of several symptoms and functional disorders of the heart and circulation. There are at present no chemical agents that can materially influence directly the course of the structural abnormality in the heart muscle and its blood vessels. Therefore, drugs have no place in the treatment of coronary disease if the subject is free of symptoms or of manifest disorders of function. The one exception is cardiovascular syphilis with coronary involvement.

The chief specific objectives toward which drug therapy is directed in the course of coronary disease are (1) pain, (2) nervous symptoms, apprehension, anxiety and restlessness, (3) congestive heart failure, (4) paroxysmal dyspnea, (5) shock, and (6) disorders of heart rhythm (auricular fibrillation or flutter, ventricular tachycardia).

The agents most frequently employed in connection with one or another of these phenomena are (1) nitrites, (2) xanthines (theobromine and theophylline), (3) sedatives, (4) opium alkaloids, (5) digitalis, (6) quinidine, (7) diuretics, (8) oxygen, (9) papaverine, (10) iodides, (11) tissue extracts and (12) emergency measures.

The use of these drugs is not confined to the treatment of coronary artery disease, but I wish to restrict my remarks chiefly to those matters concerning their use which have to do more particularly with problems arising in coronary disease.

### THE NITRITES

The nitrites are the drugs of choice in the treatment of the pain of effort angina. Attention to certain details will materially enhance their usefulness. These agents dilate all the peripheral arterioles, including the coronary vessels. The ensuing readjustment of the circulation provides a more favorable relationship between cardiac work and coronary flow. This is a physiologic form of relief, since the nitrites do not impair perception of pain but abolish the mechanism that causes the pain. The nitrites are not entirely free of disagreeable effects: the flush, headache, sensation of throbbing and tension in the head, palpitation and, in excessive doses, collapse. The patient should be

warned about the minor symptoms to avoid alarm. Sometimes these symptoms can be obviated by reducing the dose without appreciable loss of the cardiac effect.

The dose should be taken at the first suggestion of the oncoming pain rather than to wait for its full development, as patients often do, guided by a mistaken notion that some danger of injury or habit is involved in frequent use of the nitrites. Patients often declare that they endure the pain as long as they can before taking a tablet in order to avoid taking too many. It is desirable to instruct them that if the first dose does not relieve the pain within five minutes they may repeat it as many times as necessary at intervals of five minutes, until either the pain subsides or sufficient headache appears to preclude its further use for that attack. They should understand that in the doses recommended the drug is practically harmless and that as many as fifty tablets or more of glyceryl trinitrate may be taken a day without fear of injury.

For a patient with extremely frequent attacks of pain, ten or fifteen a day, coming on with the slightest provocation, even while the patient is at rest, the use of a tablet or two of glyceryl trinitrate regularly at intervals of about two hours, irrespective of whether pain is present or not, will often considerably reduce the number of attacks or even abolish them. These are sometimes desperate cases and no end of suffering may be prevented by this prophylactic measure. The danger which has been suggested that the prevention of attacks removes an important protective signal is not significant, since these patients soon discover that only during the most rigorous control of their mental and physical stress will this prophylactic dose of nitrite prove effective.

The question of habituation is sometimes raised. It takes two forms: 1. Will the frequent use of the nitrites in the course of time lead to dependence on them? 2. Will their frequent use reduce their efficacy? The patient may be assured that neither of these consequences will occur. A form of acquired immunity to the nitrites exists. It is seen in nitrite factories. The workers develop severe headaches, which subside after exposure for three or four days. This form of tolerance so rapidly disappears, however, that if the worker takes a vacation for a few days it is the practice to place glyceryl trinitrate in the hat bands during this time in order to retain the tolerance.<sup>1</sup> Such tolerance to the cardiac effect is quite exceptional, if it occurs at all, in the use of the small doses necessary in the treatment of effort angina, although with advancing disease larger doses often become necessary. I have been tempted to try the experiment of placing some glyceryl trinitrate in the hat band of the patient sub-

Read before the Section of Medicine of the New York Academy of Medicine Oct. 18 1938. Paper prepared in collaboration with Dr N T Kwit.

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<sup>1</sup> Hamilton Alice. Industrial Poisons in the United States. New York: Macmillan Company, 1925. p. 439.

ject to innumerable attacks of effort angina to provide more or less constant exposure to this drug

There is a phenomenon in patients with effort angina which has the appearance of an acquired tolerance. If a patient who has been securing satisfactory relief in the attacks of effort angina by means of the nitrites reports that he has had an attack of pain in which the usual relief was no longer obtained, he may have suffered an attack of coronary thrombosis. In most instances the severity of the attack will itself be sufficiently dramatic to direct attention to the fact that a coronary vessel has become occluded, but not infrequently this is not the case, and failure to obtain the usual relief by the nitrites is all there is in the history that distinguishes the mild attack of coronary thrombosis from the patient's previous attacks of angina pectoris. An electrocardiogram at this time is likely to prove of great value.

In the pain of the acute phase of coronary thrombosis the nitrites only occasionally afford relief. In those cases in which the arterial pressure remains high during the early days and recurring attacks of pain take place, the nitrites prove helpful. The pain in some of these cases appears to arise from two sources: (1) the completely infarcted area from which the impulses are likely to disappear after a few hours and (2) the adjacent muscle with impaired circulation, which was only partly dependent on the occluded vessel. This pain may recur during several days and appears to be similar in its behavior to that of effort angina. It is relieved by nitrites.

There is some hazard in the use of nitrites in the acute phase of coronary thrombosis, because the nitrites reflexly (from fall of blood pressure) stimulate the cardiac accelerators, which may precipitate dangerous ectopic tachycardias, and, by further lowering the blood pressure, which may already have fallen considerably, it may impair the blood flow to the rest of the coronary bed, since the efficiency of the coronary circulation depends on an adequate level of systemic pressure.

All the nitrites act qualitatively alike, and if suitable doses of one have been given without relief it is not likely that any other member will prove any more effective. The most satisfactory preparation is the tablet triturate of glyceryl trinitrate, and the average dose is  $\frac{1}{150}$  grain (0.0004 Gm) dissolved under the tongue. The pearl of amyl nitrite is commonly used by inhalation. On the whole it is not as satisfactory as the tablet of glyceryl trinitrate, with which the exact dose can be more accurately determined. In the case of amyl nitrite, the amount actually inhaled varies greatly. Furthermore, the drug is absorbed from the lungs more rapidly than glyceryl trinitrate from the sublingual tissues, producing more violent effects, and the dose of 5 minims (0.3 cc) in a pearl sometimes causes alarming symptoms in patients who are too careful to allow little or none of it to escape. Levy<sup>2</sup> recommends erythrol tetranitrate in a dose of one-half grain (0.03 Gm) at bedtime to control attacks of pain which are likely to occur during the night.

An interesting contribution to the subject of nitrite therapy was recently published by Krantz and his collaborators<sup>3</sup> from the University of Maryland. They

prepared several alkyl nitrites in the hope of combining a vasodilator action with a central sedative action of the type produced by trichloroethylene. One of the resulting compounds, octyl nitrite, appears to offer distinct advantages. It is a volatile substance supplied on saturated pledgets of cotton in a convenient glass tube inhaler similar to the familiar pocket devices employed for the treatment of nasal catarrh. Their results show that it is less potent than amyl nitrite and less volatile, that for a given degree of vasodilatation the nitrite content of the blood is lower after this compound than after amyl nitrite, that there is less methemoglobin formed and that its duration of action is considerably longer. Octyl nitrite is still in the experimental stage, but the indications are that it may have a useful place in the treatment of effort angina.

#### XANTHINES

The purine bases, particularly theobromine and theophylline, are extensively employed in the treatment of coronary artery disease. These agents are not soluble in water but, when mixed with ethylenediamine or certain salts such as sodium acetate or sodium salicylate, they go into solution readily. They are more widely used in the form of these double salts. One of the most popular of this type of preparation is theophylline with ethylenediamine, or aminophylline.

It was in 1895 that attention was first directed to the use of the xanthines in angina pectoris.<sup>4</sup> In the period of forty years that has elapsed their use for this purpose has gained momentum, and at the present time it is probable that few sufferers with cardiac pain escape a course of treatment with aminophylline at one time or another. With only one exception, clinical reports have considered these compounds effective in controlling the pain of angina pectoris. In 1902 a German writer<sup>5</sup> declared their introduction to be "the most praiseworthy achievement of the last decade," and in 1929 a paper<sup>6</sup> appeared in this country in which the writers stated that they concurred in this view with "equal emphasis." My associates and I were not at all impressed with the results we obtained with these compounds in isolated observations. On inquiry among prominent clinicians we learned, furthermore, that there exists a very considerable body of unpublished testimony to the effect that the xanthines are of questionable value in the relief of cardiac pain. An analysis of the favorable published clinical reports showed also that the conclusions were, without exception, based on observations lacking in suitable control. A few years ago this question was reexamined in our clinics in 100 selected cases of effort angina. It is not feasible to discuss here the manner in which the study was carried through further than to say that techniques were devised for controlling numerous sources of error encountered in the study of the effects of drugs on cardiac pain, such as emotional factors, the diet, the condition of the bowels, physical effort, changes in weather, spontaneous fluctuations in the functional state of the coronary circulation and subconscious bias of the examiner. How this was done is described in detail in a paper published a year ago.<sup>7</sup> The results of that study showed that

<sup>4</sup> Askanazy S. Klinisches über Diuretin. Deutsches Arch. f. klin. Med. **56**: 209, 1895.

<sup>5</sup> Breuer R. Zur Therapie und Pathogenese der Stenokardie und verwandte Zustände. München med. Wchnschr. **49**: 1604, 1902.

<sup>6</sup> Gilbert N C and Kerr J A. Clinical Results in Treatment of Angina Pectoris with the Purine Base Diuretics. J. A. M. A. **92**: 201 (Jan. 19) 1929.

<sup>7</sup> Gold Harry, Kwit N T, and Otto Harold. The Xanthines (Theobromine and Aminophylline) in the Treatment of Cardiac Pain. J. A. M. A. **108**: 2173 (June 26) 1937.

<sup>2</sup> Levy R. L. Drugs in the Treatment of Heart Disease. Ann. Int. Med. **11**: 1946 (May) 1938.

<sup>3</sup> Krantz J C Jr, Carr C J, and Forman S E. Alkyl Nitrites. II. The Pharmacology of 2-Ethyl-1-Hexyl-1-Nitrite to be published abstr. Proceedings of Sixteenth International Physiological Congress.

patients with coronary artery disease and effort angina obtain no more relief from their cardiac pain from these compounds than they do from sugar of milk administered in the same way.

We had about made up our minds that the xanthines deserve no place in the treatment of cardiac pain when an experimental study was published by Smith and his collaborators<sup>8</sup> which appeared to indicate that large doses of aminophylline greatly reduce the size of the resulting scar after a coronary artery was ligated. These results supplied experimental support for their practice of giving large doses of aminophylline to patients with coronary thrombosis. If that observation could be confirmed, it goes without saying that it would represent a discovery of surpassing significance. The conclusion was based on a small number of animal experiments, and the sizes of the scars were not measured but were estimated. The matter was reinvestigated in our laboratory.<sup>9</sup> Larger numbers of animals were used and the sizes of the infarcts were accurately measured by means of a planimeter. An important source of error was eliminated by the use of the "blind test." Unfortunately the results could not be confirmed. In fact, our "treated" animals turned out to have on the average larger infarcts than the "untreated" ones, even though the same vessel was ligated at the same point in the "treated" and "untreated" series.

The evidence, therefore, leaves no escape from the conclusion that aminophylline, theocaine, theobromine with sodium salicylate, or any of the other xanthine compounds exerts no action that is useful for the routine treatment of cardiac pain or myocardial infarction. I do not wish to be understood as believing that the purine bases have no use at all in cardiac disorders. On the contrary, they are extremely valuable as diuretics in congestive cardiac failure. Also respiratory depression with Cheyne-Stokes respiration occurring in the course of renal or cardiac failure often shows dramatic improvement from the intravenous injection of from 0.25 to 0.5 Gm of aminophylline.

#### MORPHINE

In the classic case of coronary thrombosis in which there is agonizing pain, anguish and terror of impending death, morphine is the drug of choice. The relief of the pain is due to raising the threshold at the center and not to dilatation of coronary arteries, since morphine causes constriction of smooth muscle and, by its vagal stimulating action, also tends to constrict the coronary bed. It owes its beneficial effects not only to the fact that it relieves pain but to the fact that it abolishes a disposition to move about and in many instances gives rise to a sense of well-being which is quite apart from its analgesic effects, the euphoria characteristic of this narcotic.

It may be noted that in some cases the pain is so severe that even morphine is not entirely effectual. In these instances the most one succeeds in doing by safe amounts is to dull the sharp edge of the pain by repeated doses, and after a period of several hours the pain subsides, partly as the result of its natural course independent of the drug. One should not attempt to

abolish the pain completely in such cases, since doses sufficient to do this will produce dangerous depression of the respiration.

Morphine sometimes complicates the course of coronary thrombosis. It promotes constipation with abdominal distention and urinary retention through spasm of the bladder sphincter. It also causes vomiting, which may be repeated over a period of several hours. This violent muscular effort is a source of danger in coronary thrombosis. It is also a source of confusion in that one may be at a loss to determine whether the vomiting is due to the drug or to the coronary thrombosis itself. Morphine causes strong vagal stimulation, and this renders the heart more susceptible to ventricular ectopic rhythms. One may well ask how often ventricular tachycardia after coronary thrombosis is due in part at least to the morphine with which the condition was treated. Morphine poisoning is more likely to occur in cases in which large doses of the drug appear to be necessary for the relief of agonizing pain if the pain subsides spontaneously before any appreciable amount of the drug has been excreted. This applies particularly to cases of coronary thrombosis, for in them occasionally even excruciating pain may subside spontaneously within about one-half hour. When such a patient has received a grain of morphine, the disappearance of the pain is occasionally followed by rather pronounced stupor with profound depression of respiration at 3 or 4 a minute because the stimulant effect of the pain has disappeared. Older patients are more sensitive to this phenomenon.

Two facts concerning morphine have received great emphasis, and deservedly so, in clinical writings on its use in coronary thrombosis: (1) that large doses are necessary and (2) that these patients are very tolerant to morphine. The reasons for these are important. Large doses are needed because the pain is so severe, and the patient appears tolerant because pain is an antidote to morphine poisoning. To be aware of these reasons is perhaps more necessary now than ever before, because of the advances that have been made in recent years in the recognition of the milder cases. The classic picture is often missing in patients now readily recognized as having coronary thrombosis. In them the pain is not excruciating, it is of relatively short duration, and the fear of impending death is absent.

A plan which is applicable in the majority of cases is this: one-fourth grain (0.016 Gm) of morphine sulfate by subcutaneous injection, repeated at intervals of one-half hour until the pain is abolished or reduced to a minimum. The interval between doses should not be shorter, and to give more than a total of 1 grain (0.065 Gm) in twelve hours is rarely wise. Larger doses than 1 grain are rarely more effectual against the pain.

In 1932 an eminent author<sup>10</sup> wrote: "During the acute attack relief of pain can only be accomplished, and even then only too slowly, by giving one-half grain of morphine hypodermically and repeating as necessary. Other substitutes for this drug are worthless and smaller doses do no good." This advice seems much too drastic for the conditions that prevail at the present time. One should not discourage the use of large doses of morphine in cases of coronary thrombosis in which they are essential, but the problem does need to be viewed somewhat more broadly. Not all patients

<sup>8</sup> Fowler W. M., Hurevitz H. M. and Smith F. M. Effect of Theophylline with Ethylenediamine on Experimentally Induced Cardiac Infarction in the Dog. *Arch. Int. Med.* 56: 1242 (Dec.) 1935.

<sup>9</sup> Gold Harry, Travell Janet and Modell Walter. The Effect of Theophylline with Ethylenediamine (Aminophylline) on the Course of Cardiac Infarction Following Experimental Coronary Occlusion. *Am. Heart J.* 14: 284 (Sept.) 1937.

<sup>10</sup> Paulin J. E. Coronary Thrombosis in Modern Concept of Cardiovascular Disease Vol. 1 October 1932.

with coronary thrombosis require large doses of morphine, and many of them require no morphine at all. One not infrequently encounters patients with coronary thrombosis who receive morphine two or three times a day in a routine manner although the subjective symptoms due to the disease are almost negligible. As already mentioned, this drug often complicates the course of the disease and is not infrequently the cause of its most troublesome symptoms, namely, abdominal distention, urinary retention, vomiting, irregular heart, stupor and respiratory depression. The vague notion is entertained that morphine exerts a direct beneficial effect in coronary thrombosis independent of its influence on symptoms. There is no sound justification for this view. Severe pain, its attending anxiety and the distress of paroxysmal dyspnea are the three major indications for the use of morphine in the course of coronary thrombosis. In the absence of these the occasion is rare indeed when the use of morphine is justified.

As for substitutes for morphine, codeine in doses of one-half grain or 1 grain may often be used with advantage in the milder cases of coronary thrombosis. If moderate pain persists over several days, the danger of disagreeable withdrawal symptoms is greatly minimized by the substitution of codeine, even though morphine may have been used during the early pain of the greater severity. Dilaudid, one of the synthetic derivatives of morphine, is about five times as potent and may be used in place of morphine in about one-fifth the dose, about  $\frac{1}{20}$  grain (0.003 Gm.) of dilaudid therefore being given in cases in which one-fourth grain of morphine might otherwise be used. It is doubtful whether it has any advantages over morphine in this disease. It must be used as cautiously as morphine in view of the likelihood that it also is habit forming. Opium contains about twenty different alkaloids, and the view has gained currency that the total alkaloids of opium have special merits in coronary thrombosis. A preparation known as pantopon is widely used for that purpose. There is no satisfactory pharmacologic or clinical evidence that this preparation exerts any effects other than those due to the morphine it contains.<sup>11</sup> If by any chance the patient is intolerant to morphine, so that ordinary doses cause vomiting or excitement, a combination in a capsule of one-half grain or 1 grain of codeine with  $\frac{1}{150}$  grain of scopolamine hydrobromide will occasionally provide a satisfactory substitute.

In cases in which there is pain that is resistant to other measures, placing the patient in a tent with oxygen of about 50 per cent concentration is sometimes useful.<sup>12</sup> It is especially applicable in those presenting cyanosis.

#### THE BARBITURATES

Sedatives play an important role in the management of patients with coronary disease. The most popular ones at the present time are members of the barbituric acid series, such as barbitol, phenobarbital, amytal or pentobarbital sodium. The more rapid recovery from amytal or pentobarbital sodium offers no particular advantage in coronary disease, because a more or less persistent mild depression is desirable. By reducing nervous excitability the barbiturates are effective in reducing the number and severity of the attacks of

effort angina. By means of the barbiturates, one may control the fear and anxiety which intensify the distress of acute coronary thrombosis, as well as the restlessness which involves a dangerous expenditure of physical energy in this condition. In experimental studies<sup>13</sup> it has been found that these drugs reduce the susceptibility of the heart to ectopic rhythms and in that way may contribute to the prevention of ventricular tachycardia, which is one of the complications of coronary thrombosis.

It is advisable to use only moderate doses of these drugs. As a rule it is unwise to exceed from one-fourth to one-half grain of phenobarbital three times a day or from three-fourths to  $1\frac{1}{2}$  grains (0.05 to 0.1 Gm.) of pentobarbital sodium or analogous doses of some of the other members of the group. Large doses not infrequently cause a form of stupor associated with motor unrest and defeat the purpose for which they are used. The condition is analogous to the involuntary excitement stage of ether or chloroform anesthesia. If such a state has been produced, neither large doses nor substitution of another barbiturate solves the difficulty. The drugs must be discontinued for a day or two until sufficient elimination of the drug has taken place to reestablish the patient's normal control.

#### DIGITALIS

The use of digitalis in coronary artery disease constitutes the most widely debated of all questions concerning the treatment of this disease. Should it be given as a routine in these cases? Does it ever do any good? Is it always dangerous, or are there particular cases in which it is especially valuable or especially dangerous? Such are some of the questions on which clinical opinions are sharply divided.

In order to clarify the issues, it may be well to consider first what the conditions are in which digitalis is useful. There are two general indications: (1) cardiac failure and (2) certain disorders of rhythm with or without cardiac failure, namely auricular fibrillation, auricular flutter and possibly paroxysmal tachycardia.

Clinically, primary failure of the heart muscle manifests itself in two general forms. One is referred to as right ventricular or congestive heart failure. Its chief manifestations are dyspnea, orthopnea, distended veins of the neck, enlarged liver, pulmonary congestion, edema and ascites. The other is left ventricular failure in which the outstanding clinical phenomenon is one of recurring paroxysms of dyspnea or pulmonary edema. Very frequently the clinical picture represents a combination of the two.

A patient manifesting these disorders should receive digitalis regardless of what accompanying conditions are present. There are no contraindications that would preclude the use of digitalis in cases in which the foregoing indications for its use exist. Specifically, if a patient has auricular fibrillation with a rapid heart rate, or cardiac failure in the sense in which I have just described it, with coronary thrombosis as the cause or as an accompanying condition, the patient should be digitalized in the hope of favorably influencing the course of the failing power of the heart muscle. This applies to coronary thrombosis in any stage, either early or late.

<sup>11</sup> Hayman, J. M., Jr. and Fox, Herbert. Comparison of the Analgesic Action of Pantopon and Morphine Sulfate. *J. A. M. A.* 109: 183 (Nov. 27) 1937.  
<sup>12</sup> Levi, R. L. and Barach, A. L. The Therapeutic Use of Oxygen in Coronary Thrombosis. *J. A. M. A.* 94: 1363 (May 3) 1930.

<sup>13</sup> Meek, W. J., and SeEVERS, M. H. Cardiac Irregularities Produced by Ephedrine and Protective Action of Sodium Barbitol. *J. Pharmacol. & Exper. Therap.* 51: 287 (July) 1934.

There are, of course, many persons in the terminal stages of cardiac disease presenting these clinical pictures who appear to obtain little benefit from digitalis. Nevertheless, if a patient succumbs to right or left ventricular failure without having been digitalized, it is indeed difficult to controvert the charge that the patient has been deprived of a possible means of survival. No other agent is known that exerts such potent and protracted effects in increasing the power of heart muscle to carry a load. There seems to be no clinical or experimental evidence to support a contrary view, although other preferences and fears are frequently expressed.

This should not be taken to signify that most patients with coronary thrombosis should be digitalized, quite the contrary. The functional disorders of the heart for which digitalis is useful are very uncommon in the course of coronary thrombosis, and in the early days of an episode they are extremely rare. The disintegration of the cardiocirculatory function in coronary thrombosis appears to be a form of "shock" with peripheral failure, and digitalis is no more useful in this condition than it is in the peripheral circulatory failure of pneumonia, sepsis or traumatic shock. Dyspnea, orthopnea, enlargement of the liver, distention of the veins of the neck and edema are relatively rare symptoms in the early period of a coronary thrombosis. There is therefore no indication for the use of digitalis in the circulatory difficulties of most cases of acute coronary thrombosis, because in most of them the clinical signs of right or left ventricular failure do not occur. It should be noted at this point that the distinction of right or left ventricular failure from peripheral circulatory failure often presents great difficulties in coronary thrombosis. Many cases show temporary equivocal signs such as inconstant rales at the base of the lungs. In fact a sharp line cannot always be drawn between the two conditions. However, judgment as to which condition is present is the deciding factor, and it is our practice, in such cases, to withhold digitalis until unmistakable clinical indications of right or left ventricular failure appear.

An objection has been raised to the use of digitalis in those cases in which the drug can prove effective, namely those with auricular fibrillation and those with cardiac failure. The argument is frequently based on the possibility that digitalis may do harm rather than on the conviction that, for some strange reason, it will fail to exert its customary therapeutic effect on the heart muscle. Clearcut clinical proof that such harm is produced does not exist. The fear that digitalis may do some harm receives its support mainly from certain experimental results. Four dangers are generally considered. One is that the drug, by increasing the force of the heart's contraction, will promote a tendency to rupture the tenuous tissue of the infarct. The second is that digitalis increases the work of the heart. The third is that digitalis might predispose the heart to ventricular tachycardia, since digitalis and coronary thrombosis may each by itself precipitate this abnormal rhythm. The fourth is that digitalis constricts the coronary vessels and may further diminish the coronary blood flow.

Concerning the danger of rupture, it may be said that digitalis exerts no actions on the human heart which can cause the ventricle to rupture. It does not raise the intraventricular pressure. How can it promote rupture of the ventricle without increasing the

pressure by which it is ruptured? On the other hand, it should be borne in mind that failure of the heart leads to an increase in the diastolic pressure in the ventricle, giving rise to a force which may stretch the infarcted area and in that way promote rupture of the ventricle. The danger, therefore, lies not in giving digitalis but in withholding it from a patient who has heart failure in the course of coronary thrombosis.

With regard to increased work of the heart, it should be noted that in the absence of failure digitalis tends to decrease cardiac output and diminish the work of the heart. The reverse takes place with digitalis during heart failure, namely increased output and increased work.<sup>14</sup> What is often lost sight of, however, is that the increased work after digitalis is the result of an improved capacity for work rather than an increased demand for work as occurs in exercise. The heart becomes more efficient as the result of the digitalis.<sup>15</sup> Such a phenomenon cannot be viewed as unfavorable.

Concerning the coronary vasoconstriction, the experimental literature is inconclusive, some reporting constriction, others dilatation and still others no effect. An investigation of that subject was made in our clinic recently in 120 selected cases of effort angina.<sup>16</sup> Diminution of coronary flow was to be indicated by increase in the frequency or severity of the cardiac pain. In not a single one of these patients was the course of the pain influenced by even toxic doses of digitalis. We are forced to the conclusion that digitalis does not exert any direct constrictor action on the coronary circulation in patients with coronary artery disease.

As to the danger of precipitating toxic rhythms, the experimental facts are these. It requires as much as from 50 to 75 per cent of the fatal dose of digitalis in normal animals to precipitate ventricular tachycardia.<sup>17</sup> Doses necessary in therapeutic digitalizations are a long way from those which cause this toxic rhythm. Within anywhere from twenty-four hours to three weeks after coronary thrombosis it is found that animals require only three fourths of the usual dose to cause the ventricular tachycardia.<sup>18</sup> The only problem which this suggests is the desirability of giving smaller doses to treat cardiac failure in patients with coronary thrombosis, namely, about three-fourths as much as that subject might receive if he did not have a myocardial infarct. It is a matter of no great difficulty and involves no special hazards if one proceeds to digitalize when necessary by a method involving relatively small doses.

A satisfactory dosage in the average case of auricular fibrillation or heart failure in coronary thrombosis is about 6 grains or 0.4 Gm (4 cat units) of digitalis leaf daily for three days, followed by about 3 to 4½ grains or from 0.2 to 0.3 Gm (2 to 3 cat units) a day as long as necessary. The patient should be watched carefully for the appearance or increase in the

14 Stewart H J and Cohn A E. Studies on the Effect of Digitalis on the Output of Blood from the Heart. III. Part 1. The Effect on the Output in Normal Hearts. Part 2. The Effect on the Output of Hearts in Heart Failure with Congestion in Human Beings. *J Clin Investigation* 11: 917 (Sept.) 1932.

15 Visscher M B. Energy Metabolism of Heart in Failure. *Minnesota Med* 21: 85 (Feb.) 1938.

16 Gold Harry Otto Harold Kwit N T and Satchwell Harry. Does Digitalis Influence the Course of Cardiac Pain? A Study of 120 Selected Cases of Angina Pectoris. *J A M A* 110: 859 (March 19) 1938.

17 Gold, Harry Hitzig William Gelfand Ben and Glassman Herman A. Qualitative Comparison of Various Digitalis Bodies. *Am Heart J* 6: 237 (Dec.) 1930.

18 Travell Janet Gold Harry and Modell Walter. Effect of Experimental Cardiac Infarction on Response to Digitalis. *Arch Int Med* 61: 184 (Feb.) 1938.



number of ventricular premature beats, which should serve as a guide to reduction of the dose. Such a plan carefully pursued involves no special risks to patients with coronary thrombosis.

#### DIURETICS

The indications for the diuretics overlap in part those for digitalis. They are useful for the control of congestive heart failure and attacks of paroxysmal dyspnea. An intravenous injection of 1 cc of salyrgan or meicupurin two or three times a week with or without a daily dose of 5 or 6 Gm of ammonium nitrate as the need may be often proves very helpful. The patient in whom this treatment is necessary should also receive digitalis.

#### QUINIDINE

Quinidine and the related alkaloids of cinchona have the same uses in cases of coronary disease as in all other types of cardiac diseases. They control troublesome premature contractions and abolish auricular flutter, auricular fibrillation and ventricular tachycardia. Ventricular tachycardia is the disorder most feared after coronary thrombosis, especially the more severe grades, in which the heart rate may rise to 250 a minute. The possibility that quinidine might be useful in small doses as a prophylactic in all cases of coronary thrombosis has received some attention.<sup>19</sup> Concerning this, it should be noted that it usually requires large doses to abolish the more severe forms of ventricular tachycardia, from 30 to 100 grams (2 to 6.5 Gm) in a period of several hours. There is no reason to believe that the small prophylactic doses of 9 grams (0.6 Gm) a day, as are recommended, are likely to prevent an attack of ventricular tachycardia in cases in which the larger doses would fail to abolish one within a few hours. Evidence concerning this matter is extremely difficult to obtain, but it is my belief that the prophylactic use of quinidine in this routine manner is without sufficient merit. To patients presenting premature ventricular contractions after a coronary thrombosis, an oral dose of 5 grains (0.3 Gm) of quinidine sulfate may be given three times daily, and the dose may be increased if necessary by 5 grains daily until the abnormal beats disappear or until minor toxic symptoms appear.

The intravenous injection of quinidine is dangerous and should not be used except in extreme emergencies, and then only by those familiar with its use.

It is well to bear in mind that auricular fibrillation or flutter caused by coronary thrombosis usually subsides spontaneously within hours or days, and unless the rate is unduly rapid and appears seriously to impair the circulation the condition may safely be allowed to run its spontaneous course. Quinidine should be used only if it appears necessary to expedite the restoration of the normal rhythm. If signs of congestive failure are present, digitalis is preferable to slow the ventricular rate in auricular fibrillation and to restore the normal rhythm in auricular flutter.

#### PAPAVERINE, IODIDES AND TISSUE EXTRACTS

Papaverine in one-half or 1 grain (0.03 or 0.06 Gm) doses exerts a mild general depressant action, and in animal experiments the drug relaxes smooth muscle. It appears to have little value, however, in the control of cardiac pain. While iodides are extensively

employed in the treatment of coronary sclerosis, not a vestige of evidence exists that they influence the symptoms or the course of the coronary disease in the absence of syphilis. Tissue extracts yield a host of vasodilator substances. They are widely exploited as "heart hormones" for the treatment of angina pectoris. If any one of the more optimistic reports represented the true value of these extracts, coronary disease would now have ceased to present a serious therapeutic problem. The reports are conspicuous by their lack of suitable control. It is idle to attribute the relief of pain to a substance given in a series of injections when the ritual of the treatment itself, as well as numerous other factors that have not been excluded, could have been responsible for the change. The critical reader cannot be impressed with the case that has been made out for the use of tissue extracts in coronary disease.

#### EMERGENCY MEASURES

There are several emergency situations arising in the course of coronary thrombosis in which drug therapy is extremely difficult to evaluate, namely shock, acute pulmonary edema, Adams-Stokes attacks and acute collapse at the onset of an attack in which the pulse disappears and consciousness is lost. Epinephrine is occasionally helpful in acute pulmonary edema, if the systemic pressure is low, and in Adams-Stokes attacks. There is danger in these cases of precipitating ventricular tachycardia. Solution of posterior pituitary should not be used for its vasopressor effect because of the constrictor action on the coronary vessels. Caffeine, metrazol, coramine and intravenous dextrose solutions are widely used in the peripheral failure of coronary thrombosis, but there are no satisfactory clinical studies that throw any light on their usefulness.

The detailed treatment of coronary disease is not within the scope of this discussion, but because only drugs have been considered there is danger that too much emphasis has been placed on them. It is therefore well to state that under proper supervision a large proportion of cases of effort angina as well as many with coronary thrombosis will run their course from beginning to end with little or no medicine, and this often with considerable advantage. The prevailing tendency appears to be to overtreat patients with coronary disease than otherwise, to give them too many drugs and too much of each. It ought also to be stated that, while in many instances great suffering is spared and a life is saved through the judicious use of these agents, the major part in the control of this disease lies not in drugs but in expert guidance in making the mental and physical adjustments which will enable these patients to carry on within their capacity without symptoms.

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**Book on Gynecology by Trotula**—In the fifteenth century the first printing presses were set up in Europe for the general multiplication of books by an easier method than by the pen or brush, and no less than twenty editions of the "Regimen Sanitatis Salernitatum" were printed before the year 1500. Some of these bore the title "Flos Medicinæ Salerni." To the original compilation of this work, as we have seen, Trotula contributed largely. The first printing of her gynecology, the "De Passionibus Mulierum," under her own name, came from the press of John Schottus, in 1544.—Hurd-Mead, Kate Campbell. A History of Women in Medicine, Haddam, Conn., the Haddam Press, 1938.



A NEW INTERPRETATION OF HYPER-  
GLYCEMIA IN OBESE MIDDLE-  
AGED PERSONS

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AND

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The term diabetes mellitus has in the past implied a single cause. Ever since the days of von Mering and Minkowski this disease has been attributed to a pancreatic abnormality. However, within the last few years the work of a number of investigators has made it clear that this conception is far too restricted. Houssay,<sup>1</sup> for example, has shown that the rapidly fatal diabetes produced by pancreatectomy in animals may be strikingly ameliorated by subsequent hypophysectomy. In the same sense Mann<sup>2</sup> has produced fatal hypoglycemia in depancreatized dogs by hepatectomy. A number of workers have produced hyperglycemia and glycosuria by injection of pituitary extracts, and Young<sup>3</sup> reported that he obtained permanent "diabetes" in dogs solely as the result of prolonged injection of anterior pituitary extracts.

It is therefore clear that clinical investigators must now attempt to discover the specific cause of the hyperglycemia in all patients who present the classic signs and symptoms of the abnormality to which the clinical term diabetes mellitus is attached. In this paper we are endeavoring to show that we have isolated etiologically one group of persons characterized by obesity and spontaneous glycosuria.

Joslin<sup>4</sup> has emphasized the frequency of obesity in the patients who come to him for the treatment of diabetes mellitus. He reported on a group of 3,094 patients, 20 or more years of age, whose weight at the onset of the disease was known. Of the males 63 per cent and of the females 67 per cent were obese. Our investigation concerns only those patients who were obese and middle aged when they came to us for the treatment of spontaneous glycosuria.

Table 1 shows how many patients were obese when they were first accepted at the University Hospital during the year 1936 for the control of diabetes mellitus. It will be seen that close to two thirds of the patients who were from 30 to 65 years of age were overweight when treatment for diabetes was first begun. Since this middle-aged group accounted for 72 per cent of the patients, 44 per cent of all the patients treated for diabetes were obese and middle aged when they were first accepted for treatment.

These patients had been obese for many years. Glycosuria was often discovered in a routine examination of the urine. Generalized pruritus, pruritus vulvae, mild polyuria and polydipsia or visual disturbances often caused the patient to seek the physician. Glycosuria

may have been discovered several years earlier and been ignored without the development of any marked symptoms. On the other hand, some of the patients had been receiving treatment for diabetes for many years. The physical examination revealed no constant abnormality other than obesity. Hypertension was present in 40 per cent of the cases. Moderate hepatic enlargement was noted in 12 per cent. Cataracts were not uncommon.

## METHOD OF INVESTIGATION

We chose for study only those patients who were obese, middle aged and spontaneously glycosuric on an unrestricted diet. Each subject satisfying these conditions was fed a standard normal diet (300 Gm of carbohydrate, 80 Gm of protein and approximately the maintenance number of calories) for at least three days prior to a standard dextrose tolerance test. The amount of dextrose ingested (1.75 Gm per kilogram) was calculated on the basis of ideal weight.<sup>5</sup> If under these conditions the response was such that it would be generally accepted as indicative of diabetes mellitus, the patient was included in the group.

A number of the patients who conformed to the standard diagnostic criteria for diabetes mellitus described were studied with regard to their ability to oxidize dextrose. The data were obtained by means of

TABLE 1—New Cases in Which a Diagnosis of Diabetes Mellitus Was Made During 1936 at University Hospital

Age Groups Years	Number in Each Group	Percentage of Total Number	Number Obese	Percentage of Group Obese	Percentage of Total Number Obese
0-29	54	14.6	2	3.7	0.5
30-65	266	71.9	162	61.3	43.8
Over	50	13.5	19	38.0	5.0
Totals	370	100.0	183		49.0

a respiration chamber employing the principle of continuous indirect calorimetry by the open circuit method.<sup>6</sup> The patients ate a standard preparatory diet for at least three days before the respiratory data were obtained. These data were compared with those obtained from normal control subjects under identical conditions.

Having secured these preliminary data while the subjects were both obese and glycosuric, we then placed them on reduction diets. No other treatment was instituted. The carbohydrate of the diet was reduced only to the degree made necessary by the restriction of calories. Dextrose tolerance tests were repeated during the period of weight reduction. These tests were done after the standard dietary preparation used for the original ones. Some of the patients were unwilling to adhere to the diet long enough for us to obtain any information. Only those who continued to reduce their weight by adherence to the diet were studied further. We are at present reporting the results obtained with thirty-five such patients.

The blood sugar was determined by the Benedict method<sup>7</sup> and the urinary nitrogen by the Kjeldahl

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<sup>1</sup> Houssay, B. A. and Biosotti, A. Pancreas, diabetes and Hypophyseal Hormone. *Arch. f. d. ges. Physiol.* **227**: 664-684, 1931.

<sup>2</sup> Mann, F. C. and Magath, T. B. Studies on the Physiology of the Liver. Effect of Total Removal of Liver after Pancreatectomy on Blood Sugar Level. *Arch. Int. Med.* **31**: 797-806 (June), 1923.

<sup>3</sup> Young, F. G. Permanent Experimental Diabetes Produced by Pituitary (Anterior Lobe) Injections. *Lancet* **2**: 372-374 (Aug. 14), 1937.

<sup>4</sup> Joslin, E. P. Dublin, L. I. and Marks, H. H. Studies in Diabetes Mellitus. IV. Etiology. *Am. J. M. Sc.* **192**: 9 (July), 1936.

<sup>5</sup> We have chosen as the "ideal weight" for all people over 35 years of age that weight which according to the standard weight for height tables is average for people between 30 and 35. Since at this weight life expectancy is greatest for middle-aged people we have termed it ideal weight.

<sup>6</sup> Newburgh, L. H., Johnston, M. W., Wiley, F. H., Sheldon, J. M., and Murrill, W. A. A Respiration Chamber for Use with Human Subjects. *J. Nutrition* **13**: 193 (Feb.), 1937.

<sup>7</sup> Benedict, S. R. The Analysis of Whole Blood. II. The Determination of Sugar and of Saccharoids (Nonfermentable Copper Reducing Substances). *J. Biol. Chem.* **92**: 141 (June), 1931.

glycosuric patient to be a deficiency in the mechanism by which glycogen is deposited rapidly in the liver. It seems evident therefore that the glycogenic mechanism is disturbed by the adiposity.

As far as is known there are two ways in which hepatic deposition of dextrose as glycogen may be impaired. First, a disturbance in the functional capacity of the liver cells themselves to lay down glycogen has been produced by the use of hepatotoxic chemicals and demonstrated in association with diseases of the liver.<sup>15</sup> Second, lack of insulin leads to an inability to deposit normal quantities of glycogen in the liver as well as to decreased oxidation of dextrose. If one wished to develop the latter hypothesis further with regard to the cases under consideration, he would be forced to conclude that a mild insulin insufficiency may reduce hepatic glycogen retention without at the same time affecting the oxidation of dextrose. If this is true, then this is the first demonstration in human beings that lack of insulin may adversely affect glycogen storage and yet not reduce the ability of the organism to oxidize dextrose. There are no facts available, however, that lead to the belief that insulin production is reduced by obesity. Nor is there evidence that removal of obesity increases insulin secretion.

On the other hand, we<sup>15</sup> have shown that hepatic glycogenesis, impaired in the presence of normal oxidation of dextrose in patients suffering from low grade infections of the biliary tract, becomes normal when the cause of the hepatitis is removed. It therefore seems more likely that in the type of patients discussed in this paper the abnormal accumulation of fat in the liver interferes with its capacity to lay down glycogen at the normally rapid rate.

#### CONCLUSIONS

1 A statistical analysis of spontaneous glycosuria associated with delayed disposal of ingested dextrose indicates that approximately half of the patients are obese. These obese glycosuric patients are, with few exceptions, more than 30 years of age.

2 After the weight of these patients has been reduced to normal by simple underfeeding, they remain aglycosuric, do not become hyperglycemic when they are placed on maintenance diets containing 300 Gm of carbohydrate and exhibit normal dextrose tolerance curves.

3 There is an occasional exception to this rule, but more than 90 per cent of the patients respond in this manner.

4 Recurrence of the obesity is capable of reproducing the hyperglycemia and the delayed utilization of dextrose. Subsequent reduction of weight again corrects the disturbance in the metabolism of carbohydrate.

5 It has been demonstrated that the majority of persons who have been obese for many years show delayed utilization of carbohydrate. Since the majority respond in this way to adiposity and again dispose of carbohydrate normally when the excessive weight has been removed, this phenomenon must be regarded as being the type response of the previously normal mechanism carbohydrate metabolism to the overload of obesity.

6 It is suggested that the occurrence of the hyperglycemia and glycosuria in such persons depends on the

excessive accumulation of fat in the liver, with a resulting impairment in its capacity to lay down glycogen at the normally rapid rate.

7 The studies described establish a clinical entity in which obesity is the principal abnormality and hyperglycemia is a secondary phenomenon.

#### ABSTRACT OF DISCUSSION

DR BERTNARD SMITH, Los Angeles. Clinically, it is well to keep in mind that this obese group, even with the mild degree of diabetes, continue to show poor diabetic control with large doses of insulin so long as they remain obese. They can tolerate large doses of insulin without the usual sharp hypoglycemic reactions. A report of studies on a small group of these patients has recently been given by Duncan and his associates of Philadelphia. In this group of patients the severity of the diabetes cannot be measured by the units of insulin taken so long as excess body weight is present. The respiratory studies in this report are of particular interest and are in agreement with studies on the respiratory quotient in similar groups of patients in indicating that the obese middle-aged person with diabetes of mild degree can oxidize dextrose. The diabetic condition must be due to a difficulty in glycogen formation and storage. Whether this difficulty concerns only hepatic glycogen remains a problem. Not all obese persons of middle age are diabetic, and not all show dextrose tolerance curves indicative of even potential diabetes. The group of patients included in this report have been shown to be definitely diabetic while obese. They become aglycosuric, with a normal amount of sugar in the blood so long as they follow such dietary restrictions as maintain an ideal weight. When these restrictions are not followed, loss of diabetic control results. The use of the word "cure" may subject the authors to some criticism, since the diabetic condition would appear to be present even with the perfect control of weight. This group of obese diabetic persons of middle age does not include all patients with diabetes of the insulin-resistant type. During my early studies with protamine insulin, sixty-two juvenile diabetic persons were under observation, and twenty-five of these were definitely of the insulin-resistant group. Also, among middle-aged patients with insulin-resistant diabetes will be found some who do not come under full diabetic control with reduction of body weight. These patients, in whom the diabetes appears to be more severe, will still require the help of insulin after weight has been reduced. However, the insulin requirement after reduction of weight may be small, and the diabetes may show more even control than before. It is possible that the persons with more severe insulin-resistant diabetes may have some defect in oxidation of dextrose as well as the decreased ability to store glycogen.

DR J. W. SHERRILL, La Jolla, Calif. The members are indebted to Drs. Newburgh and Conn for calling attention to this classification which they have made in diabetics. They have described relief from diabetic symptoms in this type which might be classified as the potential or prediabetic type. This work helps to explain the mildness of this condition which was recognized formerly as the prediabetic type. This differs remarkably from the true diabetic as well as the juvenile type, in that the patients preserve the ability to oxidize dextrose. If the definition of diabetes, that it is a condition in which there is failure to utilize dextrose, is to be adhered to carefully, then it cannot be said that this type would be classified as diabetes. Studies with the respiration chamber show a normal ability to oxidize dextrose. The group differs from normal persons only in that they are unable to clear their blood in normal time. Drs. Newburgh and Conn have demonstrated in graphic form the well known factor in diabetic treatment, namely, that reduction of body weight or body mass increases ability to burn dextrose and carbohydrate tolerance. Certainly they have shown that the reduction of obesity is the mechanism whereby they obtain normal tolerance curves and the ability to metabolize a normal diet. Nevertheless, physicians must still be cautious, as these persons probably have an impairment of insulogenic function. It is well known that the standard carbohydrate tolerance tests of a group of obese persons in the

15 Conn, J. W., Newburgh, L. H., Johnston, Margaret W. and Sheldon, J. M. A Study of Deranged Carbohydrate Metabolism in Chronic Infectious Hepatitis. Arch. Int. Med. 62: 765 (Nov.) 1938.

normal population reveal impaired curves in direct relation to the duration of obesity. Therefore, before the 'void cure' can be used in this instance these patients would have to be studied several years hence say ten years, because possibly it is not the obesity itself which has produced this decrease in carbohydrate tolerance but a deficiency in pancreatic function. One can hardly get away from this factor because by permitting these persons to become obese again impairment in their carbohydrate tolerance can still be demonstrated. It would be well to keep in mind that the duration in years may bring about diabetes of a more specific character in this group. This contribution will be helpful particularly from the insurance angle for the group of persons who have been denied insurance in the past. It may permit them to obtain insurance to which they are entitled.

DR FRANK N. ALIAN, Boston. Every one will agree with the facts presented by Drs. Newburgh and Conn and will feel pleased to see these results. Yet I share the opinion that their conclusions cannot be accepted without challenge. Can one say that diabetes has been cured simply because tests for blood sugar made after treatment give negative results? One would not say that heart disease is cured when signs of decompensation disappear. I think the authors should be asked to report the fate of these same persons twenty years from now or even five years from now. It is not uncommon to find that diabetes which has become latent will cause trouble later on as a result not only of neglect but of the strain of infection or other misfortune. Can one say that these patients do not have real diabetes simply because of inability to demonstrate any change in oxidation in the body? The difference may be only a matter of degree. Diabetes of only the slightest degree now may become so severe as to endanger life later on, particularly if the condition is aggravated by infection. Let this report be accepted as confirming the favorable prognosis which may be expected in diabetes associated with obesity. That gives hope and encouragement. But the diagnosis of diabetes should not be abandoned; this will surely lead to neglect and eventually to disastrous results.

DR J. W. COON, Ann Arbor, Mich. We were unable in the time allotted to discuss some of the points brought up. The question that Dr. Smith raised is this: Do all obese middle-aged persons have some degree of this disturbance in the metabolism of carbohydrate? If this disturbance is due to obesity, it should be found in all middle-aged obese persons. A large number of dextrose tolerance tests done by Kisch, Paulin and Sauls and by John indicate that from 60 to 70 per cent of all of these apparently normal people without glycosuria have lessened dextrose tolerance. The work of Ogilvie seems to answer the question of why the other 30 to 40 per cent of obese people gave a normal response. He found that impaired tolerance was related to duration rather than to degree of obesity. Thus, after eighteen years of obesity every patient in his series showed diminished dextrose tolerance. I should like to answer Dr. Sherrill's question regarding the prediabetic state. One considers the so-called prediabetic state that in which the patient shows a diabetic type or a tendency toward a diabetic type of dextrose tolerance curve but does not have sufficient rise in the sugar content of the blood to cause spontaneous glycosuria. When a patient has spontaneous glycosuria and a diabetic type of curve, he is called diabetic. The obese patients with glycosuria that we have described do not fall into the group considered by some to be prediabetic. Our group comes to the clinic with heavy glycosuria, a blood sugar value during fasting as high as 350 mg. per hundred cubic centimeters and a dextrose tolerance curve rising as high as 550, and after reduction of weight the dextrose tolerance test is normal. After the weight becomes normal these patients are not given diets. They are told to eat whatever they care to eat, candy, ice cream, potatoes and bread. They are simply instructed that they must not gain weight. Under this kind of a regimen, these patients have remained aglycosuric and have shown normal dextrose tolerance for two years thus far. Regardless of all theoretical considerations, the fact remains that obese middle-aged persons with glycosuria hitherto diagnosed and treated as true diabetes mellitus can regain and retain the normal metabolism of carbohydrate by simple reduction of weight to normal.

SPREADING PERITONITIS COMPLICATING ACUTE PERFORATIVE APPENDICITIS

ROUTINE OPERATIONS VERSUS SCIENTIFIC MANAGEMENT

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Routine defined means any regular course of action or procedure adhered to through force of habit.

Fifty-three years ago Fitz described acute appendicitis, and since then opinions and procedures of surgeons adhered to through force of habit have been responsible for the major part of the management of patients suffering with this disease and its complications. No more striking illustration of this fact can be found than what is called the mortality of acute appendicitis. During these five decades, thousands of articles have been written about it, eminent men who are relied on for accurate statements regarding the mortality of the disease have used the term, but there is practically no mortality from acute appendicitis. One in 183 dies. Patients die of peritonitis, not appendicitis.

Likewise because of force of habit surgeons have not discussed with physicians the problem of spreading peritonitis complicating acute appendicitis. Physicians

TABLE 1—Mortality of Appendicitis and Appendical Peritonitis

	No. of Cases	Deaths
Acute appendicitis	12,259	67—1 in 183 died
Acute appendicitis with local peritonitis	3,835	88—1 in 44 died
Acute appendicitis with spreading peritonitis	2,573	694—1 in 4 died
Total	18,667	849—1 in 22 died

know that the mortality of acute appendicitis as reported throughout the United States is anything from zero to 5 per cent. Do they know that the gross mortality of spreading peritonitis is from 27 to 50 per cent? According to Hoffman, the average mortality rate of appendicitis per hundred thousand in Philadelphia was 134 from 1928 to 1933. During the same period in the United States it was 171. The average mortality of spreading peritonitis in Philadelphia was 26.97 per cent. According to this ratio it must have been at least 33 per cent throughout the United States.

Have surgeons told physicians that the surest method of reducing the mortality of spreading peritonitis is to send to hospitals patients whose appendices have not ruptured?

In Philadelphia, the third largest city in the United States, with a population of over two million, a prophylactic campaign has resulted in a reduction in the number of patients with perforated appendices admitted to twenty-eight hospitals, with a corresponding reduction in the mortality for appendicitis of from 5.97 to 3.54 per cent. Three hundred and sixty-five surgeons have managed a gradually diminished number of patients with spreading peritonitis, but in the last four years the mortality has not been materially reduced.

Are surgeons and not physicians responsible for this situation? Is it significant that during the past fifty years the number of articles on acute appendicitis published in reputable medical and surgical journals in

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the United States and England exceeded the number on spreading peritonitis by 500 per cent? Would not the American Medical Association be justified in suggesting to the editors that they refuse articles on acute appendicitis for publication? Furthermore, would it not save time and a great deal of money if all labora-

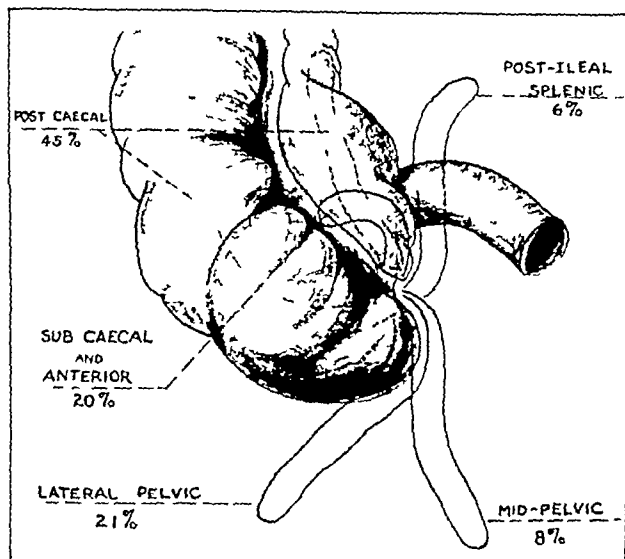


Fig 1—Location of forty-six perforated appendixes that were the cause of spreading peritonitis

tories would stop sectioning appendixes? Millions of sectionings are done each year, and what good comes of them? What do patients die of? Not what is seen within the confines of a serous membrane by the microscopist and not what is seen at postmortem examination by the pathologist, but what is not seen at operation by the surgeon

Is it true that patients die of what the surgeon does not see at operation? Figure 1 shows the location of forty-six perforated appendixes that were the cause

TABLE 2—Comparative Mortality of Appendicitis and Spreading Peritonitis

	Appendicitis Mortality per 100,000	Spreading Peritonitis Mortality, Percentage
Philadelphia	13.4	26.97
United States	17.1	?

of spreading peritonitis, in each case the process was permitted to localize, the abscess was drained and the patient was discharged from the hospital and readmitted later when the appendix was removed. With a spreading process, how much can one actually see with any type of incision?

When an appendix perforates and the reactive capacity of the patient is within normal limits, resultant gross tissue changes can, for practical purposes, be divided according to three zones, a central, a middle and a peripheral (fig 2). In the central zone, part or all of the perforated appendix is found, partially or completely covered by omentum or by fibrinous or fibrinopurulent exudate, in the middle zone the cecum and adjacent loops of ileum and omentum approximated and partially covered with plastic exudate, are found, and in the peripheral zone the changes are indetermi-

nate. The central zone and usually part of the middle zone are visible. The peripheral zone should not be seen. What happens to the patient is determined there in the front line trenches, where micro-organisms invasion either advances or is checked by processes which must not be disturbed.

The greater the number of explorations of the peripheral zone, the higher the mortality. Table 4 illustrates this point. In twelve hospitals during one year, 171 patients with spreading peritonitis were operated on an average of fifty-seven hours after the onset of symptoms, in 164 cases or 95.7 per cent.

TABLE 3—Mortality for Appendicitis and Spreading Peritonitis

Year	Appendicitis		Spreading Peritonitis	
	Perforated Percentage	Mortality Percentage	Admitted Percentage	Mortality Percentage
1925-1929	42.06	5.97	13.4	1.93
1930	11.4	4.01	15.2	26.37
1931	3.0	4.9	1.62	24.4
1932	29.62	1.44	12.80	22.10
1932	26.25	3.34	12.63	24.61

the appendix was removed. Of the patients operated on, 37.4 per cent died. This table indicates that the mortality of spreading peritonitis increases with the radius of activity of the surgeon.

Figure 3 shows what happens when the peripheral zone of the spreading processes is explored. Approximately 85 per cent of the appendixes were removed in this series. The horizontal line represents the day of disease. The vertical line represents the percentage mortality, which is 20 for the first twenty-four hours, it increases consistently to 36 on the fifth day, drops to

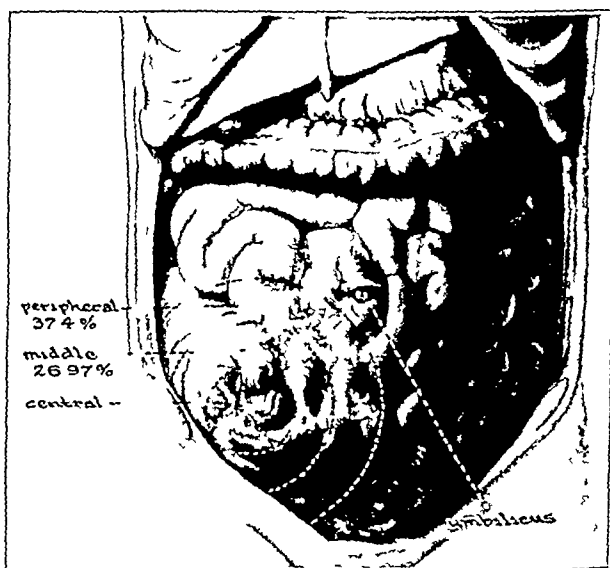


Fig 2—The three zones of gross changes in the tissue

35 on the sixth, and then to 26 on the seventh day. Of the 2,573 patients operated on, 694, or 26.97 per cent, died.

In direct contrast to the results following radical surgical intervention are those obtained when immunologic processes are permitted to develop undisturbed.

Of 18,687 patients who had acute appendicitis and were admitted to the twenty-eight hospitals, 3,855, or

20.63 per cent had a localized abscess and only eighty-eight, or 2.28 per cent, died. A majority of the eighty-eight died because the localized process was markedly disturbed at operation, they died because the appendix was searched for or removed, they died because a localized process was converted into a spreading one, they died of induced spreading peritonitis. This statement requires an explanation.

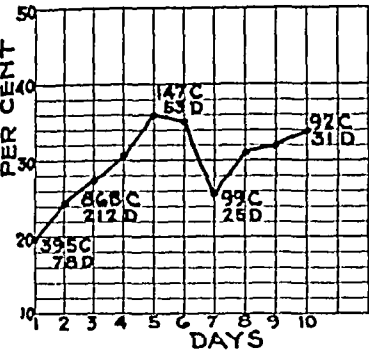


Fig. 3—Mortality of spreading peritonitis in 2573 cases (from 1928 to 1933) twenty four hour groups. C cases, D deaths.

On the clinical records of over 90 per cent of those who died, the cause of death is written by the intern was the same as the diagnosis on admission, local peritonitis. Patients rarely die of acute appendicitis and they seldom die of local peritonitis, they die of spreading peritonitis. The records showed that after operation hyperpyrexia, tachycardia and inflammatory ileus developed, the patients died of induced spreading peritonitis.

The following years show a reduction in the mortality of local peritonitis from 3.79 per cent to 0.93 per cent, or over 400 per cent because of the fact that surgeons had fewer patients to manage and the patients admitted with a local abscess which was later converted into a spreading process by operation were placed in the group where they belonged, that of spreading peritonitis.

Another factor in the low mortality of the localized abscess is the result of immune processes, the local manifestation of which is the formation of an abscess.

TABLE 4—Routine Operations and the Mortality of Spreading Peritonitis

Hospitals	Spreading Peritonitis			Appendix Removed Percentage	Average Hour Between Onset and Operation
	No. of Cases	Deaths	Mortality Percentage		
12	171	64	37.4	90.7	57

wall. The experienced surgeon limits his operative procedures to its confines, he will not remove an appendix that extends beyond or forms a part of this wall.

I wish to call attention to another wall, a wall that is thin, a wall that is difficult to see and hence is frequently disrupted, a wall that encloses a process in which the micro-organisms are virulent. I refer to a wall formed by omentum and the peritoneal surface of contiguous intestine cemented together with plastic exudate, this wall forms the outer boundary of the localizing process in the center of which is an appendix. This process is responsible for 10 per cent of the 27 per cent mortality of spreading peritonitis in Philadelphia.

Both the abscess and the localizing process are nature's attempts to cure an infection, the stage of immunologic development is the main difference. In the localized abscess not only is there a well developed wall but the tissues forming the wall and those contiguous to it have developed an immunity and in a large percentage of cases antitoxin is circulating in the blood stream.

In the localizing process the wall of protection is in the formative stage, as are local and general immunity.

TABLE 5—Mortality, Local Peritonitis

Year	No. of Patients Admitted with Acute Appendicitis	Local Peritonitis		
		Number Admitted	Admitted Percentage	Mortality Percentage
1928-1929	121	102	28.38	3.79
1930	362	625	20.19	1.76
1931	342	618	19.66	1.82
1932	346	572	16.13	0.89
1933	373	438	14.22	0.93
	18687	3855	20.63	2.28

If this localizing process is not disturbed it will develop into a localized abscess and the patient will be protected by fully developed immune processes, but if it is disturbed, if the appendix is removed, in most instances spreading peritonitis will be induced and the patient has one chance in four instead of one chance in forty-four of dying, a difference of 1,100 per cent.

The appendical abscess in its formative stage—the localizing process cannot be successfully managed as if

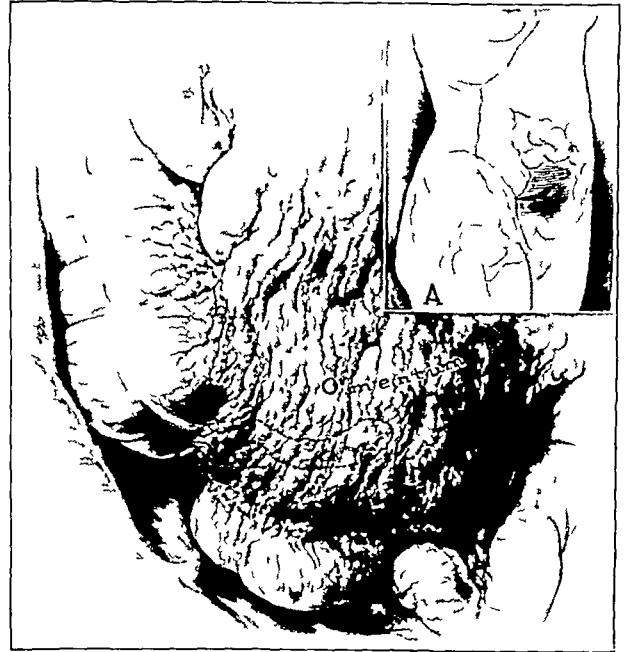


Fig. 4—Localized abscess

it were a fully developed abscess—the surgeon, when he suspects an early perforation or when he inadvertently encounters one, must think before he proceeds. He must substitute for routine procedures a management based on a workable knowledge of immune processes, he must know about antigens and antibodies and the part they play in the mortality of appendical

peritonitis Before he separates adherent loops of intestine before he pushes omentum aside, before he inserts his finger into a developing abscess he should know that he is injecting into the blood and lymph stream a dose of antigen that kills one in every four to ten patients A dose of strychnine for adults is 0.015 Gm the lethal dose is 0.2 Gm The lethal dose

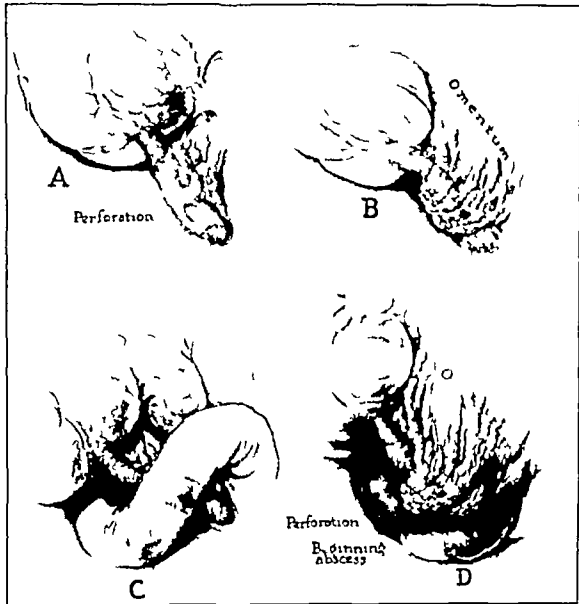


Fig. 5—Wall formed by omentum and the peritoneal surface of contiguous intestine cemented together with plastic exudate

of the antigen which the surgeon is about to give the patient is approximately the same as the lethal dose of strychnine, 0.013 Gm will kill ten pigeons each weighing 350 Gm

Figure 6 shows what happens to patients with appendical spreading peritonitis who received the lethal dose of *Clostridium welchii* toxin and other bacterial antigens Hyperpyrexia, tachycardia and delirium

TABLE 6—Standardization of *Perfringens* Antitoxin Prescribed by the National Institute of Health

0.013 Gm of <i>Clostridium welchii</i> toxin plus 1 cc of perfringens (welchii) antitoxin
Incubated forty five minutes at 37 C and injected into the breast of a pigeon should cause death within twenty four hours
Weight of pigeon 350 Gm
0.013 Gm of <i>Clostridium welchii</i> toxin is equivalent to ten minimal lethal doses

develop and the patient dies How many patients die like this? A large percentage of the 18,000 who die each year in the United States at the average age of 27 The patient whose chart is shown in figure 6 received three doses of antigen, the first was absorbed from the mucous membrane of the serosa-intact appendix, the second when the appendix perforated and the third when I searched for and removed a leaking appendix, the last dose being given when the patient was in the so-called negative phase

Figure 7 shows what happens when a patient receives two doses of antigen but is not operated on in the negative phase This patient received one dose before rupture and one at the time of rupture but not the third, because I placed the drain down to but not into

the localizing process At the second operation for removal, the appendix could not be found, it was completely absorbed

How do I know that what I have said about antigens is true? Because my associates and I have titrated the blood serum of patients who have recovered from spreading peritonitis and the peritoneal exudate removed from patients having unruptured acutely inflamed appendices

In the titration of both serum and exudate the technique prescribed by the National Institute of Health was carried out at the Mulford Biological Laboratories of

TABLE 7—Summary of Experimental Work on the Titration of Blood Serum for *Clostridium Welchii* Antitoxin

	Number of Patients	Number Showing Antitoxin	Incidence of Antitoxin Percentage
In normal health	10	0	0
Recovered from acute appendicitis	9	2	22.22
With acute or quiescent pelvic peritonitis	15	7	46.66
With or recovered from spreading peritonitis complicating acute perforative appendicitis	34	24	70.59

Sharp and Dohme A 350 Gm pigeon was given a toxin-antitoxin mixture containing 10 minimum lethal doses of *Clostridium welchii* toxin and 1 cc of antitoxin This should result in the death of the pigeon within twenty-four hours

The control pigeons those that received the toxin antitoxin mixture plus 1 cc of normal serum, died We then added to this toxin-antitoxin mixture 1 cc

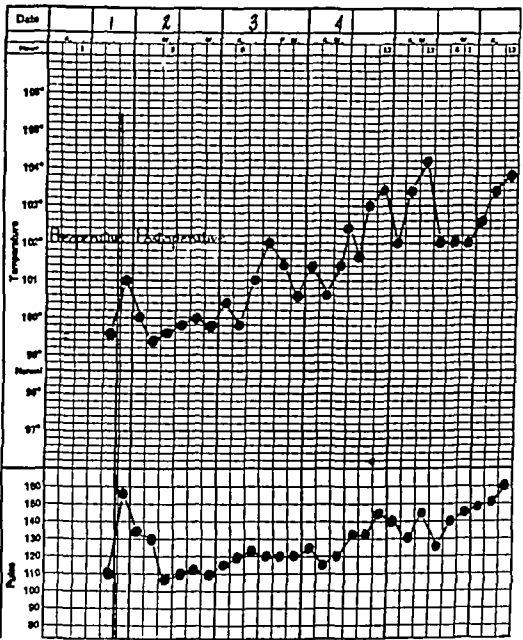


Fig. 6—Clinical chart of a patient who received the lethal dose of *Clostridium welchii* toxin and other bacterial antigens

of serum from patients who had recovered from acute appendicitis, 22.22 per cent showed the antitoxin of *Clostridium welchii* in their blood serum, with another group 1 cc of serum from patients who had recovered from pelvic peritonitis was added to the toxin-antitoxin mixture, and 46.66 per cent showed antitoxin in their

serum. Finally we removed the serum from patients who had recovered from appendical spreading peritonitis and antitoxin of *Clostridium welchii* was present in 70.59 per cent. One patient in the last group had had spreading peritonitis nineteen years previously.

We then titrated the peritoneal exudate removed from patients suffering with acute appendicitis and

cularly. The mortality was 15.39 per cent. In a second group, forty-six patients, operation was deferred for 196 hours. They were given the Ochsner routine before and after operation and were given perfringens antitoxin in addition to dextrose in saline solution intravenously. The mortality for the group of forty-six patients was 6.52 per cent and for the ninety-eight patients 11.22 per cent.

Figure 8 shows the opening of the localized abscess from the roof, which is usually done with local anes-

TABLE 9—*Lavative-Induced Spreading Peritonitis Complicating Acute Perforative Appendicitis*

	Number of Patients	Hours Between Onset of Symptoms and Operation	Perfringens Average Dose, Cc	Mortality Percentage
Immediate operation	52	54.60	44.73	15.39
Delayed operation	46	196.10	44.91	6.52
	98	122.62	44.82	11.22

thesia. After separating the fascia and muscles, the index finger palpates the mass beneath. If it is not resilient, one assumes that there is an abscess beneath and it is opened. If, however, the mass appears to be intestine, palpation is continued, the incision closed and a second made over the suspected point of contact of the abscess with the peritoneum.

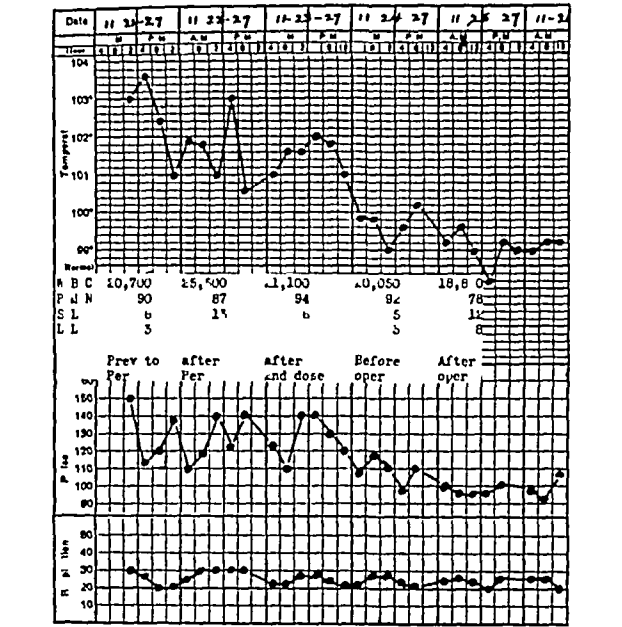


Fig. 7—Clinical chart of a patient who received two doses of antigen but was not operated on in the negative phase.

found that this fluid contained antitoxin to the toxin of *Clostridium welchii* in 33.33 per cent of instances.

The exudate for the first titration test was removed from the peritoneal cavity ten and one-half hours after the onset of the patient's second attack of appendical colic. It contained sufficient antitoxin to save the lives of three pigeons. The blood serum was then titrated,

TABLE 8—*Summary of Experimental Work on the Titration of Peritoneal Exudate for Clostridium Welchii Antitoxin*

	Number of Patients	Number Showing Antitoxin	Incidence of Antitoxin Percentage
With acute appendicitis	15	5	33.33

and it also contained sufficient antitoxin of *Clostridium welchii* toxin to save the lives of three pigeons.

These and other investigations, reported elsewhere, have resulted in a management of appendical spreading peritonitis which has for its basis the development and the preservation of local and general immunity. Briefly, it is the Ochsner routine, used until localization occurs, the giving of perfringens antitoxin and lyophile peritonitis convalescent serum, and the opening of the abscess from the roof.

Table 9 shows the results obtained in the management of ninety-eight patients with appendical spreading peritonitis. Fifty-two of these patients were operated on immediately after admission, an average of 54.6 hours after onset. In addition to dextrose given intravenously in physiologic solution of sodium chloride, they were given 44.73 cc of perfringens antitoxin intramus-

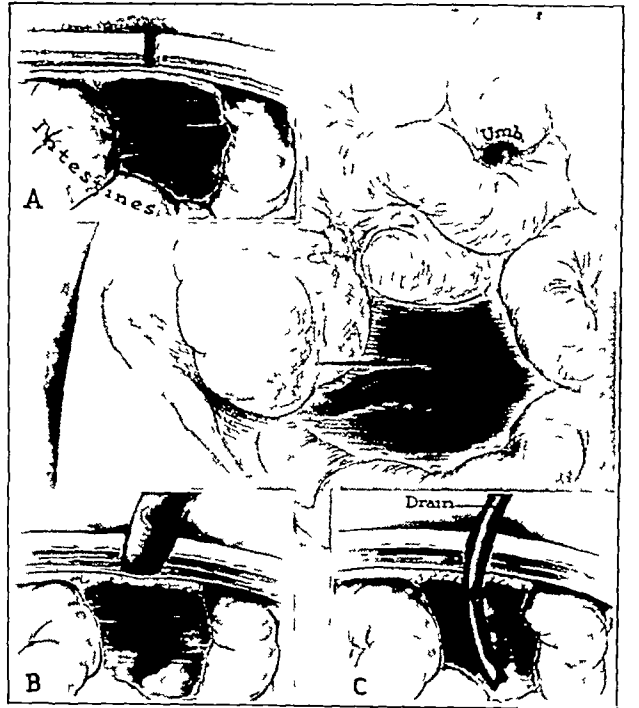


Fig. 8—Opening of the localized abscess from the roof.

The number of patients treated with lyophile peritonitis convalescent serum is not sufficiently large to report at this time.

SUMMARY

Routine operation as it pertains to the management of acute appendicitis and its complications should be limited to the nonperforative appendix. When the serous coat is intact, it makes no difference whether



the inflammation in the tissue beneath is catarrhal, suppurative or gangrenous, only one patient in 183 dies

Scientific management based on the development and the preservation of local and general immunity should be carried out when the serous coat of the appendix is ruptured

2008 Walnut Street

#### ABSTRACT OF DISCUSSION

DR HAROLD P. TOTTEY, Los Angeles My conception of the progress of peritonitis following perforation differs somewhat from that expressed by Dr Bower. It has been my experience that, while deferred operative treatment with a strict Ochsner regimen is a valuable procedure, it is not without hazard. It is well to remember that removal of the source of peritoneal contamination is one of the fundamental requirements in the treatment of perforative peritonitis from any source. Cases showing evidence of localization with abscess formation when first observed are best treated by operation deferred until about the seventh or eighth day, when surgical intervention may be safely undertaken. This period is early enough to avoid late complications. In the case of spreading peritonitis, however, a different situation obtains. The condition is progressive and it is very difficult to tell with any degree of certainty what course the disease will take or how effective expectant treatment will be in causing a subsidence or localization of the inflammatory process. Furthermore, there are a number of cases in which perforation takes place at the appendiceal base so that there is a continuous gross peritoneal soiling, and death will ensue from local peritonitis unless the leak is stopped, irrespective of the condition of the general peritoneal cavity. In view of these considerations and in the absence of evidence of localization or subsidence, granting that the condition of the patient permits, I have felt that surgical intervention is indicated after a reasonably brief period of observation and preparation. By adequate preparation and reduction of the surgical procedure to its simplest form, the range of operability may be increased to a maximum. Spinal and local anesthetics are to be preferred. Too much stress cannot be placed on the value of the McBurney incision. Placed just medial to the anterior superior iliac spine, it permits one to perform the operation practically as an extraperitoneal procedure if there is a tendency toward the formation of protective adhesions and if the appendix is readily accessible. If the appendix is not accessible, simply incision and drainage are indicated. Drainage is accomplished by the use of soft rubber tissue Penrose drains inserted along the parietal peritoneum and not between intestinal coils. Placed in this manner they will not disturb protective adhesions nor will they act as a source of intestinal obstruction. In severe infections the wound is closed by suturing the peritoneum loosely about the drains. This procedure aids drainage and combats the growth of anaerobic organisms. Enterostomy as a primary procedure is a life-saving measure in the treatment of intestinal obstruction incident to peritonitis and is indicated in cases that are potentially obstructive. Its use has been largely superseded by the Levine tube with suction except in cases that are obviously dynamic in character.

DR DAVID A. WILLIS, Chicago When a diagnosis of appendicitis has been established, with the exception of appendiceal abscess or definitely localizing cases past seventy-two hours, I have seldom delayed operation for I have too frequently been deceived by the pathologic signs in their relation to the symptoms. This seems particularly true in children, in whom the localizing ability is distinctly diminished. It is not surprising to discover in the child after a week's illness a suppurative appendix practically unprotected by omentum or adjacent bowel. Under such circumstances a ruptured appendix continues to pour out virulent organisms with which the peritoneum cannot long cope. In my series of cases of ruptured appendicitis the mortality rate has been distinctly lower than the average despite the fact that over a period of fifteen years I practically always closed the abdomen without drainage. I do, however, through an approach very close to the anterior superior iliac spine always attempt to limit the operation to the central zone. In an analysis of the cases of ruptured appendicitis treated by a number

of surgeons, it was found that the relation of the age of the patient to the mortality rate and the nature of death presented features strikingly common to all. Though about 35 per cent of the cases of ruptured appendicitis were represented by children under 10 years of age, the great majority of deaths resulting from this condition occurred in this class of patient. In a series of cases of appendiceal abscess it was found that though children represented approximately one third of the total number of cases they actually accounted for nearly all the deaths and produced a mortality rate of 40 per cent for their own class. Another significant fact was that the manner of death in these so-called abscess cases in children was similar to that following nondelayed operation for ruptured appendicitis. The child immediately after develops a rapidly rising temperature and pulse and dies within twelve to twenty-four hours with what appears to be an acute vasomotor collapse due to acute toxemia. Experience indicates two things: first, that the appendiceal abscess in the child may be more apparent than real and as such makes questionable the advisability of delayed operation. Second, that the child with ruptured appendicitis succumbs quickly to the toxin in delayed and nondelayed operation and suggests the urgent necessity of a measure to combat the acute toxemia. If these observations are correct, then in view of Dr Bower's remarkable success in lowering the mortality rate a slight delay for immunizing purposes with a substantial amount of antitoxin and lyophilic serum in addition to the usual preoperative measures may be the course to follow.

DR W. D. HAGGARD, Nashville, Tenn. The prompt operation for acute appendicitis in the early hours is ideal. Operation for spreading peritonitis is often ill advised and yields frightfully high mortalities. Many surgeons are swayed by the general feeling among the profession that a patient with appendicitis must be operated on whenever he is seen, irrespective of the duration and no matter how severe the complications. When used as an ironclad indication for operation it is pernicious. We are using our poorest surgical judgment in the fear of an evil result without operation. Many of us have called attention to the fact that the dangerous delayed third, fourth and fifth day cases of peritonitis should be delayed for preparation and to let nature accomplish her wonderful biologic protection. Taking the appendix out in the presence of spreading or generalized peritonitis is like rescuing the overturned lamp that has set the house on fire. The chemical engine is better. This new antitoxin will be welcomed. This scientific addition is to amplify what nature is doing for the patient and will give us something to do while anxiously awaiting improvement before operation. I have advocated delayed operation in delayed cases of appendicitis for some years. One can open a ten to fourteen day appendiceal abscess practically extraperitoneally and almost all the patients will get well. If we intervene before nature has partially or completely walled off the process we are interfering at a notoriously inopportune time. No wonder our mortality is above 25 per cent. Having seen how the unmolested peritoneum encapsulates an acute appendiceal process and neutralizes infections by the antitoxin, local and general, that the patient himself manufactures, we shall be greatly heartened to refrain from injudicious operation and utilize this new antitoxin against micro-organisms that the patient cannot neutralize unaided. We should give this antitoxin in the advanced, neglected, delayed cases the third, fourth and fifth day, giving every other supporting and preparatory treatment. I believe the best thing Dr Bower has told us is not to give the third and fatal dose of the toxin with the operating finger, give it in a hypodermic

DR JOHN OSCAR BOWER, Philadelphia There is a difference between individual and hospital mortality. I am sure that most surgeons have a very low mortality individually but the mortality that I have reported is hospital mortality and there is a great difference. The mortality of 365 surgeons in Philadelphia operating on 18,000 patients with spreading peritonitis is 27 per cent. I know that every man here will say that his individual mortality of spreading peritonitis is much lower than that. One thing that has been brought out in the discussion is the seriousness of the management of this disease in children. The general conception is that one should treat children differently from adults. I have not found it so. Children develop antitoxin just as adults do and localize in the same way. I put in drains after



they have localized, give dextrose and saline solution intravenously and antitoxin or convalescent serum or both. I know definitely that 60 per cent of the patients who recover from spreading peritonitis have the antitoxin of *Clostridium welchii* in their blood serum. What other antibodies they have I do not know. So far as the mortality in the age group is concerned, the average age of those here today is between 40 and 50, no matter what type of appendicitis develops, the death rate is just about 10 per cent. The mortality between 60 and 70 is about 50 per cent. Close without drainage? No, I do not believe that is the right thing to do. There are many reasons why I believe this is not indicated. Mention was made of the removal of the drains. I believe that the drains should be permitted to remain in seven days at least. I have reviewed many cases in which the removal of the drains has converted a localizing process into a spreading one. I use the McBurney incision. I do not believe that the so called leaking appendix is hazardous; it is not common. It must be remembered finally that patients recover from spreading peritonitis just as they do from pneumonia or a cellulitis. They recover because they develop a local and general tissue immunity.

## THE ACTION OF MEASURED DOSES OF EIGHT HUNDRED KILOVOLT ROENTGEN RAYS

ON CARCINOMA OF THE UTERINE CERVIX

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AND  
JOHN F. SHEEHAN M.D.  
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The solution of the problem of adequate control of carcinoma of the uterine cervix by irradiation with roentgen rays in the region of 800,000 volts comprises the study of the clinical aspects of the disease and the etiology, the pathology and the symptomatology, including the extent of the disease and the action of the radiation on the tumor and the cancer cells. The investigations reported in this communication are confined to the last two factors. It may be assumed that the degree of macroscopic and microscopic changes is dependent on the dose of radiation. These changes take place during treatment and continue for some time afterward until arrest of the cancer has or has not been attained. The observations to be reported include, therefore:

1. A consideration of the factors used in the production of the radiation which determine the intensity or quality of radiation and the duration in time of the application. The dose of radiation is the product of intensity and time.

2. A study of the visible changes taking place in the tumor. The desired local reaction is complete absorption of the tumor, leading to complete anatomic recovery with normal epithelization of the portio.

3. A study of the microscopic changes occurring in the cancer cells. Lysis of all cancer cells and not incarceration of viable carcinoma cells within dense connective tissue should be the goal.

Therefore, the dose of radiation, the local visible and palpable changes in the tumor and the microscopic reactions in the cancer cells will be discussed. The investigations were arranged so that records were kept of the dose of radiation applied in the midpelvis, of the

local conditions found on examination and of the changes seen in the carcinoma cells at stated intervals. The duration of treatment was four weeks, and reexaminations were made at eight day intervals during and at fifteen or thirty day intervals after treatment. The cases were not selected but taken in rotation. Therefore, the report represents all clinical groups according to the classification established in our institute.

### THE DOSE OF RADIATION

The favorable results of irradiation depend on many factors, such as the histologic index of malignancy, the sensitivity or resistance to radiation and the dose of radiation applied at the periphery of and within the tumor.

The dose of radiation is the product of the quality or intensity of radiation and the duration of application.<sup>1</sup> The factors used in the production of the roentgen ray determine the quality. They were 800 kilovolt maximum obtained from a double pulsating Villard current, a load of 10 milliamperes on the x-ray tube, which is rendered gas free by oil vacuum pumps, a water cooled tungsten target, a filter equivalent to 10 mm of copper, a focal skin distance of 70 or 86 cm, field sizes varying from 10 to 20 square centimeters, and a half value layer of 8.2 mm of copper, corresponding to an average wavelength of 0.028 or a minimum wavelength of 0.0128 angstrom unit. The output of roentgens per minute measured with a thimble chamber was 36 roentgens without and 44 roentgens with backscatter. The dose attained at a depth of 10 cm measured in a bakelite phantom is 54.5 per cent of the surface intensity if the size of the entrance field is from 300 to 400 square centimeters. The number of fields whenever practicable was two pubic and sacral. Since more than 90 per cent of the patients had an anteroposterior diameter of 23 cm or less, it rarely became necessary to use more than two fields. The amount of radiation required to produce a tolerance skin dose with 800 kilovolt roentgen rays is 4,000 roentgens if applied in ten fractions at forty-eight hour intervals. If two fields are used, the midpelvic dose is the same as that attained on the skin, or about 4,000 roentgens, at the lateral bony pelvic walls as well as in the midpelvis. The rate of recovery of the tissues after each fractional dose has not been subtracted. It is not as yet known what the rates of recovery of the normal in contradistinction to the abnormal tissues are. The dose attained within the pelvis after seven days was 1,000 roentgens, after fourteen days 2,000, after twenty-one days 3,000 and after twenty-eight days 4,000, with backscatter.

### THE LOCAL CHANGES

The local reactions of a carcinomatous cervix have been studied by Farrar,<sup>2</sup> Neef<sup>3</sup> and Stewart<sup>4</sup> among others after intracervical insertions of radium and by Ewing<sup>5</sup> after 200 kilovolt roentgen therapy. The reactions after the application of 800 kilovolt roentgen rays are practically the same. Within seven to ten days after the beginning of treatment hyperemia and capillary injection of the surface around the growth are seen.

1. Schmitz Henry. The Prevention and Treatment of Roentgen Injuries of Skin. *Am J Roentgenol* 38: 893 (Dec.) 1937.  
2. Farrar Lillian K. Reaction of Tissues to Radium in Treatment of Cancer of Cervix. *Surg. Gynec. & Obst.* 43: 719 (Dec.) 1926.  
3. Neef F. E. Principles and Technique Involved in the Present Day Treatment of Cancer of the Uterine Cervix. *Surg. Gynec. & Obst.* 53: 241 (Aug.) 1931.  
4. Stewart F. W. Radiosensitivity of Tumors. *Arch. Surg.* 27: 979 (Dec.) 1933.  
5. Ewing James. Adaptation as a Factor in the Cure of Cancer by Radiation. *Am J Roentgenol* 39: 165 (Feb.) 1938.

During the second week a whitish pseudomembrane covers the cervix, and after twenty-eight days necrosis appears leading to a blackish green discoloration of the bed of the growth. During the sixth to eighth week the necrotic tissue separates and is cast off, leaving a granulating surface. This is followed by epithelization

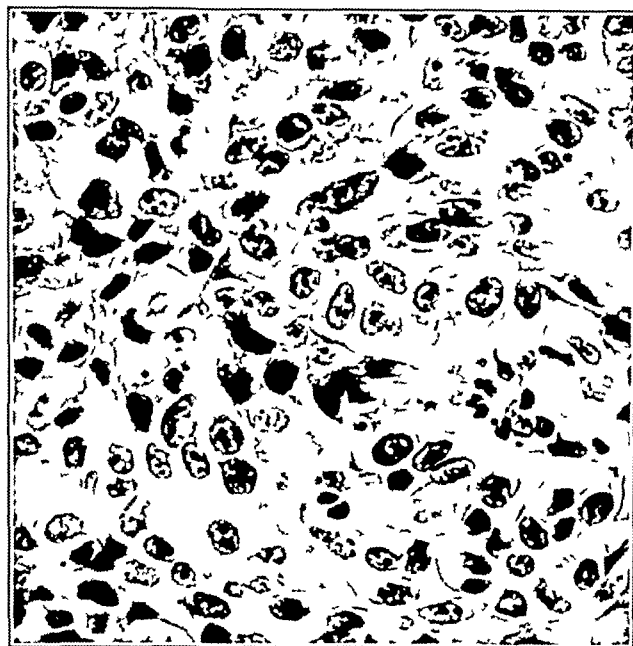


Fig 1 (case 14)—Transitional cell carcinoma after irradiation with 300 roentgens. Comparison with pretreatment biopsy specimen revealed only mild swelling of nuclei and cytoplasm. (Slightly reduced from a photomicrograph with a magnification of 500 diameters). All photomicrographs in this paper were made with the same magnification. Any change in the cellular or nuclear size is real and not the result of change in magnification.

when the prognosis is favorable and by persistence of granulation or friability of tissue when it is unfavorable. Biopsy alone can tell whether one is dealing with radiation necrosis, arrest of the growth of the tumor cells or recurrence or continuation of the primary carcinoma. Recurrence or persistence of the primary carcinoma means retreatment by irradiation. We prefer to use radium filtered with 2 mm of lead and 1 mm of aluminum or with 1 mm of platinum. The dose should be 1,500 mg element hours, repeated once or twice at intervals of eight days.

#### THE MICROSCOPIC CHANGES

Studies of microscopic changes in cancer cells due to radiation have been reported by Degrais and Bellot,<sup>6</sup> Schottlander,<sup>7</sup> Schmitz,<sup>8</sup> Alter,<sup>9</sup> Frankl and Amreich,<sup>10</sup> Neef<sup>3</sup> and Englmann<sup>11</sup> among others. The conclusions with regard to the significance of such changes, of course, vary. They should be based on the histologic index of malignancy, the grade of sensitivity or resistance to radiation and the dose of radiation. Inde-

quate doses may stun the cancer cells temporarily, adequate doses cause lysis of all tumor cells, overadequate doses may lead to temporary or permanent radiation necrosis.

The study of the microscopic changes due to 800 kilovolt 100tgen irradiation was made from biopsy material. Tissue was removed before the onset of treatment and thereafter every seven days, corresponding to tumor doses of about 1,000, 2,000, 3,000 and 4,000 roentgens. Thereafter, tissue was obtained at each follow-up examination, namely every fourteen days for the following three months. If epithelization or healing had ensued, the cancer was considered arrested. If granulation or friable tissue persisted, the biopsy would contribute to the diagnosis either of harmless granulations enclosing normal epithelial cells or of persistence or recurrence of the cancer. The biopsy specimens were obtained with a punch without the use of the cautery. They were spherical and approximately 4 mm in diameter. All specimens after the inception of treatment were fixed in Bouin's fluid and stained with hematoxylin and eosin.

Of the original twenty-five patients chosen for this study, eleven were discarded, some because they failed to cooperate, others because there was some question about the accuracy of the pathologic diagnosis made before admission to this clinic. The diagnoses for the remaining fourteen were as follows: transitional cell carcinoma for nine (three of these showed a few cornified cells and four others a few spindle cells), spindle cell carcinoma with cornification for three (two of these showed a mantle of transitional cells near the stroma, surrounding the spindle and cornified cells), spindle cell

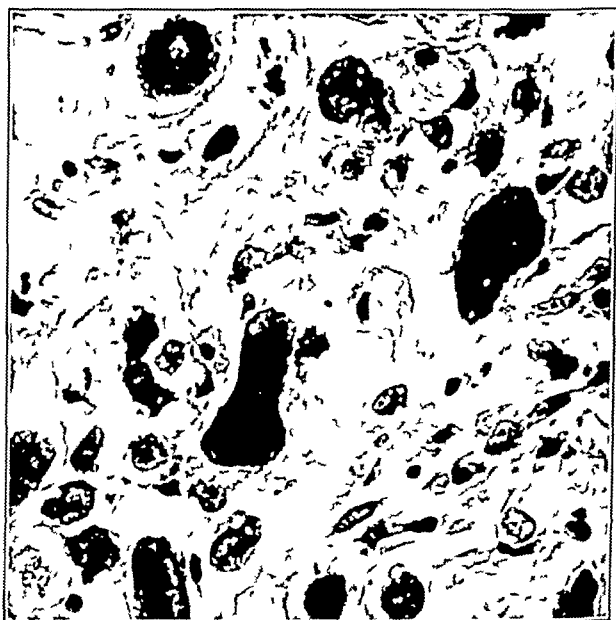


Fig 2 (case 14)—Section removed after irradiation with about 4,000 roentgens. Many bizarre nuclear forms are present; pyknosis is marked. (Slightly reduced from a photomicrograph with a magnification of 500 diameters.)

carcinoma for one (a few transitional cells were intermixed with the spindle cells), and adenocarcinoma of colloid type for one.

The changes noted in the carcinomas included (1) swelling of the cytoplasm and nuclei of the tumor cells, the cytoplasm staining palely basophilic and the nuclei becoming more vesicular with accentuation of the

<sup>6</sup> Degrais P and Bellot Anselm. Uteruskrebs und Radium. Klinische und histologische Beobachtungen. Strahlentherapie 5: 102 1915.

<sup>7</sup> Schottlander J. Zur histologischen Wertung und Diagnose der Radiumveränderungen beim Uteruskarzinom. Strahlentherapie 5: 644 1915.

<sup>8</sup> Schmitz Henry. The Action of Radium on Cancers of the Pelvic Organs. J A M A 65: 1879 (Nov 27) 1915.

<sup>9</sup> Alter N M. Histological Changes in Squamous Cell Carcinoma of the Cervix of the Uterus After Radiation. J M Research 40: 241 (Sept) 1919.

<sup>10</sup> Frankl O and Amreich I. Histological Changes Incident to Radium and X-Ray Treatment of Uterine Carcinoma. Surg Gynec & Obst 33: 162 (Aug) 1921.

<sup>11</sup> Englmann K. Die mikroskopischen Veränderungen an der Tumorzelle und den gesunden Geweben des Menschen nach Strahlenbehandlung. Die Röntgentherapie 1938 chapter 3 p 26.

nucleoli, (2) loss of regularity in the pattern of the tumor, with increasingly great variation in size, shape, structure and staining qualities of the nuclei, (3) increasing cornification in the masses of tumor cells predisposed to cornification, (4) relative increase in abnormal mitoses and increase in the number of cell

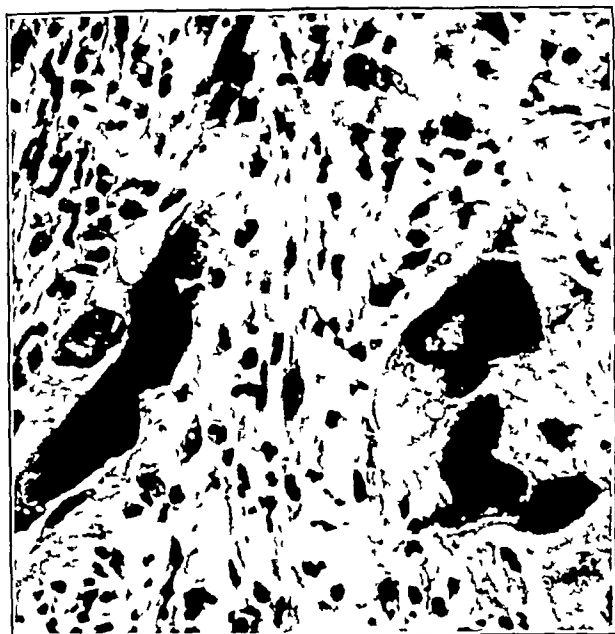


Fig 3 (case 14)—Section removed one week after completion of treatment (from 4,000 to 4,500 roentgens). Few tumor cells are present. The stroma is increased and the nuclei are enormous. There is marked irregularity of the nuclear contours and the nuclei are markedly hyperchromatic and pyknotic. A nucleus in the lower left portion of field persists as a basophilic smudge. Fine vacuolation of the cytoplasm is present in one cell. (Slightly reduced from a photomicrograph with a magnification of 500 diameters.)

monsters, i.e., cells with giant hyperchromatic nuclei or multiple nuclei, (5) obliteration of the boundaries of cells, (6) bizarre nuclear forms, with irregularities of the nuclear membranes, (7) karyolysis, particularly marked in cells with palely basophilic, swollen cytoplasm, (8) pyknosis, most marked in cells with giant hyperchromatic nuclei and rather deeply eosinophilic cytoplasm, (9) neutrophilic infiltration in partially or completely cornified masses of cells, (10) foreign body giant cells in apposition to masses of keratin, (11) fine and coarse vacuolation of the tumor cells, and (12) decrease in the size of sheets of tumor, with relative increase in the amount of stroma.

The changes in the fibromuscular coat of the cervix included (1) surface ulceration with necrosis and neutrophilic infiltration, (2) a zone of edema beneath this layer, with swelling of capillary endothelium and granulations, (3) swelling of collagen and ultimate hyalinization, often most marked around capillaries and arterioles, particularly in the deeper tissues, (4) necrosis of the capillary endothelium and the walls of the arterioles with thromboses, noted only at the margin of the necrotic surface, (5) swelling of collagen and hyalinization in the subendothelial tissues of the walls of the small arteries, with narrowing or occlusion of the lumens and rarely with thrombosis, more marked in the deeper vessels, and (6) atrophy of smooth muscle.

In the noncancerous cervical epithelium edema, vesiculation and desquamation of the stratified squamous epithelium were noted. Relatively little variation in the columnar epithelium was encountered.

The changes just enumerated showed a certain sequence in response to increasing doses of radiation. To make these more intelligible, a distinction must be drawn between cells with little or no tendency toward cornification and those with such potentialities. In the first group (group 1 cells) are included the spindle cells, the bulk of transitional cells and some of the spinal cells, notably those peripherally located in the sheets of tumor i.e. near the stroma. The second group (group 2 cells) comprises partially cornified cells and the spinal cells near cornified cells. Some transitional cells probably should be included here, as our observations seem to indicate direct cornification of some transitional cells without previous conversion into spinal cells. In general it may be said that cells of the first group, under the influence of increasing doses of radiation, have a tendency to assume either of two forms: (1) that of markedly swollen cells with palely basophilic cytoplasm, at times finely vacuolated and with single large vesicular nuclei or multiple small nuclei showing a trend toward karyolysis, and (2) that of large, even enormous cells, with giant hyperchromatic nuclei and rather dense eosinophilic cytoplasm, showing little vacuolation, the nuclei tending definitely to become pyknotic. These will be referred to hereafter as the large palely basophilic type and the large eosinophilic type, respectively.

The cells of the second group (prone to cornification) assume two main forms: (1) that of small cells with single or multiple bright red intracytoplasmic masses, apparently composed of keratin, and with small, distorted, compressed and even pyknotic single nuclei, and (2) that of larger cornified plates. Hereafter these will be combined under the term "cornified cells."

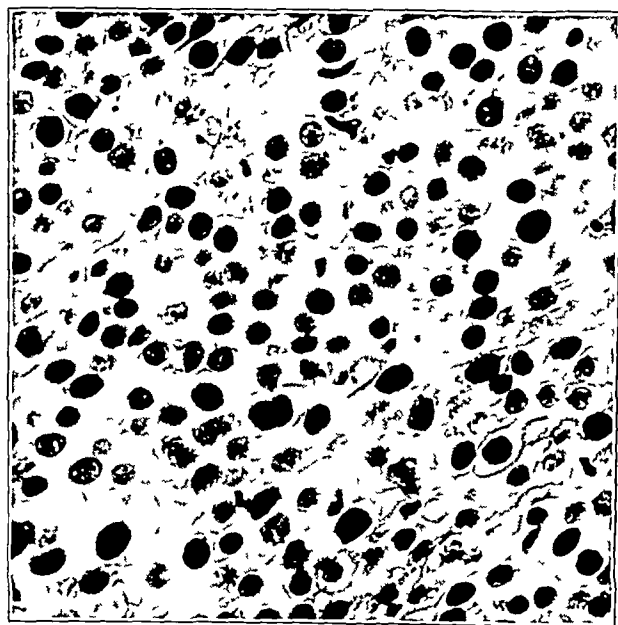


Fig 4 (case 22)—Transitional cell carcinoma after irradiation with 1,000 roentgens. The general pattern of an untreated tumor has been retained. Comparison with the pretreatment biopsy specimen revealed only moderate uniform swelling of the cytoplasm and nuclei. (Slightly reduced from a photomicrograph with a magnification of 500 diameters.)

By the end of the first week of therapy (after about 1,000 roentgens) the most notable change was rather uniform moderate swelling of the cytoplasm and nuclei of the tumor cells of group 1. The swollen cells had a palely basophilic, finely reticulated cytoplasm, and their nuclei showed some vesiculation with accentuation of the nucleoli. The nuclear dimensions had increased.

from an average of 6.5 by 10 microns to 10 by 13 microns in one case, and from 7 by 13 to 13 by 19 microns in two others. Scattered larger nuclei, about 13 by 26 microns, were noted, these were more numerous than at pretreatment biopsy. Group 2 cells showed increasing cornification. Neutrophilic infiltration was noted in certain groups of cornified cells.

By the end of the second week (after about 2,000 roentgens, a more marked effect was evident. Much of the regularity in the pattern of the untreated tumor had been lost. In tumors with group 1 cells (not readily cornified) more marked variations in size, shape and staining qualities of the nuclei were noted. Numerous cells of the large eosinophilic type with enlarged nucleoli were noted. Some of these were pyknotic. However, the large palely basophilic type predominated. Fine vacuolation of the cytoplasm and fading of the nuclei were noted in many of these. In tumors com-

be observed. Vacuolation of the cytoplasm was rather marked. In tumors with group 2 cells cornification was much more extensive, some nests of tumor cells being completely cornified. The few transitional cells and spinal cells which persisted as a poorly defined mantle around some cornified cells showed changes described at this stage for group 1 cells.

By the end of the fourth week after the onset of treatment (after about 4,000 roentgens) the qualitative changes in group 1 (noncornifying cells) were about the same as at the end of the third week, but quantitatively more cells of the large eosinophilic type were noted, and in these there was greater irregularity in the shape and outlines of the nuclei. Pyknosis in these was much more pronounced. Some of these giant nuclei, robbed of cytoplasm, persisted as large basophilic smudges. However, the large palely basophilic cells were also in evidence. Karyolysis in these was much more marked, some of the cells having lost their nuclei entirely. Particularly large nuclear forms were found, a few reaching a size of 30 by 75 microns. The largest seen measured 45 by 102 microns. In tumors with group 2 (cornifying) cells almost all the cells were cornified, and foreign body giant cells were noted in apposition. The compactness and large size of the sheets of tumor cells in the untreated tumor disappeared, only small masses of tumor cells remained.

The summary just given represents general trends. Our biopsy material included only the superficial portions of the tumors close to the surface necrosis produced by radiation. Furthermore, the changes in every tumor were not as uniform as the summary might indicate. In one case a definite deviation was noted in a biopsy specimen taken at the end of the third week of therapy. Near the necrotic surface the large eosinophilic type predominated, about 1 mm deeper the large palely basophilic type was in the ascendency. Two millimeters deeper, tumor resembling that in the pretreatment biopsy specimen and showing but little effect of radiation was noted.

Many of the cases included in this investigation were followed by biopsy for several months after the completion of treatment. In four cases no tumor was noted even thirteen weeks after cessation of therapy. In two of these the tumor had disappeared by the end of the second week of roentgen therapy. In other cases the tumor persisted and the previously listed effects of radiation on tumor cells were noted as long as five weeks after the completion of treatment but no definite recurrence was in evidence. In seven cases, however, there was definite recurrence in some cases as early as two weeks after completion of therapy. The reappearing tumor showed the features observed at pretreatment biopsy. No effects of radiation were present. In these cases radium therapy was subsequently given.

The one adenocarcinoma of the cervix in this series was of the mucous gland type. Before therapy the glands were lined for the most part with tall columnar cells. Flattened cells were also noted. The changes in these cells included those listed previously for group 1 cells but were milder. Swelling of cells and nuclei, the disappearance of cellular boundaries, the appearance of eosinophilic cells with large pyknotic nuclei and paler cells showing some karyolysis and finally the complete loss of much of the epithelial lining of the gland spaces were noted. The few remaining cells were notably damaged. The mucus in the gland spaces seemed to become denser as irradiation continued.

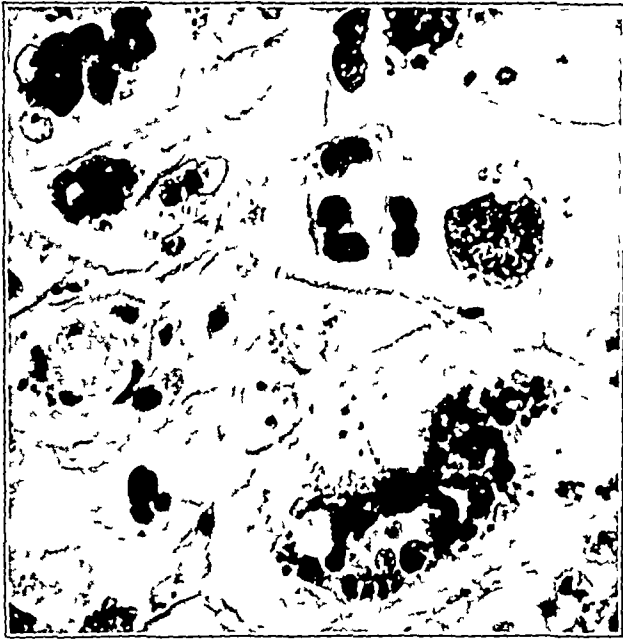


Fig. 5 (case 22)—Section removed after irradiation with about 3,000 roentgens. The swelling is more marked than in a section removed after 2,000 roentgens. There are more bizarre nuclear forms. An enormous multinucleated cell can be seen in the lower right portion of the field. Note the vacuolation of the cytoplasm, neutrophilic infiltration, karyolysis and pyknosis. (Slightly reduced from a photomicrograph with a magnification of 500 diameters.)

posed of group 2 cells (readily cornified) the cornification of the central cells in the tumor masses had progressed at the expense of the mantle layer of spinal and transitional cells around them. In this mantle layer the changes noted at this stage in group 1 cells had occurred.

By the end of the third week (after about 3,000 roentgens) the sheets of tumor cells were smaller than before and the cytoplasm and nuclear boundaries more irregular, poorly defined or even indistinguishable. In tumors with group 1 cells, swelling seemed to have reached or to have passed its peak. More bizarre nuclear forms were noted. Some of these tumors were composed now only of cells of the large eosinophilic type, and pyknosis and nuclear lobulation were much more prevalent. In other tumors of this type, however, the large palely basophilic type was in the ascendency, with karyolysis and particularly multinucleation prominent features. Clusters of small nuclei, numbering as many as fifteen or twenty to a single cell, could

No definite sequence was noted in the changes in the fibromuscular tissues of the cervix or in the noncancerous cervical epithelium. Swelling of collagen, most marked around capillaries or in walls of arterioles, was noted by the end of the first week of therapy. The changes in the subendothelial tissues in the walls of small arteries were most pronounced by the end of the third week, although noted as early as the end of the first week. These changes were not particularly severe. Edema and vesiculation of the epithelium were also noted by the end of the first week but were not constant features.<sup>12</sup>

No prognostic significance could be attached to the presence of numerous eosinophils in the inflammatory exudate in the tumors included in this series. In two cases in which their presence was a rather prominent feature, the carcinoma had disappeared by the end of the second week of therapy. However, in some cases in which the carcinoma persisted or recurred, eosinophils were also in evidence, particularly in one case in which recurrence and even invasion of the broad ligaments were noted shortly after completion of therapy.

In another series of cases clinical observations unsupported by microscopic examination of biopsy specimens after completion of therapy established a rate of four year clinical cure of 50 per cent with the same therapy used in this investigation. In the present series, checked by repeated biopsy, the absolute disappearance of carcinoma was noted in four cases (about 25 per cent). In seven cases (50 per cent) definite recurrence was noted. Degenerated tumor cells were still present in the remaining three cases. The cases, however, have not been followed for a sufficient length of time to determine whether the degenerative changes are an omen of ultimate complete disappearance. The clinical results of a 50 per cent arrest of cervical cancer after four years might support such a hypothesis.<sup>13</sup> These studies will be continued in an endeavor to determine this point as well as the value of repeated biopsies.

#### SUMMARY

The gross and microscopic changes occurring in a series of fourteen carcinomas of the uterine cervix when subjected to 800 kilovolt roentgen therapy were observed.

A pronounced action of these rays on carcinoma cells with a relatively mild effect on the normal tissues was noted.

The significance of persisting, though markedly degenerated, tumor cells weeks after completion of treatment cannot be appraised at this time. Further studies may clarify the matter. It might be assumed that these cells remain inert from the fact that 50 per cent of growths treated more than four years ago have become clinically arrested.

The value of repeated biopsies after the completion of therapy, as used in this investigation, cannot be sufficiently well appraised at this time.

Biopsies at stated intervals coinciding with the application of known tumor doses may aid in the recognition of growths which have been irradiated inadequately. Such growths should then be retreated with the object of increasing the good clinical end results.

#### ABSTRACT OF DISCUSSION

DR DANIEL G. MORTON, San Francisco. I have examined microscopically sections from the cervixes of numerous patients first irradiated and later operated on. In the majority the Memorial Hospital technique was used, occasionally this was supplemented by roentgen therapy. As the operations were performed at varying periods after the irradiation, it was possible to observe the effect of time. The changes produced by 800 kilovolt irradiations are qualitatively similar to those produced by radium but appear to be slower in developing, as pronounced effects are demonstrable after radium within fourteen to twenty one days. The persistence of cancer cells in many of the cervixes after full irradiation occurs after radium also in about half the cases. When these cells are degenerate forms their significance is difficult to assay. Such cells may be dying dead or merely injured. The persistence of cancer in the cervix after full irradiation emphasizes that irradiation cannot yet be trusted to destroy all local cancer. This applies to both radium and x-rays. These pathologic changes also explain the fact of frequent local recurrences, even in early cases, examples of which I have noted repeatedly. The immediate gross reaction to irradiation is often deceptive. Good surface healing may occur but is not necessarily indicative of cure as cancer often persists in the tissue depths in spite of good surface response. This occurred in many of our specimens and taught us that a prognosis could not be made on this basis. I can see no advantage in excluding radium from the treatment of cervical cancer. I have learned that the field of effectiveness of radium is limited yet within its field the destructive effect on cancer is definite and valuable. It seems clear that high voltage radiations should also be used, as they appear to be capable of reaching and killing cancer cells in regions of the pelvis inaccessible to radium. At the University of California Hospital the percentage of five year survivors after irradiation has been almost doubled since the addition of 200 kilovolt therapy. Following Taussig's work we have been removing the regional glands in certain borderline cases in which irradiation had been done previously. Some of our patients have received roentgen therapy preoperatively and some have not. Eventually it should be possible to demonstrate a difference in the incidence of involved glands in the two groups if the x-rays are in fact capable of destroying cancer in these locations, as most of us believe that they do.

DR ROBERT R. NEWELL, San Francisco. Knowledge of the usefulness of supervoltage falls in three categories, namely physical tissue dose at surface and in the depth, reaction of cells and tissues to these doses and response of tumors. Theory and measurement have made it clear that the physical depth dose is better when high voltages are used. Expressed in percentage the superiority of supervoltage is not very great, but it is real and for thick parts like a pelvis, especially a fat woman's pelvis, it is undoubtedly of clinical importance. Evaluation of superiority in clinical results by going to supervoltages is not easy to establish as firmly as the physical measurements. The authors have already contributed to our knowledge in this category. The present paper concerns the second category, tissue reactions attained by supervoltage. It is a striking experience to see radiation-reactions in the cervix produced by external irradiation similar to what we have previously known only by local irradiation or radium. In our own clinic, using 350 kilovolt x-rays filtered to give a half value layer of 5 mm of copper, my associates and I have succeeded in attaining roentgen reactions qualitatively but not quantitatively similar to what we look on as essential for the cure of epidermoid cancer in the mouth or on the face. In fact we know that it is not today possible, even with a million volts, to get by external irradiation tissue doses in the uterine cervix even a third as large as what we consider standard practice with radium. It would still seem necessary to add local irradiation (radium or Chaoul) to the cervix itself. Now the advantage of external irradiation is that it has filled the whole pelvis with therapeutic reaction, of which the authors are reporting samples from the cervix. This fills in the defect in radium treatment to the cervix—I mean, the discouraging insufficiency of tissue dose in the parametria. In those widespread cases of cervical cancer which we classify as groups 3 and 4, one might well rest one's therapy just with external irradiation. But if one has any hope that the cancer

<sup>12</sup> Morton, Daniel G. The Persistence of Carcinoma in the Cervix Uteri after Irradiation. *Am J Roentgenol* 29: 487 (April) 1933.

<sup>13</sup> Schmitz, Henry, Schmitz, Herbert E. and Sheehan, J. F. Clinical Observations on the Treatment of Primary Carcinomata of the Cervix with 800 kv Roentgen Rays. *Am J Obst & Gynec* 35: 405 (March) 1938.

is confined within a couple of centimeters of the cervix, then I would think one ought to use radium too. And if four weeks of x-ray cross-fire has at all shrunk the cancer, so much the better chance that it is now all within reach of the radium.

DR L. H. GARLAND, San Francisco. It has been my privilege for some years to observe the end results on patients treated with supervoltage roentgen irradiation at the San Francisco Hospital. We do not have a supervoltage unit at that institution but receive patients from the other institutions in the city, two of which have supervoltage units. It is generally agreed among careful observers that equal doses of 200 kilovolt radiation and 1,000 kilovolt radiation produce identical changes. Supervoltage therapy has no magic except that the large output of supervoltage machines permits the therapist to apply it more efficiently to some deep-seated lesions. It is my impression that carcinomas of the uterine cervix, whether treated with orthovoltage or supervoltage, always need additional radium irradiation for cure. In his discussion Dr. Morton made one statement which must be challenged, and that is that viable cancer cells persist in the cervix in 50 per cent of patients treated with radium, immediately after the end of treatment. Dr. Morton is referring to cases inadequately treated with radium, that is to say, treated with about 3,500 milligram hours of radium. It has been demonstrated by Heyman, Regaud and others that the great majority of cases of carcinoma of the cervix need between 7,000 and 10,000 milligram hours of radium for cure. They need such a dosage whether the filtration is 2 mm. of brass or 1 mm. of platinum. Following such dosage suitably spaced only a small number of cases will fail to show significant local destruction of cancer immediately at the end of treatment. Whether one treats cancer of the cervix by irradiation or by surgery, it is not the size of the x-ray machine or the sharpness of the surgeon's knife that enables one to cure the cancer; it is the skill and judgment of the physician in radical therapy. It is the voltage of the physician's brain and not of the machine which helps to cure the condition.

DR. MORTON. In remarking that cancer persisted in 50 per cent of cervixes previously completely irradiated, I was referring to a number of cases in which radium irradiation was carried out and later followed by the Wertheim operation. The radium technic which we have been and still are following at present is that in use at the Memorial Hospital in New York and involves the use of a basic dose of 4,500 millicurie hours. This may be supplemented according to circumstances. In the majority of our cases, the radium dosage was in the neighborhood of 4,500 millicurie hours, in a few it was less, and in a few, more. The matter of correct or sufficient dosage remains as yet an unsettled question. The percentage of actual gamma rays which arrive in the tissues depends to some extent on the amount of screening. The screening of those employing the higher dosages is much greater than that which we have used, and therefore comparisons expressed in so many millicurie hours are not possible.

DR. HENRY SCHMITZ, Chicago. The questions arising in radiation therapy are from a physical and biologic standpoint so intricate that it is an impossibility to answer them by general statements. In 1915 at a meeting of the American Medical Association in San Francisco I presented one of the first papers written in this country on the influence of radium on carcinoma cells in the uterine cervix, and we have been interested in this work ever since. The distribution of radiation intensity from radium is so diffused and decreases so rapidly from the source of the irradiation that one is at a disadvantage from the very beginning when one has to treat a large area. The second important point is the radiation dose. One cannot compare a group of cases which have been adequately treated by such amounts of radiation that would kill or degenerate the cancer with those groups of cases which have been treated with comparatively very small inadequate doses. And no matter how one may try either by radium or by 200 kilovolts, extending the tolerance dose by using interstitial radiation, one will not be able to produce or send into the true pelvis such enormous doses of homogeneous radiation intensities as one can with higher voltage. I would not wish to say that the curative results from supervoltage are eventually going to be better or that it is worth while to go to the enormous expense and worry if the same results

could be attained with the combination treatment of radium and 200 kilovolt x-rays. One must remember, reviewing the large amount of material that has been accumulated in the surgical and radiologic treatment of carcinoma of the cervix, that the five year absolute good end results from surgical treatment are probably from 20 to 25 per cent, and the absolute five year good end results from the treatment of carcinoma of the cervix with radium are probably 25 per cent or somewhat higher. If we can increase these end results to 35 per cent or 40 per cent (and some Europeans are now reporting 35 and 40 per cent five year cures) and if we can do this by the introduction of supervoltage which gives a better distribution of an adequate homogeneous dose, then we shall have to find ways to install supervoltage transformers.

## ULCERATIVE GASTRITIS AND RESIDUAL LESIONS

H. E. ROBERTSON, M.D.

ROCHESTER, MINN.

One who is interested in the subject and who peruses the voluminous writings on chronic gastritis may be struck by the thought that for a matter in which the clinical manifestations are fairly definite and the pathologic characters are readily observable and easily catalogued there is a curious excess of speculation, arbitrary conclusions and disturbing contradictions.

Even Henning,<sup>1</sup> whose treatise covers most of the important observations which have been made concerning chronic gastritis, leaves one with a sense of futility, if any effort is made to harmonize signs and symptoms with the pathologic pictures which he so graphically presents.

Perhaps it is fortunate for me that I am not directly concerned with the clinical phases of this question. But I have studied these sufficiently to realize their exceedingly great complexities and to appreciate the reason for so much comparatively fruitless writing about them. Furthermore I am convinced that any attempt to correlate clinical phenomena with a given set of pathologic conditions is foredoomed to failure, for at one time a particular group of lesions may account for one fairly definite clinical picture and at another time or in another person an entirely different collection of symptoms or none at all may result as far as can be observed, from identical pathologic alterations.

The stomach represents a very complex physiologic mechanism affected almost as frequently and as severely by extrinsic as by intrinsic factors. When an extrinsic influence, such as a lesion in the brain or a severe anemia, upsets this mechanism the resulting disturbances may in turn bring about local changes which further complicate the clinical picture.

But these perplexities are for my colleagues in clinical medicine to solve. My present concern is in my own field of pathologic anatomy where some observations and deductions from these may serve to clarify somewhat the fundamental factors which produce such diverse lesions in the stomach.

It is well, here, to consider some of the peculiar anatomic features of the gastric mucosa. If one injects the arterial trunk with any substance which permits the capillaries to be visualized, they will appear in the mucous membrane as an extremely thick network so

From the Section on Pathologic Anatomy, the Mayo Clinic. Read before the Section on Pathology and Physiology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

1. Henning, Norbert. *Die Entzündung des Magens*. Leipzig: J. A. Barth, 1934.



numerous that by dilating them with India ink one will see that the surface resembles a solid mass of this black substance. Whenever, for any reason an abnormal congestion of these capillaries occurs, one receives the same impression of a tremendously rich capillary blood supply to the entire mucosa. In ordinary microscopic preparations even of freshly preserved normal stomachs, these capillaries are but inadequately seen, but their importance in the interpretation of many lesions in the stomach cannot be overestimated.

This importance is emphasized by the fact that in the otherwise perfectly normal stomach the most frequent pathologic change is hemorrhage in the superficial layers of the mucosa (fig 1). Apparently whenever congestion of the capillary network occurs, even with the normal physiologic stimuli of digestion a slight overdistention in any local area may bring about a rupture of one or more capillary loops. Many of the causes of these hemorrhages are well known. Excesses of food or drink, abnormal congestions, poisons of many kinds, local infections, mental disturbances, fevers and anemias are but a few of the conditions in which gastric hemorrhages have been observed. As soon as the hemorrhage occurs, necrosis of the involved part is an inevitable result. This necrosis is promptly digested and leaves an ulcer, which ordinarily is promptly repaired with complete restoration of the integrity of the mucosa. In most instances probably the entire process is without a single discoverable clinical sign or symptom, unless perchance the modern science of gastroscopy may reveal these comparatively silent "hemorrhage-necrosis-ulcer" syndromes.

These lesions have been directly studied, among others, by William Beaumont<sup>2</sup> in the stomach of his noted patient Alexis St. Martin. Some of his observa-



Fig 1—Hemorrhage in the superficial layers of the gastric mucosa, stained with hematoxylin and eosin slightly reduced from a photomicrograph with a magnification of 25 diameters.

tions and conclusions deserve direct quotation. On page 99 he said:

In undue excitement, by stimulating liquors, overloading the stomach with food—fear, anger or whatever depresses or disturbs the nervous system—the villous coat becomes somewhat red and dry. There are sometimes found on the internal coat of the stomach eruptions or deep red pimples at first sharp pointed and red, but frequently becoming filled with white purulent matter.

Again, on page 252 there was the following report:

August 3, 7 o'clock a.m. Inner membrane of stomach unusually morbid—the erythematous appearance more extensive and spots more livid than usual from the surface of which, exuded small drops of grumous blood. Notwithstanding this diseased appearance of the stomach no very essential



Fig 2—Residual lymphocytes in the mucosa of the stomach, stained with hematoxylin and eosin ( $\times 77$ ).

aberration of its functions was manifested. Aug 6, 8 o'clock a.m. Stomach empty, coats clean and healthy as usual.

Further, on page 254, he said:

Diseased appearances, similar to those mentioned above, have frequently presented themselves, in the course of my experiments and examinations. They have generally, but not always succeeded to some appreciable cause. Improper indulgence in eating and drinking, eating voraciously or to excess, swallowing food coarsely masticated, invariably produce similar effects. These morbid conditions are however seldom indicated by any ordinary symptoms, or particular sensations described or complained of. They could not in fact, in most cases have been anticipated from any external symptoms and their existence was only ascertained by actual, ocular demonstration.

It is interesting [he added] to observe to what extent the stomach may become diseased, without manifesting any external symptoms of such disease, or any evident signs of functional aberration. Extensive active or chronic disease may exist in the membranous tissues of the stomach more frequently than has been generally believed.<sup>3</sup>

Surgeon Beaumont was unquestionably observing small focal hemorrhages which resulted in necrosis, often followed by leukocytes and other elements of an exudate with occasionally a pseudomembrane formation. These lesions then became small localized ulcers, which rapidly healed and apparently left the stomach restored to its normal state. The word "apparently" is used advisedly because, while many small hemor-

<sup>2</sup> Beaumont, William. *The Physiology of Digestion with Experiments on the Gastric Juice*. Burlington, Vt.: C. Goodrich, 1847.

<sup>3</sup> These observations and conclusions have been abundantly substantiated by recent gastroscopic studies of living stomachs.

changes and their resulting ulcers may be followed by complete restitution, often there remain more or less definite gross and microscopic evidences of the fact that, after one or more local areas in the stomach have previously suffered from ulcers, imperfect instead of perfect healing has resulted. By imperfect healing I



Fig. 3—Depression in gastric mucosa with lymphocytes stained with hematoxylin and eosin (X85)

mean that, while the outer layer of mucosal cells may be perfectly restored and, to the unaided eye, the entire mucosa may appear absolutely normal, study of stained sections by the microscope reveals certain lesions which I assume to be the residual alterations accompanying the incomplete restoration of the deeper layers.

The most constant of these signs is one or more collections of lymphocytes in the mucosa (fig. 2). These are usually located close to the muscularis mucosae, are almost always sharply localized and range in size from only a few cells to large follicle-like aggregations, some with secondary centers. They may occupy the entire thickness of the mucosa and may even appear in the submucosa. In the region of the larger collections there may be depressions in the mucosa and a comparative diminution or even entire absence of the specialized peptic and acid cells (fig. 3).

In the healing of deeper ulcers, various deformities of the muscularis mucosae occur. Local fibrous tissue thickening is often present and frequently fibrous strands extend various distances toward the surface, occasionally partially enclosing small groups of gland cells and lymphocytes (fig. 4). With more severe processes, the submucosa is invaded and transformed into a compact fibrosis, sometimes even invading the muscle layers.

Even more striking are the changes in the glands. Besides depressions in the mucosa and atrophy of the specialized cells, the mucous glands become more prominent, often with wide and corkscrew-like lumens and broadened bases which occasionally spread out along

the thickened fibrous muscularis mucosae (fig. 5) or become cystic dilatations (fig. 6). A few glands may be caught in the meshes of the fibrous tissue and in rarer instances will be found sequestered in the submucosa (fig. 7). Paneth cells are often present. Associated with these changes the mucous glandular cells may exhibit evidences of increased rapidity of growth, such as larger and more numerous cells, hyperchromatic nuclei and even mitotic figures.

The residual lesions after the healing of more severe ulcers are, then, collections of lymphocytes, irregular fibrosis of the muscularis mucosae, atrophy of the mucosal differentiated elements and disorganization, often with hyperplasia of the fundamental mucous glands. At first such changes are strictly localized, but later with more widespread involvement practically the entire gastric surface may be affected.

As the residuals of ulcers increase in extent and magnitude, subsequent ulcers probably occur more frequently and heal more sluggishly, thus advancing more deeply into the wall and in turn giving rise to more severe secondary lesions. In this connection it is fitting to inquire as to what influences may be active in promoting or hindering the prompt healing of gastric ulcers. There is probably good reason to assume that the acid peptic juice secreted by the specialized gastric cells alters materially the forces which in general govern the healing of wounds. In our laboratory we have long been interested in the digestions of the stomach and esophagus which are prone to occur following death from lesions of the brain. This erosion often acts so promptly and extensively that some special combination of influences must be presumed to be present. In a special study of these stomachs my associates and I have been struck by the comparative absence of mucus on the digested surfaces. In certain instances a definite line of thick mucus has marked the limit of the eroded area. This fact has suggested to us that perhaps these



Fig. 4—Stomach hyperplasia of glands and disorganization of muscularis mucosae stained with hematoxylin and eosin, slightly reduced from a photomicrograph with a magnification of 85 diameters

postmortem phenomena are accelerated by the lack of a protective coating of mucus. Without the layer of mucus the gastric juices etch the stomach wall. Further it is highly probable that mucus performs a similar function during life and may be the sole factor which prevents the stomach from digesting itself. When hemorrhage in the mucosa produces necrosis, the pro-



duction of mucin in that area ceases and the necrotic zone is promptly digested until the living glands are exposed and fresh mucous reserves can once more inhibit the action of the digestive ferments. The lack of sufficient mucin as to either quality or quantity may thus account for the failure of proper or prompt heal-

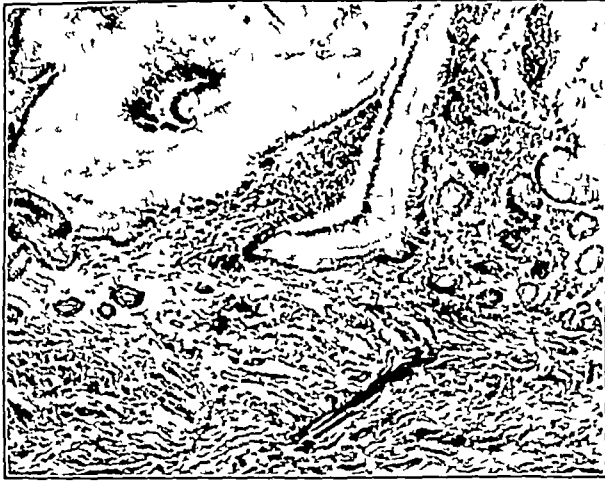


Fig 5—Dilatation and distortion of mucous glands in the stomach stained with hematoxylin and eosin slightly reduced from a photomicrograph with a magnification of 77 diameters

ing of certain ulcers. The part played by lesions of the brain in postmortem digestion is, of course, not understood. We know all too little about the influences which promote or retard the secretion of mucus, one of the most important substances in the body. The possibility that some nervous mechanism, definitely affected by cerebral conditions, may play a role in the elaboration of this substance has to be seriously considered. Perhaps this mechanism may account for the well known fact that nervous states have a definite influence on the healing of gastric and duodenal ulcers, as is so often strongly suggested by the effects of proper rest in such cases.

As Beaumont observed smaller, more superficial ulcers disappear and leave a stomach apparently normal. However, if the ulcer is deeper and more severe, after healing a stellate scar may be clearly visible as a residual gross lesion. If the atrophic processes are marked, local depressions may result or, when they become more generalized, a thin flattened mucosa is a characteristic appearance. When hyperplastic changes become prominent the mucosa may be raised in ridges or local bosses and, if these are generalized, there results a cobblestone appearance which was designated by Stoerk<sup>4</sup> as "état mamellonné."

The frequency with which such appearances as those just described are found in stomachs in which carcinomas develop strongly suggests the possibility that under certain circumstances these hyperplastic changes in the mucous glandular cells may proceed to the stage of autonomous new growth. Thus it would appear that the old controversy concerning the question as to how frequently carcinomas develop in gastric ulcers was comparatively futile. That carcinomas occasionally actually arise on ulcer margins is fairly certain, but probably they most commonly have their origin in the atrophies, disorganizations and reparative hyperplasias which represent the residuals of many previous ulcers.

Many logical objections may be raised against the theories which have just been proposed. The first and most important question concerns the mucosal collections of lymphocytes, which I have assumed represent the residual (or the continuation) of inflammatory processes. This assumption, I am compelled to admit, is insufficiently supported by the facts at my command. The true significance of lymphocytes, whether in the blood stream, bone marrow, lymph nodes or follicles, under normal conditions is but little understood. Not much more is known about their meaning in pathologic processes. Their constant presence in the delayed repair of almost all inflammations and wounds has led most pathologists to assume that when lymphocytes are seen in abnormal locations or abnormal numbers some form of chronic inflammation is indicated. When such collections of lymphocytes are accompanied by other evidences of inflammation this assumption would seem to be confirmed, although whether the lymphocytes wander in ("infiltrate") or are formed in situ from some form of connective tissue cells, and why they are there at all is not known. But when collections of lymphocytes are found where lymphocytes are not normally present and no other inflammatory phenomena can be identified the problem becomes more complex. The other day I examined sections from an 18 year old boy whose death was due to diabetes. The mucosa was mottled by numerous large collections of lymphocytes. Did they represent the residual of previous innumerable ulcers and, if so, how could they collect in



Fig 6—Cyst in the mucosa of the stomach in case of carcinoma stained with hematoxylin and eosin (X56)

such large numbers with scarcely no other evidences of disorganization? It strains one's imagination, I must confess. But suppose for the sake of argument that some other influence, certainly not known, accounts for these lymphocytes. Does their mere presence denote chronic gastritis? I doubt it and still insist that lymphocytes are a part of the incompletely healed ulcer complex, even if they also may occur from other causes.

<sup>4</sup> Stoerk Oskar Ueber Gastritis chronica. Wien klin Wchnschr 35 855 860 (Nov 2) 1922

When the usual discussions dealing with the various causes of gastric ulcers are reviewed, my assumption meets with further objections. One school mentions bacterial infection either directly invading the mucosa or carried to the stomach wall by the blood stream. Another view considers embolism or thrombosis with consequent infarction of the mucous membrane as the fundamental lesion behind many gastric ulcers. Direct attack by the gastric juice or ingested corrosive agents has also been considered. It must be granted that at times each of these "causes" may operate in the production of gastric ulcers, but even in such (to me) unusual conditions the lesion is accompanied by hemorrhage and necrosis. Once the ulcer is produced, by whatever mechanism, when healing is in any respect incomplete, the residual deformities which I have described must result.<sup>5</sup> I am still of the opinion that the most frequent cause of ulcer of the stomach is hemorrhage from the capillaries of the mucosa, that many, perhaps most, of these ulcers so produced heal perfectly, but that a few in most persons and many in some heal



Fig. 7—Glands in the gastric submucosa stained with hematoxylin and eosin slightly reduced from a photomicrograph with a magnification of 60 diameters

less completely and leave persisting the various disorganizations which I have described. When the healing is so imperfect that the surface layer defect still remains, naturally a more or less "chronic ulcer" is a correct designation.

While admittedly, experimentally produced ulcers in animals do not necessarily parallel in clinical and pathologic manifestations the ulcers found in man, nevertheless the same physical reactions should occur in the development subsidence and residuals of the lesions in the two instances. It was therefore particularly important to examine the stomachs of dogs in which ulcers had been produced by administration of cinchophen after the method described by Stalker, Bollman and Mann.<sup>6</sup> Studies of microscopic sections of these stomachs revealed in all essential details the same pictures which have been found and described so frequently in human stomachs.

We are now in position to consider more critically the meaning (or lack of meaning) of the words "chronic

gastritis." If we assume that the residual lesions which accompany the healing of certain gastric ulcers represent diminishing or receding processes, terms denoting chronic inflammation may not properly be employed. Unfortunately there are no appropriate names to denote the lesion which is in the stage of being healed but in which there will not be complete restoration of the affected part. "Unresolved" gastritis might be used but the word "resolution" usually refers to purely exudative inflammations. Even if it is conceded that the term "chronic gastritis" may be employed to denote the conditions under discussion, at best it would only have a significance for the pathologic anatomist and would in no way be useful to the clinician for correlation purposes.

Therefore I am proposing that the unqualified designation "chronic gastritis" should not be employed to represent a separate entity either clinical or pathologic. "Ulcerative gastritis" either "acute" or "chronic" is an eminently appropriate term when ulcers are present. If "syphilitic gastritis" or "tuberculous gastritis" or other specific lesion is diagnosed, the qualifying words are clearly indicated. But for the various conditions which I maintain represent the results of an imperfectly restored "ulcerative gastritis" after the ulcer surface has been covered with epithelium, I am forced to suggest the rather awkward designation "residual of ulcerative gastritis" with atrophy, hyperplasia or scar formation as the case may be.

It is strongly urged also that the clinician should not use the almost meaningless term chronic gastritis. Instead he should employ names which have a definite significance such as atrophy of gastric mucosa, hyperplasia of gastric mucosa (localized or polypoid), ulcerative gastritis, syphilitic gastritis, tuberculous gastritis, alcoholic gastritis, atony of stomach or achlorhydria. Even the old fashioned word dyspepsia, rather discredited at the present time has more clearcut clinical distinction than other more popular substitutes.

It has not been my purpose to cover the entire pathology of the stomach. Lesions or dystrophies of the central or local nervous mechanisms may profoundly affect the motor and secretory activities of the organ and play a prominent part in clinical judgments. Primary and secondary anemias, passive and active congestions, high temperatures and diseases of neighboring viscera may exert definite influences on gastric functions. Lastly, it is quite probable that in the future various abnormal amounts or lack of hormones or vitamins may be proved to determine certain gastric lesions just as to an increasing degree they are assigned an important role in the alterations of other structures of the animal body.

#### CONCLUSIONS

- 1 The most frequent lesion of the gastric mucosa is capillary hemorrhage.
- 2 These hemorrhages result in necrosis and ulcer formation.
- 3 Most of these ulcers, more in some cases than in others, result in complete restitution of the stomach lining and are without recognizable clinical phenomena.
- 4 Some ulcers are sufficiently severe to leave residual lesions even when the outer epithelial lining is restored and the ulcer as such disappears.
- 5 These residual lesions are collections of lymphocytes, irregular thickening and fibrosis of the muscularis mucosae, atrophy of the specialized gastric cells and

<sup>5</sup> By incomplete healing, I do not mean any residual defect in the superficial layer of mucosal cells. These cells may cover the healing ulcer but the underlying elements may or may not be perfectly restored.

<sup>6</sup> Stalker, L. K., Bollman, J. L. and Mann, F. C. Experimental Peptic Ulcer Produced by Cinchophen. Methods of Production, the Effect of a Mechanical Irritant and the Life History of the Ulcer. Arch. Surg. 35: 290-308 (Aug.) 1937.

more or less hyperplasia of the mucous glandular cells with varying degrees of disorganization of the mucous glands

6 The hyperplasia of the mucous glands may have some relation to the development of carcinoma

7 Some ulcers persist, for unknown reasons, and become chronic

8 It is suggested that lack of mucus may be one factor in delaying the healing of gastric ulcers, and furthermore that mucus production itself may in some manner be under cerebral control

9 Experimentally produced ulcers in the stomachs of dogs present pictures similar to those studied in human stomachs

10 The residual lesions of ulcerative gastritis are the most frequent pathologic changes seen in the stomach wall

11 The designation "chronic gastritis" has no clear significance and should not be used without qualifying adjectives, for example "chronic ulcerative gastritis"

12 Clinicians should use only terms which have a definite clinical and pathologic significance

#### ABSTRACT OF DISCUSSION

DR ALVIN FORD, Los Angeles Might I ask Dr Carlson whether he found in the man into whose stomach he looked for many years any of these ulcers and hemorrhages?

DR A J CARLSON, Chicago I didn't intend to say anything at this time, but being asked I wish first of all to remark that it is a pleasure to listen to a pathologist whose reasoning hasn't become pathologic. The relation of gastric lesions to subjective symptoms is certainly complicated. Yes, I looked into the stomach of Mr Vlcek almost every week for thirteen years before he developed cancer in the old scar in the gullet. Dr Beaumont was a good observer. Anything that Dr William Beaumont saw and described has stood the test of time. Now, my edition of Alexis St Martin wasn't quite as bibulous as Beaumont's, and I didn't have so many alcoholic conditions. But I saw from time to time in Vlcek's stomach virtually all that Beaumont observed in St Martin. And I saw another thing. That this man could have severe symptoms of gastric pain, with all the mucosa that I could see perfectly normal. I remember one time I had a balloon in his stomach. This didn't produce any pain. I have had balloons in my own stomach. But at that time Vlcek had a spasm of the stomach lasting twenty minutes, and as he was sitting there cold sweat ran down his forehead and he was saying "Carlson, I can't stand it, I can't stand it." I said "You have got to, I want to see how long this is going to last." There might have been something beyond the pylorus which I couldn't see. There might have been something in the extreme antrum that I couldn't see, but the rest of the gastric mucosa was perfectly normal. An extreme spasm of a healthy organ gave rise to something that is not so different from the extreme spasm in a healthy uterus or a charleyhorse in a healthy muscle. I should like to know why some of these extensive superficial erosions sometimes give rise to a sensation of not definitely localized pain but discomfort. One just doesn't feel right. One of the most interesting things described here by Dr Robertson is the "occlusions," in other words, gastric glands that have no openings. Did you follow them from end to end? Do it, please, because that is very important. If you are right we have here something like those dermoid cysts, probably with distention with the surface of the mucosa perfectly normal. The sensory nerves in the gastric mucosa, particularly those that refer to pain and reflexes are probably stimulated by tension.

DR H E ROBERTSON, Rochester, Minn I have recently been interested in several papers published by gastro-enterologists who have been observing stomachs with the gastroscope. They are now seeing under difficult circumstances the same thing that Dr Beaumont and Dr Carlson have seen with their own eyes, and under much better conditions. The interesting

thing is the frequency of these hemorrhages observed by these people. The thing that I feel they have missed is the fact that ulcers are the result of the hemorrhages that they see, most of them healing completely. We all have them frequently, probably every single day of our lives, and when for some reason or other they don't heal, then in a few of us comes possibly the real ulcer. It isn't. What causes the ulcers? The question is "Why don't some of the ulcers which we have from time to time heal?"

#### THE USE OF FREE FULL THICKNESS SKIN GRAFTS

J EASTMAN SHEEHAN, M D

NEW YORK

In every case in which skin is to be replaced, consideration is to be given to all the conditions existing, so that choice may be made of the best form of graft or flap for the particular repair. Thus, when the defect to be covered is on the face, a primary consideration is to ensure that the new skin will conform to its surroundings in texture, in surface level and in coloration and will incorporate imperceptibly with the skin adjoining.

While these requisites might be found in a pedicle flap raised from an adjoining area, the difficulty is that this method produces and leaves a visible disfigurement. The thin epidermic graft will not do either. It is too thin to maintain the surface level of its surroundings, and it tends to take on a brownish tint that does not conform to the rest of the face. The tubed pedicle flap, valuable as it is in some situations, undergoes changes in its fat and fibrous tissues in the period after it is tubed, which operate against its conforming to the new surroundings, in texture, elevation and motility.

The preference, therefore, in conditions that are otherwise favorable is for the free full thickness skin graft, which has none of these disadvantages. What for a long time militated against its selection was the uncertainty of successful application.

Not so long ago, a 50 per cent success was about all that could be expected. At present, while it might be oversanguine to claim a hundred per cent success, anything below that may be due to some exceptional and undisclosed condition.

To what can this improvement be attributed?

The answer goes in part to the conditions prevailing when the graft is taken, in part to the handling and care of the graft in the process of replacement, in part to the state of the base on which it is applied and in part to the concern shown for the graft after it has been applied.

1 The skin should be in a healthy state. This applies not alone to the immediate vicinity of the area from which the graft is to be taken but to the body generally. Some of the deterrent conditions are obvious, as disease. Some are danger signals, as pimples, which suggest delay until improvement has been effected. There may be a concealed infection, of which the skin itself gives no sign but which will prove disastrous when it is declared in the weakened condition of the cells after they have been deprived of their normal sustenance. Two highly useful tests can be applied by way of check on such unknown factors. One is the Schilling test. In the presence of infectious processes, immature neutrophils enter the circulation in increased

numbers. As compared with a ratio of 10 in normal persons and of 25 in slight infection, there may be indicated an index of 50, 75 or more. By any such indication of infection the operator is put definitely on warning and must postpone until the index is suitably lowered. Again, as the success of the graft is to be attained only when the bed on which it is placed is at its best, and as oozing will impair or destroy this condition, it is important to know what the probabilities are in this particular. Where, for example, the blood platelet count is much too low, such oozing is to be apprehended, with consequent danger to the success of the graft, as a whole or in spots. In presence of these or any other warnings against haste, delay is instituted to allow of the conditions being corrected.

2 The graft area itself equally demands respect. It has a normal oxygen and sulfur content, and if either is below normal the impaired vitality of the cells will be reflected when the graft is transferred. Biochemical tests for these contents have been devised, and if the results are unsatisfactory there is reason for delay until correction is effected. Moreover, it has been found that these contents are reduced in the process of cleansing and preparing the area for operation. The cleansing for this reason, is best done the night before the operation to allow time for recovery of the oxygen content. The skin is scrubbed with soap and water further cleansed with sulfuric ether and left covered with antiseptic gauze overnight. The use of antiseptics with a view to bacterial destruction on and within the apertures of the skin has not survived trial and error. The most successful of them as germicides have been found to set up conditions difficult to deal with and in any event more importance attaches to having the skin in a healthy condition than to precaution against germs of infection in a skin not at its best.

3 A dry base at the defect area is absolutely essential. There must be close adherence of the graft to the base, and this there cannot be if there is oozing and consequent blood clots, even the smallest of which will be destructive as to the space it occupies. Obviously, the vessels in the base must have attention. If any are to be tied it must be by suture threads that will not promote infection. The finest Deknatel silk is used. Precautions having been taken against oozing by reason of conditions disclosed by the count of the blood platelets, it may be desirable to obtain further assurance by irradiation of the spleen by roentgen rays in amounts of from one-tenth to one-fifth erythema dose. About twenty-four hours after irradiation the coagulation time of the blood is gradually materially reduced, a fact helpful to the restoration of the graft. Intravenous injection of calcium or a hemostatic preparation the day before operation may be of additional advantage.

4 In taking the graft, the lines of skin tension should be respected. The graft should be cut without bevels at the edges and be a little less than will cover the defect, as it is well to have the graft on stretch a little when it is sutured in place. There is no need for rough handling. The graft can be gently transferred by threads that are to serve as anchor sutures. It should not be washed in saline or other solution. Its own serums have the double utility of temporarily countering infection and of assuring adhesion between the graft and the base. The suturing in place must be done with great patience and with care to ensure that the resultant scar at the wound edges will have the least attainable visibility.

5 With all this done, there is still to consider the factors that govern the restoration of life and function in the graft skin. With a sound, viable graft, on a dry bed, that phase begins on skin that has been detached from the normal agencies that supply life to the cells. There are two influences that make for recuperation from this moribund condition. One is the infiltration of minute vessels from the base into the corium, the other is the nourishment that may be derived by the cells from the pervading lymph. Vascular infiltration is a slow process, and if the very lowest part of the skin is transferred, as was formerly the practice, it takes time for the vessels to reach the tissues of the subpapillary layer. Whereas the cells of the epidermis are not sustained by vessels but are nourished by the lymph from the base on which they are set, when it can be conveyed to them, the connective tissues of the corium must have sustenance from vessels to which they are accustomed. To mitigate the delays, the lowest, densest subcutaneous layer is removed. Whether it is that this results in more rapid infiltration of the remainder of the corium or that the subpapillary area shares with the epidermis the sustenance derived from the lymph fluid, or both, the fact is that restoration proceeds with greater rapidity and with increased assurance when this lowest stratum of the skin is discarded. To this may be attributed much of the recent advance in the ratio of success.

With the graft in place, concern is for the proper pressure and, no less important, for immobility. One of the first things learned about the graft was that either too much or too little pressure would cause it to fall. With too much, the infiltration of vessels was impeded, with too little, the adherence of graft to base was disturbed. Ferris Smith, arguing from the circumstance that infiltration of vessels from the base to the graft is the critical stage, found a mean of pressure related to that of the blood. This provided a practical answer to the problem of too much or too little. The method of applying the pressure varies. It can be by pressure bags, judiciously inflated, or it can be on smaller, well situated areas, by means of a mold of stent. In either case, to insure immobility is a desideratum. A mold, for example, may be immobilized on the cheek by means of an outer frame of celluloid (Coelst), so placed as to relieve the mold and graft of adjacent strains. In other instances, changes in contour may present difficulties, which can, however, be overcome. In either case, motion must be prohibited during several days. For example, when replacement is in the neighborhood of the mouth, no food or drink is allowed to enter by mouth, a Nelaton tube is introduced through the nose for purposes of feeding.

Finally, the patient must be kept quiet. There is some sympathetic reaction to operation, and the consequent irritability should be allayed.

Two capsules of thiamin chloride consisting of 2,000 international units given daily, with nicotinic acid in 1 grain (0.065 Gm.) doses, have been found to give relief. When there is evidence of shock toxemia, food is stopped and intravenous dextrose solution given. The essential quiet can be further induced, of course, by personal attention and the confidence it inspires.

The sum of it all is that knowledge of the life of the skin, and respect for its demands in the stress to which it is exposed by transfer, has changed the whole outlook on the use of the free full thickness skin graft.

With all the precautions that can be taken, and with the full thickness skin graft thus made practical as

cover for larger and larger areas and for greater variety of reparative recourse, it is not to be inferred that complete success is automatically assured. On the contrary, it must be watched continuously and danger signals should receive prompt attention. Of these the first is rise of temperature, which may mean infection in the graft. One is not to assume that the high temperature is of this origin. It may be located quite otherwise, thus averting the mischief that might ensue on too hasty removal of the bandages. But if high temperature is accompanied by discharge at the graft area and by odor that tends to become foul the graft is uncovered and remedial measures are promptly taken. When there are none of these indications of infection, the bandages are usually left for about three weeks. By that time the preliminary organization usually is definitely established.

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#### ABSTRACT OF DISCUSSION

DR GEORGE W. PIERCE, San Francisco. There is no doubt that full thickness skin grafts are of great value in reconstruction surgery. As compared with the success of such types of grafts twenty-five years ago there has been a tremendous advance and the advance has been the result of the successful use of these grafts through attention to the minutiae of detail. I think that hemorrhage looms larger as a deterrent of success than any other one factor. I am glad that Dr. Sheehan called attention to the use of soap and water in preparation. There is one point I wish to mention in regard to these free grafts, and that is that in my experience and in cases that I have seen in different medical centers I have noted pigmentation of these free grafts occurring in at least 20 per cent and in such marked degree in from 5 to 8 per cent that for use on the face it almost precludes promise to the patient that the color will be the same. As to the splinting of these grafts, I prefer physiologic solution of sodium chloride, gauze, marine sponge and finally a bandage which is made by cutting stockinet on the bias. This provides an elastic pressure which is necessary for a period of three weeks on these grafts.

DR H. L. D. KIRKHAM, Houston, Texas. The principles as laid down by Dr. Sheehan for the use of free grafts are the same no matter whether they are a full thickness, a split or the so called thin Thiersch graft, that is to say, the principles of preparation and condition, the bed pressure, the cleanliness and good condition of the skin that is taken and also the area it is being taken from. I cannot quite follow him in his estimation of oxygen and sulfur, why that should be more important in a full thickness than in any other type of graft and certainly I believe that the results in the percentage of takes, at least in my hands, of full thickness as compared with the other types of free graft are not as good. Then too it is always possible in the use of any of these plastic procedures that the personal equation of the surgeon enters largely into it and that method within normal and proper limits which meets the best and most uniform success in an individual's hands should be his method of choice. I was glad to hear Dr. Pierce mention the question of pigmentation in free grafts. Probably I can speak a little more feelingly about the matter, coming from the South with a large Negro population and a large Mexican population—in other words, people with pigmented skins. The development of pigment in the free graft is so prevalent in those races that I would no more dare think of putting a free graft to a white Negro's face or exposed part without warning him ahead of time that it was not a possibility but a probability that the graft would almost, as in some instances it does, get coal black, whereas the rest of his skin is white. Dr. Sheehan gave, as the signs or symptoms of trouble with his graft, high temperature and a foul discharge. He then recommended that if those appear, suitable remedial measures must be instituted. My experience in using these free grafts is very like taking a kodak picture. After one has used the proper shutters and all the proper factors that go with it, it then becomes, as the Negro said, a "question of you either you is or you ain't." And

if the graft "ain't," I don't know of any remedial measure one can take to bring it back to life after it has once died, and I would like to ask what remedial measures Dr. Sheehan uses when the symptoms he mentions appear.

DR J. EASTMAN SHEEHAN, New York. Pigmented cells take rise at the level of the epithelial layers and normally are carried off as they descend. In the epidermic and intermediate grafts, when cut and transferred, the avenues of descent are impaired, and the tendency in the thin grafts is for the melanotic cells to group and so affect coloration. This applies to white skin, with which I usually have to deal. The comments regarding Oriental and Negro coloration suggest that there may be different problems, in the incidence of pigmentation, in these categories. My primary problem is so to simplify the procedures that the repair can be effected without producing disfigurement. This can be done, and done best, even on large areas, by recourse to this free full thickness graft. The point about oxygen and sulfur content is that if they are below par the success of the graft is less assured. Both are important elements of the skin, and, since their adequacy can be determined, impairment of the normal should be guarded against, and deficiency should be rectified before operation. It has not been made clear to Dr. Kirkham what is meant by resort to remedial measures. The enemy, of course, is infection, and infection may be detected beneath the bandage. Ordinarily, the longer the bandage can remain the better for the graft. But a bandage that covers infection obviously should be removed, and since one does not want to remove it, one watches for signs that one must. Rise of temperature is a danger signal, but if its origin is located elsewhere there is no need to remove the bandage. If there are discharge and odor, the bandage comes off, and I proceed to deal with the infection. I need not go into the measures that are needed to control infection. They are peremptory, whether they succeed in saving the whole of the graft or only part of it.

#### THE CLIMATIC TREATMENT OF HAY FEVER AND ASTHMA

WITH SPECIAL REFERENCE TO FLORIDA

FRANK C. METZGER, M.D.

TAMPA, FLA.

The mirage of climate as a curative agent for disease has long been pursued both by physicians and by the public. Its lure has had particular appeal in the treatment of chronic ills such as tuberculosis, hay fever and asthma, but the results of climatic change have all too often been disappointing, certainly so far as asthma and hay fever are concerned.

The peninsula of Florida, uniquely situated as it is, has a climate differing radically from that of most of the United States and Canada. Consequently its subtropical setting invites countless sufferers from all walks of life who seek climatic relief from hay fever and asthma. Those who come to the state for this purpose fall naturally into three groups: (1) those who obtain no relief, (2) those who become worse in the new climate or environment and (3) those who obtain complete or partial relief.

In a practice in Florida confined exclusively for years to the treatment of the allergic diseases, there have come under my observation too small a number of patients who have found complete or partial relief through climatic change to warrant this form of treatment. In this group, group 3, a careful study of the history of the patient often discloses that relief has resulted from accidental removal from the source of trouble, or it transpires that some causative factor has been discovered and eliminated that could as easily have been removed at home. Scientifically, to increase the number of persons who obtain complete or partial

relief through climatic change or other agency is a primary objective. From the humanitarian standpoint, as worthy an objective is to recognize the cases in which relief resulting from change of climate is not to be expected, thus sparing the patient unnecessary change.

The physician over the land who glibly advises change to a fancied climatic utopia is spared the problems his injudicious counsel frequently creates for his colleagues and the communities of the state or region for which he unwittingly makes fallacious claims. Nor is he confronted with the stark human tragedy that often follows in the wake of ill advised change. Not infrequently whole families, greatly to their disadvantage, are torn from their financial and social roots in the interest of the individual sufferer. The present economic situation, with its widespread unemployment, increases the difficulties and hazards of such change for many persons or families already handicapped by illness.

Before change of climate may be discreetly advised for sufferers from hay fever and asthma, a knowledge of two things is necessary. First, the allergen or allergens that precipitate the patient's trouble must be found. Fortunately the newer concepts of allergy, with the means and methods now available through cutaneous tests, histories, eliminative diets and other procedures, make possible the determination of the offending substances in the large majority of cases. In the second place it is necessary to know in what climate or place the allergens affecting the person in question do not exist, exist in small amounts or are easily avoidable.

The clinical observations, results of experimentation and conclusions here set forth are designed to aid the general practitioner in particular, and the allergist as well, in disseminating information regarding the occurrence and distribution of allergens in Florida. Since the allergens causing hay fever are, in general, able to cause asthma also, the statements here made regarding the one are applicable also to the other. As certain pollens are present throughout the year in this state, the term *pollinosis* is used to designate the type of hay fever in which pollen predominates as a causative factor, and the term *allergic rhinitis* is applied to those types in which other allergens are the offenders.

*Pollinosis* occurred in 24 per cent and *allergic rhinitis* in 76 per cent of the patients coming under my observation who were year round residents of Florida, including Key West, and of Cuba. In the practice of allergists in the more northerly states, such as, for example, Drs. Milton B. Cohen<sup>1</sup> of Cleveland and Tell Nelson<sup>1</sup> of Evanston, Ill., these percentages were almost completely reversed. The reason for the relatively few cases of *pollinosis* apparently lies chiefly in the fact that pollen concentrations are not nearly so great in this state as in the Northern, Eastern and Midwestern states.

#### POLLINOSIS

In considering the pollens it is well to divide the state roughly in half, placing the dividing line from Brooksville near the west coast to St. Augustine on the east coast. The climate, the soil and, consequently, the flora and the occupations differ greatly in the northern farming section from those in the southern portion, with its truck gardening and cultivation of citrus fruit.

Ragweed, grass and trees furnish the offending pollens of most importance. *Ambrosia elatior*, or dwarf

ragweed, is the only variety of ragweed having clinical significance. Present in the state for many years in small amounts, it has increased greatly since 1925 in the wake of new road building and widening areas under cultivation. Many factors enter into its pollination time and the concentration of its pollen in the air. In coastal cities alternating sea and land breezes cause the air-borne concentration to fluctuate. Pollen slides exposed in Miami Beach and in downtown Miami rarely showed ragweed pollen granules, but a series of slides exposed in June 1935 at Coral Gables, 7 miles west of Miami, showed as many as 1,010 granules of ragweed per cubic yard a day. Miami's prevailing east wind accounts for this condition, at least in large measure. The west coast has no prevailing wind, and, in consequence, the pollen count varies with the alternating sea and land breezes.

Throughout the state the season of ragweed pollination varies greatly. At Ellenton, 35 miles south of Tampa, it begins as early as May 10. There, where the big spring crop is tomatoes, and a little farther south on the truck and celery farms east of Sarasota, heavy fertilization of the fields, with consequent fertilization of the ragweed bordering them, seems to be the only explanation of the early pollination in that locality. At Sanford, in the central part of the state, where celery has long been intensively cultivated, ragweed grows in abundance, and pollination begins early and continues over a long period.

Ragweed in Tampa attains a height of from 2 to 4 feet about May 20 and appears to be ready to burst into full bloom, but appreciable amounts of its pollen are not found on exposed slides before the middle of August. The appearance of clinical symptoms in patients sensitized to it coincides with this date. Close to the Gulf of Mexico but without a prevailing west wind, Tampa has a fairly steady pollen count from day to day, the average in 1936 having been 11 granules per cubic yard a day and the maximum 59 granules. Without frosts to kill the weed, it dies out gradually and is gone by the middle of November. The situation is practically the same in St. Petersburg.

Grass pollens are so nearly alike microscopically that their identification on exposed slides is seldom attempted. The many wild or native grasses of Florida produce little pollen, and the heavy producers of pollen, i. e., the cultivated grasses raised for pasturage, such as timothy, are practically nonexistent. The Bermuda, St. Augustine and centipede grasses, the three cultivated grasses used chiefly for lawns, are prolific producers of pollen, especially the Bermuda grass, its pollen containing a large amount of the protein excitant of *pollinosis*. Frosts or freezes rarely kill these grasses and they are in a state of pollination every month of the year, having seasonal peaks. The season of heaviest pollination usually begins late in February and continues through March and April, varying with the amount of rainfall, and there occurs a second peak of production during the summer rainy season in June or early July. Actually, the grass pollen count even in these peak seasons rarely exceeds 14 granules per cubic yard a day and varies from 2 to 7 granules throughout most of the other months. This concentration is in contrast to the grass pollen count of Cincinnati, for example, which runs commonly from 85 to 100 granules per cubic yard a day in April and May. In southern Florida, therefore, patients highly sensitized to grass pollen require treatment throughout the year. Those with a relatively high tolerance

<sup>1</sup> Personal communication to the author.



complain of symptoms only from March through September, but those with a low tolerance have trouble all the year

There is another group of patients, in whom pollen from grasses may act as a contributing cause and symptoms are present only in winter. Unless such patients are appropriately treated for this secondary factor, relief will not be obtained

Next in importance are the trees. The citrus trees and the various kinds of blossoming palm trees over the state rarely cause trouble, for they are largely insect pollinated. The pollen of the long leaf pine, the tree most commonly found in Florida, is generally conceded to have little or none of the protein excitant of hay fever. The cypress tree, plentiful in growth and having its season of pollination in January and February, is also negligible as a causative agent. The eucalyptus tree is practically never found except in towns and cities, usually in the wake of women's garden clubs. Its pollen is a source of trouble, as a rule in February or March. The pecan tree is so seldom encountered in southern Florida that it constitutes only a local problem, but in the far northern section of the state, where pecan groves are numerous, its pollen is troublesome. Certain species of oak are common to the state. A rank growth of scrub oak, mostly white and burr oak, like that covering the uncultivated lands of the northern section, occurs sporadically in the southern part, but the large oaks so familiar to the northern scene are seldom found there. The live oak and the water oak are found in both sections. They are heavy producers of pollen, but even trees of the same species growing close together may differ as much as a month in the time of their pollination. Consequently the season for oak may last six or eight weeks, and it starts as early as January 20 if there has been considerable rain and warm weather immediately preceding. The pollen count for oak this year in and around Tampa ranged as high as 240 granules per cubic yard a day.

The Australian pine, known botanically as *Casuarina*, is a new tree now being widely grown in the towns and on the beaches of southern Florida for shade. Despite its name, it is not a conifer. November is the season of its heaviest pollination. Many of my patients have been tested with solutions of its pollen, but positive results have not yet been obtained. Mr. O. C. Durham, chief botanist of Abbott Laboratories, stated that there is "no reason why its pollen should not cause trouble."

The pollen counts herein reported were made with the assistance of the Florida State Board of Health and checked by Mr. Durham. Recently Mr. Durham made counts of the pollen of the bayberry bushes and found an appreciable amount in the air. The season for their pollination is in March or April. "Spanish moss," often inquired about, is a true flowering plant, blooming in May and June and classified as *Dendropogon usneoides*. My experiments,<sup>2</sup> both with the pollen and with the dried plant, gave only negative results.

Although the variety of plants in the chenopod, composite and amaranth groups is large, such plants are but minor sources of trouble, and only a few cases have come under my observation in which pollens from them were contributing factors. Dog fennel is fairly abundant. Pigweed, or spiny amaranth, grows to great height and is not uncommon. The common plantain is not found in Florida. The wide variety of shrubs,

plants and trees introduced from the North, largely for purposes of landscape gardening, have no general importance.

#### ALLERGIC RHINITIS

According to my records, the offending inhalant allergens in allergic rhinitis in Florida are, in the order of their importance, house dust, orris root, feathers, animal inhalants and occupational dusts. House dust, the chief offender, requires special comment. The observation, over a period of years, that certain resident patients were relieved of symptoms when they visited Northern states or Cuba and that many patients from the North, sent by their physicians to take the "climate cure," became worse immediately or shortly after arrival, led to a survey which showed that in these cases, with few exceptions, housedust was the predominant factor. To test whether the unknown offending allergen of house dust was present in greater amount in the dust of Florida than elsewhere, specimens of an extract of house dust from homes in the state were sent to Drs. Milton B. Cohen of Cleveland, Tell Nelson of Evanston, Ill., Harry L. Huber of Chicago and Matthew Walzer of Brooklyn. After these physicians had made comparative tests and given clinical treatment with this extract to patients proved sensitized to dust, Drs. Cohen, Nelson and Huber<sup>1</sup> reported that the extract of house dust from Florida was undoubtedly more concentrated than that taken from their local sources by the same method. After making comparative cutaneous tests, Dr. Walzer<sup>1</sup> did not concur in this conclusion. Certain it is that, clinically, the percentage of cases in which house dust assumes a foremost place is larger in my practice than in the practice of the Northern allergists<sup>3</sup> with whom I have consulted. The explanation of the relief experienced by patients sensitive to house dust who visited in Cuba probably lies in the relative lack of sources of house dust in a land of open windows, tiled floors, little overstuffed furniture and few carpets and window draperies.

Second in importance is orris root. This substance should in future cause less trouble, as most manufacturers of cosmetics and talcum powders have ceased to use it as an ingredient of their products.

Feathers, ranking third, need no comment.

The explanation for the dearth of cases of allergic rhinitis caused by animal inhalants is not too apparent. Certainly there are as many household pets in Florida as elsewhere, but living conditions in the mild climate tend to keep both man and animal more in the open and therefore less in intimate contact. Also there are relatively few farms, with their horses, mules, cows, pigs and chickens.

Occupational dust is infrequently a cause of allergic rhinitis in Florida. The comparatively few manufacturing plants in the state operate under airy conditions and with windows open at all seasons.

Rarely does a case of allergic rhinitis come under my observation in which sensitivity to food is not a factor. The foods producing symptoms of themselves or complicating inhalant factors differ somewhat in Florida from those listed elsewhere.<sup>4</sup> In a series of 500 of my cases, foods in the order of the frequency with which they produced sensitivity were oranges and other citrus fruit, condiments, sea foods (both fish and

<sup>2</sup> Metzger, F. C. Spanish Moss (*Dendropogon Usneoides*). J. Florida M. A. 24: 99 (Aug.) 1937.

<sup>3</sup> Drs. Milton B. Cohen, Cleveland; Tell Nelson, Evanston, Ill.; Harry L. Huber, Chicago; Matthew Walzer, Brooklyn; John P. Henry, Memphis, Tenn.; and Hal Davison, Atlanta, Ga.  
<sup>4</sup> Coca, Arthur F., Walzer, Matthew and Thommen, August A. Asthma and Hay Fever in Theory and Practice. Springfield, Ill. Charles C. Thomas, Publisher, 1931. p. 412.

shell fish), milk, wheat, rice, eggs and vegetables. Winter visitors find oranges astonishingly cheap, and both temporary and permanent residents, rich and poor alike, consume them in large quantities. Fish and shell fish also constitute a staple article of diet, for they are fresh, cheap and plentiful all the year. Too, they call for condiments. That these foods take precedence among offending foods favors the hypothesis that the allergic person, having a tendency to become sensitive, naturally becomes sensitized to the foods he eats in excess or with greatest frequency.

In general, patients with allergic rhinitis respond less readily to treatment than do those with pollinosis. A large number require close cooperation between the allergist and the rhinologist. The situation varies little over the state, for slight difference is noted between patients living in Jacksonville, Gainesville and Pensacola and those living in Tampa, Miami and Fort Myers.

#### NONSPECIFIC AND PSYCHIC FACTORS

Nonspecific causes, thermal, chemical, neurogenic and physical, are not well understood and their mode of action is uncertain, but when they are a large factor the patient should find the climate of Florida ideal. Smoke and soot are practically absent from the air. The temperature is of the marine type, and the sudden violent changes that appear to affect allergic persons more than the degree of heat or cold are unusual. Patients whose condition is complicated by a cough with profuse expectoration, bronchiectasis or sinusitis are usually benefited by sunshine and warm weather.<sup>5</sup> It is well known that Florida has some 600 more hours of sunshine annually than most Northern states.

The neurogenic or psychic element presents an unexplained vagary to be reckoned with in the treatment of allergic diseases. Changing physicians, taking a new remedy or starting a new procedure, regardless of the therapeutic value may relieve a patient of a prolonged spell of asthma, doubtless because of faith in that which reputedly cured a relative or a friend. Accordingly, so radical a procedure as a change of climate, backed by the strong suggestion of the physician that benefits will result, should in some cases turn the neurogenic factor to favorable account, at least temporarily and perhaps permanently if the new climate and environment are wisely chosen with a view to meeting the patient's other needs. On the other hand, fear of being away from home or worry over the expense involved may cause an asthmatic patient to become worse regardless of the absence or presence of specific allergens in the new climate. The results of change of climate may not always, therefore, be interpreted solely on the basis of the distribution of specific allergens.

#### SUMMARY

Investigations have shown that in Florida the amount of air-borne pollen is small, its variety limited and its season practically all the year. Only the pollens of ragweed, grass and oak are of practical importance. The concentration of ragweed pollen is very small, and clinical observation warrants the conclusion that most persons sensitized to this allergen are free from symptoms in Florida. The east coast section, the nearer the beach the better, should afford freedom from symptoms to all sufferers from the pollen of ragweed, the midstate section and the west coast are suited to all

except those highly sensitized to this pollen. With the exception of patients sensitized to oak or highly sensitized to grass pollen, persons with pollinosis should do well in the state. Those who fear that Florida is unbearably hot during the months in which the pollen to which they are sensitized is in the air in the North or Midwest need only consult the records of the United States Weather Bureau.

Until the nature of the allergen in house dust is identified, it appears wise from clinical observations to advise asthmatic patients sensitized predominantly to house dust not to take up residence in Florida, especially in winter. Other inhalants causing allergic rhinitis are no more troublesome in Florida than elsewhere, and some such as animal inhalants and occupational dust, much less so.

Sensitivity to food is almost invariably a primary or a contributing factor in allergic rhinitis, and in my study of 500 cases I observed that the chief offending foods differed somewhat from those listed by other investigators. My observations tended to support the hypothesis that persons with a tendency to food sensitivity become sensitized to foods eaten in excess. Thus, the informed patient, on coming to Florida, may avoid the possible hazards of such major offenders as citrus fruit and sea foods by not indulging excessively in them.

In selected cases in which nonspecific causes are of importance, the climate of Florida may be of particular benefit. The psychic element, however, in the treatment of both asthma and hay fever may render difficult the interpretation of results.

The problem of the allergic patient is highly individual. The physician who advises change of climate without knowing the sensitivities of the particular patient, and without ascertaining the distribution of allergens and the general suitability of the climate suggested, fails to do the patient full justice. In recommending change he need be guided only by the dominant factors characterizing the patient's history, and he may obtain information about climate for the asking. Likewise, the layman who, at great mental or financial risk, perhaps, seeks a "cure" in Florida or elsewhere without securing competent professional advice and accurate information, takes a long, long chance on following nought but the lure of a climatic mirage.

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**Cells Which Secrete Hydrochloric Acid**—One of Bernard's often quoted discoveries in the field of digestion is his location of the glands which secrete hydrochloric acid. The date of the experiment was January 1850. Into the vein of a fasting rabbit he injected a solution of a soluble salt of iron, the lactate, then followed it with a solution of potassium prussate. In the presence of acid these two salts form prussian blue, the vivid color of which is readily detectable in very small quantities. The animal was killed three quarters of an hour later and an autopsy performed. In the superficial layer of mucus covering the surface of the stomach, especially along the lesser curvature, the blue color was to be seen. In his comment on this experiment Bernard stated that it not only showed the glands which secrete gastric juice since this product is always acid, but it also showed that the acid did not exist within the glands themselves but that the gastric juice only acquired its acid properties outside the gland when mixed with the other liquids of the stomach. This deduction was correct and the chief additional fact which has come to light since Bernard's day regarding the secretion of gastric juice is that it does not come from one single kind of gland, the acid comes from one kind of cell and the pepsin from another—Olmsted, J. M. D. Claude Bernard, Physiologist, New York, Harper & Bros., 1938.

<sup>5</sup> Welch, P. B. A Comparison of Disease Incidence in Iowa and Florida with Special Reference to the Effect of Climate upon the Incidence of Digestive Disease. *J. Florida M. A.* 22: 72 (Aug.) 1937. Nichol E. Sterling. Rheumatic Heart Disease in Southern Florida. *Am. Heart J.* 9: 63 (Oct.) 1933.



## GASTRO-ENTEROLOGY IN THE PRACTICE OF CARDIOLOGY

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The problems of gastro-enterology and cardiology in a given case are often closely related. Present day emphasis on the qualifications of a specialist increases the importance of retaining a broad outlook such as had the general practitioner of the old school. In the physician's efforts to become expert in a chosen field he must not become a localist. Most patients consult, or are referred to, the cardiologist with the belief that their condition is primarily due to a disorder of the heart, but many of their symptoms are of gastro-enterologic origin.

A study of symptoms reveals that the most frequent gastrointestinal symptoms encountered in the practice of cardiology are flatulence, anorexia, nausea, vomiting, dysphagia, jaundice and abdominal pain. It might be said that every patient with cardiac disease at some time or another complains of a gastrointestinal symptom. Confusion often arises in the interpretation of these symptoms.

A great deal has been written concerning the interrelationships of cardiology and gastro-enterology. The subject is still difficult to clarify. There is often discrepancy between clinical observation and experimental evidence. A better understanding of this problem can be had by a consideration of the cardiac-gastrointestinal relation under three main headings: (1) mechanical, (2) chemical, toxic and infectious and (3) reflex.

## MECHANICAL ASPECTS

*Cardiovascular Pathologic Conditions Affecting Abdominal Viscera*—Under the heading of mechanical influence of cardiac abnormalities on the abdominal viscera, among the most obvious are embolic manifestations from a valvular vegetation—mitral or aortic—or from a thrombus on the left side of the heart. For example, a young woman under observation for rheumatic cardiac disease apparently had an acute abdominal condition. Autopsy revealed an embolus in the superior mesenteric artery, with beginning gangrene of the segment of the intestine supplied by this vessel.

Failure of the right side of the heart with attendant venous congestion leads to chronic passive congestion of the abdominal viscera and thus interferes with the function of these organs. Among the common examples of gastrointestinal disturbance secondary to cardiac failure are hepatic distention with abdominal pain, a common picture in advanced mitral disease. Chronic passive congestion of the mucosa of the stomach sometimes results in nausea and vomiting, as well as a multitude of chronic digestive complaints. These are, on rare occasions, diagnostically confusing, particularly in patients receiving digitalis, but tend to clear up when cardiac compensation has been restored. In hypertensive cardiovascular disease with arteriosclerosis, hemorrhages, usually small, may occur in any of the abdominal organs, producing acute abdominal symptoms but having as a primary cause the underlying cardiovascular disease. Arteriosclerosis of the mesenteric vessels sometimes gives rise to symptoms of

abdominal pain, formerly called abdominal angina,<sup>1</sup> the exact functional pathology of which is not well understood.

In mitral stenosis of long standing the left auricle dilates, pressing on the esophagus, and occasionally gives rise to dysphagia. A recent example<sup>2</sup> of this condition occurred in a white American woman aged 33, who had as one of her complaints difficulty in swallowing liquids. On fluoroscopic examination a huge left auricle was found to be pressing on the esophagus. At autopsy the esophagus was seen to be compressed and pushed over to the right by the enlarged left auricle. It lay along the posterior aspect of the left auricle, looking something like a thin rubber tube stretched across the surface of an inflated balloon.

In similar fashion an aneurysm may disturb the position or function of the other organs by mechanical pressure, as on the trachea, esophagus and abdominal viscera, and thus cause symptoms related to the disturbed organ when the primary cause is cardiovascular. A recent example was observed in a white butcher aged 57, who had been under observation for coronary sclerosis and one day collapsed. On physical examination a tender mass was noted within the abdomen. This mass presented a difficult diagnostic problem. There was continuous pain in the left flank, with marked tenderness at the left costovertebral angle. During a gastrointestinal consultation to determine the nature and mode of treatment of the condition the patient died. Autopsy revealed a huge ruptured abdominal aneurysm.<sup>3</sup>

*Effect of Pathologic Conditions of the Abdomen on the Cardiovascular System*—Conversely, there are a number of intra-abdominal conditions which may have a direct mechanical influence on the function of the heart. Among the most frequently seen is flatulence. There is considerable discrepancy between clinical and experimental observation on the effect of flatulence on cardiac function. Clinically flatulence has been thought to be a potent factor in the production of extrasystoles, tachycardias and, in susceptible subjects, anginal attacks, by elevating the diaphragm and thus pushing the heart upward and disturbing its function.

In my experience unusually large amounts of gas have frequently been found in the stomach or colon on fluoroscopic examination, but this finding is rarely associated with any cardiac arrhythmia. Furthermore, Wayne and Graybiel<sup>4</sup> did not find any decrease in tolerance of exercise in persons with angina after the stomach had been distended with air.

The subject has been studied experimentally in dogs by Owen.<sup>5</sup> Electrocardiograms of lightly anesthetized animals were taken before, during and after dilation of the stomach with air. Changes in rate, usually a slight increase, and on rare occasions an extrasystole, were observed. Extrasystoles seemed to occur a trifle more frequently with belching than during distention. Of a number of medical students who could swallow air at

1 Albutt T Clifford Diseases of the Arteries Including Angina Pectoris London Macmillan Company 2 304 1915

2 Bishop Louis Faugeres Jr and Babey Andrew Massive Left Auricle J A M A 106 462 464 (Feb 8) 1936

3 Bishop Louis Faugeres Bishop Louis Faugeres Jr and Trubek Max Aneurysm of the Abdominal Aorta Internat Clin 2 134 (June) 1935

4 Wayne E J and Graybiel Ashton Observations on the Effect of Food Gastric Distension External Temperature and Repeated Exercise on Angina of Effort with a Note on Angina sine Dolor Clin Sc 1 287 (Nov) 1934

5 Owen S E A Study of the Viscerocardiac Reflexes I The Experimental Production of Cardiac Irregularities in Icteric Dogs with an Analysis of the Role Played by Nausea and Vomiting Am Heart J 8 496 506 (April) 1933

will and belch, none showed cardiac irregularities or significant changes in rate on electrocardiograms taken during the swallowing of air or belching.

The experiments in dilation of the stomach were repeated after attempts were made to render the heart susceptible by such means as feeding large doses of barium chloride, crushing one of the coronary arteries, inducing hyperthyroidism or diphtheritic myocarditis, using stimulants of the sympathetic and parasympathetic nerves or tying the common bile duct to produce jaundice. In the sensitized animals there was some increase in tendency to extrasystoles and to changes in rate after visceral dilation. The supposition is that the irregularities, when produced, were due rather to reflex stimulation, probably sympathetic judging from the work of Percy and Howard<sup>6</sup> than to mechanical distention of the stomach with pressure on the heart from elevation of the diaphragm. The effect then of flatulence on the susceptible human heart is questionable and, if affected, the mechanism is probably reflex rather than mechanical. From Owen's<sup>6</sup> studies of medical students the assumption is that flatulence and belching do not affect the cardiac function of nonsusceptible persons.

The same discrepancy between clinical experience and experimental evidence exists in the effect of abdominal distention from causes other than flatulence such as ascites, abdominal tumors and pregnancy, on cardiac function. From the clinical standpoint cardiac irregularities occurring in the presence of abdominal distention are thought to be due in certain instances to pressure on the diaphragm. But here again Owen<sup>6</sup> was unable to demonstrate the phenomena in dogs. He distended with air the peritoneal cavity of lightly barbitalized dogs and failed to observe any electrocardiographic changes before, during or after distention. Congenital defects in the diaphragm with diaphragmatic hernias belong to this group, but their effect on cardiac function is so individual and so related to the degree and character of the particular diaphragmatic anomaly as to make generalizations untenable. An example has recently been seen in a case of large diaphragmatic hernia with the stomach in the thorax anterior to the heart, in which there were no cardiac symptoms. The patient was entirely unaware of the anomaly.

#### CHEMICAL, TOXIC AND INFECTIOUS ASPECTS

*Cardiovascular Pathologic Conditions Affecting Abdominal Viscera*—The effect which circulatory failure with venous congestion and anoxemia may have on the electrolytes of the blood and tissue fluids is not clearly understood, but it is well known that in passive congestion and edema there is retention of salt in interstitial tissue, with resultant intracellular dehydration. Andrus and Carter<sup>7</sup> have shown that cardiac tissue is particularly sensitive to alterations in hydrogen ion concentration. This may occur in the cardiac muscle itself, through products of its own metabolism, or by changes in  $p_H$  or the carbon dioxide content of the fluid bathing it. Andrus and Carter suggested that the difference in hydrogen ion concentration within and without the cell is a factor in controlling its excitation. How sensitive are the tissues of the gastrointestinal

tract under these conditions? Long-standing chronic passive congestion of the liver may disturb its function so that a change takes place in the albumin-globulin ratio of the blood, the osmotic pressure of the plasma is lowered and the small globulin molecule has ready access to the interstitial fluids. By this means intercellular edema in the gastrointestinal tract and elsewhere is increased, and disturbances of gastrointestinal function result.

The fever, leukocytosis and high erythrocytic sedimentation rate following coronary thrombosis are evidences of generalized toxemia, with the cardiac lesion as the direct etiologic agent. Jaundice, which occasionally occurs in congestive heart failure,<sup>8</sup> may be a manifestation of toxemia or may again be only the result of hepatic congestion secondary to failure of the circulation.

*Effect of Pathologic Conditions of the Abdomen on the Cardiovascular System*—The number of extracardiac diseases which affect the cardiovascular system by some obscure chemical or toxic means is numerous. The field of gastroenterology certainly includes many of these—typhoid fever, acute and chronic dysentery and acute and chronic disease of the gallbladder, to mention only a few. The chemical mechanisms by which the cardiovascular system is affected in general toxemia from acute and febrile illness are not known. Myocardial damage has been demonstrated in dogs in acute diffuse peritonitis by Steinberg and Kobacker.<sup>9</sup> The study of the effect of accessory food substances on the heart and of the disorders of the gastrointestinal tract which prevent or delay absorption of these substances is still in its infancy but is an open, promising field.

#### REFLEX DISTURBANCES

*Cardiovascular Pathologic Conditions Affecting Abdominal Viscera*—The question of reflex disturbances which find their primary seat in the heart, with referred symptoms elsewhere, has received much attention, particularly in coronary thrombosis simulating acute abdominal disease. The mechanism of acute and chronic cardiac lesions giving rise to pain referred to the abdomen, simulating disease of the gallbladder, peptic ulcer and pancreatitis, is apparently the result of a crossed reflex arc whereby pain fibers from the cardiac regions enter a segment of the cord through the vagus or sympathetic chains and are confused with the impulses entering the same segment of the cord from the abdominal viscera, and thus the pain is "referred" to the abdomen. This referred pain is often seen in angina pectoris and pericarditis. This was strikingly illustrated not long ago in the case of a young married woman in whom an abdominal operation was contemplated for four days on account of prominent abdominal signs and symptoms. A pericardial friction rub, rapid enlargement of the heart and symptoms of progressive cardiac enlargement subsequently developed.

In abdominal conditions with cardiac manifestations the error of regarding acute disease of the gallbladder as coronary occlusion is all too frequently encountered. There is a good deal of real justification for this confusion. As mentioned before, there is the problem of referred pain, either from heart to abdomen or vice

6 Percy J. Franch and Howard Helen. Studies on the Visceral Nervous System. Reflexes from the Peritoneal Viscera to the Heart. *Am. Heart J.* 2: 530-541 (June) 1927.

7 Andrus E. Cowles and Carter Edward P. The Mechanism of the Action of Hydrogen Ion upon Cardiac Rhythm. *J. Clin. Investigation* 3: 555 (Feb.) 1927.

8 Kugel M. A. and Lichtman S. S. Factors Causing Clinical Jaundice in Heart Disease. *Arch. Int. Med.* 52: 16 (July) 1933.

9 Steinberg Bernhard and Kobacker J. Lester. The Cardiovascular System in Protected and Unprotected Animals with Acute Diffuse Peritonitis. *J. Exp. Med.* 20: 1180 (June) 1935.

versa, this is common in disease of the gallbladder. There is experimental evidence that under certain circumstances stimulation of the gallbladder may cause cardiac arrhythmias and produce changes in the electrocardiogram. Umber<sup>10</sup> reported tachycardia, irregularities and bradycardia as due to pain of the gallbladder. Hoppe-Seyler<sup>11</sup> described irregularities of pulse of vagal origin produced by gallstone colic. Straus and Hamburger<sup>12</sup> expressed the belief that extrasystoles in disease of the gallbladder may be due to stimulation of the vagus-supplied viscus (gallbladder), to absorption of toxin from the pathologic organ or to both. A series of experiments on dogs, begun by Owen<sup>5</sup> and continued by Crittenden and Ivy,<sup>13</sup> in which cardiac function was followed electrocardiographically after distention of the biliary system with air, did much to clarify the subject. As with distention of the stomach of normal lightly anesthetized dogs, Owen<sup>5</sup> failed to produce extrasystoles or irregularities other than slight changes in rate when he distended the gallbladder. It was found that jaundice, disease of the biliary tract or hepatic injury sensitized the animals to cardiac irregularities and even minor changes in electrocardiographic form. Crittenden and Ivy<sup>13</sup> confirmed Owen's<sup>5</sup> observations and further noted that the cardiac irregularities were due rather to the nausea and vomiting incident to biliary distention in the presence of jaundice than to the distention per se. They observed electrocardiographic abnormalities, such as extrasystoles and auriculoventricular blocks in 10 per cent of students who were nauseated and retched during the swallowing of a stomach tube. Carrying this work to observations on human beings during all kinds of abdominal operations, Maher, Crittenden and Shapiro<sup>14</sup> found suppression of the P wave and assumption of nodal rhythm in the majority and expressed the belief that the electrocardiographic changes are probably chiefly a result of deep anesthesia. Extrasystoles and bradycardia occurred in a few persons. The authors were unable to demonstrate any constant or specific relation between the particular surgical procedure and the cardiac response.

Bettman and Rubinfeld<sup>15</sup> attempted to eliminate the factor of anesthesia by using spinal anesthesia and limited the observations to operations on the gallbladder. They found that the effect of pressure, clamping and pulling on the gallbladder was to increase the cardiac rate. In a few cases extrasystoles developed during operation, one patient had shown them before operation.

Applying this work to clinical medicine, it is conceivable then to have electrocardiographic changes in the presence of acute disease of the gallbladder, particularly if jaundice is present, but these changes are probably related to nausea and retching and should therefore be transient. A heart which is itself sensitized because of pre-existing coronary sclerosis might, in the presence of disease of the biliary tract (which Owen<sup>5</sup> stated does sensitize the heart), show electrocardiographic abnormal-

ities on much less provocation than would a normal heart. In support of this hypothesis is the not too frequent observation, on which Straus and Hamburger<sup>12</sup> have reported, that patients with obvious coronary disease who in addition have chronic cholecystitis and cholelithiasis are sometimes rendered entirely free of cardiac symptoms, with return of the electrocardiogram to normal, after removal of the diseased gallbladder.

Further confusion in the differentiation between coronary and cholecystic disease arises from the fact that occasionally glyceryl trinitrate will relieve the pain in biliary colic by relaxing the cystic, or common duct, spasm, thus nullifying the efficacy of administering glyceryl trinitrate as a therapeutic diagnostic test in angina pectoris. On occasion it is almost impossible to differentiate the two conditions. A series of roentgen studies of the gallbladder, if the patient is in condition to weather it, may help to throw the weight of diagnostic evidence on one side or the other. This is particularly true if the studies give negative results, on the other hand, if they show a pathologic condition, with or without stones, one can never be sure whether in any one particular case this is coincidental or causative. If one recognizes the real difficulty in making the differentiation and remembers that cholecystic and coronary disease may attack the same type of person and therefore not infrequently coexist, one will steer an alert cautious course until the diagnosis is definitely established and thus avoid the error of operating on a patient with acute coronary thrombosis or progressive coronary sclerosis.

Other diseases which may be confused with coronary disease are gastric ulcers, acute pancreatitis, mesenteric embolism, acute intestinal obstruction, esophageal spasm and diverticulitis.

121 East Sixtieth Street

#### ABSTRACT OF DISCUSSION

DR. JOHN R. TWISS, New York. Pain is unquestionably an outstanding feature of both coronary disease and gallbladder disease. I have studied 200 patients with gallbladder disease from the point of view of pain. In no less than 50 per cent the pain was situated in the epigastrium rather than in the right upper quadrant, and in a large proportion of the patients the pain was referred to the precordium rather than to the back. Since glyceryl trinitrate may relieve gallbladder pain, a study of the associated symptoms is sometimes of assistance. I have found that the symptoms of indigestion with cardiac disease usually are associated with evidences of cardiac decompensation or to some extent following the taking of digitalis. The indigestion of the patient with disease of the gallbladder, on the other hand, is likely to be prolonged and intermittent, commonly following some dietary indiscretion such as overeating or taking foods to which the patient has an intolerance, such as fats. Being "afraid to eat" on account of the subsequent discomfort is a common story with cholecystitis. Further assistance in differential diagnosis may be obtained by physical examination in that conditions such as dyspnea, cyanosis and edema of the extremities are more common in the cardiac patient. With biliary tract disease I have found more frequently signs of localized tenderness and spasm of the right upper quadrant as well as jaundice. The laboratory tests which have proved most useful in establishing a diagnosis of biliary tract disease have been the cholecystogram, biliary tract drainage and the icterus index determinations. The existence in the same patient of both coronary disease and gallbladder disease, as stated by Dr. Bishop, is not uncommon. In my experience the most frequent sign in these cases is an appearance of extreme toxicity, usually associated with weakness and loss of weight. The blood pressure is commonly low, there may be cardiac irregularities, which I feel are due to a toxic myocarditis. Cholecystectomy has in

10 Umber F. Erkrankungen der Leber und der Gallenwege. Handbuch der inneren Medizin 3: 115, 1918.

11 Hoppe-Seyler. Die Krankheiten der Leber, ed. 2, 1912, p. 252.

12 Straus David C. and Hamburger Walter W. Significance of Cardiac Irregularities in Reference to Operability of Cholelithiasis. Cholecystitis and Duodenal Ulcer. J. A. M. A. 82: 706 (March 1) 1924.

13 Crittenden P. J. and Ivy A. C. A Study of Viscerocardiac Reflexes. II. The Experimental Study of Cardiac Irregularities in Icteric Dogs with an Analysis of the Role Played by Nausea and Vomiting. Am. Heart J. 8: 507-518 (April) 1933.

14 Maher C. C., Crittenden P. J. and Shapiro P. F. An Electrocardiographic Study of Viscerocardiac Reflexes During Major Operations. Am. Heart J. 9: 664-676 (June) 1934.

15 Bettman Ralph B. and Rubinfeld S. B. Gallbladder Heart Reflexes in Man Under Spinal Anesthesia. Am. Heart J. 10: 550-552 (April) 1935.

some of these cases given dramatic results not only in relieving the symptoms mentioned by Dr. Bishop but also in improving the general condition of the patient and eliminating attacks of pain which were apparently coronary in origin. In the absence of actual signs of decompensation, these patients usually stand operations well. Whenever possible a preliminary rest in bed is advisable, the glycogen reserve being built up by means of a high caloric, high carbohydrate diet.

## Clinical Notes, Suggestions and New Instruments

### DANGERS IN THE USE OF CHEMICAL HAIR STRAIGHTENER

FREDRIC LEWIS, M.D., NEW YORK

Consistent with the profession's eternal preoccupation with sordid materialism is the fact that there has been no literature on the subject of hair straighteners. A reasonably careful search, including perusal of the Surgeon General's Catalogue, the *Quarterly Cumulative Index Medicus* and *Chemical Abstracts*, demonstrates that, certainly for many years back, this phase of esthetics has been neglected. In some very incidental paragraphs it has been mentioned,<sup>1</sup> to be sure, that materials such as gum tragacanth might impose on the hair a brute force, gravitational kind of rectilinearity. But, while medical science slept, cosmeticians have pushed the borders of their own domain back far beyond this mucilaginous stage.

#### HISTORICAL

Chemical hair straighteners, according to the best available authorities, began to evolve toward 1910. Their origin is obscure, probably indeterminate. For a long time Negro women had been successfully straightening their tresses with a grease and hot comb mechanism, but for use on the closely cropped male pate there was needed a new invention. The tonsorial call was heard and from somewhere in New York was answered by an anonymous genius.<sup>2</sup> The industry has grown hardily, weathering intervening depressions and recessions as only a staple can, and today it sells its produce in Europe, Africa, South America and all over the United States. There are about six competing houses that distribute the straightener through drugstores and barber shops. Their clients—principally, but by no means exclusively, Negroes—are satisfied ones, and they write lavish, spontaneous testimonials in pencil.

The straighteners vary slightly in color and price and a great deal in strength, but fundamentally they are all of a chemistry. The 6 ounce jar (sufficient, perhaps, for three applications) costs somewhere between 40 and 80 cents. A busy drugstore may average two sales a day. The barber, charging a dollar a treatment, may have from one to five straightening contracts a month.

#### CHEMISTRY

The mode of action of hair straighteners is to make a supple out of a rigid shaft. The cystine moiety of the hair proteins can be broken at its disulfide bond to induce this fiber relaxation.<sup>3</sup> Thus the kinking, due to thickness gradations and axial twists,<sup>4</sup> may be overcome. Three general types of treatment can be responsible for this phenomenon:

- 1 Reducing substances, which ordinarily contain stannous chloride, sodium hyposulfite, sodium polysulfide and the like.<sup>5</sup>
- 2 Agents which bring large amounts of heat to the individual hairs by their exothermic reaction with water (calcium oxide, for example).<sup>6</sup>
- 3 Caustics, chiefly sodium and barium hydroxide.<sup>7</sup>

From Harlem Hospital

The chemical information involved was supplied by John V. Scudi, Ph.D., Department of Pathology, Harlem Hospital.

<sup>1</sup> In Queries and Minor Notes in *THE JOURNAL* and in Questions and Answers in *Hygeia*.

<sup>2</sup> Credit has been suggested for Asbury Park.

<sup>3</sup> Speakman, J. B., and Whewell, C. S. *J. Soc. Dyers & Colourists* 52: 380, 1936.

<sup>4</sup> Negro Hair Nature 132: 106 (July 15) 1933.

<sup>5</sup> Malone Carroll and McKee. U. S. 2,087,933. 'Composition for Straightening Curly Hair.'

<sup>6</sup> Rudolph List. U. S. 2,076,521.

<sup>7</sup> No references except as discussed in Speakman and Whewell.<sup>8</sup>

The reducing and the exothermic agents, followed by treatment to restore the original texture of the hair, are mechanisms prevalent in literature on the permanent wave. Hair straightening, on the other hand, seems to be effected exclusively by the caustic method. Three changes may occur under the influence of caustics: hydrolysis, imbibition and destruction of the disulfide linkage. The result is a malleable protein gel susceptible to mechanical straightening, a softer hair.

The commercial products surely differ as to all constituents but outstandingly in caustic content. The Federal Caustic Poison Act restricts the percentage of sodium hydroxide to 10, and so far as examination has shown the marketed straighteners are within this limit, although, obviously, there can be no regulation of their extralegal (?) manufacture in the home and barbershop. Much of the peril lies, no doubt, with such synthesizing amateurs who would do miracles of straightening.

The samples analyzed were whitish yellow creams, with a faintly disagreeable perfume, apparently in a petrolatum and soap vehicle. No evidence of a reducing or of an exothermic substance was found. Duplicate determinations on two different hair straighteners showed an average caustic content, titrated to congo red, of 6 per cent by weight.

#### REPORT OF CASES

CASE 1—J. D., a Negro youth aged 19, was seen in response to an ambulance call about 11 o'clock one night in December 1937. He was moaning in agony and daubing his cheeks with a wet cloth. The skin of his face was very edematous, covered with blotches of raw, red erosion, and diffusely erythematous—of an appearance identical with severe, second degree lye burns. The only relief from his excruciating "stinging" pain was continual moisture. An almost empty bottle of gray hair straightener lay on the table. The cream, unhappily, had been used on J. D.'s head, and the rinsings therefrom he had allowed to bathe his face.



Depigmentation from burn caused by hair straightener in case 2.

The patient was brought immediately to the accident room, treated with dilute acetic acid and analgesics and thence transferred to Bellevue Hospital. After three weeks he was discharged with the diagnosis of dermatitis venenata. Efforts to see J. D. for follow-up have been in vain, for he is gone with some fortuitous Harlem wind, nay, eddy, and his new address could not be found. It is probable, however, that the scars are permanent.

CASE 2—C. B., a Negro aged 45, was admitted to Harlem Hospital March 27, 1938, for pulmonary disease. A striking area of depigmentation on the forehead (as shown in the accompanying illustration) excited questioning, and a history of a burn from hair straightener was elicited. Seven years before, the patient's barber, while applying a cream for the purpose of straightening the patient's hair, got, as the patient relates, to talking of women people. Original sin haunted that barbershop and for fully five minutes enraptured its proprietor, though C. B. made efforts to tell him that something was burning his forehead. The sequelae are not accurately remembered by the patient, but apparently there were several days of soreness, then crust formation and gradual exfoliation with disappearance of chromatophores. The depigmentation proved enduring, but the straightening of the hair, alas, was transient.

DANGERS

The manner of use, as detailed by a large random sample of unimble barbers on Lenox Avenue, is in itself a confession of its dangerousness. The ears, the temples and all skin marginal to the hair is coated first with petrolatum. When the "tougher" of the products is used, a protecting layer of petrolatum is rubbed into the scalp itself. The cream is then smeared like icing on the dry hair and gently blended in. Thus it is left for a brief time—from one to twenty minutes, depending on the straightener's pugnance and the straightenee's sensorium. It must be washed off promptly with many rinsings of hot water and careful regard for the skin of the face. (Failing these precautions, 'it give your skin the devil'") Now the hair is straightened, it lies even as a hilly pool, and its texture is silken soft. The treatment is superbly effective. Relapses occur monthly.

It is difficult to estimate the extent of danger in the use of hair straightener. Certainly sensitivity to the caustic is widely variant among individuals. We ourselves made the serene sacrifice in the form of patch tests but suffered no ill consequence. Examination of the records of chemical burns of the scalp, face and neck admitted to Harlem Hospital in the last five years yields not a single one attributed to straighteners. Admitting physicians, on the other hand, have seen the inflammatory pathologic condition on many occasions and even patches of alopecia ascribed to straighteners. It is freely confessed by the barbers and the drugstore "docs" that bad burns may result from its imprudent use, but one must suffer to be beautiful.

SUMMARY

- 1 A reasonably thorough search of the literature reveals virtually no reference to hair straighteners as such.
- 2 Very persuasive hair straighteners are in general use. The cogent constituent is sodium hydroxide, which converts hair protein to a gel.
- 3 Their use is not without danger. Burns may be of such severity that the employment of straighteners is inadvisable except with great care or under the supervision of a qualified fireman.

875 West End Avenue

DECOMPRESSION FOR EXOPHTHALMOS  
REPORT OF THREE CASES

FRANK B. KISTNER, M.D., PORTLAND, ORE.

In the remote past the profession was concerned over the distressing, often tragic, sequelae of progressive exophthalmos, particularly with those caused by hyperplastic goiter. With the development and progress of goiter surgery it seemed that the problem had been solved, but there remained a small percentage of patients with this condition who were not relieved, some even continuing a progressive course after surgical treatment of the goiter. I have also had an occasional idiopathic case.

Various procedures were suggested and carried out for the relief of these patients with little or no success until Naffziger and Jones<sup>1</sup> in 1932 reported the successful result of operation in six cases in the previous two years and established the principal etiologic factor in this condition. Naffziger's<sup>2</sup> article had a very complete bibliography on the subject of exophthalmos.

Swift<sup>3</sup> in 1934, entering the orbit by a modified Kroenlein approach for a supposed retrobulbar tumor, found that the unilateral exophthalmos was due to the same pathologic condition found by Naffziger, namely a tremendous enlargement of the extra-ocular muscles. His decompression was followed by complete relief of all symptoms. Space for expansion of the orbital tissues with Naffziger's operation is at the expense

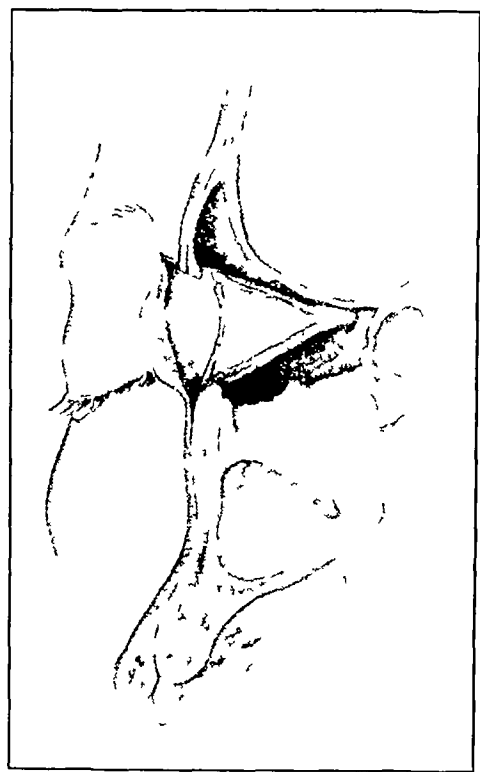
of the tissues in the anterior fossa, the bulk of the bone removed being negligible. With Swift's procedure the result is due to the plasticity of the tissues in the temporal region.

In 1936 Sewall,<sup>4</sup> working on this problem in the laboratory, proposed utilizing the space occupied by the sinuses to gain room for the orbital contents. He states that he does not know of this method ever having been used for the relief of exophthalmos.

I am reporting three cases of decompression for exophthalmos, one by the Naffziger method and two as suggested by Sewall.

REPORT OF CASES

CASE 1—A man aged 22 was operated on in September 1927 by Dr. T. M. Joyce for toxic goiter. He had moderate exophthalmos, more pronounced in the right eye. Otherwise the eyes were normal except for a moderate refractive error. Following the operation there was little change in the condition of the eyes for seven or eight months, at which time it became apparent that the exophthalmos was becoming more pronounced.



Semidiagrammatic sketch showing incisions in the periorbital fascia, or periorbita after removal of the floor of the frontal sinus, the ethmoid cells and the lamina papyracea.

He was working and feeling fine in every other way. Physical examination revealed no other abnormality. He was given compound solution of iodine at intervals during the following five years, but the progress of the exophthalmos continued.

By June 1933 his eyes were so prominent that he could not wear his glasses. There was some limitation of movement, especially upward and on looking to the right. He had transient diplopia. The lids could be closed and there were no changes in the fundi. The right eye was much more prominent than the left and he said he could not see as well with the right eye as with the left. He insisted that something be done to relieve him.

June 15, Dr. Joyce and I operated on him according to Naffziger's method. The frontal sinuses were small. The ethmoid cells did not extend into the roof of the orbit. Bilateral frontal flaps were reflected, the dura of the frontal lobes was elevated, exposing the roof of the orbit. All the bony roof of the orbits external to the sinuses was removed back to and including the upper outer portion of the optic foramina. The

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Read before the Western Section meeting of the American Laryngological, Rhinological and Otolological Society, Inc., Santa Barbara, Calif., Jan. 29, 1938.  
<sup>1</sup> Naffziger, H. C. and Jones, O. W., Jr., The Surgical Treatment of Progressive Exophthalmos Following Thyroidectomy, J. A. M. A. 99, 638 (Aug. 20) 1932.  
<sup>2</sup> Naffziger, H. C., West J. Surg. 40, 530 (Oct.) 1932.  
<sup>3</sup> Swift, G. W., Operative Approach for Exophthalmos, West. J. Surg. 43, 119 (March) 1935.

<sup>4</sup> Sewall, E. C., Operative Control of Progressive Exophthalmos, Arch. Otolaryng. 24, 621 (Nov.) 1936.

ligaments of Zinn were cut and anteroposterior incisions made in the fascia of the orbit. Postoperative recovery was uneventful. During the first few months following operation there was a noticeable regression of the exophthalmos, though the right eye still remained more prominent than the left. There was visible pulsation of the eye globes synchronous with the pulse.

It has now been over four years since the decompression. Neither eye has receded to its normal position. The right eye is 2 mm more prominent than the left. The patient complains of "jumps" in his eyes with each heart beat, which makes it very difficult for him to read. He states that the vision in the right eye is better than before the operation.

CASE 2—A married woman aged 30 presented herself at the Portland Clinic in July 1937 complaining of "bulging eyes." She gave the following history: Twelve years previously she had a sudden onset of swelling of the lids of both eyes. The swelling subsided, but the right eye continued to bulge and symptoms of toxic goiter developed. After three years she consulted Dr. W. B. Holden of Portland, who did a thyroidectomy. This relieved her toxic symptoms but not the exophthalmos. In August 1936 the left eye began to bulge and the vision to fail, but there were no symptoms of toxicity. In December more thyroid tissue was removed with no improvement of the exophthalmos.

Corneal ulceration had occurred many times—fifteen times in the right eye, according to her statement—and she had a continuous dead aching pain in both eyes which interfered seriously with her rest. She complained of an occasional diplopia. Vision in the right eye was 20/100, in the left 20/40. There was some fulness of the disk with nasal blurring and temporal pallor.

Aug. 3, 1937, I performed a bilateral transfrontal ethmoidectomy, removing the entire floor of the frontal sinus, the ethmoid labyrinth and the lamina papyracea back to the optic foramina. The bone at the foramen was not removed nor was the sphenoid entered. It is essential to remove or destroy the mucous membrane lining of the frontal sinus and supra-orbital ethmoid cells in order not to isolate secreting membrane in a situation that has inadequate or no drainage. The orbital fascia was opened by two anteroposterior incisions and one transverse incision. The anteroposterior incisions were placed one at the lower border of the resected lamina papyracea, the other at the upper border. The transverse cut was started at the external limit of the frontal sinus and carried internally across the anterior ends of the two previous incisions. Before closing, the mucoperiosteal flap was placed to protect the fronto-nasal opening.

Recovery from the operation was uneventful. The constant aching pain in the eyes was relieved in five or six days. It could be seen that the eyes were receding as soon as edema following the operation had subsided. The patient left Portland for her home twenty-three days after the operation. The eyes had receded 4 and 5 mm and she was comfortable. Reports from her since that time indicate continuous improvement in her vision.

CASE 3—September 25 I carried out the same procedure on a woman aged 26. Eighteen months before she had had a thyroidectomy for toxic goiter. There was some exophthalmos before the operation and it continued to progress after all the general symptoms were relieved. Various forms of treatment were tried without result. At the time of the transfrontal decompression there was some puffiness of the eyelids and lacrimation. She could not close her lids and had had a corneal ulcer on one eye. Mobility of the globes was impaired and her vision was failing. She left the hospital five days after the operation. At the end of the first week the lids could be closed. The eyes had receded to within normal limits in four weeks. The vision has improved and there has been some increase of mobility of the globes since then.

#### COMMENT

So far as I know this is the first report of the space occupied by the sinuses being utilized for the relief of exophthalmos.

The advantages of this operation over that of Swift or Naffziger are that it is less formidable, there is less disfigure-

ment from the scar than by the Kroenlein approach, it provides actual rather than potential space for expansion of the orbital contents, it does away with the pulsation of the eyes which was such a disagreeable sequel in the case in which I operated by the Naffziger method, and it can be done when widely extending supra-orbital cells would make the Naffziger procedure impracticable.

Mayer Building

## Special Article

### THE PHARMACOPEIA AND THE PHYSICIAN

#### THE TREATMENT OF INFANTILE ECZEMA

FROM THE POINT OF VIEW OF THE DERMATOLOGIST

MARION B. SULZBERGER, M.D.

NEW YORK

*This is one of a series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopoeial Committee on Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—Ed.*

According to modern interpretation, the term "eczema" describes not a disease entity but a more or less characteristic form of cutaneous reaction. Although it is difficult to give a brief, yet accurate, description of the eczematous reaction, I believe that the following definition enjoys the most universal acceptance. All "eczemas" consist of inflammatory reactions in the uppermost portions of the skin. These reactions are characterized, clinically, by one or more of the following: erythema, papulation, vesiculation, oozing, crusting, scaling and thickening, and, histologically, by intra-epidermal edema (spongiosis), vesicles, parakeratosis and acanthosis, and with concomitant, more or less marked, acute or chronic inflammatory changes in the upper cutis. This form of reaction is the most common of all dermatologic changes, "eczemas" of various types and from various causes rank with the common cold and with acne vulgaris as perhaps the most frequently encountered of all human diseases.

In recent years, dermatologists have been trying to distinguish more and more sharply between the various forms of eczematous and eczematoid dermatoses, as seen in older children, in adolescents and in adults. Most observers agree that in patients beyond infancy and in typical cases the expert should be able to differentiate between the following main representatives, each one constituting in all probability a more or less distinct entity, which is often fundamentally unrelated to the other forms:

1 Eczematous contact-type dermatitis (true "eczema" of Jadassohn,<sup>1</sup> Bloch<sup>2</sup> and many American authors)

This is the most common form of allergic cutaneous disease in adults, in all probability it is the most common of all allergic diseases.

2 Atopic dermatitis (Coca-Sulzberger) (synonymous with prurigo of Besnier, lichen chronicus disseminatus of Vidal,

This is the second of three articles on this subject.  
1 Jadassohn, Josef. *Dermatologie*. Vienna: Bern, Weidmann & Co. 1938. p. 41.  
2 Bloch, Bruno. The Role of Idiosyncrasy and Allergy in Dermatology. *Arch. Dermat. & Syph.* 19: 175 (Feb.) 1929.



"neurodermite diffuse" of Brocq and "spriet exudatives ekzematoid" of Rost)<sup>3</sup>

3 Seborrheic dermatitis or seborrheic eczema of Unna

4 Nummular eczema, "orbicular eczema," "parasitic eczema," the "exudative neurodermite" of Kreibich and the "true eczema" or "autosensitization eczema" of many English dermatologists

A common cutaneous disease of entirely unknown etiology and pathogenesis generally appearing in sharply circumscribed, round or oval plaques of various sizes, often highly pruritic and favoring the extensor surfaces

5 Eczematous and eczematoid responses to micro organisms, either present at the affected site or originating from foci elsewhere in the skin or elsewhere in the body (The latter are the eczematous microbids of Jadassohn, Drier and Bloch)

The best known representatives of this group are the eczematous fungous eruptions, known as dermatophytoses and dermatophytids, and the eczematous reactions to monilia

6 Eczematous and eczematoid eruptions from physical causes (friction, repeated trauma, scratching, light, heat, cold, moisture and the like) and from chemical irritation (alkalis, acids, salts, terpenes, and so on)

7 Lichen chronicus simplex circumscriptus of Vidal (circumscribed neurodermatitis)

8 Combinations of any and even of all the foregoing forms

It is undeniable that the great progress which has been made in the subdivision of these dermatoses in the age groups above infancy not only has led to theoretical advances and to an approach to clearer understanding of pathogenesis but has also been most fruitful in the practical management of many of these cases. Today the dermatologist usually approaches the problems of treating an eczematous or eczematoid eruption in an older child or in an adult by first attempting to subclassify the dermatosis in its proper category among the groups mentioned. For determination of the exact group or groups into which a particular case will fall often determines the entire therapeutic approach, the prognosis and the prophylactic measures. Methods that are successful in one group are often unsuccessful and even harmful in another.

For these reasons an attempt to classify, in a similar manner, the eczematous and eczematoid eruptions in infancy was obviously indicated (Here I define "infancy" as up to the age of 2 years)

One finds, most recently, that attempts to identify some of these various forms have gradually been advancing from the specialist into the pediatric and general literature both here and abroad. Hill<sup>4</sup> for example, who is the author of the most complete and recent practical chapter on this subject, is in essential agreement with the outlined classification,<sup>6</sup> he now distinguishes between infantile eruptions which may be classed as (1) seborrheic dermatitis, (2) eczematous fungous conditions, (3) contact dermatitis and (4) atopic dermatitis. But Hill too emphasizes the many combinations and transitional forms, the frequent insurmountable difficulties in differential diagnosis and the

fact that in infants the topical and dermatologic treatment is the same, or very similar, in all these different groups.

I should certainly be the last to deny the necessity for continued efforts in the endeavor to subclassify the eczematous and eczematoid eruptions in all age groups, for I have been a strong proponent of this endeavor and am convinced that examples of many or even all the forms found in adults may be present in infancy.<sup>5</sup>

However, the situation in infancy is distinctly different from that in adults, particularly because of the additional diagnostic difficulties encountered in infants. I doubt whether the nondermatologist who approaches the problem of practical treatment will, in the present rudimentary state of knowledge in this field, derive much of value in attempting to distinguish between the various forms of eczematous and eczematoid dermatitis in children below the age of 2 years. Some of the reasons for this doubt may be summarized as follows:

1 In infants the atopic form or forms in which atopy plays a major role is numerically so preponderant that each of the other types represents only a small, almost insignificant fraction of the total cases encountered (The criteria for establishing the atopic nature of infantile eruptions may be found in my previous papers<sup>6</sup> and in the other articles in this symposium.)

2 The localization in the infantile cases does not usually permit the clearcut distinctions often found in adults. In infants the scalp and face seem to be the sites of predilection not only in seborrheic but also in atopic forms, there is usually no marked favoring of antecubital and popliteal spaces, even in the most typically atopic cases. Thus the infantile eczematous eruptions do not, as a rule, present the typical distributions which constitute such important aids in the differential diagnosis of the adult forms.

3 The blistering and weeping, which are almost pathognomonic of adult contact-type dermatitis and which are absent in uncomplicated atopic and seborrheic dermatitis in adults, are likely to be present in all forms of infantile eczema.

In my opinion this may be merely a result of a difference in the properties of infantile skins which permit exudation from below to permeate and progress upward. The superficial structures then naturally respond with vesiculation (compare also the different type of whealing which cutaneous tests elicit in infantile, as contrasted with adult, skins). The superior tendency to vesiculation in young skins is seen not only in eczematous and eczematoid eruptions but also in the blisters encountered in many other infantile dermatoses, for in infants blisters often appear in dermatoses which are usually nonvesicular in adults (syphilis of pemphigoid type, bullous impetigo, bullous scabies, bullous reactions to insect bites, urticaria topped by small vesicles, miliaria and the like). In infants the vascular and urticarial reaction of atopic dermatitis<sup>7</sup> and the inflammatory edema of seborrheic dermatitis often lead to vesiculation, weeping and crusting, while these same cutaneous conditions produce no manifest vesicles or

3 Sulzberger, M. B. and Hill, L. W. Evolution of Atopic Dermatitis. Arch. Dermat. & Syph. 32: 451 (Sept.) 1935. Rostenberg, Adolph Jr. and Sulzberger, M. B. Some Results of Patch Tests. Ibid. 35: 433 (March) 1937. Sulzberger, M. B., Spain, W. C., Sammis, F. and Shabon, H. I. Sulzberger, M. B. and Rostenberg, A. Sulzberger, M. B. and Goodman, J. Sulzberger, M. B. and Rostenberg, A. Sulzberger, M. B. and Goodman, J.

4 Hill, L. W. Eczema, chapter 43 in Brennemann, Joseph. Practice of Pediatrics. Hagerstown, Md. W. F. Prior Company, 1938.

5 Rackemann, Francis, Ratner, Bret and Sulzberger, M. B. Round Table Discussion on Allergy in Children. J. Pediat. 9: 804 (Dec.) 1936.

6 Sulzberger, M. B., Spain, W. C., Sammis, F. and Shabon, H. I. Studies in Hypersensitiveness in Certain Dermatoses. J. Allergy 3: 423 (July) 1932. Sulzberger, M. B. and Goodman, Joseph. Description of a Technique for the Study of Allergy in Eczematous and Eczematoid Dermatoses. Journal Lancet 56: 134 (March) 1936. Sulzberger, M. B. and Rostenberg, Adolph Jr. Practical Procedures in the Investigation of Certain Allergic Dermatoses. J. Allergy 6: 448 (July) 1935.

7 Sulzberger, M. B. A Suggestion for the Classification of Certain Allergic Dermatoses. J. Michigan M. Soc. 34: 78 (Feb.) 1935. Remarks on Definitions and Classifications in Certain Forms of Dermatologic Allergy. New England J. Med. 215: 330 (Aug. 20) 1936.



crusting when older persons are affected. And thus, as previously mentioned, the most helpful clinical criterion in the attempt to distinguish between atopic or seborrheic and contact dermatitis in adults is likely to be entirely absent in the infantile eruptions.

4 In infants, the results of various forms of cutaneous tests and the changes with regard to antibodies do not help to differentiate between atopic and non-atopic forms in the same degree as in adults. For example, almost all patients with infantile eczema (over 80 per cent in my material<sup>8</sup>) have positive wheal reactions and reagins to egg-white, and, as Peck and Salomon<sup>9</sup> and Hill<sup>10</sup> have shown, also to cutaneous tests with house-dust and other inhalants and thus, by these criteria, would be atopic. However, many of these very cases would certainly seem to be strongly seborrheic, if one would judge only by the appearance by the clinical course and by the response to the therapy.<sup>8</sup>

5 The mixed forms, transitional and complicated cases (impetiginization, fungi and the like), exist in adults but are much more common in infants—so common, indeed, that many infantile cases cannot be further classified. The eruption in infants often presents a crusting, oozing, excoriated and superficially infected dermatitis of noncharacteristic and nondiagnostic appearance.

#### GENERAL MANAGEMENT AND THERAPY

When one considers these examples of the many difficulties which, in infancy, beset subclassification even by the expert and when one further realizes that, as stated, the vast majority of infantile eczemas are atopic and, more important still, that the management of all the different forms in infants is often identical, it seems to me that, from purely practical considerations and until medicine has acquired more accurate knowledge in this field, the nondermatologist will be more successful if he discards theory and, for the present at least, regards "infantile eczema" as a cutaneous eruption to be managed as a unit. The management of these cases is then reduced to questions of logical and dermatologic approaches, based on the characteristics and circumstances of the individual case, on the form and stage of the eruption and on the sites affected.

In other words the dermatologic treatment is determined by the state of the skin rather than by the cause or category of the eruption. In infantile eczema the most promising therapeutic approach is that which is directed against the presenting manifestations, for

example, the removal of crusts and scales, the combating of infections, the soothing of irritation, the alleviation of itching and the prevention of scratching regardless of the subclassification or technical name of the particular form.

In this approach it is well to remember, first, that one is often dealing with not one but at least two and sometimes even three or more patients. The mother and the other person or persons who are taking care of and are concerned with the child must be meticulously instructed in the proper procedures and must commonly be regarded as the major sufferers and reassured, calmed and inspired with confidence. To accomplish this, it is best to commence enumerating, for their benefit, the cheering points, approximately as follows:

1 The baby will almost certainly get over the cutaneous disorder. This is true, for, while about 50 per cent<sup>11</sup> of the adults with atopic dermatitis have had infantile eczema, only a smaller proportion of infantile eruptions go on to adult forms. In most instances there is spontaneous cure at about the age of 2 years or before.

2 No marks and no scars will be left by the eruption.<sup>12</sup> The child's skin has every prospect of eventually being as perfect as that of any other child.

3 The cutaneous condition is not contagious.

4 The baby is a "healthy" one. The inner organs, the blood, the nerves and so on are all in good condition. The general health, nutrition and the like of the baby will not suffer because of the eczema. (In spite of all the itching, the sleeplessness, the scratching and the often massive superficial infection it is remarkable to note that these children, almost without exception, maintain an excellent state of health, of nutrition and of rate of growth.)

5 Provided the local treatment is correctly executed, there is practically no danger whatever of "infection" or "blood poisoning" in spite of all the scratching. (Enlargement of the lymph nodes may occasionally be present but suppuration is rare.)

6 The baby is not really suffering to the extent to which it appears to be. When it gets over this trouble, no general impairment will remain and no memory of the episode. (Atopic babies are, of course, candidates for atopic cutaneous diseases and asthma and hay fever, but these later troubles cannot be regarded as actual sequelae of the infantile eczema.)

Reassuring statements of this type will often pave the way to cure by enabling the distressed family to compose itself and become of valuable assistance in the further management.

From this point on the treatment becomes purely dermatologic—with perhaps a dash of practical allergy. In our present state of knowledge—or, rather, of ignorance—the value of general pediatric or medical studies is surely negligible so far as finding systemic changes or other underlying disturbances as causes of infantile eczema.

The most practical point of view for both physician and mother, nurse or other attendant is that which regards infantile eczema as a result of maladjustment of the skin to the radical changes of environment which occurred when the baby moved from the uterus into the world.

8 As Schloss and his collaborators (Anderson A. F., Schloss O. M. and Myers Constance. The Intestinal Absorption of Antigenic Protein by Normal Infants. *Proc Soc Exper Biol & Med* 23: 180, 1925; DuBois, R. O., Schloss O. M. and Anderson A. F. The Development of Cutaneous Hypersensitivity Following the Intestinal Absorption of Antigenic Protein. *ibid* 23: 176, 1925; Lippard V. W., Schloss O. M. and Johnson Priscilla A. Immune Reactions Induced in Infants by Intestinal Absorption of Incompletely Digested Cow's Milk Protein. *Am J Dis Child* 51: 562 [March] 1936) have demonstrated in many infants there are likely to develop transiently not only precipitins but also positive specific wheal reactions to cutaneous tests after ingestion of a new article of diet. Most probably this will be found to hold true also after any massive exposure to a new inhalant or other environmental factor. It is therefore obvious that many of the evanescent cutaneous reactions to the foods that the infant has ingested or to the substances of his environment cannot be considered as signs of atopy; moreover many of these reactions including those to egg white are of course without clinical significance. Even the marked and persistent cutaneous reactions to egg white to house dust and the like which may perhaps be considered as a sign of atopy are surely not always a proof of the etiologic role of the specific substance. This was first clearly shown by Sallenbach (Untersuchungen über die Laktar und Storm Reaktion. *Arch f Dermat u Syph* 165: 198, 1932) in the case of egg white and infantile eczema (see Hill<sup>4</sup> Sulzberger Spain Sammis and Shanon<sup>6</sup> Peck and Salomon<sup>9</sup> and Hill<sup>10</sup>).

9 Peck S. M. and Salomon Gustav. Eczema in Infancy and Childhood I. Contacts as Etiologic Agents with Particular Reference to Feathers. *Am J Dis Child* 46: 1308 (Dec.) 1933.

10 Hill L. W. Sensitivity to House Dust and Goose Feathers in Infantile Eczema. *J Allergy* 9: 37 (Nov.) 1937.

11 Sulzberger M. B. and Goodman Joseph. The Relative Importance of Specific Skin Hypersensitivity in Adult Atopic Dermatitis. *J A M A* 106: 1000 (March 21) 1936.

12 This is true except in rare instances with exceptionally deep traumatization and infection.

The skin is not only the most delicate and the most exposed organ, it is also that organ which has, to the greatest degree, the function of protecting the individual from the outside world, of adapting the individual to the environment. It is therefore not surprising that certain skins—and apparently most particularly those of atopic babies—will suffer and will be unable at first to cope with the abrupt and radical transitions that take place in changing from intra-uterine to extra-uterine life. All the new substances of the outside world—dust, feathers, wool, silk, animal emanations, gases, vapors, cleansing agents, caustics (soaps!)—begin their onslaught, and the varying physical forces—heat, cold, light, moisture, friction, pressure—all must be met and compensated for by cutaneous adjustments and regulatory mechanisms. The hordes of living micro-organisms—fungi, bacilli, cocci and virus which begin to settle on the surface of the skin and take up their activities there—must be controlled and resisted. In addition to all these external attacks, the skin must learn to cope with the hematogenous supply of the products of diet and digestion and of substances absorbed by inhalation.<sup>13</sup> Moreover, the skin must be able to adapt itself to the products emanating from new foci of internal and external infection, to the products of metabolism and of cutaneous excretions and to the influences of the newly coursing nervous and other impulses.

It therefore follows that the eczematous baby should be protected, as far as possible, against the violence of these onslaughts. The temperature of the room and of the entire environment should be kept even (about 68 F). The clothing should be light, soft and cool, next to the skin smooth cotton or linen should always be used in preference to woolen or other rough materials.

The baby's skin should be kept clean and soft, and this must be accomplished without the use of soap. If there is one point on which all authors agree, it is this: Except on the scalp, soap is "poison" for most infantile eczemas. It is my opinion that the greatest care must be taken to see that no soap remains in the clothing or bed linen. The most thorough and repeated rinsing of all garments and linens is essential.

Instead of soap being used, the child should be sponged or bathed with tepid water to which bran, starch or oatmeal<sup>14</sup> has been added. In many cases it is advantageous to add tar to the bath. This can be done by putting from 2 to 3 cupfuls of solution of coal tar, N F, in the small tubful of water or by adding 1 or 2 tablespoonfuls of the purchasable oil of cade and sulfonated castor oil mixtures.<sup>15</sup> These baths may be given at intervals varying from twice a day to once every two or three days, according to the effects observed.

<sup>13</sup> Sulzberger M. B. and Vaughan W. T. Experiments in Silk Hypersensitivity and the Inhalation of Allergen in Atopic Dermatitis. *J. Allergy* 5: 554 (Sept.) 1934.

<sup>14</sup> Of course these additions must not be used in cases of allergy to the particular cereals. It is the first duty of the physician to guard against the error of prescribing any remedy which may contain an ingredient to which the patient is sensitive. In this connection it should be mentioned that proprietary remedies of unknown composition present unknown dangers and are therefore always improper therapeutic agents. Not only active therapeutic ingredients but also vehicles, bases and the like must be considered as possible irritants. It is not always easy to avoid the many pitfalls. But with due care the physician can usually avoid the obvious hazards such as those of prescribing ointments containing wool fat or wool fat derivatives in cases of sensitivity to wool or of recommending olive oil, peanut oil, sesame oil, corn oil, cottonseed oil, linseed oil or fish oil (vitamins) for topical or internal use in cases in which there is sensitivity to the respective cereals, foods, animals and the like.

<sup>15</sup> A mixture of this kind is manufactured by the Almay Pharmaceutical Company of New York.

Soap substitutes such as sulfonated oils or alcohols, aliphatic esters and other nonalkaline detergents may be given a trial.

In cases in which the bath does not seem to be well tolerated, baths must be discarded and other cleansing measures must be redoubled. These measures—and it should be noted that they are to be employed after every bath as well as in lieu of a bath—consist of

1 The careful removal of all crusts, scales and debris, often best accomplished after gentle sopping or after the application of wet compresses (see prescriptions 8 to 11 inclusive) or of bandages soaked in olive oil or liquid petrolatum (prescription 1 A and B).

#### PREScription 1—*Lubricating and Softening Oils and Greases*\*

A (Salicylic acid 1 to 2 per cent)  
Olive oil in sufficient quantity  
or

B Liquid petrolatum in sufficient quantity to make 120 Gm  
Label For softening and for removal of crusts. Apply as directed.

\* In all the prescriptions submitted with this article, medicaments that can be omitted or included in any number and at will are enclosed in parentheses. Square brackets are used to enclose medicaments which should not be used simultaneously but which may be used as substitutes for one another.

2 Theunction of the baby's entire skin with one of the oils mentioned, followed by a generous sprinkling of plain, unscented, finely powdered talc or zinc stearate or other mild dusting powder (for example the one given in prescription 2).

#### PREScription 2—*Mild Dusting Powder*

[Powdered Boric acid 1 to 3 per cent  
or

Tannic acid 1 to 3 per cent]  
Zinc oxide  
Zinc stearate  
Purified talc each in sufficient quantity to make 30 Gm

Mix and dispense in a sifter top can

Label Use freely as required

In the cleansing process, particular attention should be paid to the crevices and folds of skin—to the so-called intertriginous areas.

During the cleansing, the medicaments that have been applied should be removed gently with the oily or aqueous solution, care being taken not to injure the skin by rough measures or by too vigorous rubbing. It is better to leave some of the medicament and apply the new layer over the remains of the old than to use force in the process of removal.

Several useful oily or greasy prescriptions for removing medicaments and for lubricating the skin are here submitted (prescriptions 1 and 3).

#### PREScription 3—*Softening and Lubricant Cream and Soft Ointment Vehicle*

	Gm or Cc
Liquid petrolatum	30.0
White wax	7.5
Distilled water	12.0
Sodium borate	0.225

Mix and label. Apply by gentle massage and bandage on in a thick layer (if required).

(This preparation may be used also as a vehicle for antipruritics [menthol 0.25 per cent, phenol 0.25 per cent], crude tar from 5 to 10 per cent, naitalan (a distillate from Caucasian shale) from 5 to 20 per cent, ammoniated mercury from 2 to 5 per cent or almost any other topical medicaments except salicylic and other acids that will break down the emulsion.)

Among the other general hygienic measures, the care of the diapers deserves mention, particularly in intertriginous or gluteal eruptions. As already stated, these skins are almost always sensitive to friction and to alkalis and the diapers must therefore always be soft, clean, loose and free from every trace of soap. Rubber "panties" and the like should be dispensed with. More-

over, the effects of ammoniacal stool and urine must be obviated, this is most readily accomplished by rinsing the diapers with a mildly acid and antiseptic solution. In most cases it is sufficient to soak the napkins in a saturated solution of boric acid.<sup>16</sup> The affected intertriginous areas may be painted with a mildly antipruritic, parasitocidal and acidifying shake lotion, such as that given in prescription 4. In this prescription the resorcinol and the addition of solution of coal tar, N F, are particularly effective in cases of the seborrheic type and the resorcinol or the red mercuric sulfide alone in cases complicated by monilia and other fungi. When resorcinol is used on infants it is safest not to apply it to large areas. Signs of cutaneous irritation and particularly of systemic poisoning, i. e., phenoluria, must be watched for.

Among the other general measures, regulation of the diet, with the proper proportions of protein, fat and carbohydrates, as well as vitamins and minerals, should be carried out by pediatric methods according to the weight and general condition of the patient, the type of stool and the like. It is my experience, however, that such general regulation has little influence on an infantile eczema except in isolated cases and in infants who are obviously overfed and pasty. Of recent years diets such as those low in animal protein and high in fresh fruits and vegetables have been recommended in

*PRESCRIPTION 4—Mildly Parasitocidal, Soothing and Drying  
Antieczematous Paint (Shake Lotion)*

(Menthol)	0.25 to 0.5 per cent
(Phenol)	0.25 to 0.5 per cent
(Red mercuric sulfide)	1 to 2 per cent
(Resorcinol)	1 to 3 per cent
(Solution of Coal Tar N F)	1 to 5 per cent
Calamine lotion	sufficient quantity * to make 120 cc

Dispense in a wide mouthed bottle

Mix and label. Shake well and paint on affected parts three or four times a day using an ordinary flat varnish brush.

\* The calamine lotion N F contains 80 per cent of prepared calamine and zinc oxide.

atopic forms, and diets high in protein (casein) and low in fats and carbohydrates are said to be useful in seborrheic forms. The detailed discussion of dietetic approaches will doubtless be covered by Dr. Hill in the present symposium.

The elimination of possible allergens from the diet is of much greater importance than are general dietary measures. It is my conviction that the empirical approach is usually more fruitful than any other in children under 2 years of age. The approach through the history, the close observation of the effects of elimination and reexposure to certain foods and the constant awareness that a certain few foods are notorious offenders will prove to be more successful, as a rule, than reliance on the results of hundreds of cutaneous tests. For, although results of cutaneous tests are occasionally most useful guides, positive reactions to cutaneous tests are, in infantile eczema, often without clinical significance, even when accompanied by specific reagins, conversely, substances that fail to elicit cutaneous reactions may nevertheless sometimes be factors in the production of the eruption.

For these reasons certain almost obvious empirical conclusions are likely to be of greater help than any cutaneous tests. When an eczematous baby has a family history of asthma or hay fever and is being fed nothing but milk, the simplest and often the most effective procedure is to try the complete elimination

of ordinary milk and the substitution of denatured milk or a milk substitute.<sup>17</sup>

Moreover, if after a reasonable trial any case of infantile eczema has proved to be refractory to topical measures, it is advisable to undertake the elimination, one by one, of such potential common dietary causes as cow's milk, wheat, eggs, citrus fruits, spinach, peas, tomatoes, fish and fish products, named here in the approximate order of importance. The details of elimination, substitution and regulation of the diet to avoid deficiencies of any type are covered in the contributions of my colleagues in this symposium.

One of the most striking facts about infantile eczema, and one to which perhaps insufficient attention has been accorded, is the observation of the almost unbelievably potent effects of environment in the broadest sense of the word.

As has often been stressed, and as has recently been substantiated by Osborne, a high percentage of all infantile eczemas "clear up," sometimes with spectacular rapidity, on hospitalization or other radical change of environment and without any other therapy whatever.<sup>18</sup> This phenomenon is also observed in adult atopic dermatitis and in many other dermatoses.<sup>11</sup>

I am certain that Rappaport and Hecht will present convincing evidence to show that environmental allergens may be of great significance in certain cases of infantile eczema and that these allergens include particularly the specific house dust and the substances coming from pillows, mattresses, bedding, rugs, draperies and dyed and colored objects. It is therefore expedient to remove all sources of such dusts. No feathers,<sup>9</sup> kapok mattresses, overstuffed furniture, rugs or draperies should be present. The room should be as bare as barracks, with washable walls and floors, if possible. An iron cot with a sterilized horsehair mattress and plain, painted wooden chairs should constitute the bedroom furniture. If kapok and feathers cannot be removed, the mattress, pillows or other articles containing these allergens should be covered with so-called allergen-proof covers.

Whenever possible, these precautions should be taken as a routine not only because they sometimes result in striking improvement of the eczema but because some eczematous infants are surely strong candidates for future respiratory allergy, in which these environmental dusts may be of prime importance.<sup>19</sup>

In infantile eczema the face and scalp are the most common and usually the most important sites affected. Crusts should be removed from the scalp by soaking with the oil given in prescription 1. This oil should be applied two or more times a day by thorough massage and held in place with oil-soaked, soft linen or cotton

17 Rappaport B. Z. and Hecht, Rudolph. The Treatment of Infantile Eczema from the Point of View of the Allergist. J. A. M. A. to be published.

18 In controlled experiments I have been able to convince myself that the improvement in some of these cases was not due to dietary changes or to changes in the general care of the infant for the sudden improvement occurred even when the home diet was brought to the hospital and even when the mother continued in complete charge of the hospitalized child. The change responsible for the beneficial effects was therefore an environmental one in which the word "environment" may include a great many as yet unknown and perhaps purely physical factors.

19 I have often expressed the opinion that the environmental substances mentioned such as wool silk and dyed materials may produce vascular cutaneous reactions not only through inhalation or swallowing and subsequently hematogenous distribution to the blood vessels of the skin but also by direct exposure from without. I have previously referred to the permeability of the infant's skin as evidenced by the strong tendency to vesiculation. It is probable that this permeability exists not only to substances and fluids coming from within but also to those coming from without, so that allergens may penetrate transdermally and may thus produce atopic reactions even when the shock tissue is situated in the vessels of the cutis. This penetration may be possible even when the skin is undamaged and is of course almost certain whenever the skin is scratched and damaged and whenever the skin's protective continuity is interrupted.

cloth, covered with a bonnet or cap. Such a cap is easily made from the top of a woman's white stocking. After twenty-four, forty-eight or seventy-two hours of such treatment most of the crusts can usually be removed, and treatment with prescription 5, 6 or 7 may then be instituted. These ointments should be

#### PRESCRIPTION 5—Scalp Ointment 1

Solution of coal tar N F 5 per cent  
[Red mercuric sulfide 1 to 2 per cent  
or  
Ammoniated mercury 1 to 3 per cent\*]  
Combine with the soft ointment of prescription 3  
or in petrolatum sufficient to make 30 Gm

Mix and label. Rub gently into affected parts from two to four times daily and bandage as directed.

\* Effect must be carefully observed because of possible sensitization to mercury.

#### PRESCRIPTION 6—Scalp Ointment 2 Containing Sulfur and Salicylic Acid\*

Salicylic acid 2 to 3 per cent  
Precipitated sulfur 2 to 5 per cent  
Liquid petrolatum  
Wool fat  
Petrolatum each in sufficient quantity to make 30 Gm

Mix and label the same as prescription 5.

\* Do not use when mercury is used.

#### PRESCRIPTION 7—Scalp Face and Body Ointment

Solution of coal tar N F 5 to 20 per cent  
(Ammoniated mercury 1 to 3 per cent)  
[Combine with simple ointment U S P XI  
or

preferably without wool fat as in U S P XI to make 30 Gm

Mix and label. Apply and bandage as directed.

massaged in gently, twice a day or oftener, bandaged on a thick layer and removed gently with olive oil or liquid petrolatum before each new application. The scalp apparently tolerates soap and water as well as most other remedies to a much greater degree than does any other part of the body's surface, it is therefore permissible and often advisable to wash the scalp thoroughly with a bland soap before beginning treatment, and at intervals of once or twice a week thereafter.

#### PRESCRIPTION 8—Mild Astringent Solution

[Solution of aluminum subacetate N F or solution of aluminum acetate N F 240 cc]

Label. Dilute with from fifteen to twenty parts of water and use as a cleanser [or apply as a wet poultice or dressing].

#### PRESCRIPTION 9—Mild Astringent and Disinfectant Solutions

A Potassium permanganate (tablet) 0.065 Gm  
Thirty tablets

Mix and label. Add one tablet to approximately 1 or 2 pints of water (1:7,000 or 1:14,000 solution). Stir and dissolve thoroughly before using.

or

B Potassium permanganate 2.5 Gm  
Distilled water to make 120.0 cc

Mix and label. One half or one teaspoonful to 1 pint of water (approximately 1:12,000 or 1:6,000 solution of potassium permanganate).

#### PRESCRIPTION 10—Mild Antiseptic and Astringent Solution

Boric acid (crystals or, if crystals are not obtainable, powder) 120 Gm

Label. One teaspoonful to each tumblerful of hot water; allow to cool and apply as cleansing solution or as wet compresses.

#### PRESCRIPTION 11—Boro Salicylated Solution (Thiersch's Solution)\*

	Gm or Cc
Boric acid	12.0
Salicylic acid	2.0
Distilled water	1,000.0

Mix and label. Apply undiluted as a wet compress.

\* Pharmaceutical Recipe Book II, page 205.

In managing the facial eczema, the crusts and the more severely impetiginized and infected areas are first treated by repeated and assiduous sopping with absorbent cotton and oil (prescription 1 A or B with or without the salicylic acid, or with cotton moistened

with one of the mildly antiseptic and astringent solutions given in prescriptions 8, 9, 10 and 11).

Moreover, these solutions can be applied as wet compresses to great advantage, always provided the correct technique can be rigorously observed.<sup>20</sup> In the periods between these swabbings prescription 3 or 5 should be massaged in gently and reapplied as often as necessary to keep the face lubricated and constantly covered. All crusts that can be removed should be swabbed off with soft cloth soaked in oil (prescription 1) or with cream (prescription 3) at least twice a day.

After the worst of the crusting and impetiginization has been eliminated (usually in two or three days), the face is often best treated with crude coal tar (prescription 12 or 13).

#### PRESCRIPTION 12—Coal Tar\*

Coal tar N F 30 Gm

Mix and label. Paint on the affected areas and powder over with talcum.

\* May be used with or without masks and bandages. Not to be used on extensive infected or open areas.

#### PRESCRIPTION 13—Coal Tar Ointments and Pastes

A Coal tar N F 3 to 5 or even to 10 per cent [in zinc oxide ointment or paste of zinc oxide N F] in sufficient quantity to make 30 Gm

Mix

or

B Ointment of coal tar N F (this is 5 per cent coal tar in paste of zinc oxide) 30 Gm

Label. Apply to affected parts two or more times a day.

(This is the most universally employed and often the most effective of all topical remedies in infantile eczema. The possibility of local or general intolerance to coal tar must be borne in mind when this or prescription 12 is used.)

I have found direct application of undiluted tar, painted directly on the face—a thick layer covered with purified talc—to be one of the very best of all methods of treatment. This method of application has in my hands been not only more effective but also, on the whole, less likely to irritate than any other active remedy.<sup>21</sup> The tar should be left on from one to three days, and then a face mask with yellow or borated petrolatum should be applied for twenty-four hours. The tar painting should then be repeated, the layer to be left on for another two, three or four days, again followed by a day of lubrication. This procedure can be repeated several times more if necessary. (The baby should not be exposed to sunlight when tars in any form or other photosensitizing agents are used.)

Face masks should be made of soft, unstarched, smooth, closely woven linen or cotton cloth. The mask is cut with holes for the eyes and openings for the mouth and nose. It must be large enough to reach over the forehead to the occiput on top and to the middle of the neck below. It can first be tied by means of sewed-on tapes and then held in place with careful, meticulously adjusted windings of gauze bandage as shown in the accompanying illustration. Swartz and Reilly<sup>22</sup> give detailed and excellent directions.

If the mask is properly made and applied, it will often increase the efficacy of all the salves and ointments used, as well as help keep the tar in place. However, not every one is capable of making and applying such a mask, for these procedures require more experi-

20 Garbe William and Sulzberger M B. *Dermatology. Some Techniques of External Therapy*. Am J Nursing 36: 873 (Sept.) 1936.

21 There are very few cases of irritation from such applications of tar. Nevertheless it is safer first to try tar—as well as all other active remedies—on a small area only. Among the warning signs of the skin's intolerance to tar are increased itching, erythema, oozing and spread of eruption or pustulation and impetiginization and swollen lymph nodes. Such signs as well as any evidence of systemic toxicity call for immediate cessation of active treatment and return to indifferent remedies.

22 Swartz J H and Reilly M G. *Diagnosis and Treatment of Skin Diseases*. New York: Macmillan Company, 1935.

ence, skill, patience and care than does the usual surgical bandage or dressing. What has been said about face masks applies equally to all forms of dermatologic bandaging—for example, on the extremities. All dressings must be applied in the correct and orthodox manner and with the most precise exactitude, there must be no unevenness, binding or friction. In all dermatologic bandages, soft linen or cotton cloths—not gauze—must be used as the layer juxtaposed to the skin, which is to serve to hold the ointments or pastes in place. When properly applied, such bandages are decidedly helpful in many cases of eczema. When carelessly or incorrectly executed, both face masks and bandages are often worse than useless.

It is usually difficult, if not impossible, to treat the trunk or any large area with bandages and salves,



Face mask held in place with properly adjusted windings of gauze bandage

high concentrations of tar, phenol, resorcinol and the like should not be used on large surfaces because of the dangers of poisoning by absorption. The face and one or two isolated areas on the body are about all one should attempt to treat with the tar or with the

service than ointments. The lotions and liniments should be painted on thickly and evenly with a regular flat varnish brush three or four times a day. Only the excess of remaining lotion or liniment should be swabbed off, the new coat is to be applied over the lotion or liniment that adheres.

PRESCRIPTION 15—Soothing and Drying Lotion\*

	Gm or Cc.
[Solution of aluminum subacetate \ T or Solution of aluminum acetate \ T]	38 0
Purified talc	42 0
Zinc oxide	42 0
Glycerin	30 0
Solution of calcium hydroxide	to make 240 0

Mix and label as in prescription 4 or 14

\* Any and all of the medicaments suggested in prescription 14 may be incorporated here

PRESCRIPTION 16—Calamine and Zinc Oxide Lin I—(Thin)  
Modified Pusca's Liniment\*

	Gm or Cc.
Triglycerin in fine powder	4 0
Phenol	
Glycerin	of each 0 66
Prepared calamine \ I	
Zinc oxide	of each 30 0
Olive oil	120 0
Distilled water	to make 480 0

Mix and label. Paint on area with a brush or rub in with the palm of the hand

\* Any and all of the medicaments mentioned in prescription 14 may be incorporated in this liniment

PRESCRIPTION 17—Modified Calamine and Zinc Oxide  
Liniment II (Thick)\*

	Gm or Cc.
Prepared calamine	60 0
Zinc oxide	60 0
Triglycerin in fine powder	2 5
Glycerin	1 5
Liquefied phenol	1 7
Olive oil	240 0
Distilled water	to make 1 000 0

Mix and dispense in wide mouthed bottle or jar

Label as in prescription 16

\* Any and all of the adjuvants of prescription 14 may be incorporated here. Pharmaceutical Recipe Book II page 64

When there is so much oozing that the lotion or liniment cures excessively and when salves prove too "heating" or irritating, stearic acid creams (vanishing creams<sup>-3</sup>) (prescription 18) or pastes (prescription 19) should be substituted. The active therapeutic agents in pastes are usually less rapidly absorbed and generally have less contact with the skin so that they may be prescribed in greater concentrations in this type of vehicle.

PRESCRIPTION 18—Medicated 'Vanishing Cream'\*

[Ammoniated mercury or oleate of mercury]	1 to 3 per cent
[Solution of coal tar or coal tar or naphthalin or juniper tar]	5 to 10 per cent 3 to 5 per cent 5 to 10 per cent 3 to 10 per cent
in unscented vanishing cream (stearic acid cream) in sufficient quantity to make 60 Gm	

Mix and label. Apply liberally to the affected parts by gentle massage two or three times a day

\* This medication may be applied without bandages and simply massaged in and powdered over. This makes one of the cleanest and most easily employed of all topical remedies

Prescription 19 represents an excellent standard paste a modification of Lassar's in which the starch has been replaced by finely powdered talcum. Theoretically, at least, this substitution is an improvement, as it eliminates the organic material which may permit

23 Vanishing cream I or II Pharmaceutical Recipe Book II page 372			
No I Formula		No II Formula	
Stearic acid	190 0	Stearic acid	14 0
Oleic acid	38 0	Glycerin	14 0
Potassium hydroxide	10 0	Distilled water	70 8
Distilled water	762 0	Sodium borate	0 25
		Potassium carbonate	0 5
To make	1 000 0	To make	100 0

PRESCRIPTION 14—Paint ("Shale Lotion") for Trunk,  
Extremities Neck and the Limb

(Menthol	0 25 to 0 5 per cent)
(Phenol	0 25 to 1 per cent)
(Solution of coal tar N T	3 to 10 per cent)
(Red mercuric sulfide	1 to 2 per cent)
(Resorcinol	1 to 3 per cent)
Zinc oxide	
Purified talc	of each 20 0
Glycerin	15 0
[Water or alcohol 50 per cent]	to make 120 0

Mix and label. Dispense in wide mouthed bottle. Shake well and paint on area with a flat varnish brush. (See directions and remarks under prescription 4)

phenolic remedies. For the body areas, it is best to rely on the tar baths described, on the swabbings with one of the solutions mentioned and on theunction (three or four times a day) of an ointment such as prescription 3, 7 or 13. In many cases I have found that on the trunk, and even on the extremities, lotions and liniments or "vanishing cream" bases (prescriptions 4, 14, 15, 16, 17 and 18) are likely to be of more

fermentation or offer a culture medium for cutaneous fungi and other organisms. This paste—often efficacious and soothing, even when used alone—may contain any of the various antieczematous agents which are used in ointments (prescription 19). The pastes may be applied and removed in the same way as salves, they can be bandaged on, but often if properly dispensed, the paste will adhere to the skin without

#### PREScription 19—*Pastes*\*

[Zinc oxide or bismuth subnitrate] of each 25 per cent  
Purified talc  
Lecithinum to make 60 Cm

Mix and label. Apply to the affected areas twice a day.  
\*Most advantageous in subacute or slightly oozing eruptions. Useful alone or particularly with the incorporation of coal tar or one of the other tars listed in prescription 18. Any of the active agents mentioned in the ointment prescriptions may be incorporated here. May be applied with bandages or simply rubbed on in a thick layer, the surface powdered over liberally with plain talc and left without bandages.

dressings, provided it is rubbed and patted on smoothly and then covered with a thick layer of talcum powder, which is spread over and rubbed gently into the surface of the paste after the paste has been applied.

The methods here sketched and the few prescriptions here submitted do not, of course, pretend to be exhaustive. An infinite variety of other methods and of other combinations of medicaments can be and have been recommended. However, when all is said and done, it will be found that the medicaments which are recommended over and over again in all treatises on the topical therapy of infantile eczema consist, in the main, of coal tar, other tars, mercurials, resorcinol and sulfur—in manifold forms, permutations and combinations—and of these crude coal tar or one of its derivatives is the acknowledged best.

Rather than multiply and complicate his remedies and prescriptions, the physician should learn thoroughly the properties and actions of a few active agents and of a few vehicles—their indications, the manner of their

#### PREScription 20—*Sedative Mixtures*

A Gm or Cc  
Chloral hydrate 10  
Potassium bromide 15  
Syrup to make 30.0

Mix and label. One half teaspoonful in water three times a day (Bromodermas and/or other signs of intolerance should be watched for) or

B Phenobarbital 0.015  
Mix and make into a powder  
Label. One powder mixed well with milk formula three times a day if necessary

correct application and removal and their possible disadvantages. He must then be able to take the time and the trouble to teach those caring for the baby just exactly how the treatment should be executed, and in order to do this he must be in a position to explain each step in the minutest detail.

By beginning with simple and mild measures, by closely observing their effects, by changing to another measure only when lack of continued progress or when any by-effect or irritation makes the change necessary the physician will achieve satisfactory results in most cases. For it is often not what but how that makes the difference between success and failure in the treatment of infantile eczema.

The prevention of scratching, through tying of hands and feet to the bed, through splints on the arms, by means of metal cups on the hands or by the use of sedatives such as small doses of phenobarbital or combinations of chloral hydrate and bromides (prescription 20) all are permissible and even indicated in intractable pruritus. Although proper splinting and

tying may at first seem cruel, these measures are often the kindest in the long run. A sheet of cellophane perforated for the passage of the head and covering the pillow or mattress in back and the chest in front will sometimes prevent the disastrous results of the constant fretful rubbing of the face and head against the bedding. Sometimes daubing the face and scalp with hot solutions will stop an itch crisis. Care should be taken not to burn the part, the solution must be of a temperature at which the adult finger can be dipped and kept.

Other methods of controlling itching and other treatments of eczema in general have been suggested by numerous authors.<sup>1</sup>

Nevertheless a common sense selection of the foregoing dermatologic measures alone will prove useful in almost all cases and sufficient in many. For, in the "cure" of eczema in children below the age of 2 years, my experience has shown that the various factors can be ranged in the following order of importance:

1 Time. Most patients get well by the age of 2 years or before and many then remain free of cutaneous disorders.

2 Complete change of environment unfortunately this is possible only in rare instances.<sup>25</sup>

3 Meticulous execution of the application of topical remedies, and of the local management described.

4 In many cases in which removal from the general environment is out of the question, the elimination of a few notorious food allergens and environmental causes.

Through the advances made in classification and subclassification of forms of eczema, one may at some future time be able to dispense with many or all of the purely palliative and symptomatic measures which I have cited, for through increased knowledge of the pathogenesis and mechanisms of the various forms—through greater understanding of their basic causes, of their immunology and endocrinology and metabolism (vitamins?)—one will be able some day to discard many of the present approaches as obsolete and to apply more fundamental and causal therapy.

But for the present, and at the hands of physicians at large, correct local therapy, combined with common sense, patience, perseverance and proper instruction to those in charge of the treatment, promises the greatest success in the majority of all forms of infantile eczema.

962 Park Avenue

24 These include

Sulzberger M B and Wolf Jack. Pruritus and Its Treatment. M Clin North America 19 3 (Nov.) 1935

Wise Fred and Sulzberger M B. Modern Treatment of Eczema. The 1935 Year Book of Dermatology and Syphilology. Chicago Year Book Publishers Inc. 1936

Becker S. Commoner Diseases of the Skin. New York National Medical Book Company 1935

Sutton R L and Sutton R L Jr. Diseases of the Skin ed 9. St Louis C V Mosby Company 1935

Ormsby Oliver A. Practical Treatise on Diseases of the Skin ed 5. Philadelphia Lea & Febiger 1937 p 249

Garbe and Sulzberger. Philadelphia Lea & Febiger 1937 p 249

Swartz and Reilly.

25 Here hospitalization plays a most important role although many eruptions recur soon after return to the home. I am well aware that hospitalization of patients with infantile eczema is looked on with justifiable fear by most pediatricians in this country and in England because of the danger of contracting serious infectious diseases. However in many years and in a material of several hundred cases I have never seen a severe complication due to hospitalization. It is true that the patients with infantile eczema whom I have seen treated in hospitals have been exclusively dermatologic hospitals and wards removed from intimate exposure to infectious diseases. It seems to me that this may account for my happier experience. It is unfortunate that such segregation is so rarely possible in this country owing to the present lack of separate dermatologic institutes. During hospitalization or segregation proper precautions must of course be rigidly enforced. These should always include meticulous general care feeding and the avoidance of local irritation or infection or of poisoning by absorption of phenolic topical remedies applied to large areas.

## Special Clinical Article

### THE NEWER CONCEPTS OF INTESTINAL INFECTION

CLINICAL LECTURE AT SAN FRANCISCO SESSION

JOSEPH FELSEN, M.D.

NEW YORK

The present nebulous state of knowledge concerning intestinal infections is perhaps best illustrated by the obscure terminology of "diarrhea, enteritis and dysentery" used in public health reports all over the world. A peculiar admixture of pathology and symptomatology, it is a frank admission of our ignorance concerning their cause. To justify the presentation of this subject I undertook a worldwide survey covering the five year period from 1933 to 1937. This period was chosen so that the observations might be correlated with coincident investigations of bacillary dysentery. Comparative studies based on data furnished directly by public health officers and compiled from reports of the U. S. Public Health Service reveal the following facts:

1. As the reported cases of bacillary dysentery increase, the cases of unclassified "diarrhea, enteritis and dysentery" rapidly decline. The incidence of amebic dysentery remains low and approximately level.

2. There is a rising incidence of bacillary dysentery in the United States, the figures for 1937 being approximately sixteen times those for 1933. A similar trend is indicated in other parts of the world, notably Denmark, Scotland and England.

3. The general consensus regarding bacillary dysentery as well as unclassified intestinal infection appears to be that the former comprises the majority of cases and that the actual incidence of both is greatly underestimated. In many cases the disease is unrecognized or not reported.

4. Present indications are that bacillary dysentery already far exceeds typhoid as a public health problem in the United States and that the incidence will continue to mount until the rising tide forces vigorous and heroic measures for its control.

Since the problem of intestinal infection is largely that of bacillary dysentery, the first part of this paper will be devoted to its consideration. The second part will be concerned with the mechanism of nonspecific or unclassified infections, their underlying pathologic changes and clinical significance.

Bacillary dysentery may be defined as a systemic disease due to *Bacillus dysenteriae* in which both the enteric and the extra-enteric manifestations are caused by one or more toxins. This concept implies that the intestine is only one of several organs affected, an unorthodox observation which accounts for some of the new and atypical forms of the disease, which must be recognized before effective control can be instituted. They appear to represent adaptations to a new environment and virgin soil, for bacillary dysentery is no longer limited by geographic or seasonal boundaries. The meningitic type<sup>1</sup> is ushered in by typical meningitic

manifestations. Headache, drowsiness, stupor or convulsions may be present. The neck is held rigid. Kernig and Brudzinski signs may be elicited and some photophobia is evident. Spinal tap reveals a clear fluid under increased pressure, with normal cells and sugar, no globulin and negative culture. Within approximately twenty-four hours the enteric manifestation gradually increases until they dominate the clinical picture, the subsequent course being that typical of bacillary dysentery. In every instance there is a labial or nasal herpes, suggesting the possible association of virus with the neurotropic toxin. Instances of the meningitic form comprised 13 per cent of my cases in the Jersey City epidemic of 1934.

The pneumonic type<sup>2</sup> of bacillary dysentery starts rather abruptly with a chill, pain in the chest and short nonproductive cough. The patient feels "grippy," the cheeks are flushed and the temperature may rise to 106 F. On auscultation of the chest there are fine moist rales which persist after coughing. A roentgenogram taken at this stage reveals a localized area of increased density corresponding in location to the auscultatory signs. The clinical picture strongly suggests incipient lobar pneumonia. Within twenty-four to forty-eight hours, however, the pulmonary symptoms and signs subside to be replaced by the classic features of bacillary dysentery.

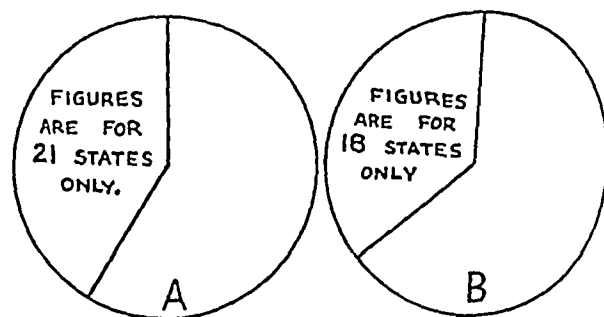


Chart 1—4. Incidence of diarrhea, enteritis and dysentery in the United States from 1933 to 1937. There were 79,042 cases with a yearly average of 15,808 and an average mortality for nine states of 17.8 per cent. B. Incidence of bacillary dysentery in the United States from 1933 to 1937. There were 56,102 cases with a yearly average of 11,220 and an average mortality for six states of 15.7 per cent. The figures are based on communications from state health officers.

The agranulocytoid type<sup>3</sup> is characterized by a blood picture closely resembling that seen with agranulocytosis. There is severe, progressive neutropenia with toxic changes and almost complete disappearance of the granulocytes. The intestinal signs and symptoms are prominent from the start and persist with unabated severity until the disease is terminated by perforation and death. Profound toxemia is a striking feature of this form of dysentery.

The appendicular form<sup>4</sup> of bacillary dysentery is of rather frequent occurrence and is characterized by manifestations in the right lower quadrant, mesenteric lymphadenitis and, usually, acute inflammation of the distal portion of the ileum. The abdominal pain and tenderness tend to shift with change in the position of the body. The leukocyte count may be normal or there may be actual leukopenia. The differential diagnosis between the appendicular form of bacillary dysentery and acute suppurative appendicitis is sometimes diffi-

Read in the Medical Division of the General Scientific Meetings at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 14, 1938.

The author wishes to acknowledge the many courtesies extended to him by health officers in the United States and other parts of the world in the compilation of figures on the incidence of bacillary dysentery and intestinal infections of unknown cause.

1. Felsen, Joseph, Rundlett, Emilie V., Sullivan, James, and Gorenberg, Harold. Atypical Flexner Dysentery. A Preliminary Report of the Jersey City Epidemic. J. A. M. A. 103: 1055 (Oct. 6) 1934.

2. Felsen, Joseph. The Pneumonic Type of Bacillary Dysentery. New York State J. Med. 37 (Feb. 1) 1937.

3. Felsen, Joseph. Acute Fulminating Type of Bacillary Dysentery with Marked Toxic Neutropenia. New York State J. Med. 35: 1037 (Oct. 15) 1935.

4. Felsen, Joseph. Appendicular Form of Bacillary Dysentery. With Case Reports on Acute Distal Ileitis. Am. J. Dis. Child. 50: 661 (Sept.) 1935.



cult, particularly if the patient is seen early and diarrhea is not yet a prominent feature. In doubtful cases it is wise to operate but if the appendix appears normal to abstain from resecting it or the inflamed terminal portion of the ileum since persistent fecal fistula or peritonitis may follow.

During outbreaks I have encountered three other types of bacillary dysentery, asymptomatic, afebrile and constipated. The patients affected by these paradoxical forms of the disease are not healthy carriers. Clinical and laboratory examinations reveal the characteristic diagnostic criteria and the typical progressive stages of intestinal disease. It is this group of patients who are frequently responsible for the endemic perpetuation of the disease. The practical clinical inference is that all contacts should be examined daily for evidence of bacillary dysentery regardless of the presence or absence of symptoms. Sonne-Duval dysentery, which is rapidly increasing all over the world, is often described as being a relatively benign and asymptomatic disease. I have had, however, the distressing experience that some of my cases of severest involvement in recent years have been of the Sonne-Duval type. For this reason outbreaks, particularly among children, should be terminated promptly. There appears to be no appreciable placental transmission of agglutinins against B dysenteriae from mother to newborn infant,<sup>5</sup> suggesting the marked susceptibility of the latter to the disease.

There is a characteristic three stage pathologic change<sup>6</sup> in acute bacillary dysentery, affecting primarily the lymph nodules with secondary involvement of the mucosa or deeper structures. Stage 1 is that of punctate follicular hyperplasia, in which the enlarged follicles stand out like discrete grains of sand on a reddened background of inflamed mucosa. Within approximately twenty-four hours the centers of the follicles become necrotic, appearing on the mucosal surface like the mouths of tiny diverticula. This constitutes stage 2, or the stage of punctate follicular necrosis. The ulceration is progressive, so that the third stage, of discrete and confluent mucosa ulceration, reaches its maximum by about the fourth or fifth day. More than one stage may be seen in the same person, since reabsorption of toxin occurs throughout the course of the disease. Healing usually begins by the seventh to tenth day and is accompanied by rather obstinate constipation, which represents nature's effort at splinting the bowel to favor repair. Babies often die during stage 1 or 2, that is, within the first forty-eight hours of the disease, with toxemia, dehydration and acidosis. The major pathologic change is produced during this period, within which therapeutic serum proves most effective. The serums of greatest value are those of high antitoxin content, since the primary lesions are produced by the dysentery toxins. The dysentery toxins may be divided into the enteric and neurotropic, isolated by Olitsky and Kligler,<sup>7</sup> and the arthritic, myelotropic and pneumonic, which are hypothetical, the probability of their existence being suggested by clinical and laboratory evidence. The intestinal lesions are produced largely during the process of excretion of the absorbed toxin from the mesenteric blood vessels through the wall of the bowel into the lumen. This statement is based on the following obser-

ventions. 1 The intestinal lesions can be reproduced in the rabbit by the intravenous injection of the toxin. 2 An eighteen hour broth culture of B dysenteriae injected into the marginal ear vein of the rabbit under proper control conditions also causes the disease and the bacillus can be recovered within twenty-four hours in the intestinal canal. 3 Early lesions are often seen after B dysenteriae has disappeared from the intestinal tract. Diarrhea in bacillary dysentery is a purposeful attempt to eliminate the dysentery toxins. It ceases when this object has been accomplished, but its cessation is not synchronous with the disappearance of the intestinal ulcers. They gradually disappear during the postdiarrheal healing period of approximately ten days. From these statements it may be surmised that the practice by our forebears of administering castor oil at the onset of the disease has some scientific basis. It aims

*Incidence of Bacillary Dysentery, Amebic Dysentery and Unclassified Dysentery from 1933 to 1937, Based on U S Public Health Service Reports*

	1933	1934	1935	1936	1937
B	625	2 197	7 241	11 555	10 428
A	1 573	1 994	1 388	1 483	1 674
D	17 042	8 189	4 961	5 824	4 940
Total	19 240	12 380	13 590	18 862	17 042
Grand total		81 114			

Note the steady rise in the number of cases of bacillary dysentery the incidence in 1937 being sixteen times that in 1933. Note the inverse relationship of bacillary to unclassified dysentery.

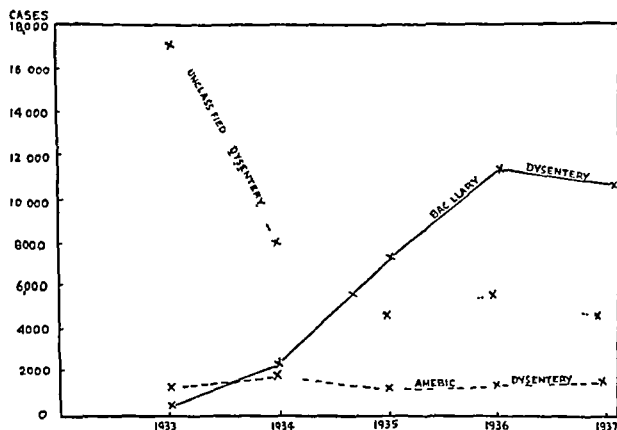


Chart 2—Relation of the incidences of bacillary dysentery, amebic dysentery and unclassified dysentery from 1933 to 1937. As reported cases of bacillary dysentery increase the incidence of unclassified dysentery falls. Note the steady low incidence of amebic dysentery unaffected by the fall in the curve for unclassified dysentery.

at eliminating the specific bacteria and their toxins before they are absorbed into the systemic circulation.

The essential diagnostic criteria in a typical case of acute bacillary dysentery may be summarized as follows.

1 Clinical. An incubation period, which may be as short as twelve hours, is followed by the sudden onset of abdominal cramps and diarrhea. Intestinal spasm and tenderness are always present, are most marked in the right and left lower quadrants, occur early and persist during the acute phase of the disease. They are due to involvement of the distal portion of the ileum and the sigmoid colon. Repeated sigmoidoscopic examination reveals the characteristic three stage pathologic change.

2 Laboratory. The diagnostic tetrad consists of a positive culture of material from the intestine early in the course of the disease, a rising agglutination titer, the presence of bacteriophage at a later period and the purulent character of the cytologic exudate.

5 Felsen Joseph and Osofsky A G. Susceptibility of the Newborn to Acute Bacillary Dysentery. Serologic Data on the Placental Transmission of Antibodies to Bacillus Dysenteriae. *Am J Dis Child* 53: 975 (April) 1937.

6 Felsen Joseph. Acute and Chronic Bacillary Dysentery. *Am J Path* 12: 395 (May) 1936.

7 Olitsky P K and Kligler I J. Toxins and Antitoxins of B dysenteriae Shiga J. *Exper Med* 31: 19 (Jan) 1920.

In concluding this brief consideration of bacillary dysentery I wish to mention the prophylactic value of mass vaccination, therapeutic serum and the use of blood from recovered patients. It is my opinion, based on clinical and experimental evidence that these are valuable preventive measures in sporadic and epidemic outbreaks. Vaccines to be effective must be made up of strains indigenous to the time and place.

The bizarre character of bacillary dysentery is not limited to the atypical acute forms. Follow-up studies indicate that approximately 10 per cent of the patients pass over into the chronic phase and have chronic ulcerative colitis or chronic distal ileitis. The increasing prevalence of these chronic infections, often passing under the guise of colitis or enteritis, appears to parallel the increasing incidence of bacillary dysentery. I have seen them develop from acute bacillary dysentery. One can readily surmise how difficult it often is to trace chronic "colitis" or "enteritis" to an initial bacillary dysentery infection, particularly when the acute disease dates back one or several years. In some cases the original diagnosis has been overlooked or the patient did not seek medical attention. Persistent study, however, will clearly reveal in many instances that the chronic infection merely represents a perpetuation of the acute phase of bacillary dysentery in which the lesions have never healed and secondary nonspecific infection has been superimposed. It is therefore advisable to follow up all cases of the acute disease for one year which represents the time necessary for the full development of the chronic lesions.

Besides the acute and chronic bacillary dysentery infections there is a second group, that of nonspecific intestinal infections. The latter form a heterogeneous class and are caused by a variety of bacteria, toxins and perhaps viruses. The mechanism of intestinal involvement is best understood by regarding the intestine as an organ which possesses a dual excretory mechanism. The first is the direct excretory mechanism, whereby substances which have been ingested are digested and the waste products eliminated directly from the body. It appears unlikely that the intestine, continually laved by a flora rich in pathogens or potential pathogens, can be affected solely by the direct action of ingested bacteria on its mucosal surface. The second, or indirect hematogenous, excretory mechanism implies that bacteria or toxins which have been absorbed into the systemic circulation from an enteric or extra-enteric focus are excreted in part through the intestinal wall into the lumen of the bowel and thus eliminated from the body. This applies not only to bacteria and their toxins but also to heavy metals, notably lead. The skin, kidneys and possibly lungs play a lesser part, the tetrad forming what may be termed the reciprocal excretory mechanism of the body, since these organs appear to form a mutually cooperative system. The great protective barrier of the bowel is its rich lymphoid deposits and reticulo-endothelial network. Each solitary acuminate lymph nodule and Peyer patch is embraced and penetrated by a delicate filamentous network of thin-walled mesenteric vessels. The earliest response to toxic agents in the blood stream is therefore seen in the lymphoid tissue, which undergoes rapid hyperplasia. In mild infections, punctate follicular hyperplasia may be all that is seen. In severe infections or intoxications there is marked congestion with necrosis and ulceration of the mucosa. Intestinal symptoms and signs may therefore be associated with any extra-enteric focus of infection. The result is a confusing clinical picture

because the intestinal manifestations predominate while the primary extra-enteric focus may appear unrelated or remain undiagnosed. I have noted intestinal manifestations with infections of the upper part of the respiratory tract such as the common cold, "grip" and streptococcal sore throat. In pharyngogenic hematogenous streptococcal peritonitis (so-called primary peritonitis) focal hemorrhagic necroses are produced, particularly in the distal part of the ileum. I have reproduced these lesions in healthy rabbits by the intravenous injection of eighteen hour broth cultures of the organisms recovered from human beings. The streptococci injected into the marginal ear veins of these rabbits under proper control conditions appeared in the feces within twenty-four hours.<sup>8</sup> In subacute bacterial endocarditis, multiple mucosal petechiae of the bowel are far more common than mesenteric thrombosis. Embolic intestinal lesions occur frequently with bacteremia due to the hemolytic streptococcus, *Staphylococcus aureus*, meningococcus or type 7 pneumococcus. In the case of pneumonia the most marked intestinal lymphoid response may occur with hyperemia, particularly when the pneumococcus is of type 7. Rheumatic intestinal necrosis is usually seen in or near the ileocecal region, simulates acute appendicitis and has as its basic pathologic condition pronounced rheumatic vascular changes. Acute necrotizing pancreatitis with transverse linear thromboses of the mesenteric vessels in the mucosa or submucosa is seen with periarteritis nodosa. In the case of typhoid it is noteworthy that positive fecal and urinary cultures are often obtained after the blood cultures become negative. This suggests that the blood stream rids itself of the organisms at least in part by eliminating them through the wall of the bowel into the lumen. The hematogenic theory of the portal of entry of *Bacillus typhosus* implies that the blood stream is invaded by penetration of the mucosa of the throat or intestinal tract. The enterogenic theory implies a direct passage of the organism through the intestinal mucosa with the production of local lesions in the lymphoid tissue followed by passive invasion of the lymph and blood streams. There appears to be no evidence, according to Goodpasture,<sup>9</sup> that *B. typhosus* actually multiplies within the intestinal canal.

While the possibility exists that in some of these diseases the organisms may be swallowed, survive the action of the acid gastric juice and intestinal flora and subsequently exert a direct action on the mucosa, the retrograde hematogenous route for bacteria or their toxins appears more plausible on the basis of experimental and clinical evidence. Just as in the case of the dysentery toxin, the absorbed toxic agent is excreted from the blood stream into the lumen of the bowel. In the process the intestinal wall may be irritated or injured and focal symptoms may ensue. Reabsorption of excreted toxin often occurs, and a vicious cycle may be established which lasts as long as the systemic infection persists. When this is the case, depending on the nature and severity of the infection, there is not always a responsive diarrhea. The judicious use of enemas or cathartics will therefore often relieve toxemia, particularly since the terminal part of the ileum and the colon appear to be the chief sites of the excretion of toxin. The indirect hematogenous excretory mechanism of the intestine is important in explaining many

<sup>8</sup> Felsen Joseph and Osofsky A. G. Pharyngogenic Hematogenous Streptococcal Peritonitis. Arch. Surg. **31**: 437 (Sept.) 1935.  
<sup>9</sup> Goodpasture E. W. Concerning the Pathogenesis of Typhoid Fever. Am. J. Path. **13**: 175 (March) 1937.

poorly understood nonspecific intestinal infections or so-called infectious diarrheas. The primary cause often exists outside the intestine, and search for specific noxious agents in the bowel is then futile. Focal intestinal symptoms often cease abruptly after the primary extraenteric focus of infection is eliminated, but they may persist for a longer period if necrosis and ulceration have been produced.

While it is apparent that steady progress has been made in our understanding of intestinal infections, much remains to be done. Cases numbering 79,042 of "diarrhea, enteritis and dysentery" occurred in twenty-one states during the five year period from 1933 to 1937, with a yearly average of 15,808 and an average mortality of 17.8 per cent for nine of the states. Improved and cheaper methods of transportation have introduced new factors in possible dissemination of disease, viz., the automobile, train, ocean liner and airplane. The situation presents a formidable public health problem requiring cooperative epidemiologic, clinical and research efforts for its solution. To this end an international dysentery registry has been established for the study of infectious diarrheas. It is hoped that by joint action there will ultimately be achieved a better understanding of this group of diseases with a corresponding diminution in morbidity and mortality, particularly among infants.

120 East Thirty-Ninth Street

## Council on Pharmacy and Chemistry

### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH Secretary

**ANTI-ERYSIPELOID SERUM**—A serum containing the antibodies and antibacterial properties of *Erysipelothrix rhusiopathiae* (suis).

**Actions and Uses**—For treatment of the clinical condition known as erysiploid, which is not to be confused with erysipelas.

**Dosage**—It is suggested that from 10 to 20 cc be administered subcutaneously or intramuscularly and quantities of 0.25 to 0.5 cc at numerous places about the border of the lesion.

Jensen-Salsbery Laboratories, Inc., Kansas City, Mo.

**Anti Erysiploid Serum Jensen Salsbery**—Prepared from horses subjected to increasing subcutaneous injections of live cultures of *Erysipelothrix rhusiopathiae* (suis). The serum is derived from the blood of such horses by defibrination, centrifugation and Berkefeld filtration; it contains 0.5 per cent phenol as preservative. Technic used in preparation and tests for sterility of the product are in conformity with requirements of the National Institute of Health. Potency test on pigeons is employed in which 0.1 cc of the serum protects against infection lethal to controls in from three to four days. Marketed in vials containing 20 cc.

**DIPHTHERIA TOXIN FOR THE SCHICK TEST** (See New and Nonofficial Remedies, 1938, p. 435).

Parke, Davis & Co., Detroit

**Diphtheria Toxin Diluted for Schick Test**—Also marketed in packages of one vial containing 5 cc of diluted diphtheria toxin sufficient for fifty tests.

**IRON AND AMMONIUM CITRATES**—"Contains ferric citrate equivalent to not less than 16.5 per cent and not more than 18.5 per cent of Fe." U S P.

For standards see the U S Pharmacopeia under Ferric and Ammonium Citrates.

**Actions and Uses**—See general article Iron and Iron Compounds, N N R 1938, p. 279. Iron and ammonium citrates is a hematinic which is practically nonastringent.

**Dosage**—From 0.5 to 2 Gm.

**Capsules Iron and Ammonium Citrates 0.5 Gm (7½ grains)**  
Prepared by The Upjohn Co., Kalamazoo, Mich. No U S patent or trademark.

**CINCHOPHEN** (See New and Nonofficial Remedies, 1938, p. 177).

**CINCHOPHEN-MERCK**—A brand of cinchophen-N F.

Manufactured by Merck & Co., Rahway, N. J. No U S patent or trademark.

**DIGITALIS** (See New and Nonofficial Remedies, 1938, p. 186).

**Whole Leaf Tablets Digitalis Haskell 1½ grains** Each tablet contains one cat unit.

Prepared by Charles C. Haskell & Co., Inc., Richmond, Va.

**GREEN IRON AND AMMONIUM CITRATES** (See New and Nonofficial Remedies, 1938, p. 281).

The following dosage forms have been accepted.

**Ampoule Solution Iron and Ammonium Citrates Green 0.05 Gm (¾ grain) 1 cc** Each cubic centimeter contains green iron and ammonium citrates U S P 0.05 Gm and quinine and urea hydrochloride U S P 0.005 Gm in aqueous solution.

Prepared by The Upjohn Co., Kalamazoo, Mich. No U S patent or trademark.

**Ampoule Solution Iron and Ammonium Citrates Green 0.1 Gm (1½ grains) 1 cc** Each cubic centimeter contains green iron and ammonium citrates U S P 0.1 Gm and quinine and urea hydrochloride U S P 0.005 Gm in aqueous solution.

Prepared by The Upjohn Co., Kalamazoo, Mich. No U S patent or trademark.

**ABBOTT'S STANDARDIZED BREWER'S YEAST TABLETS**—Each tablet contains 0.5 Gm (7½ grains) of dehydrated brewers' yeast (*Saccharomyces cerevisiae*) and is biologically assayed to contain not less than 23 international units of vitamin B<sub>1</sub> and not less than 12 Sherman units of vitamin B (G).

**Actions and Uses**—For use in prevention and treatment of disorders arising from deficiencies of vitamin B<sub>1</sub> (thiamin chloride) and of vitamin G (riboflavin).

**Dosage**—Daily prophylactic dose against vitamin B<sub>1</sub> (thiamin chloride) deficiency, from three to six tablets, therapeutic dose, as prescribed by the physician.

Manufactured by Abbott Laboratories, North Chicago, Ill. No U S patent or trademark.

Abbott's standardized brewers' yeast tablets are prepared from a selected strain of *Saccharomyces cerevisiae* especially cultured. The yeast cells are washed and dried; the dry powder containing approximately 5 per cent of moisture and compressed into tablets.

The vitamin B<sub>1</sub> content of the tablets is determined by comparison with the international standard by the modified Smith rat curative method. The vitamin G content is determined by the Sherman-Bourquin method.

**AMINOPHYLLINE** (See New and Nonofficial Remedies, 1938, p. 503).

**Aminophylline-Gane**—A brand of aminophylline-N N R.

Manufactured by Gane Chemical Works, Inc., New York (Gane & Ingram, Inc., New York, distributor). No U S patent or trademark.

**Aminophylline-Searle** (See New and Nonofficial Remedies, 1938, p. 505).

The following additional dosage form has been accepted.

**Ampules Solution Aminophylline Searle 0.48 Gm 20 cc** Each ampule contains aminophylline Searle 0.48 Gm in sufficient distilled water to make 20 cc.

**CARBROMAL** (See New and Nonofficial Remedies, 1938, p. 155).

**Carbromal Tablets 5 grains**

Prepared by The Upjohn Company, Kalamazoo, Mich.

## REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

PAUL NICHOLAS LEECH Secretary

### SULFAPYRIDINE

Recent reports from investigators indicate that a pyridine derivative of sulfanilamide [2(p-aminobenzene-sulfamido)pyridine or sulfanilamidopyridine] is apparently more promising in the treatment of certain types of pneumonia than sulfanilamide itself. A number of investigators, and manufacturers as well, requested the Council to coin a nonproprietary designation for this product. The Council has therefore adopted the term "sulfapyridine" (sulf-a-pyr-i-dine). The product is in an experimental stage and as far as present advices are concerned the government has not licensed it for interstate sale. The Council will publish a preliminary report on this product in the near future.

THE JOURNAL OF THE  
AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JANUARY 7, 1939

THE ST LOUIS SESSION

Announcements at a recent meeting of the Council on Scientific Assembly of the American Medical Association with the secretaries of the various sections and with representatives of the Scientific Exhibit indicate that the annual session of the American Medical Association, which will be held in St. Louis, May 15-19 inclusive, will bring before the medical profession of this country many of the amazing developments in scientific medicine which have attracted attention during the year. Such topics as the new uses of sulfanilamide and its derivatives, the new work on the vitamins including the uses of nicotinic acid and vitamin K and the vitamin B complex, the progress made in the treatment of pneumonia, and recent investigations on the endocrine glands will be conspicuous features of the program.

In the Convention Number of THE JOURNAL, which will be published April 15, the preliminary program will be given in detail. Already, however, the secretaries of the sections have been overwhelmed with applications for places on the program, and many of the contributions that were offered have already been accepted. Several new features have been incorporated in the presentation of scientific material this year. Among them will be a panel discussion of pneumonia in infancy and childhood, in which the elucidation of scientific facts will be by discussion rather than by formal presentation of a manuscript. Several of the sections are planning combined meetings. For example, the pediatricians are combining with the otolaryngologists in a session on pneumonia, also the physiologists with the neurologists on the uses of sulfanilamide in conditions affecting the nervous system. The campaign on syphilis will have attention in a symposium in the Section on Dermatology and Syphilology. In the Section on Preventive and Industrial Medicine and Public Health there will be a symposium on air conditioning and respiratory diseases, and in the Section on Urology a special symposium on the use of new endocrine derivatives. Another special feature of the annual session will be joint meetings of several sections on the concluding day of the session.

Especially important as a part of the annual session of the American Medical Association is the close relationship between the Scientific Exhibit and the presentation of manuscripts in the scientific sections. For some years those who present new contributions in the various sections have had opportunity to exhibit the actual materials with which they worked, in the form of case records, microscopic slides, charts, diagrams and other material. The author of the manuscript is thus enabled to demonstrate at first hand to physicians who are especially interested the details of his work, forming for those who attend the session a magnificent postgraduate opportunity not available in any other way. The popularity of this feature is attested by the fact that many physicians spend almost their entire time during the week in the Scientific Exhibit. Every year there are an increased number of appeals that more time be given for attendance on the Scientific Exhibit.

The location of St. Louis at well nigh the geographic center of the United States, the magnificent railroad, airplane and other transportation facilities, the fine hotel accommodations with which excellent cooperation is becoming apparent, are indications that the St. Louis meeting will maintain the record of these annual assemblies as the high point of the medical year.

THE INDICTMENT OF THE AMERICAN  
MEDICAL ASSOCIATION

Last week THE JOURNAL published the complete text of the indictment of the American Medical Association and other defendants, in the District of Columbia, by a grand jury which, for some weeks, had heard a mass of evidence presented to it by attorneys from the Department of Justice. Elsewhere in this issue of THE JOURNAL appears a chronology of this case from the time when the so-called Group Health Association, Inc., first appeared on the scene in the District of Columbia to the time when the grand jury made its report. Also in the Organization Section will be found a number of editorials and cartoons which have appeared in newspapers throughout the United States indicating, as far as such pronouncements can indicate, the public reaction to this extraordinary indictment.

At the special session of the House of Delegates which was held in Chicago in September, the Board of Trustees of the American Medical Association, anticipating the government's activities, presented a consideration of the possibility of an indictment. This matter was referred by the House of Delegates, as is customary, to a reference committee and the report of the reference committee was unanimously adopted by the House of Delegates. This report authorized the Board of Trustees to employ suitable legal counsel and to carry this matter even to courts of last resort in order to determine the issue.

Apparently the press of the United States finds it impossible to separate the activities of the Department of Justice from the proposal of a vast expansion of

medical service under governmental control. Thus Gerald G. Gross, in the *Washington Post* of December 25, writes "A convincing case can be built up to support the theory that the extraordinary grand jury study was, to put it bluntly, propaganda looking forward to Congressional consideration of the proposed National Health Program."

The commentators in the American press, including even those newspapers which have been most persistent in the campaign for new methods of medical practice, have been well nigh unanimous in their opinions that the action of the Department of Justice under Mr. Thurman Arnold was the wrong way to achieve the objective if that objective is to be achieved. Certainly this legal procedure can do nothing to solve the problem of medical care. It is a pity that the federal government, including its executive, investigative and a considerable number of other departments, should have embarked on a procedure which is inclined to cast public discredit on a great profession and to impugn the motives of workers in that profession. Moreover, a suitable defense will cost the Association a considerable sum of money that in the ordinary course of events would have been spent for the advancement of the science and art of medicine and the protection and promotion of public health. The time may yet come when those representatives of our government who have been chiefly responsible for initiating, conducting and manipulating this performance with all of its far-flung manifestations will review regretfully the part they have played in this incident.

### INDUSTRIAL CARBON DISULFIDE POISONING

The making of artificial silk, rayon, by the viscose process is an important industry in all industrial countries. In the United States this industry, which has grown rapidly during the last thirty years, employs now more than 50,000 persons in some twenty factories in thirteen states. This industry utilizes one poison, carbon disulfide ( $\text{CS}_2$ ), another, hydrogen sulfide ( $\text{H}_2\text{S}$ ), is evolved during certain processes. The presence of these hazards brings viscose manufacture into the class of the dangerous trades in most countries, notably Germany, France, Italy, England, the Netherlands and Japan. Especially in the first three of these countries, much attention has been drawn to the action of carbon disulfide. This poison, according to Koester,<sup>1</sup> produces as varied a clinical picture as does lead.

In the United States a period of thirty-three years elapsed between the publication of an article on this subject by Jump and Cruice<sup>2</sup> in 1905 and one by Gordy and Trumper<sup>3</sup> in 1938. Not only was the industry

expanding rapidly during those years, however, but the foreign literature was full of case histories of carbon disulfide psychosis, neuritis, paralysis and peptic ulcer. American physicians, even those in charge of institutions for the mentally disturbed, which draw patients from viscose factory towns, have never recognized carbon disulfide poisoning as a clinical entity. Until recently systematic investigation had never been made of this trade. Now the Pennsylvania Department of Labor and Industry has issued a bulletin on the manufacture of rayon in that state. This report contains a medical section by specialists from the University of Pennsylvania School of Medicine who examined 120 men employed at the time in the two departments in which carbon disulfide is present in greatest quantity.

The Pennsylvania group was under the leadership of F. H. Lewy, formerly head of the neurologic institute of the University of Berlin, now on the faculty of the University of Pennsylvania, who had made a study of the rayon industry in Germany. The object was not so much to uncover cases of severe poisoning, unlikely to be present in a working group, as to observe the early symptoms and signs and to develop, if possible, new diagnostic procedures for the guidance of industrial physicians. Stress was laid on the application of apparatus and methods giving quantitative results: for instance, the testing of the pupillary reflex to light with the Zeiss pupilloscope, sensitivity with von Frey's graduated hairs and thorns, the electrical irritability by chronometry, the size of the blind spot with the help of the Peter campimeter, defects of the central fields with the Lloyd stereocampimeter and the Hartz scotometer, the acuity of hearing with a Western Electric 2A audiometer in a frequency ranging between 32 and 13,000, and the heart with the portable electrocardiograph.

Carbon disulfide poisoning became known to the medical world through the classic description of Delpech,<sup>4</sup> who observed rubber workers<sup>5</sup> in France and in 1856 published his first report on the mental and emotional changes caused by this poison. The first German article to attract attention was Laudenheimer's<sup>6</sup> monograph in 1899 describing some fifty cases of carbon disulfide psychosis observed in Flechsig's clinic in Leipzig. Italy's contributions came later, but in recent years Italian investigators have led the world in the study of this occupational poison.<sup>7</sup> The noxious effect of carbon disulfide on the nervous system is attributed to its fat-solvent properties, but it is far more toxic than many good solvents such as the higher alcohols,

4 Delpech A. L. D. Accidents produits par l'inhalation du soufre de carbone. *Gaz hebdomad* 1856 p. 384.

5 Carbon disulfide was used in the so-called Parkes process for curing rubber known in this country as the acid or cold cure. This has largely given way everywhere to the heat cure and is no longer used in the United States.

6 Laudenheimer R. Die Schwefelkohlenstoffvergiftung der Gummiarbeiter. Leipzig 1899.

7 Ranelletti A. Industrial Poisoning by Carbon Disulfide in Italy. *Arch f Gewerbepath u Gewerbehyg* 2: 664 (Dec 17) 1932. *abstr J Indust Hyg & Toxicol* 15: 5 1933. The Cumulative Index Medicus for 1934 lists thirteen articles all by Italians.

1 Koester G. Ein klinischer Beitrag zur Lehre von der chronischen Schwefelkohlenstoffvergiftung. *Deutsche Zeitschr f Nervenh* 26: 1 1904.

2 Jump H. D. and Cruice J. M. Chronic Poisoning from Carbon Disulfide. *Univ Pennsylvania M Bull* 17: 193 (July-Aug) 1904.

3 Gordy S. F. and Trumper Max. Carbon Disulfide Poisoning. *J A M A* 110: 1543 (May 7) 1938. A full bibliography is afforded.

certain of the chlorinated hydrocarbons, ether or acetone. The commonly observed early symptoms are insomnia, fatigue, listlessness and loss of initiative, depression of spirits, irritability and causeless anger, loss of memory and premature loss of libido. Later on paralyses develop, impairment of vision or temporary blindness, headaches, perhaps acute hallucinatory psychoses, impotence, emaciation and cachexia.

The 120 men examined in the Pennsylvania study exhibited these symptoms in their early stages but unmistakably, thus furnishing confirmation of the European work done in this field. To summarize briefly the results, 71 per cent showed psychic disturbances varying in degree from severe insomnia with bad dreams to extreme irritability, uncontrollable anger with rapid changes of mood, marked memory defects and in some instances psychoses, usually of maniacal type. Loss of libido was found in 75 per cent of the men under 45 years of age. The nerves most commonly involved were the peroneal and the radial and ulnar. Seventy-five per cent of the men suffered pain or, less often, decreased sensitivity in the early course of the intoxication, followed by weakness and partial paralysis. Determination of chronaxia proved valuable in the quantitative evaluation of early changes in motility. A decrease of corneal and pupillary reflexes was observed in half of those examined. Parkinsonism of various degrees occurred in 16.5 per cent, i. e. in every sixth or seventh man. The influence of carbon disulfide is seen in the fact that a third of those afflicted with parkinsonism worked in the churn room, the place of greatest exposure to carbon disulfide, while these workers represent only one thirtieth of the whole number exposed to carbon disulfide. In addition, three were found with the typical thalamic syndrome, in one case combined with parkinsonism, in another with choreoathetotic movements. Fifty-four per cent showed some ocular disturbance, such as enlargement of the blind spots, contraction of the peripheral fields, anesthesia of the cornea (partly due to the effect of hydrogen and sulfide), diminution of the pupillary reflex and nystagmus. This enlargement of the blind spot has not been previously reported in medical literature, and the diminution of the pupillary reflex has been mentioned only rarely. In the ear, the cochlear and vestibular nerves were involved in 71 per cent of those examined. The most important change found was a lacuna in the hearing curve, like that accompanying tobacco-alcohol amblyopia, which was found at the frequency of 4,096 double vibrations. This hearing loss, which is above the range of speech frequency, was detected in more than half of the men. Examination of the blood showed, as the most consistent abnormality, an alteration in morphology and staining properties of the monocytes, which exhibited a slaty blue cytoplasm crowded with minute neutrophilic granules and numerous vacuoles. Such "toxic monocytes" were found in almost every

specimen examined and constituted about 90 per cent of the monocytes counted in each case. It is noted that only 5 per cent of the specimens of blood examined gave a positive Wassermann reaction, a low proportion for an industrial group, according to the figures of the U. S. Public Health Service.

An important contribution to the literature of carbon disulfide poisoning is the report of a necropsy on a viscose worker, a spinner for twenty-two years, who died after an operation on the gallbladder. Extensive parenchymatous degeneration of peripheral nerves (sciatic and intercostal) was found and toxic changes in the ganglion cells of the cerebral cortex. The pathologic changes in the liver, kidneys and heart muscle were possibly to be attributed to the cholecystitis. This is a valuable addition to the scanty number (four in all<sup>3</sup>) of necropsy records published up to now.

## Current Comment

### VENEZUELAN EQUINE ENCEPHALOMYELITIS

Coincident with the recent severe epidemics of equine encephalomyelitis in Canada and the United States, a similar disease was recognized in Venezuela. Portions of the brains of horses dying of this disease were sent to Beck and Wyckoff<sup>1</sup> of the Lederle Laboratories for comparison with the northern types. When inoculated into guinea pigs and mice the Venezuelan virus produced symptoms similar to those of eastern encephalomyelitis. The virus, however, was from ten to a hundred times more virulent (or in greater concentration) than the usual eastern strain. Vaccines made from the Venezuelan strain and treated with formaldehyde would confer a solid immunity against the Venezuelan type. Cross protection tests, however, showed that solid immunity against the western virus was not accompanied by a demonstrable increase in resistance against the Venezuelan strain. Eastern immune guinea pigs also could be infected with the South American strain. A solid immunity against the Venezuelan virus, however, protected against a single minimal lethal dose of the eastern virus but showed no demonstrable protection if tests were made with ten or more minimal lethal doses of eastern virus. The results of the cross protection tests demonstrate that the Venezuelan virus is immunologically distinct from the western North American type of this disease but presumably has a minor heterophile factor common with the eastern virus. For all practical purposes, therefore, three immunologically distinct epidemics of horse encephalomyelitis must now be recognized on the Western Hemisphere. A polyvalent vaccine containing all three types of the formaldehyde treated virus is now the subject of experimentation.

8 Cenci (1907) Redaelli (1925) Ascarelli (1933) Abe (1933) The last (Abe Mazarro Beitrag zur pathologischen Anatomie der chronischen Schewefelkohlenstoffvergiftung Jap J M Sc Tr VIII Int Med Pediat. & Psychiat 31:1 [Sept 1933]) is the only one that measures up to modern standards.  
1 Beck C E and Wyckoff Ralph W G Science 88:530 (Dec 2) 1938

# ORGANIZATION SECTION

## PRESS COMMENT ON THE INDICTMENT

### A PREPOSTEROUS INDICTMENT

[St. Louis Daily Globe Democrat Dec 21 1938]

The indictment by a federal grand jury at Washington of the American Medical Association, three local medical societies and twenty one individual physicians indicates the lengths to which Assistant Attorney General Thurman Arnold is prepared to go in waging war on what he chooses to term monopolies. As a matter of course, when Congress years ago passed the antitrust laws it never dreamed that they would or could be applied to such conditions as Mr. Arnold is now attacking. Indeed, there is no reasonable basis either in the spirit or the letter of these laws for such official procedure by the Federal Government. Mr. Arnold is simply making his own laws and by means of criminal indictments on charges that in no proper sense can be regarded as criminal is endeavoring to force organizations which for any reason he does not like to consent to regulations of his own that Congress has never authorized. The "consent degree" which by such coercive procedure he forced upon the automobile companies, applying to their relations with automobile credit associations, is the most recent instance.

Mr. Arnold is presumably in favor of "Socialized Medicine," and because the American Medical Association—which is said to include in its membership 110,000 of the 145,000 physicians practicing their profession in this country—is actively opposed to the forms of socialized medicine recently developing here, he subjects the Association, and many of its members individually, to criminal indictments. The American Medical Association contends that the group health associations against which it has taken its stand tend to lower the high standards of medical practice and to break down the close relations between the physician and his patient. There are certain attractions in the idea of group health insurance which appeal to large numbers of people, but whether it is really in the public interest is a debatable question. Certainly the great majority of physicians do not think so.

And because they do not think so they are, through their vast organization, subjected to criminal indictment by what is erroneously called the "Department of Justice." Regardless of the merits of the controversy no more tyrannical procedure by government could be imagined than this in a country that is still supposed to be free. It is a threat to every organization of citizens, professional or otherwise, that is established for the promotion of common interests. If one can be subjected to such pressure others can be whenever charges against them can be trumped up by an official of the Department of Justice disposed to take such action. The American Bar Association itself could be made answerable to criminal indictments if the Department of Justice as now conducted saw fit to charge it with conduct displeasing to Mr. Arnold. While Congress is investigating this, that and the other it had better look into the conduct of the Department of Justice, else, who knows, it may also be indicted.

### MISUSE OF A LAW

[Herald Dispatch Huntington W. Va. Dec 21 1938]

Application of the Sherman antitrust law to the professions is an idea that only the New Deal could have been expected to conceive. The launching of a criminal prosecution against the American Medical Association is on a brazenness par with the attempt to pack the supreme court of the United States.

Laws, especially federal laws, are peculiar. Often they are so worded that their actual purport can be stretched to points entirely beyond the intent of their framers and this may prove true in relation to the charges brought against the A. M. A. and certain individual physicians. But it is patent that the congress which enacted a law for the curbing of industrial and commercial monopolies never dreamed that it might some day be used for the harassing of the professions.

The word "professions" is used advisedly, for if it can be applied to physicians it certainly can with equal force be directed to dentists, lawyers, engineers and any other organized professional group—even ministers and churches.

So far fetched is the Sherman law prosecution of the "medical trust" that it can only be construed as being based on a vengeance motive, vengeance because the A. M. A. has been cool toward the administration's medical care program.

News of this prosecution will stir the nation profoundly. Whatever the result of the proceedings in the courts themselves, they will serve to widen, not heal, the breach between the government and the medical profession as well as to center the attention of the public on the subject of medical, surgical and hospital costs.

News of the action of the department of justice followed almost immediately upon that of a pioneer step in socialized medicine taken by the California Medical Association. This association has approved a health insurance plan with medical, surgical and hospital care on a basis of about \$2.50 a month.

This insurance is to be sold only to wage earners whose maximum incomes do not exceed \$2,500 annually.

Under it, the patient is to choose his own physician and hospital. Physicians are to be paid on a unit basis, with no interference with private practice.

The California experiment will be watched attentively by the nation at large. Wherever it exists it is on an experimental basis, working toward the solution of the widely recognized problem of medical care and toward the averting of the socialization of medicine in an actual sense by the assertion of government or state control.

### ABOUT DOCTORS

[New York Daily Mirror Dec 22 1938]

Most of the idealism, the self sacrifice, the unselfishness, the burning passionate interest in the welfare of humans, the unflinching devotion to their duty, and the deepest religious convictions that exist in the young men who begin their lives in America, you will find in those young men who enter medical schools.

As doctors, these young men have gone on to raise the standards of American medicine higher than you will find in any of those European or Latin American countries that boast of their "socialized medicine."

The average American receives medical care that is better than the best that the rich or the politically powerful can get from their specialists in Europe.

The problems of the American medical profession, and its standards, are matters which we as a newspaperman cannot hope fully to understand, would not dare try to dictate. We have not had the training of a Man of Medicine.

By the same token, we do not believe that any brush-lipped college professor—who was chiefly noted at Yale for his campus-variety wit and his delight in the sound of his own voice—we do not believe that such a man as Thurman Arnold is remotely qualified to set up through coercion a code of "fair practice" for those skilled men who devote their lives to healing the sick.

We believe that Thurman Arnold has unwittingly raised an issue that lawyer-politicians would prefer to keep quiet.

How much more of our freedom of action, of our liberties to engage in the exchange of goods and services, must we sacrifice to the obsessions of legalistic department dictators in Washington who have unlimited power to regulate a productive system which they do not understand?

Such a dictator is this Thurman Arnold, who has used his power to indict as a tyrant's club to force the American Medical Association to alter a position taken by the democratic action of its members.



He cracks down on the Medical Association and presumes to say that it has "restrained trade" by disciplining its own members and controlling the growth of "group medicine."

Mr Arnold refuses to recognize that there are already 2,000 such cooperative medical groups operating in America, with the full approval of the Medical Association, because they do not RESTRAIN the patient's right to choose his own physician.

Mr Arnold refuses to recognize the very danger which he best represents—the POLITICAL control of the medical profession.

Woodrow Wilson once said "Every man who takes office in Washington, either grows or swells."

Mr Arnold is "swelling." Tomorrow, we'll tell you how he uses his "consent decrees" as a club to enforce his 'benevolent despotism'."

## The Tyrant



Thurman Arnold, ex college professor and now trust busting Assistant Attorney General has indicted the ruling body of American Medicine on charges of restraining the activities of group medicine. But if the Medical Association had agreed to play ball with Arnold the indictment would have been shelved. Arnold's system is a brutal combination of the Star Chamber and Nazi bureaucracy. The doctors of America should unite in this fight against a system which jeopardizes the liberties of every citizen.—New York Daily Mirror

## ON THE MEDICAL FRONT

[Charleston S. C. Evening Post Dec 21 1938]

If laymen do not know all the details of the quarrel between the American Medical Association and the Group Health Association, Washington medical cooperative, or of the proceeding which the government has brought against organizations of physicians in the courts of the District of Columbia, they are nevertheless able to understand that the anti-monopoly prosecutions which have been instituted with grand jury indictments may have a far-reaching effect on the practice of medicine and the relations between physicians and patients in this country. Since everybody in the United States is at least a potential patient, the subject is one that concerns all.

Behind the federal prosecution is, of course, the fight of organized medicine against a movement for cooperative medicine and toward socialized medicine. The Group Health Association is a cooperative enterprise that undertakes to provide medical care for government workers who pay regular fees into a central fund for the purpose. The plan attracted national attention some months ago, when at one and the same time the

issue of socialized medicine was debated at the meeting of the American Medical Association and the federal administration named a group to study the subject. It is charged that the defendants in the present case, who include the American Medical Association, several affiliated societies and a number of individual physicians, conspired to "restrain trade" by preventing doctors hired by the Washington cooperative from practicing in the hospitals or consulting with other doctors.

However the Washington case comes out, it is plain that the American Medical Association and its affiliates, which include the overwhelming majority of recognized medical organizations, are certain to feel increasing pressure for socialized medicine of all kinds, an inevitable outgrowth of the political and economic ideas which have been propagated and fostered in the United States in the last few years. Socialized medicine is an inevitable accompaniment of social insurance. When the New Dealers decided to investigate the subject, it was not for the purpose of finding out how to prevent the spread of the idea but rather how to promote it.

What will happen to the art and science of medical practice if and when medicine has been socialized is a matter for conjecture but a good argument could be made out for the claim that when the individual practitioner becomes a salaried worker for the government or a quasi public cooperative, progress in the profession may be retarded, to say the least. What seems fairly certain is that the close personal relationship that has always existed between physician and patient and that many believe is an important element in ordinary medical practice and care will suffer materially and perhaps vanish if the time comes when the doctor is an impersonal agent of government like the inspector of income tax returns or the postoffice clerk. So long as this country is a democracy the people are entitled to have within the limits of the organic law, what they want, but why they should desire to socialize and federalize the practice of medicine is a mystery.

## A STRUGGLE FOR CONTROL OF THE PUBLIC HEALTH

[Philadelphia Evening Public Ledger Dec 22 1938]

Issues of far-reaching importance to the people of the United States are involved in the indictment by a District of Columbia Grand Jury of the American Medical Association and several other medical societies on the charge of participating in an unlawful combination and conspiracy in restraint of trade. It is an extraordinary charge and in many ways unprecedented. It calls the doctors to account under the Sherman Anti-Trust Act, alleging that they intend to make and maintain a monopoly of medical service.

The case, of course, will be bitterly fought to the final decision of the Supreme Court of the United States. Organized medicine, represented by the American Medical Association, recently adopted a resolution that it would fight any such case "to the utmost with every means in its power, exhausting, if necessary, the last recourse of distinguished legal talent."

But on the other side is the plain intent of the Federal Government to establish the principle of group health insurance on its own terms. Many regard this intention as the entering wedge of socialized medicine. Voluntary enrolment of individuals in societies providing medical care is the forerunner of compulsory health insurance under Federal control, probably paid for, in part, with public funds.

The case before the courts is remarkable in many ways. For a long time the fight it represents has been maturing to a crisis. About a year ago the Group Health Association, Inc., was formed in Washington, with its membership restricted to low-income employees of the Home Owners Loan Corporation. Later membership was extended to all Government employees.

But this was an organization unlike many medical insurance groups, about 2,000 of which have received the approval and support of organized medicine. In California, recently, a state program of medical insurance was overwhelmingly endorsed by the profession.

The complaint of the doctors against Group Health Insurance, Inc., was twofold. One objection was that it denied the right of the patient to choose his own physician, requiring him to call on a doctor associated with the organization. The other was that a "third party" intervened between patient and physician, hiring the doctor's skill and services and selling them to the subscriber.

In vigorous terms the men of organized medicine have denounced these characteristics of the plan. They consider them dangerous to the public health, mainly because of the possibility that incompetent practitioners may attach themselves to this type of organization for the sake of the fixed income it offers. They regard them, too, as destructive of the rights and responsibilities of their profession and ultimately of all private medical practice.

So the American Medical Association, the Medical Society of the District of Columbia and the Washington Academy of Surgery thought fit to fight back. They were joined by other medical societies and by a number of Washington hospitals.

Doctors serving the Group Health Association were "disciplined." Some were suspended from membership in medical societies. Some were denied use of hospital facilities. On these grounds, the medical associations are now accused of conspiracy in restraint of trade, an extraordinary charge against a learned profession.

The doctors, therefore, must now defend another point of principle. Dr. William J. Carrington, president of the Medical Society of New Jersey, points out that "organized medicine has always believed that its right to discipline its own members was just as unimpeachable as the right of trade unions to discipline theirs." The principle involved is fundamental, for the code of professional conduct and ethics has bound the men of medicine for centuries and is effective only because there has been power to enforce it. Refusing sanction and approval to the Group Health Association organized medicine had no choice but to put pressure on physicians who defied its disapproval.

This is the case before the court, but a larger issue is before the country. It is not the question whether group health insurance is right or wrong. It is already an established fact. What must now be determined is whether it shall be planned, organized and controlled by the medical profession or by private commercial enterprise and eventually by Government.

### THE MEDICAL "TRUST"

[Atlanta Gr Constitution Dec 25 1938]

Considering the somewhat unrestrained condemnation of the medical profession which emanated from the Department of Justice last summer, the indictment of the American Medical Association by a federal grand jury comes as no startling surprise. Thurman Arnold, assistant attorney general, forecast the procedure. He said, with reference to closing Washington Hospitals to certain doctors affiliated with a group hospitalization plan, that "it is an attempt on the part of one group of physicians to prevent qualified doctors from carrying out their calling."

In the legal eye of the assistant attorney general this was a perfect example of a combination in restraint of trade, punishable under the Sherman anti-trust act. He considered it his duty, presumably, to dissolve the "trust" and punish those responsible for its operation. Hence the indictment.

But when the matter is examined in the cold light of common sense with all the political fog removed, the premise upon which the indictment is based is absurd. The American Medical Association is no more of a trust, or a combination in restraint of trade than Mr. Arnold's American Bar Association, or the national organization of architects, or, indeed, the American Federation of Labor, all of which have prescribed rigid rules of practice.

If a lawyer, or an architect, or a plumber violates the rules of his organization he is chased out at the first meeting, just as a doctor is expelled for practices considered unethical in medicine.

Unfortunately for the idea of a greater expansion of medical services among the people, many shallow-thinking politicians

have jumped to the conclusion that a simple appropriation of \$850,000,000 by the federal government will fill the bill. They labor under the delusion that money can buy anything, that a well equipped office—beautiful furniture, overstuffed chairs and shiny new instruments—means a well equipped doctor.

The profession of medicine, by its very nature, is a monopoly. It couldn't very well be otherwise. It requires at least eight years, from the time he graduates from prep school, to fit a man merely to start "practicing." Additional years are required to make him into a "doctor." So the standards of practice naturally ascend to a high plane. It requires never ceasing vigilance to maintain these standards. If they were altered to fit some particular social theory, the profession would soon be overrun with all manner of smooth-tongued quacks.

It is not denied there is room for broadening and improving the medical care of all the people. The doctors, as a whole, are aware of this. They are willing to cooperate. They are cooperating on a broad front, and in a practical way. The nature of the extensions sought, however, are such as should call for making haste slowly. It must first be decided just what is to be done.

Therefore the indictment under the assumption that a certain pet scheme in Washington to revolutionize medical practice is everything to be desired will, in all probability, do more to retard than to hasten the movement.



From the Evening Star Washington D C Dec 23 1938

### A M A INDICTMENT

[The Dallas Morning News Dec 22 1938]

Certainly open to serious question is the legitimacy of the indictment brought against the American Medical Association and certain of its officials and groups for violation of the anti-trust laws. Medicine and surgery do not constitute trade in the ordinary meaning of the term. A conviction can do no good and an acquittal, highly probable, may deter the reforms in medical practice which the group health association movement seeks to effect.

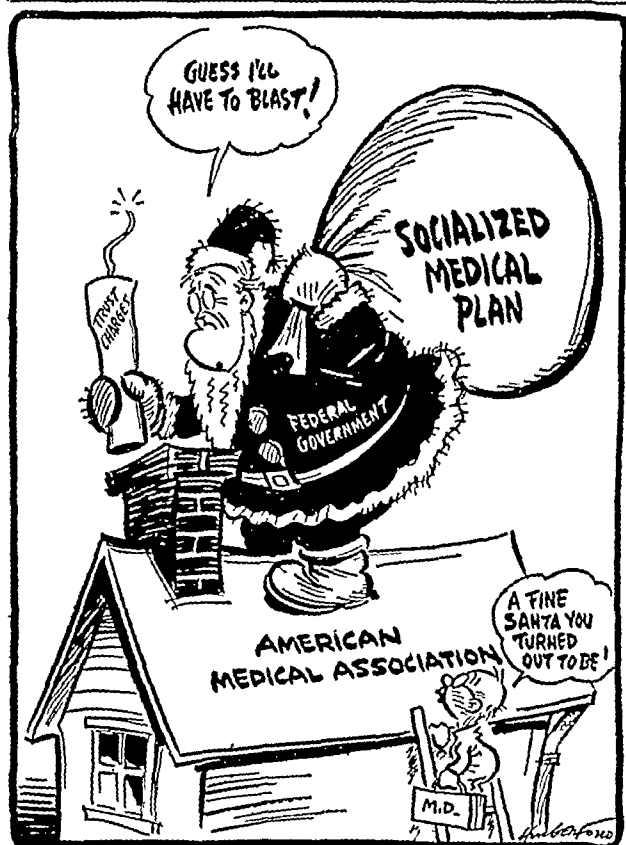
Fearful of the state medicine boggy and apparently wilfully blind to the successful operation of contract medicine in Great Britain the A M A has long set its face sternly against any effort to solve the problem of medical care cost on a pre-contract group basis. The A M A has certainly sought to discipline the ethical doctor and prevent his serving the sort of practice to which it objects regardless of his standing as a practitioner.

In all probability the best cure for that would be found in statutory regulations which would protect those physicians who seek to cooperate in group health experiments. The present A M A case is by no means comparable to ordinary trust suits, for the association will not deny the acts recorded in the

complaint except in the interpretation made of them by the grand jury. But the A. M. A. can itself be disciplined without criminal proceedings for acts which the organization does not regard as criminal or even as wrong.

As a matter of fact, of course, all signs point to voluntary agreement by the medical field to experiments from which it has long shied so violently. Group medicine plans for low or medium income bracket patients are now being studied and in some cases tried by medical societies. The affected public believes medicine has long been in error in its attitude. But it knows the doctors are not criminals and it believes that medicine can be trusted to set itself right.

### Chimney Surgery—By Hungerford



From the Pittsburgh Post-Gazette Dec. 22, 1938

### MEDICAL CHARGE

[The Indianapolis News Dec. 22, 1938]

The indictment at Washington of officials of the American Medical Association and members and officials of local medical societies in the District of Columbia indicates that the department of justice has not receded from its position that the anti-trust laws were violated when the medical groups used their power to obstruct the formation and operation of a group health association in Washington. This association was formed by government employees. In return for monthly dues they expected to receive medical and hospital service. The government contends that the medical societies in Washington opposed this move by barring physicians who were retained by the group health association from their organizations and from recognition as hospital staff members.

The American Medical Association has declared that it will defend itself and its members on two basic grounds. Their first defense is that the anti-trust laws are directed against monopolies in restraint of trade, while the practice of medicine is in no sense a trade within the commonly accepted meaning of the term. Their second line of defense is that they have opposed these organizations because they tend to throw control of the

practice of medicine into the hands of the laymen who direct the group. They have indicated that they are not opposed to group health organizations which give full recognition to the right of physicians to make their own professional decision.

In prosecuting this case, the department of justice will have to pioneer in a field which heretofore has never been regarded as affected by the anti-trust law. The right of professional groups to organize for the purpose of protecting their profession from unworthy practitioners and from methods which are deemed to be adverse to the public welfare has always been respected. If the government's position is sound every organization of professional and skilled workers will risk similar action. Certainly trades unions which insist on high standards of skill as a condition of membership will face the possibility of having to defend their organizations. The question goes to the fundamentals of personal liberty under the American system of free enterprise.

### MEDICINE ON TRIAL

[Grand Rapids Mich. Press Dec. 22, 1938]

Federal indictments against the American Medical Association, three medical societies and twenty-one individuals charging violation of the anti-trust laws have thrust before the American people a subject of deep significance.

Legally the case reaches down into the fundamental meaning of professional service. Is medicine to be considered a profession or a trade? Is medical service to be dispensed like an ordinary commodity or will it continue to be regarded as a service, the professional and ethical standards of which shall be regarded as above the ordinary rules of trade and commerce?

It may not be possible for the government prosecution to limit medicine with trade and commerce from a legal standpoint. But apparently it is to be the principal defense at the outset. But even though a successful defense may be made on these grounds it will not solve the problem which now confronts the profession.

If medicine and trade are closely connected in the public mind it is indicative of a grave development of public thought. If the practice of medicine is not to be regarded as based on ideals of highest service to the community, but rather on a foundation of pure commercialism, is there not a serious threat of deterioration in standards of practice? The average medical man probably would answer that question in the affirmative.

How far the public mind has progressed toward this concept is indicated in part by the fact that a grand jury of twenty-three laymen approved the indictment. The Grand Rapids Press bureau in Washington reports that this jury was made up of salesmen, business executives, managers, a grocer, a truck driver, engineers, merchants and a Negro messenger. The group which decided there was evidence sufficient for indictment was not drawn from any one class of citizenry. It was a diversified group. And while the grand jury did not decide whether medicine is no more than a trade, it was convinced nevertheless that indictments were warranted under laws which forbid conspiracies "in restraint of trade or commerce." It would appear that in these laymen's minds, at least, the distinction is not sufficient to be a bar to action.

The medical profession might properly conduct a searching inquiry into its own practices in an effort to discover why this has come about. Has it been because of a failure to reach and retain the respect of large masses for the standards and position of the profession?

It may be possible for the A. M. A. and others under indictment to beat this case on the ground that the profession does not fall within the scope of the law. But there must be a frank answer to the specific charges as well if public confidence is to be retained. The profession as represented in the A. M. A. has been accused of using its power to force members to abide by its rules against engaging in group medical projects, it is accused of practicing professional ostracism to restrain cooperation with the groups and of forcing hospitals to close their doors against those who do not comply.

Perhaps the answers to these charges are easily made. Perhaps the medical association can refute the accusations completely or explain them satisfactorily. That is what it

should attempt to do. It should not seek to evade these answers by taking refuge behind a purely technical defense, for the charges have raised questions in the public mind to which the general public will expect replies. Medical men close to the A M A declare these suits are merely the climax of the fight between those wishing to provide a lower standard of medical care and those trying to maintain a higher standard. The public must be informed of the issues, however, if fair judgment is to be passed.

It is worthy of note also that the same practices charged against the A M A have been followed by other organizations, notably union labor, without drawing the fire of the department of justice. Workers declining to join unions have been ostracized. The monopoly in certain labor markets has not been challenged by the government. It seems to make a difference who follows these alleged practices.

Out of all this turmoil there ought to come a better understanding of organized medicine. The gain may not be all on one side. The whole question of a wider distribution of medical care and a more even distribution of its costs may be reviewed before this case is settled. That should be all to the good unless the forces of prejudice are allowed to take control.

## MEDICINE AND THE LAW

[Minneapolis Journal Dec 23 1938]

The American Medical Association three local medical societies and twenty-one individual physicians are now under federal indictment charged with violation of the Sherman Act. The indictments charge interference with spread of group medical practice. They mean criminal prosecutions—a government big stick.

Whether socialized medicine or group practice are desirable social objectives are questions still open to debate. Highly complex, they are receiving the profound study of some of the best minds in the profession itself. But assuming for the moment that they are, is criminal prosecution of medical leaders the way to accomplish those ends? To ask the question is to answer it.

This is not to say that wider distribution of the best medical service is not desirable. Doctors themselves do not deny that there are great numbers of people who, through ignorance, improvidence or any one of a dozen causes, are living on decidedly substandard levels medically speaking. Clinging and prosecuting the medical profession, however, is not the way to bring these groups to higher standards.

In the last five years the profession itself has shown its willingness to attempt a solution of the knotty problem of medical economics. Beginnings have been made in many communities and some states. These, without exception, have been on medicine's own initiative. They have been brought about largely by the pressure of changing social and economic forces, and the doctors' knowledge that we live in an age of ferment and new departures. Coercion seems wholly unnecessary.

## INDICTING THE DOCTORS

[Springfield Mass Union]

The American Medical Association three other medical societies and twenty-one physicians have been indicted by a Federal Grand Jury for violation of the Sherman Antitrust Act. A first impression, and one which the public will undoubtedly share quite generally, is that the Department of Justice has used a butcher's cleaver where a tempered blade would be more suitable for the purpose.

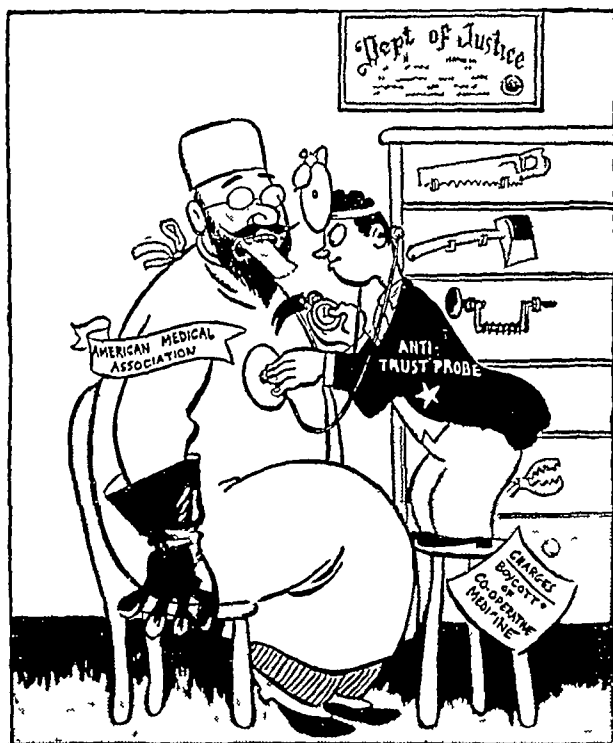
That purpose is to forward the Government's group insurance program to do which it is willing to frighten and malign highly respected medical associations and a distinguished group of able and honorable physicians and officials. We have in this roughshod procedure one of the best examples yet produced of the New Deal's reckless and ill considered methods of achieving its ends.

This is entirely aside from the merits of the question in dispute on which there are sincere and legitimate differences

of opinion. There is much to be said for group health projects, and those who believe in them are enthusiastic in their determination that a plan be adopted under government auspices. Nor is the American Medical Association entirely opposed to group health in principle. What this highly respected association of distinguished medical men insists upon is that thorough study shall first be made of plans which can be made to work effectively and efficiently with a minimum of Federal control.

The medical profession is working out plans that will be practicable and equitable. They require time. The present Administration has given us many examples of hasty experimentation which have worked out badly and proved costly. In the field of medicine the more scientific approach is not only desirable but imperative, because the public welfare is vitally concerned.

## LOOKING INTO THE PHYSICIANS



From the New York Times

## THE DOCTORS ARE INDICTED

[New York Herald Tribune Dec 22 1938]

With his indictment of the American Medical Association and its eminent officers together with its District of Columbia affiliates and several of the leading physicians of Washington Mr. Thurman W. Arnold has fired the second gun of his campaign to regulate the vexed question of "group medicine" through the unlikely instrument of the anti-trust laws. The ordinary American entertains, we believe, a high respect for the medical profession as composed in general of men of exceptional unselfishness, competence and devotion. When he thinks of it, he probably admires its powerful official organization—represented by the American Medical Association and its local societies—for the probity with which it has maintained ethical and technical standards and policed the profession against quackery and venality. It will be difficult for Mr. Arnold to convince the public that American physicians are a greedy crew and their organization a selfish monopoly primarily interested in the ruthless suppression of competition.

On the other hand, the ordinary American is coming to regard the leadership of the medical association as inclined to err rather heavily on the conservative side in facing the real problems underlying the economics of medical care in the contemporary

world. He is being led to doubt whether that leadership is fully representative of the most alert thought among physicians themselves on this social and economic side of medical care, and if the facts should tend to sustain Mr. Arnold's allegations of a fairly ruthless suppression, in the District of Columbia, of a possibly hopeful experiment in voluntary group medicine, it would be difficult for the American Medical Association to convince the public that its action was either wise or allowable.

The anti-trust laws seem to us a most unsatisfactory instrument wherewith to raise this issue. If, as he hopes, Mr. Arnold gets a consent decree regulating the Washington situation alone, it will leave the Department of Justice with a kind of discretionary power over medicine it is hardly competent to exercise. If the case is fought through the courts, as the medical association promises that it will be, it must end either in a victory for them, which would leave everything as before, or a defeat which might very gravely jeopardize their invaluable function of generally policing the profession. Now, however that the battle has been joined, it will have to be fought out and perhaps the air will be somewhat clearer when it is over.

## THE DOCTOR AND THE TRAFFIC COP



Shoemaker in the Manchester Union

## "DOC" INDICTED

[New York World Telegram Dec 21, 1938]

"Organized Medicine Indicted as Trust," says headline

Which gets into a big subject, very big, indeed—one that touches not only every doctor but every other son of man who has been afflicted with any ill to which flesh is heir, from belly-ache to coronary thrombosis.

For some reason or other the headline reminds us of a story, attributable, if our memory serves us right, to the late Lincoln Steffens.

The devil, as the story goes, grew alarmed at a report that sin wasn't doing so well in a certain remote community of his realm. He sent a lieutenant to investigate. The report returned, after careful inspection, was that not a gram of evil could be found.

"Is that community organized?" asked the devil.

"No," replied the emissary.

"Well that's what's wrong," said the devil. "Organize it!"

This is an age of organization. And organization up to a point is essential in as intricate a civilization as ours. But

organization can become too refined—whether it be organized business, organized art, organized labor or organized professions, whether the National Association of Manufacturers, the American Federation of Labor, the Congress for Industrial Organizations, the New York Stock Exchange, the American Bar Association or the American newspaper publishers.

So the real test in this suit against the American Medical Association and its allied units is—Has organization gone too far—has the economic aspect been exalted under the guise of professional ethics to a point where, as the indictment alleges, the peace and dignity of the United States of America are threatened?

Without seeking to try the case or to restate all the issues set forth by the District of Columbia Grand Jury, we do want to say this about 'Doc'—

Whether he be on one side or the other in this controversy between the American Medical Association and the group health associations, we think that medicine, of all occupations, is least motivated by the acquisitive impulse. We've all needed Doc. We all have been willing to give our shirt and the fillings from our teeth if he would only come right now, and then we all have kicked about his bill if it was more than \$2 after we got well.

The very nature of his work—the strange ambition which makes one human being want to spend seven or eight years learning the anatomy of other human beings in order to keep their microbes on straight—has always been a mystery to us. From the old country doctor to the most modern and steam-heated specialist its service that can't, by its very nature, be essentially mercenary. Commercially you could go farther and acquire more, applying the same amount of energy and intelligence, in the shoe business, where the telephone doesn't ring in the middle of the night.

But maybe this inherently noble vocation has, as the Steffens story puts it, become overorganized.

Anyhow, that's the question in this antitrust case.

## POINT NOT WELL TAKEN

[Louisville Ky Times Dec 21, 1938]

"It is indicted," says a Washington dispatch, "that the American Medical Association may carry the case to the United States Supreme Court, if necessary, with the contention that its operations cannot be restricted by the Sherman Act since medicine is not a trade, but a profession."

The whole question of what should be done to give Americans, instead of a small class of Americans, good medical service is baffling.

The Times is not inclined to rush in with a solution.

But if the American Medical Association should go to the Supreme Court with the contention that its operations cannot be restricted by the Sherman Act, and if at the same time those operations should be by popular verdict, declared antisocial, a law might be found to restrict the American Medical Association.

Laws are mutable.

No group of citizens, with a learned profession as their shield, could long withstand public sentiment if it were believed that their attitude blocked what promised to be a practical plan to broaden the services of medical and surgical science.

The fundamental question is how those who are neither rich nor extremely poor can get medical service, and how medical service for the poor may be so improved that it will not repel rather than attract those whose lives may depend upon accepting it.

That is a much larger question than whether a physician is subject to regulation under an act designed to regulate business.

The question is one of the largest which thoughtful Americans are considering.

Legalistic argument cannot be brought to bear effectively in the circumstances. A battle, hardly a war, might be won on a technicality in such a situation.

## THE STORY OF THE INDICTMENT

*Chronologic Record of Events Leading to the Indictment of the American Medical Association Because of the Difficulties of the G H A , Inc*

In the Annual Report of the Twentieth Century Fund, Inc, for 1936, appears this statement

"As a result of the activities of the Fund, and of the Health Economics Association, substantial progress has been made in the promotion of voluntary, cooperative, group payment medical service organizations. At the end of the fiscal year twelve agencies of this kind had actually been organized, consisting mostly of small groups. A total of nine other organizations were definitely committed to such plans, of which one is actively engaged in establishing a plan and the others are in various stages of negotiations with organization officials and employees. Chief among these groups is the employees in the District of Columbia of the Home Owners Loan Corporation."

The Twentieth Century Fund, Inc, was organized under a Massachusetts charter in 1922 as a successor to the Cooperative League, which had been organized in 1919 by Mr Edward A Filene. In 1936 Mr John H Fahey was chairman of its executive committee.

Again in 1937 the report of the Twentieth Century Fund said

"The most important project assisted by the Association in 1937 was the organization set up by the employees of the Federal Home Loan Bank Board to furnish, on a periodic payment basis, practically complete medical services for themselves and families. These employees formed the Group Health Association, Inc, a non profit organization, chartered by the District of Columbia specifically for this purpose.

"This group started to furnish service on November 1, 1937, to approximately one thousand employees and their families. It now has a list of twenty-seven hundred subscribers who, with their families represent a membership of approximately ten thousand individuals. The Group Health Association has an income which amply meets its expenses in furnishing this service. This group has been subjected to severe attacks from the local medical association, as well as from certain District officials."

Early in 1937 there began to be circulated in Washington, D C, a prospectus marked "Confidential For Private Circulation Only," entitled "A Plan for a Cooperative Medical Service on a Periodic Payment Basis for Federal Employees and Their Families in Washington." It was indicated that attempts would be made to obtain the cooperation of members of the Medical Society of the District of Columbia, that the Medical Society of the District would be invited to appoint a representative to sit with the committee in establishing the plan, and that an advisory committee of physicians would be appointed to aid the medical director on relevant matters.

On February 24, 1937, the Group Health Association, Inc, filed its certificate of incorporation, and in March 1937 two members of the staff of the Home Owners Loan Corporation, Messrs Russell and Zimmerman, were directed to prepare and present a definite outline for procedure for consideration by the board of directors. Thereafter Horace Russell, general counsel of the Home Owners' Loan Corporation, in March, sent to the Corporation a resolution authorizing a contract between the Home Owners' Loan Corporation and the Group Health Association, Inc. This contract was executed on March 22, 1937. It must be remembered that Mr John H Fahey, chairman of the executive committee of the Twentieth Century Fund, Inc, was also chairman of the Board of Directors of the Home Owners' Loan Corporation. As part of the details of

the contract, the Home Owners' Loan Corporation agreed to pay to Group Health Association, Inc, \$10,000 on request and, beginning on the date of the establishment of its service, the sum of \$833.33 monthly in advance for a period of twelve months, and thereafter the sum of \$1,666.67 per month for the next twelve months. Thus was created the appropriation of \$40,000 of government money for the financing of a private corporation to provide medical services in the District of Columbia. The interlocking character of the arrangement was further established by a stipulation which provided that two of the five members of the executive committee of the Group Health Association, Inc, would be nominated by the Federal Home Loan Bank Board and that the by-laws of the Association would be satisfactory to the Corporation.

Attempts were made by the Chairman of the Economics Committee of the Medical Society of the District of Columbia and by the director of the Bureau of Legal Medicine and Legislation of the American Medical Association to find out the details of operation of the Group Health Association, Inc, the details of the contract and other data necessary to determine the lawfulness of the arrangement. Incidentally, unlawfulness at that time was impliedly admitted later by the Association through changes in its by-laws which were apparently made for the purpose of attempting to bring it within the law.

In November 1937 the question of the legality of the practice of medicine by a corporation was raised and various attorneys expressed varying opinions. Then on Nov 20, 1937, counsel for the Medical Society of the District of Columbia submitted to the United States Attorney in and for the District of Columbia and to the corporation counsel for the District of Columbia a brief showing that Group Health Association, Inc, was engaged in the practice of medicine and in the business of insurance.

The publicity associated with these legal procedures was followed by an attempt by members of the Senate and Congress of the United States to determine the legality of the diversion of the funds of the Home Owners' Loan Corporation to the use of Group Health Association, Inc. In December 1937 Senator McCarran requested the acting comptroller general of the United States to inform him as to the authority of law under which public funds had been diverted from the Home Owners' Loan Corporation for the purpose of establishing a social health organization among the employees of the corporation. Then acting comptroller general, Mr R N Elliott, replied

"It has been the long-established rule in the Federal service that the functions of the agencies of the United States are restricted to those activities authorized by general or special enactments of the Congress, and where an activity involves the expenditure of moneys of the United States, the appropriation laws must make the moneys available therefor in no uncertain terms if such activity is to be accepted as lawful. Accordingly, it must be concluded in the instant matter that the disbursements and other costs were made and incurred without authority of law."

With this opinion, the legal department of the Home Owners' Loan Corporation differed. However, a sub-committee of the Committee on Appropriations of the



House of Representatives gave hearings on the Independent Offices Appropriation Bill 1939, in which appropriations for the Home Owners' Loan Corporation in relationship to Group Health Association, Inc., came up for consideration. The diversion of funds for this purpose was defended by Mr. Russell, general counsel for the Home Owners' Loan Corporation. The board might, Mr. Russell thought, provide dental services and in fact do whatever in its judgment was necessary for the accomplishment of its major purpose. To which Mr. Woodrum of Virginia, chairman of the subcommittee, replied:

"As long as I have been a member of the Appropriations Committee I have never heard any department advance that sort of philosophy to the Appropriations Committee."

Mr. Woodrum continued:

"Entirely separate and apart from the merits or demerits of the proposition that you have announced or whether there should or should not be group insurance and medical treatment and entirely from the standpoint of congressional supervision and control of appropriations and expenditures I have never understood, nor do I think it is the law or by any possible wide stretch of the imagination that a department can have money appropriated for it have hearings and come back and justify expenditures for something entirely foreign and separate and apart that was not in the minds and certainly could not have been in the minds of any member of this committee or the Budget when they passed upon this appropriation of \$40,000 which, of course relatively speaking is insignificant. It is the principle of the thing."

"If you should come back next year with some like proposition entirely separate and apart I should feel that it is a perfect farce for a committee to sit here and undertake to go over the appropriations and discuss what you should spend your money for if next year you are coming here and say 'Oh, sure. We did that, but we have general power to spend our funds for anything that the board determines is of vital interest to the Corporation. I don't understand your view about the law, and certainly that is not the ruling of this committee.'"

The publicity associated with the promotion of Group Health Association, Inc., indicated promptly that it had the support of many of those associated with the federal government.

In May 1938 Attorney General Cummings of the Department of Justice explained in a press release that the Department of Justice proposed to undertake certain prosecutions under the antitrust laws and that a series of public statements would be issued throwing light on the policy. One of the statements to be given out, it was said, would be to call the attention of Congress to the interpretation and application of antitrust laws by the Attorney General as they might have a bearing on contemplated legislation. From this time on came the series of peculiarly timed releases to the press from the Department of Justice associated with the endeavors of the federal administration to support Group Health Association, Inc. Thus on June 1, 1938, the *Evening Star* of Washington, D. C. announced that:

"The Department of Justice has launched an inquiry into complaints that the American Medical Association and the District of Columbia Medical Society have violated Federal anti-trust laws in connection with their fight against 'group health' plans."

"The inquiry is being made by the anti-trust division of the department, under the direction of Assistant Attorney General Thurman Arnold, recently appointed by President Roosevelt as the administration's chief trust buster."

"It is understood the complaints, presumably from interests associated with or defending Group Health Association, Inc., of the Home Owners' Loan Corp., charged that alleged obstructionist tactics adopted by the District Medical Society and the

American Medical Association are in conflict with anti-trust laws forbidding 'combinations in restraint of trade.'"

On June 3 a representative of the American Medical Association called at the Department of Justice to ascertain the basis for the foregoing statement. The statement was given out for publication, it was learned, on the basis of a call at the office of Mr. Thurman Arnold, Assistant Attorney General in charge of the Antitrust Division by one man who requested Mr. Arnold to have the Department of Justice intervene in the controversy between Group Health Association Incorporated and the Medical Society of the District of Columbia. The caller filed no formal complaint and the statement given out was based, it appeared, entirely on the verbal request of the caller. The name of the caller was not disclosed.

This announcement immediately preceded the meeting of the House of Delegates of the American Medical Association in San Francisco on June 13.

#### ANOTHER RELEASE FROM THE DEPARTMENT OF JUSTICE

On the last day of the meeting of the National Health Conference, July 20, the Department of Justice presented to the press another of its releases. On that day it released to the press a statement concerning a petition in equity that it had filed against the major motion picture companies, their associated and subsidiary companies and numerous individuals connected with the industry under the Sherman Antitrust Act. In making this announcement the Department of Justice undertook to justify its failure to proceed against these corporations and individuals, by criminal prosecution, saying:

"One reason for determining to proceed first in equity rather than criminally is therefore, the fact that only an equity decree can accomplish the result which the Department believes to be essential."

"A further reason for instituting equity rather than criminal proceedings at this time should be noted. In the course of its study of the motion picture industry the Department attempted through the voluntary cooperation of the major producers, to adjust the difficulties of independent exhibitors who brought their problems to the Department and who consented to such a course. The Department believes that in the light of its dealings with the industry in the past, it would be inequitable to institute a general criminal proceeding relating to the general subject matter of this suit."

"The Department desires to encourage and not to retard the development and orderly operation of the motion picture industry."

Leslie C. Garnett, United States District Attorney for the District of Columbia, and his successor in office, David A. Pine, recognized the fact that Group Health Association, Inc., was practicing medicine in violation of law and indicated an intention to prosecute. J. Bach Moor, Superintendent of Insurance for the District of Columbia, recognized that the association was engaged unlawfully in the business of insurance and he likewise threatened prosecution. Representatives of Group Health Association, Inc. in order to avoid these criminal prosecutions, petitioned the District Court of the United States for the District of Columbia for a declaratory judgment in which the court might express its opinion as to the legal or illegal character of the activities of the Association. The court, through Justice Jennings Bailey, rendered a memorandum opinion, July 27, 1938, to the effect that—

"I see no reason why an individual may not, without violating the statute, contract with a physician for medical services for a stipulated period at a fixed compensation, and it would seem



that a group of individuals might make the same arrangement with a group of physicians. It would seem that this group of individuals might incorporate themselves for their own mutual benefit for the same purpose. Such a corporation, not for profit but for the mutual benefit of its members, is in my opinion not engaged in the practice of medicine or in holding itself out as doing so. It is true that a corporation can act only through its agents and employees, but the physicians with whom the plaintiff makes contracts are rather in the position of independent contractors, and the plaintiff does not in any way undertake to control the manner in which they attend or prescribe for their patients."

With the contract between the Home Owners' Loan Corporation and Group Health Association, Incorporated, whereby the association agreed to provide "substantially complete medical and hospital service to such employees of the Home Owners' Loan Corporation as care to join it on a reasonably monthly basis" Justice Bailey found more difficulty, but he concluded that the contract for such service did not constitute the practice of medicine. With those provisions of the contract between the Home Owners' Loan Corporation and Group Health Association, Incorporated, whereby the association agreed to provide physical examinations at the time of employment of all new employees in the Washington office and to manage and supervise the emergency rooms and the employees in the nursing service maintained in connection with such emergency treatment and in visitations to employees of the Washington office who are on sick leave, Justice Bailey did not concern himself. He rejected citations to cases bearing on the right of corporations to practice law, saying that they were "not closely analogous, they being based on the common law and governed by the courts independently of any statute." Justice Bailey concluded that Group Health Association, Incorporated, was not engaged in the practice of medicine but gave no citation to any decision tending to support that position. Similarly, and apparently for the sole reason that he believed that the word "payment" "as ordinarily used" means the payment of money, Justice Bailey held that Group Health Association, Incorporated, was not engaged in the business of insurance. It undertook to discharge its obligations in services and not in money. Consequently, on July 29, 1938, the court entered a decree to the effect stated above. The Superintendent of Insurance for the District of Columbia and the United States District Attorney noted an appeal to the United States Court of Appeals for the District of Columbia, which appeal was allowed. It is understood that the United States District Attorney did not perfect his appeal. The Superintendent of Insurance for the District of Columbia, it is believed, is pursuing his appeal from the judgment of the District Court that held that Group Health Association, Incorporated, is not engaged in the business of insurance.

On July 30, Assistant Attorney General Thurman Arnold released in Washington, for the morning papers of August 1, a statement of what he said were the results of "A preliminary investigation made by the Department of Justice in response to numerous complaints with reference to activities within the medical profession in the District of Columbia." He alleged that the Medical Society of the District of Columbia, the American Medical Association and some of the officials of both these organizations were attempting to prevent Group Health Association, Inc., from functioning and he stated what he said were the methods that had been used to accomplish that end. This,

he said, was a violation of the antitrust laws, because in the judgment of the Department of Justice those laws prohibit "combinations which prevent others from competing for services as well as goods [sic]." The persons responsible for this alleged attempt to prevent Group Health Association, Incorporated, from functioning could be ascertained, Mr. Arnold said, only by a grand jury investigation, and such an investigation would be undertaken in the near future. He ignored the apparent availability of civil proceedings, such as the Department of Justice seemed to deem sufficient in dealing with the motion picture industry in a situation similar to that in which Mr. Arnold undertook to place the medical profession. Assistant Attorney General Arnold undertook to discuss the economic conditions of medical practice in the United States, apparently as a basis for his proposed prosecution. He stated that, "In the event that voluntary cooperation results in constructive proposals going *beyond the elimination of illegal practices*, the Department will adhere to its previously announced policy of submitting such proposals to the court as a basis for a consent decree." How far "beyond the elimination of illegal practices" such supposedly voluntary cooperation would have to go to meet Mr. Arnold's wishes he did not state, but it is known that in one of the latest drafts of his newspaper release it was stated that such so-called constructive proposals would have to go "far" beyond the elimination of illegal practices.

On August 12, Sterling Ruffin, M.D., Prentiss Willson, M.D., and Elijah W. Titus, M.D., in their respective individual capacities as licensed physicians in the District of Columbia, filed a bill of complaint against the Group Health Association, Incorporated, in the District Court of the United States for the District of Columbia, praying that Group Health Association, Incorporated, show cause why it should not be enjoined and restrained from engaging in the practice of medicine and surgery in the District of Columbia and praying that, pending the final hearing and determination of the cause and thereafter, Group Health Association, Incorporated, be enjoined and restrained from doing any act, or holding itself out to do any act, which constitutes the practice of medicine and surgery in the District of Columbia.

On August 19, Assistant Attorney General Thurman Arnold broadcast an address over the Columbia Broadcasting System, entitled "The Antitrust Laws, Their Past and Future." He said, in part:

"The American Medical Association, by use of various types of pressure, declines to allow a patient to be admitted to a hospital unless he is attended by a member of that association. The Department, of course, would regard as reasonable attempts of the medical association to require the highest standards. What they are doing, however, is to prevent qualified physicians from practicing their profession in hospitals because they disagree with their social views as to the best method of furnishing medical care to the poor. They have expelled a physician who was associated with Group Health and reinstated him when he dropped that association. The Department is not interested in Group Health or in any particular form of labor organization or in the encouragement of any particular industry. It is only interested in insuring equal opportunity for all qualified persons to compete in either rendering services or selling goods excepting in those cases where Congress decides otherwise by special exception to the antitrust laws."

Mimeographed press releases of this address were issued in Washington.

On August 26, a representative of the Bureau of Investigation of the Department of Justice called at the offices of the American Medical Association, in Chicago, and reported that he had been sent to look over the files of the Association. He was told that the office was open to him and thereafter proceeded to examine carefully the files of the Bureau of Legal Medicine and Legislation, the Bureau of Medical Economics and the Council on Medical Education and Hospitals. He took away with him from time to time documents from the files, for the purpose of having them photostated for the use of the Department of Justice. The originals were returned.

On October 1 Assistant Attorney General Thurman Arnold delivered an address before the Missouri Bar Association, at St. Louis entitled "The Enforcement of the Sherman Act." Press releases were issued in Washington by the Department of Justice. Concerning the American Medical Association, Mr. Arnold said:

"Forty years of sporadic enforcement of the antitrust laws has prevented our forming a body of precedents with respect to particular industries. This has created a vicious circle which runs as follows: 1. It is not fair to enforce the antitrust laws in cases where their application is not clear. 2. At the same time the application never becomes clear because the cases are not brought before the court.

"Let me give an example which has caused wide comment in the press—a grand jury investigation of the use of coercion and boycott by members of medical societies. I will cite a typical instance of the kind of complaints which gave rise to this investigation. A physician was under contract with a corporation to care for its employees. He was a member of the medical society in his community, in fact he was a vice president. Nothing was ever said by any medical group against this very praiseworthy attempt of the corporation to further the interests of public health. This physician signed a contract with a labor union in almost identical terms with the contract which he already had with the corporation. The following consequences ensued: (1) He was expelled from his medical society, (2) the medical society by threats and pressures attempted to close hospitals against him. He was a fighter. He could not understand how in a free country he should be excluded from practicing his profession because of his views on how to distribute medical services so long as no medical standards were involved. He succeeded in retaining privileges in one hospital. His practice was crippled but not stopped. Thereupon members of the medical society approached the insurance companies which protected him against suits for malpractice. They succeeded in getting his policies canceled. The doctor was amazed at this sudden turn of events, but he was not of the stuff that yields to such un-American methods. He took out insurance in Lloyds in England at double the rates. He still has his head above water, but at a terrific cost.

"The private organization which did these things acted on the sincere belief that they had the right to enforce their views against contract practice by boycotts and coercion of third parties. Most of them never thought of the antitrust laws. Those who did think of them were informed that they did not apply to physicians for reasons which had been urged and rejected in England twenty years ago.

"The reason for this confusion was that no case had ever been brought before to determine whether this simple and direct form of coercion was a peculiar privilege of physicians. England had settled the question holding such practices on the part of the British Medical Association a conspiracy in restraint of trade. Here, no case had ever been brought.

"The confusion about the purposes of the antitrust laws after half a century of neglect is illustrated by a resolution passed by the American Medical Association at its last meeting with respect to the grand jury investigation. It declared it was not a monopoly and denounced attempts to treat it as such.

"Yet the essence of the charge against the medical society is not that it is a monopoly but that it is guilty of illegal restraints

and coercions. Others equally confused thought that the Department of Justice was advocating group health. It has no interest in group health or in any form of medical care. Its interest is in preserving the freedom of qualified individuals to pursue their calling without the fear of a secondary boycott. The Department believes that, out of this freedom to compete and experiment, the medical problem will be solved in an American way. It has no interest in whether medical societies take a liberal or reactionary attitude. It desires freedom of individuals to take any attitude.

On the same day as that on which Assistant Attorney General Arnold attacked the medical profession in St. Louis, the Department of Justice, through Charles Pearce, Special Assistant to the Attorney General, made a similar attack before the Sixteenth Annual Fall Conference of the New York Women's Trade Union League, under the title "Monopoly and Medical Care." Mimeographed copies of the Department's attack were issued in Washington. The address is most aptly described as a diatribe against the medical profession. It carries with it the usual invitation for the medical profession to come to the Department of Justice with a draft of a proposed consent decree, saying—

"In such a situation the Department has no alternative except to proceed before a grand jury unless special considerations render a criminal proceeding inequitable."

On October 4, the United States Attorney for the District of Columbia filed in the office of the Clerk of the District Court of the United States for the District of Columbia a certificate or petition for the impaneling of an additional grand jury before which certain special assistants to the Attorney General might conduct an investigation into alleged violations of the Sherman Antitrust Act. On the same day the chief justice of that court entered an order for the impaneling of such an additional grand jury.

On October 17 the additional grand jury impaneled under the order of the court of October 4 was instructed by Mr. Justice Proctor of the District Court of the United States for the District of Columbia.

Later in October a subpoena was received from the District Court of the United States for the District of Columbia, calling on the American Medical Association to appear before the Additional Grand Jury, in Washington, D. C., November 2, with certain documents specified in the subpoena. Dr. William C. Woodward, Director of the Bureau of Legal Medicine and Legislation of the American Medical Association, presented himself at that time, with the documents called for. By advice of counsel, he declined to waive his right to immunity that would arise if he testified. He therefore was not allowed to appear and testify or even to present the documents. He returned with them to the headquarters of the Association. Thereafter Dr. W. W. Bauer, Director, Bureau of Health Education, appeared before the Grand Jury and presented the documents called for.

On November 3 a second subpoena issued by the clerk of the District Court of the United States for the District of Columbia was served on the American Medical Association, directing it to appear before the Grand Jury in Washington, D. C., November 21, and to bring with it numerous documents named in the subpoena. On November 10 the American Medical Association filed in the office of the clerk of the court a motion to quash the subpoena.

On November 7 the Department of Justice, in a press release at Washington, D C, under the title of "Antitrust Laws Consent Decrees Presented by the Government in the Automobile Finance Cases," said

"Antitrust prosecution will not be compromised upon mere agreement to cease the practices complained of. This would constitute nothing more than the exercise of executive forgiveness for an offense already committed. However, if a voluntary plan is submitted by defendants, which not only eliminates the practices complained of but goes farther and offers provisions in the public interest, designed to create a more orderly market and to prevent a repetition of violations in the future, it will be considered as a ground for recommending a *nolle prosequi*.

"The test of whether a *nolle prosequi* will be recommended on the basis of a consent decree is whether that decree accomplishes more in effectuating the purposes of the Sherman Act than could be obtained through the criminal court."

On November 10 the Department of Justice, through special assistant to Attorney General Wendell Berge, reported to the Fifth Annual Business Convention of the American Finance Conference, on "Consent Decree Policy in Antitrust Suits." This report is important as indicating the extralegal ends sought by the Department of Justice, through actual and implied threats of criminal prosecution under the antitrust laws. Mr Berge said

"The criminal proceeding cannot be used to coerce any kind of consent decree. Nor can the government, when a criminal case is pending concurrently, make compromises or engage in bargaining in order to induce the inclusion of certain decree provisions in return for the concession of others. If, however, parties who have been indicted are willing to offer constructive proposals which are in the public interest and which go beyond what the law requires and beyond anything that might be achieved through successful criminal prosecution, the Department can always receive and consider such proposals and if it deems them in the public interest can submit them to the court for consideration as a basis for settlement of the controversy. If decrees which have been thus voluntarily proposed by the defendants are accepted by the Department they may be submitted to the court with the recommendation that the indictment be *nolle prosequi*. The vital question in such a situation is whether the proposed decree goes so far in promoting the public interest that the Department is warranted in recommending dismissal of the criminal proceedings.

"Moreover, when criminal proceedings are pending, the Department will always reject consent decrees which merely eliminate unlawful conduct. It is not enough when parties have been indicted that they shall promise never to break the law again. Officers charged with the enforcement of criminal laws cannot dismiss proceedings upon the simple promise of the parties to be good. The only consent decrees which the Department is willing to consider during the pendency of a criminal case are those containing provisions for affirmative public benefits which could not be secured by the criminal proceeding alone.

On November 17 Justice Proctor of the District Court of the United States for the District of Columbia quashed the first and second paragraphs of the second subpoena and allowed the third paragraph to stand.

On or about November 23 a third subpoena was issued by the District Court of the United States for the District of Columbia, calling for certain additional documents. This subpoena was served on counsel for the American Medical Association in Washington, D C, and on the same day the Association filed a motion to quash it. The court denied the motion. Thereafter the American Medical Association, by Dr W W Bauer, Director, Bureau of Health Education, appeared before the Additional Grand Jury and

delivered the material described in the third paragraph of the second subpoena and all matter described in the third subpoena.

On December 1, notwithstanding the fact that the Additional Grand Jury in Washington was hearing evidence concerning the alleged violation of the antitrust laws by the American Medical Association, the Department of Justice released to the press in Milwaukee by a special assistant to the Attorney General, Douglas Maggs, in a symposium in which Dr Kingsley Roberts and Dr Morris Fishbein participated. Mr Maggs pointed out that the Department of Justice was presenting to a special grand jury in Washington a charge that the American Medical Association was engaged in "an alleged conspiracy by organized medicine to suppress, through coercive measures, a new social invention—group medical practice coupled with risk-sharing prepayment of the costs of medical care—a new social invention for which the claim is made that it enables the lower income group to get more and better medical care than it is now getting." His speech was an astute bit of special pleading on behalf of Group Health Association, Inc., and an attack on the American Medical Association and organized medicine, permeated with egregious misstatements of facts. Mr Maggs stated, for instance, that the Medical Society—

"charged that the \$40,000 HOLC grant was an illegal expenditure of government funds. But, on advice of the Legislative Counsel, it was determined in Congress that the grant was wholly proper."

As a matter of fact, Congress never acted on this matter, legislative counsel for the House of Representatives, so far as is known, had nothing to do with it, legislative counsel for the Senate, according to best available information, said only that it was not clear that the Home Owners' Loan Corporation did not have authority to make the expenditure, and then pointed out two ways through which such expenditures might be made clearly illegal in the future, and the chairman of the subcommittee of the House of Representatives' Committee on Appropriations that had charge of the appropriation bill covering monies for Home Owners' Loan Corporation, after an extended hearing, condemned in vigorous language the policy by which representatives of the Corporation undertook to justify the grant.

This statement fairly represents, it is believed, the degree of accuracy with which the special assistant to the Attorney General presented his case to his Milwaukee audience and in which the Department of Justice, through its issue of press releases, presented it to the reading public in Washington and elsewhere.

On December 9 the Medical Society of the District of Columbia filed a motion to instruct the Additional Grand Jury on the law applicable to the matters under consideration by it, with particular reference to the act generally known as the Sherman Antitrust Act. This motion was resisted by the representatives of the Department of Justice having in charge the presentation of the alleged violation of that act by the American Medical Association, the Medical Society of the District of Columbia and others. Thereafter, the court denied the motion. This left the grand jury to act only on such general instructions as to the law as had been given it by the court when it was impaneled and such further instructions as might be given it by representatives of the Department of Justice having the matter of prosecution in charge.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### CALIFORNIA

**Dr Gibbons in Charge of Exposition Hospital**—Dr Morton R. Gibbons Sr., San Francisco, has been appointed in charge of the hospital to be operated on Treasure Island during the Golden Gate Exposition. The hospital already completed, is housed in the north wing of the Administration Building. After the exposition closes, the hospital will be maintained as a permanent adjunct of the airport. Dr Gibbons was president of the California Medical Association, 1929-1930.

**Society News**—At a joint meeting of the Los Angeles Society of Ophthalmology and Otolaryngology and the Research Study Club of Los Angeles December 19 Dr Samuel Rodman Irvine spoke on 'Present Status of Experimental Cataract and Possible Clinical Significance'. The Los Angeles County Medical Association was addressed December 1 by Drs Emil Bogen on 'Predictability of Routine Laboratory Tests', Ernest M. Hall 'Subacute Alcoholic Cirrhosis' and Newton G. Evans, 'Lutemic Cirrhosis'.

### DISTRICT OF COLUMBIA

**Society News**—Dr William J. Mallory was elected president of the Washington Social Hygiene Society October 12 filling the unexpired term of Dr Earl Baldwin McKinley, who disappeared with the *Hawaiian Clipper* last summer. Dr Mallory is also president of the Medical Society of the District of Columbia. Dr Frank E. Adair, New York, discussed 'Cancer of the Breast' at George Washington University Medical School October 15. A symposium on therapeutics was presented before the Medical Society of the District of Columbia November 30 by Drs Alexander Simon on 'Insulin Treatment of the Psychoses', Walter Freeman and Hyman D. Shapiro, 'Metrazol Treatment of the Neuroses', and Arthur Camp Stanley, 'Observations on the Use of Chaulmoogra Oil in Arthritis'. A symposium on practical considerations of common problems in obstetrics and gynecology was presented before the society December 14 by Drs Lawrence Lee Cockerill, Bernard Notes and James R. Costello. The program was furnished by the Georgetown Clinical Society and the Georgetown University Medical Society.

**Dr Guthrie Joins Staff at St Elizabeths**—The superintendent of St Elizabeths Hospital, Washington, D. C., announced December 23 the appointment of Dr Riley H. Guthrie, Boston, as first assistant physician at the hospital. According to the *Washington Evening Star*, the appointment was based on a civil service examination in which Dr Guthrie received the highest rating. Dr Guthrie is a native of Arkansas and was educated at the University of Arkansas and at the University of Tennessee School of Medicine, Memphis, where he graduated in 1921. He was on the staff of the State Hospital at Little Rock for three years, was in private practice for two years, and then resumed institutional work at the State Hospital at Massillon, Ohio. For six years he was assistant superintendent of the Monson State Hospital at Palmer, Mass. He was appointed assistant to the Massachusetts state commissioner of mental diseases in June 1935 and in the same year became medical officer at the Boston Psychopathic Hospital. Dr Guthrie will assume his new duties at St Elizabeths about January 15. He will be assistant to Dr Winfred Overholser, superintendent, who has been without an assistant since Dr Herbert C. Woolley's resignation nearly two years ago.

### FLORIDA

**New Division of Venereal Disease Control**—The Florida State Board of Health has created a new division of venereal disease control. Dr Leo C. Gonzalez, Jacksonville, head of the Franklin Gulf counties health department, has been appointed director of the new unit and Dr William A. Chapman, Miami, has been named medical consultant for the division's work among the colored people.

**Society News**—Dr Ammon Buist Litterer, Miami, discussed "The Clinical Value of Quantitative Blood Studies in the Management of Syphilis, Including Fever Therapy" before the Dade County Medical Society November 1. The Duval County Medical Society was addressed November 1 by Drs

John F. Lovejoy on "Diagnosis of Pain in the Hip in Children", Shirlar A. Richardson, "Retinal Detachment," and James L. Borland, "The Dysentery Problem in the Jacksonville Area". At a recent meeting of the Leon-Gadsden Liberty-Wakulla Jefferson County Medical Society in Quincy, Drs Rudolph Bell, Thomasville, Ga., spoke on "When to Operate for Urinary Calculi", James C. Robertson, Chattahoochee, "A Review of Syphilis at State Hospital," and Robert F. Godard, Quincy, "Menace of State Medicine".

**Special Society Meetings**—Dr Frederick J. Waas, Jacksonville, was elected president of the Florida East Coast Medical Association at its eleventh annual meeting in Rockledge, October 26-29. Dr Thomas C. Keniston, Cocoa, retiring secretary, was elected vice president and Dr Arthur J. Logie, Jacksonville, was chosen secretary-treasurer. The next annual session will be held in Jacksonville. The association includes all the eastern counties from Fernandina to Key West. The Florida Public Health Association held its tenth annual convention in Hollywood November 28-30. The speakers included Drs Thomas Parran, surgeon general U. S. Public Health Service, Washington, D. C., Stuart I. Kitchen, Tallahassee, John E. Lindendorf Jr., Pensacola, James A. Baker, state health officer, Montgomery, Ala., and James A. Hayne, state health officer, Columbia, S. C.

### ILLINOIS

**Memorial to Physician**—A new \$300,000 diagnostic center was dedicated at Peoria State Hospital Peoria November 1 and named in honor of the late Dr George A. Zeller, formerly superintendent of the institution. A boulder and tablet were also unveiled as a memorial to Dr Zeller. A. L. Bowen, Springfield, director of the state department of public welfare, presided at the dedicatory ceremonies and Dr George W. Mitchell, Peoria, gave the eulogy. The new diagnostic center has a capacity of 200 beds. Dr Zeller died June 29, 1938.

### Chicago

**Changes in Health Department**—Dr G. Howard Gower, director of the Chicago Urban health service and instructor in bacteriology, University of Illinois, has been appointed chief medical officer of the Chicago board of health, effective sometime in January. The post is a newly created one. Dr Isaac D. Rawlings, chief of the bureau of communicable diseases of the board, has been retired on pension at his own request.

**Building Program at Dunning**—An expansion program will begin during 1939 at Dunning State Hospital to include a \$110,000 addition to the main building, a \$375,000 building for a diagnostic center, and a \$200,000 infirmary building. The hospital's normal capacity is 4,000, newspapers reported December 9 that it had 4,200 patients as compared with 478 at the same time in 1937. During the last year 380 patients have been transferred to the new state hospital at Mankato.

### LOUISIANA

**Graduate Assembly**—The third New Orleans Graduate Medical Assembly will be held February 6-9 with eighteen guest speakers providing the program. A preliminary program mentions the following:

Dr Harry J. Shields, Toronto: A Consideration of Anesthetic Procedures in a Large Canadian Hospital and Spinal Anesthesia Practiced in the Toronto General Hospital.  
Dr William P. Wherry, Omaha: Deafness and Mandibular Joint Disorders.  
Dr Frederick T. Tisdall, Toronto: Role of Nutrition in the Care of Your Patient and Prevention and Cure of Vitamin and Mineral Deficiencies.  
Dr Wiley D. Forbus, Durham, N. C.: Variations in Morphology of Reaction to Injury Considered in Relation to the Determining Factors and the Clinical and Pathological Aspects of Chronic Pyelonephritis.  
Dr Cyrus C. Sturgis, Ann Arbor: The Menace and Treatment of Obesity and Treatment of the Anemia of Pregnancy.

### MARYLAND

**The DeLamar Lectures**—According to the Johns Hopkins University School of Hygiene and Public Health, Baltimore, the following DeLamar lectures make up the series for the present session:

Rupert B. Vance, Ph.D., Chapel Hill: November 1: Social and Economic Problems of the Rural South.  
Dr Carl Ten Broeck, Princeton, N. J.: December 6: Encephalomyelitis in Horses.  
Dr Martha M. Eliot, Washington, D. C.: January 10: Child Health.  
Dr George R. Minot, Boston: February 14: Anemia.  
Dr Edward Stuart Russell, director of fishery investigations, Ministry of Agriculture and Fisheries, University College, London: February 15: Populations and the Effect of Fishing. Dr Russell's subject will be covered in five lectures to be given in April although the exact dates have not yet been decided.

## MASSACHUSETTS

**Soma Weiss to Be Physician-in-Chief at Peter Bent Brigham**—Dr. Soma Weiss, associate professor of medicine, Harvard University Medical School, Boston, and assistant director of the Thorndike Memorial Laboratory of Boston City Hospital, has been appointed physician-in-chief of Peter Bent Brigham Hospital to succeed Dr. Henry A. Christian. The appointment will be effective September 1. Dr. Weiss will become professor of medicine at the same time. A native of Besterecz Hungary, Dr. Weiss received the degree of doctor of medicine at Cornell University Medical College in 1923. He taught biochemistry at the Royal Hungarian University from 1918 to 1920, when he became assistant in pharmacology at Cornell. He joined the faculty at Harvard in 1925 as assistant in medicine, subsequently serving in various capacities until 1932, when he was named associate professor of medicine. Dr. Weiss will be the second physician-in-chief at the Peter Bent Brigham Hospital, Dr. Christian having served since the hospital was completed in 1912.

**Appointments in Department of Mental Health**—Dr. Francis H. Sleeper, assistant superintendent of the Worcester State Hospital, has been appointed to the newly established position of director of hospital inspection for the department of mental health, it is announced. The appointment of Dr. Birdwell H. Flower, assistant superintendent of the Grafton State Hospital, as assistant commissioner in the state department of mental health has been approved by the executive council, according to the Boston *Herald*. Dr. William C. Gaebler, assistant superintendent of the Foxboro State Hospital, has also been appointed an assistant in the department, according to the *Herald*. He will make special investigations and coordinate the medical and business affairs of the various state hospitals. Dr. Edgar C. Yerbury, assistant superintendent of the Danvers State Hospital, has been appointed director of the division of mental hygiene in the state department of mental health, newspapers reported. Dr. Yerbury graduated at the Boston University School of Medicine in 1921. Dr. Ella P. Cahill, Cambridge, has been appointed senior psychiatrist in the division, succeeding Dr. Olive A. Cooper, Revere, who has been named director of the Springfield Child Guidance Clinic, sponsored jointly by the department of mental health and the Springfield Community Chest.

## MICHIGAN

**Personal**—Stanislas M. Keenan, Detroit, historian of Eloise Hospital, died December 6. He was an honorary member of the Detroit Roentgen Ray and Radium Society and member of the American Roentgen Ray Society.—Dr. Leverett S. Woodworth, New York, has been appointed assistant director of Harper Hospital, Detroit.

**Society News**—Dr. Joseph C. Birdsall, Philadelphia, addressed the Wayne County Medical Society December 19 under the auspices of the Detroit branch of the American Urological Association, his subject was "Renal Pathology and Its Correction in Urinary Tract Obstructions".—Dr. Fenimore E. Davis, Ann Arbor, discussed "Recent Advances in Anesthesia and Analgesia" before the Genesee County Medical Society November 30.

**New University Hospital**—The new university hospital now under construction at the Michigan State College has been named in honor of the late Dr. Richard M. Olin, East Lansing, who from 1925 had been director of the college health service. A graduate of University and Bellevue Hospital Medical College in 1899, Dr. Olin entered practice in Caro the same year. He served as head of the sanitary department of the St. Louis Exposition. In 1917 he became secretary of the state board of health in Lansing and in 1919 was appointed the first state health commissioner, a post created under a reorganization of the department. Dr. Charles F. Holland, assistant physician to the college health service, has been appointed acting head of the health service, effective to the end of the current fiscal year.

## MISSISSIPPI

**Public Health Meeting**—Dr. William H. Cleveland, Tupelo health officer of Lee County, was chosen president-elect of the Mississippi Public Health Association at its third annual session in Jackson December 9. Dr. Francis Michael Smith, Vicksburg health officer of Warren County, was inducted into the presidency, succeeding H. A. Kroeze, state director of sanitation. Dr. John A. Milne Jackson, director of county health work, state department of health, was reelected

secretary. The speakers included Abel Wolman, Baltimore, on "Housing in Its Relation to Public Health" and Dr. Henry C. Ricks, Jackson, procedures in typing pneumonia.

**Plan to Augment Medical Library**—Three thousand volumes of miscellaneous medical and surgical works have been added to the Rowland Medical Library of the University of Mississippi during the past year, the first in a five year program to enlarge the library. In January the board of trustees voted to name the medical library in honor of Dr. Peter W. Rowland, professor of pharmacology at the school, in recognition of his voluntary services in securing books for the library. According to the first annual report, in addition to the acquisition of 3,000 volumes, contributions of \$2,500 from medical alumni were received to purchase new books. A reprint file was also begun during the year. According to the report, a special appropriation of \$3,000 in 1936 provided for new quarters including a reading room, two study rooms and the librarian's office. In the spring of 1937 Dr. Rowland volunteered his services and became field director of the library. It is hoped that in the remaining four years of the program a valuable collection will be assembled for the medical students and physicians in the state.

## NEW JERSEY

**Committee Studies Eugenic Sterilization**—A special committee of the Medical Society of New Jersey organized for the study of eugenic sterilization recently outlined its objectives in the state medical journal. The committee plans to accumulate information concerning the surgical and eugenic aspects of sterilization and to distribute information to the medical profession. It wishes to become familiar with the work of lay organizations interested in the subject, to make known their conclusions to the medical profession and to cooperate with them by giving them the benefit of medical experience and by helping them to follow scientific medical principles. Finally it wishes to make available competent surgical service for those who need and desire such operations. The committee plans to collect data on operations and indications for sterilization and make it available through the package library of the state medical society. The names of surgeons and hospitals available for such operations will be sought and will be given to persons desiring this service.

## NEW YORK

**Society News**—Drs. John B. Alsever and Charles A. Gwynn addressed the Syracuse Academy of Medicine December 20 on "Collection and Preservation of Placental Blood for Transfusion Purposes".—Dr. William S. McCann, Rochester, addressed the Oswego County Medical Society November 23 on "Practical Consideration of Water in the Body".—The program of the Medical Society of the County of Nassau November 29 was presented by the Nassau County Surgical Society with the following speakers: Drs. Arthur C. Martin, on "Causes of Nonobstetrical Vaginal Bleeding", Otho C. Hudson, "Emergency Treatment of Fractures", Richard Derby, Oyster Bay, "Causes of Rectal Bleeding", and Algernon S. Warinner, "A Lump in the Breast". The surgical society was recently organized with Dr. Benjamin W. Seaman, Hempstead, as president and Dr. Hudson as secretary.—Dr. Richard E. Shope, Princeton, N. J., addressed the Rochester Academy of Medicine December 8 on "Recent Advances in Our Knowledge of the Virus Diseases".—Dr. John S. Lawrence, Rochester, addressed the Glens Falls Academy of Medicine November 22 on "Agranulocytosis—Human and Experimental".

## New York City

**World's Fair Pharmacy Building Dedicated**—The Hall of Pharmacy at the New York World's Fair was dedicated November 13. Mary Pickford raised the American flag above the building and the speakers included Deputy Mayor Henry H. Curran, James L. Fieser, vice chairman of the American Red Cross, Washington, D. C., William Jay Schieffelin, chairman of the dedication committee, Grover A. Whalen, president of the fair, and Joseph A. Huisking, chairman of the committee for the drug industry's participation in the fair.

**Course in Neuro-Ophthalmology**—Mount Sinai Hospital in cooperation with Columbia University offers an eight weeks course in neuro-ophthalmology, February 6 to March 31, under Drs. Morris B. Bender and Nathan Savitsky. It will consist of the anatomy and physiology of the motor and sensory systems of the eye and of clinical and experimental demonstrations. It will be given for a minimum of four students. Apply to the Secretary for Medical Instruction Mount Sinai Hospital, Fifth Avenue and One Hundredth Street.

**Opening in Bureau of Child Guidance**—The board of education of New York City has announced an examination for a license as assistant medical director of the bureau of child guidance. The salary is \$10,000 a year. The position involves the supervision of child guidance clinic units situated in various parts of the city. Applicants must not be over 46 years of age, must be graduates of an approved medical school and must have had twelve semester hours in approved and appropriate courses in psychiatry and psychology and eight semester hours in approved courses in supervision and in administration or organization. The latter requirement of eight semester hours may be completed within three years after appointment. Applicants must have five years of practice in psychiatry, including 800 hours of appropriate clinical experience in institutions for treatment of mental disease and 1,200 hours of appropriate experience in approved clinics for the study and treatment of personality and behavior disorders of children and three years of experience as a psychiatrist in a child guidance clinic in a school system or in supervision in an approved clinic for the study and treatment of personality and behavior disorders of children. Application in complete form must be postmarked no later than January 15. Complete information may be obtained from the board of education, 500 Park Avenue.

## OHIO

**District Meetings**—At the semiannual meeting of the Union District Medical Association, Hamilton, October 27, the speakers were Drs. Elroy T. Storer, Middletown, on "As Laymen See Us," Parke G. Smith, Cincinnati, "Abnormal Renal Mobility," Max M. Zimmerer, Cincinnati, "Treatment of Stomach and Duodenal Lesions," and John R. Pate, Louisville, Ky., "Certain Aspects of the Control of Syphilis."—Guest speakers at a meeting of the Eighth District of the Ohio State Medical Association at Granville, October 27, were Drs. Norman R. Kretzschmar, Ann Arbor, on "Surgical Treatment of Pelvic Abscess and Cellulitis," and Endocrinology in Gynecologic Practice," Fred J. Hodges, Ann Arbor, "X-Ray Diagnosis of Gastrointestinal Disease," and George H. Gardner, Chicago, "Frequently Encountered Lesions of the Cervix Uteri."

**Dr. Corrigan Named Ambassador to Venezuela**—Dr. Francis P. Corrigan, Cleveland, and now minister to Panama, has been appointed by President Roosevelt as the first United States ambassador to Venezuela, according to the *Cleveland Plain Dealer*. A native of Cleveland, Dr. Corrigan graduated at Western Reserve University School of Medicine in 1906. He completed his internship at St. Alexis Hospital, later serving as pathologist and from 1910 to 1917 as surgeon. He was chief surgeon of the Chile Exploration Hospital 1917-1919. Subsequently he engaged in organization work in South America for the American College of Surgeons. From 1922 to 1932 he was concurrently consulting surgeon to St. John's Hospital and director of surgery at St. Alexis. He has served as envoy extraordinary and minister plenipotentiary to San Salvador since 1934. He was special representative of the President of the United States in 1935 at the inauguration of President Martinez of El Salvador and since 1937 has been envoy extraordinary and minister plenipotentiary to Panama. He was representative of the United States of America in the Mediation Commission in the boundary controversy between Nicaragua and Honduras, San Jose, Costa Rica, November-December 1937. Dr. Corrigan is also the author of several books.

## PENNSYLVANIA

**Hospital News**—A new building providing more than 300 beds was dedicated at the Norristown State Hospital, Norristown, October 20. Two old buildings were recently renovated as part of a program for which the legislature has appropriated \$2,000,000.

## Philadelphia

**Personal**—Clarence Marshall, D.V.M., professor of veterinary medicine at the University of Pennsylvania, died October 29, aged 74. He was a former president of the American Veterinary Medical Association and was a member of the advisory council of the state board of health.—Dr. Herbert M. Goddard has been appointed assistant director of public health to succeed the late Dr. Alfred F. Allman.

**Society News**—Drs. Norton Canfield, New Haven, Conn., and Julius Lempert, New York, addressed a joint meeting of the Philadelphia Laryngological Society and the section on otolaryngology of the College of Physicians of Philadelphia

December 13 on "Labyrinthine Fistulas" and "Experience with Surgical Penetration of the External Semicircular Canal: Improvement of Hearing in Otosclerosis" respectively.—Dr. Arnold L. Gesell, New Haven, Conn., addressed the Philadelphia Pediatric Society December 13 on "The Place of Developmental Diagnosis in Clinical Pediatrics."—At a meeting of the Pennsylvania State Physical Therapy Association December 15 the speakers were Drs. Oscar T. Wood Jr. and William H. Schmidt on "Treatment of Chorea by Artificial Fever" and "Treatment of Strick Syndrome" respectively.—Dr. Eric Miles Atkinson, New York, among others, addressed the Philadelphia Neurological Society December 16 on "Localized Nonsuppurative Encephalitis as a Clinical Entity."—Dr. Elliott P. Joslin, Boston, was the guest speaker at a meeting of the Philadelphia County Medical Society December 18 on "Changing Aspects of Diabetes." Miss Catherine Roe, representing the Philadelphia Dietetic Association, spoke on "Interpretation of Diabetic Diet Prescriptions" and Dr. Joseph F. Beardwood Jr., representing the Philadelphia Metabolic Association, discussed metabolism.—Dr. William Bord, Toronto, addressed the College of Physicians of Philadelphia December 7 in the fifty-first Thomas Dent Mütter Lecture on "Some Reasons for the Recent Increase in Bronchial Carcinoma."

## UTAH

**Program on Pneumonia Control**—The Utah State Board of Health recently sponsored a program on the management of pneumonia preliminary to opening a campaign to control the disease throughout the state. The program included the showing of a film on the recent developments in pneumonia management and lectures by Dr. George F. Cooper, San Francisco, a technical medical adviser on pneumonia management. Meetings were arranged in every section of the state through the cooperation of the component medical societies with the deputy state district health officers.

## WISCONSIN

**Personal**—Dr. Mary Allen, Cleveland, was recently appointed staff physician of the bureau of maternal and child health of the state department of health. She succeeds Dr. Ruth A. B. Bennett, Galveston, Texas, who resigned.—Dr. Albert F. Young will retire as superintendent of the Milwaukee Hospital for Mental Diseases, Wauwatosa, January 1. Dr. Young was appointed first assistant at the hospital in 1894 and superintendent in 1916.

**Society News**—A symposium on orthopedic subjects was presented before the Medical Society of Milwaukee County November 11 by the following physicians: Drs. David J. Ansfield, on faulty posture in childhood, Harry B. Sadoff, handling of the injured, John O. Dieterle, diagnosis of spinal injuries, and Albert C. Schmidt, diagnosis and treatment of fractures of the ankle.—A symposium on tumors of the bladder was presented at a meeting of the Wood County Medical Society, Wisconsin Rapids, November 3, by Drs. Walter G. Sexton, Robert S. Baldwin, Roy P. Potter and Stephan Epstein, Marshfield. Drs. Donald Waters and Rogers E. Garrison, Wisconsin Rapids, spoke on "Multiple Myeloma" and "Melanosarcoma" respectively.—Dr. Julius L. Spivack, Chicago, addressed the Milwaukee Society of Clinical Surgery November 22 on "Some Points in the Technic of Appendectomy" and Dr. Silvanus A. Morton, Milwaukee, on "Relation of Surgery and Radiation Therapy in the Treatment of Cancer."

## GENERAL

**Medical Missions to Be Coordinated**—The Christian Medical Council for Overseas Work was recently formed in New York to represent twelve foreign mission boards active in medical work. Dr. Edward H. Hume, who has spent many years in medical work in China, will be director of the new council, which will have its headquarters at 156 Fifth Avenue, New York. The new organization will act as an advisory body and will aid in development of facilities at home for training and retraining doctors and nurses for overseas service.

**Otolaryngology Examinations**—One hundred and twenty-nine candidates were examined by the American Board of Otolaryngology in Washington, D. C., October 7-8. Ninety-seven were certificated. During 1939 examinations will be held in St. Louis May 12-13 prior to the annual session of the American Medical Association and in Chicago October 6-7 before the meeting of the American Academy of Ophthalmology and Oto-



**Laryngology** Prospective applicants for certificates should secure application blanks from the secretary, Dr William P Wherry, 1500 Medical Arts Building, Omaha, Neb

**Check Forger Is Swindling Physicians**—From Virginia comes a report of a man who has recently visited eye, ear, nose and throat specialists, usually for an eye examination, and has then presented forged checks for more than his bill, receiving considerable amounts in change. He poses as a farmer and the check he presents, which is made out to him, is marked "For 1 Holstein heifer." The checks are signed with names of prominent persons in other towns than the one in which he is operating. He is described as being about 48 years old and weighing about 165 pounds, with sandy hair and brown eyes.

**Society Elections**—Dr Julian L Rawls, Norfolk, was elected president of the Seaboard Medical Association at the annual meeting in Greenville, N C, December 6-8. The following vice presidents were elected: Drs William M B Brown, Greenville; John L Rawls, Suffolk, Va; John A Payne, Sunbury, N C, and Southgate Leigh Jr, Norfolk. Dr Clarence Porter Jones Sr, Newport News, Va, was reelected secretary. Dr Brinn C Svord, New Haven, Conn, was elected president of the American Society of Anesthetists at its annual meeting in Philadelphia December 8. Dr Fayette Elmore Hubbard, Montclair, N J, was elected vice president and Dr Paul M Wood, New York, reelected secretary. The society will hold four stated meetings during the year in New York and two meetings in other cities.

**World Sclerosis Conference**—The International Labor Office at Geneva, Switzerland, conducted a sclerosis conference from August 29 to September 10. Drs Royd R Sayers, senior surgeon division of industrial hygiene, U S Public Health Service, Washington, D C, Leroy U Gardner, director, Saranac Laboratory for Study of Tuberculosis Saranac Lake N Y, and Leonard Greenburg, executive director, division of industrial hygiene, New York State Department of Labor, New York, represented the United States. Other countries represented were Australia, Belgium, France, Great Britain, Japan, Denmark, Switzerland, the Netherlands and the Union of South Africa. The report of the conference dealt with definitions and diagnosis of sclerosis and included suggestions for preventing it. It recommended the use of dust protection masks only when the suppression of the dust at its source is impossible.

**Statement by Trustee of McKesson & Robbins**—William J Wardall, sole trustee of McKesson & Robbins, issued a statement December 24 indicating that the company is carrying on its regular business of manufacturing and distributing drugs. Mr Wardall said "While the fictitious operations of Coster and his group in crude drugs were carried out in terms of equally fictitious warehouses and companies, the real business of McKesson & Robbins in manufacturing drugs and other preparations in accordance with the rigid standards of the Food and Drug Act and in wholesaling the equally high grade products of other manufacturers, is continuing." The statement added that manufacturers are continuing to distribute their products through the firm and retail druggists are continuing to buy these products from the company. The statement concluded "In the meantime, I am continuing the intensive investigation into the financial affairs of the company in cooperation with all other agencies and expect to have something further to say on the subject as soon as my investigation has reached the point where essential facts can be determined."

**Health Record in the United States for 1938**—No previous year has even closely approached the record of the United States for low mortality established for 1938, according to Louis I Dublin, Ph D, statistician of the Metropolitan Life Insurance Company, New York. Month after month the death rates among the many millions of persons who were industrial policy holders of this company have been even lower than during 1937. In the middle of December the year-to-date death rate was more than 7 per cent below the previous minimum established in 1937. Information for the first nine months of 1938 was available also from the health officers of thirty-nine states, and their story, without exception, shows an improved mortality rate in 1938 as compared with 1937. It is practically certain, Dr Dublin says, that 1938 will be acclaimed the banner health year in the history of the United States.

The death rates from tuberculosis pneumonia and influenza have reached new minima for the United States during 1938. It is almost certain that the mortality from tuberculosis for the country as a whole will drop below 50 per 100,000, for the first time in history. If the present rate of decline con-

tinues for a few more years tuberculosis will reach the stage at which the number of open cases will no longer be sufficient to maintain it among the leading causes of death in this country.

There were no major epidemics of influenza or pneumonia in 1938. In the case of pneumonia, there was also the added factor, no doubt, of the wide adoption of the new serum treatment against the more prevalent types of pneumococcus. The sole exception to this rule, in 1938, was the continuance of the rise in deaths charged to coronary artery disease. But this increase may be only apparent, reflecting improved diagnosis together with the newly awakened interest of physicians in this form of heart disease.

Among the most gratifying aspects of the mortality picture for 1938 was the marked decline in automobile fatalities. Present figures indicate that the final tabulation will show fewer deaths by one fifth from this cause than were recorded in 1937 and this will mean about 8,000 lives saved. Fatal occupational accidents, as well as those occurring in public places, likewise resulted in fewer fatalities this year, although accidents in the home appear to have been as numerous as those reported a year ago.

Further gains against both infant and maternal mortality also contributed to the salutary state of public health during the past year. It is safe to report new minimal death rates in both of these important fields of public health work.

Aside from the rise in mortality from coronary artery disease, about the only disturbing feature of the present mortality picture is the continued increase of the cancer death rate. The year 1938 is the twentieth consecutive year to register a rise in this malignant form of human affliction. There is some doubt, however, as to whether this upward trend in cancer deaths actually marks an increase of the disease or merely reflects the rapid aging of our population. Improved means of diagnosis and more accurate reporting also have been important elements in the apparent increase in cancer mortality.

All but two of the leading communicable diseases showed below-normal prevalence during 1938. The country was especially blessed in that it was comparatively free from poliomyelitis (infantile paralysis). Less than 1,700 cases were recorded throughout the entire country and no section has suffered what might be called a major outbreak.

Only measles and smallpox were unusually prevalent during the current year. Fortunately neither of them was responsible for much mortality, although the exceptionally low death rate from measles in 1937 was probably quadrupled in 1938.

**Section Meetings of Otolaryngologists**—The annual section meetings of the American Laryngological, Rhinological and Otolological Society will be held during January in Boston, New Orleans, Sioux City, Iowa, and Spokane, Wash. The eastern meeting will be in conjunction with the New England Otolaryngological Society at the Massachusetts Eye and Ear Infirmary, Boston, January 29. The speakers will include:

- Dr Westley M Hunt New York Esophageal Abscess—the Importance of Early Intervention
- Dr De Forest C Jarvis Barre Vt Twelve Varieties of the Common Cold
- Dr William Mithoefer Cincinnati Pertinent Facts Concerning Pan-sinusitis

The southern section will meet at the Roosevelt Hotel, New Orleans, January 14, with the following speakers, among others:

- Dr Watt W Eagle Durham N C Nasopharyngeal Cysts (Thornwaldt's Bursa)
- Dr Harvey B Searcy Tuscaloosa Ala Oily Solutions for Sinus Irrigation
- Dr James W Jervy Greenville S C Insulin and Other Therapy in Otolaryngology A Comparative Study
- Dr Robert G Reaves Knoxville Tenn Motion Pictures of Intranasal Sinus Operation with Animated Illustrations

The middle section will meet January 19-20 with the Sioux Valley Eye and Ear Academy at Sioux City. The speakers will include:

- Dr Allen C Starry Sioux City Iowa Pathology of the Tonsil
- Dr Horace Newhart Minneapolis A State Program for the Conservation of Hearing
- Dr Millard F Arbuckle St Louis The Bronchoscopist in the Thoracic Surgery Team
- Dr Howard C Ballenger Chicago Osteomyelitis of the Sphenoid

The western meeting will be at the Davenport Hotel, Spokane, Wash, January 29. Among the speakers will be:

- Dr Aubrey G Rawlins San Francisco Operative Procedure for the Relief of Stenosis in Double Abductor Paralysis of the Larynx
- Dr Brien T King Seattle A New and Function Restoring Operation for Bilateral Recurrent Nerve Paralysis
- Drs Edwin J Barnett and Harold D Carnahan Spokane Nasal Allergy in Children
- Dr Ralph A Fenton Portland Ore The Present Status of Sulfanilamide in Otolaryngology



## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Dec 10, 1938

#### Radium Beam Therapy

The Medical Research Council has issued a report on radium beam therapy which is the outcome of work done under an organization known as the Radium Beam Therapy Research, consisting of leaders of the medical profession and eminent physicists such as the late Lord Rutherford. Physical research preceded clinical work, so that everything was done to protect patients and staff. The investigation extended over four years, during which 366 patients were treated. There was no case of the slightest damage from radiation either to patients or to staff. The radium used was a unit of 5 Gm, which was subsequently increased to 10 Gm. The greatest care had to be taken in moving such a large amount. A pneumatic transference device enabled the radium to be taken from the safe where it was kept and to be placed in the required position without any handling by or exposure of the operators. The exact placing of the patient and the adjustment of the apparatus were done before the radium was in working position. Thus the necessary care and time could be given to the preliminary adjustments, as all danger of manipulation was avoided. The apparatus was a modification of that designed by Sievert of Stockholm which secures the maximum protection for patient and staff. Difficulties encountered were the lack of a standard unit of dosage and of a method of directing the radiation accurately and estimating the amount received at the site of the disease and in the body generally. These were largely overcome. The beam was directed by a directional caliper, and the radiation received by the tissues was calculated from specially prepared charts. Total radiation was estimated by an "electrical condenser in the form of a man." The general effects of radiation were estimated by regular blood counts, the most important effect being a diminution of the total leukocytes. No one except the patient was present in the treatment room during the whole course of the exposure, but communication between nurse and patient was rendered easy by an ingenious installation of microphones and loud speakers, while observation was conducted by a system of periscopic mirrors.

It was decided to limit the investigation to cancers of the mouth, tongue, larynx and pharynx, which are easily accessible to inspection and treatment and for which operations have to be drastic and often ultimately fail. Good results have been obtained by the interstitial insertion of small radium needles, but this means surgical intervention and much discomfort when the needles are in position. Beam therapy is conducted externally as with x-rays and the discomfort of needles is avoided, although a certain amount of discomfort is inevitable. Reaction of skin and mucous membrane is bound to occur, but the patient is much more comfortable than after interstitial irradiation and incomparably more so than after the mutilations of surgical treatment.

#### RESULTS

Complete disappearance of early and localized growths may be expected. When lymphatic glands in close proximity are involved, their enlargement may be made to disappear. Even with advanced primary growth and local lymphatic involvement, disappearance may occur in a small proportion of cases and many distressing symptoms be relieved in a large proportion. Though it is too early for definite pronouncement, the treatment by radium beam is at least as satisfactory as surgical intervention or interstitial application of radium. Fur-

ther work with a 10 Gm unit is to be undertaken on cancer of the breast. Of the 366 patients treated from 1934 to 1937, forty-four died of intercurrent disease. Of the remaining 322, only thirty-four had operable growths. Of these, 122, or 37.8 per cent, were symptomless in January 1938. Of the patients treated in 1934, 32 per cent were symptom free after three years. The curability rate of cancer of the tongue, floor of the mouth, alveolus and palate is similar to that for other methods, but cancer of the tonsil, pharynx, larynx and post-cricoid region shows a decided balance in favor of beam therapy. No less than 102 patients with cancer of the pharynx were treated and thirty-three were rendered symptom free. In the treatment of inoperable cervical lymph glands, other methods have proved of little value. In seven cases palpable masses or infiltrations disappeared under beam therapy and the patient remained symptom free for from eighteen months to three years.

#### Every Hospital in British Empire to Have a Respirator

The munificent gifts to medicine by Lord Nuffield the automobile magnate, have been reported previously. The latest is the presentation to every hospital in the British Empire of a respirator of the 'iron lung' type, known as the Both respirator. Owing to their high cost and the infrequency with which they are required only a few hospitals have respirators, and when an emergency arises one has to be borrowed, with delay and difficulty which may mean loss of life. Lord Nuffield will manufacture the respirators at a probable cost of \$500 each. It is estimated that there will be a demand for 5,000, so that his gift will amount to \$2,500,000. His interest in 'the iron lung' was stimulated by a film on artificial respiration prepared by the department of anaesthetics of the University of Oxford, to which he has made colossal gifts for the development of the medical school. The respirator which Lord Nuffield is making is designed by the young Australian inventor Mr. E. T. Both and owes its creation to the severe epidemic of infantile paralysis which prevailed in Australia in 1937, in which it was used with success. After all applications for respirators have been complied with, stocks will be kept in readiness for any sudden epidemic. Unlike its predecessors the Both respirator is made of laminated wood. It is operated by a half-horse power motor where electricity is available and otherwise by hand.

### PARIS

(From Our Regular Correspondent)

Dec 10, 1938

#### Tenth French Pediatric Congress

The subjects chosen for special reports and general discussion during the 1938 session of the French Pediatric Congress were (1) severe anemias in infancy, (2) the malignant syndrome in the course of the acute infectious diseases and (3) megacolon and dolichocolon.

#### SEVERE ANEMIAS IN INFANCY

Dr. Louise Weill gave as normal figures for the blood in infancy erythrocytes 4,200,000, hemoglobin 75 to 85 per cent and leukocytes 6,000 to 12,000 with a predominance of mononuclears. The instability of the hemopoietic organs is a striking characteristic of the blood in infancy, revealing itself in the frequent appearance of immature cells such as erythroblasts or nucleated red corpuscles and of myelocytes. The presence of these two pathologic forms is of less importance in the blood of infants than in that of adults. There are two types of pernicious anemia, the plastic and the aplastic. The latter is rarely observed in infants. On the other hand, pseudoleukemic, or splenic, anemia in infants is the most common type. In addition to the marked decrease in the number of red corpuscles, it is especially characterized by splenomegaly, intense erythroblas-

tosis and a marked reaction of the red bone marrow. There is also extreme pallor, but there are no hemorrhages and only slight hepatomegaly. Examination of the blood reveals a decrease in the number of red corpuscles, the hemoglobin content and the color index, slight lymphocytosis and the presence of megakaryoblasts. This splenic type of anemia is not always fatal, and recovery may take place if the cause is eliminated. It must be differentiated from leukemia, from which recovery is extremely rare. Clinically, all types of splenic anemia are encountered, from benign to very severe. Differentiation from leukemia depends on the course and the number of lymphocytes. The results of sternal puncture may often be of great aid. In the etiology, syphilis plays an important part. In general, the health of the mother during pregnancy is of great influence, because all the anemias observed in infancy are of congenital origin. Treatment includes the administration of vitamins, anti-syphilitic medication, medullary opotherapy, hemotherapy and, in some cases, splenectomy.

#### MALIGNANT (TOXIC) SYNDROME IN THE ACUTE INFECTIOUS DISEASES

Dr R. A. Marquely and Miss Ladet of Paris based their report on the observation of sixty-two cases. The syndrome is characterized by (a) symptoms of nervous origin such as adynamia, asthenia or ataxia and convulsions, (b) hyperthermia, (c) cardiovascular and respiratory (dyspnea) disturbance and (d) digestive and renal symptoms, hemorrhages and erythema. At necropsy one finds generalized hyperemia, submucous hemorrhages in the digestive tract and tumefaction of lymphoid tissue. As to the cause, the most plausible theory is that the condition is the result of some dysfunction of the autonomic nervous system. Reilly and his co-workers reported their experimental work in 1935. They found that the hemorrhages and the vascular and lymphatic lesions could be reproduced by injecting various bacterial toxins into the perisplanchic tissues. The lesions do not present any specific characteristics depending on the type of toxin which has been injected. They are found even after injection of mineral poisons such as lead or nickel, arsenic and even nicotine. In closing, the authors of the report expressed the hope that some preparation would be found which, by acting directly on the sympathetic nervous system, could be used at the onset of any acute infectious disease to prevent the development of the malignant syndrome.

In the discussion of this report, Professor Lereboullet of Paris emphasized the prominence in the clinical picture of adrenal dysfunction, which responds so well to opotherapy. Dr Lesne of Paris called attention to certain associated humoral changes which have an unquestionable prognostic value when accompanied by a high nonprotein nitrogen content of the blood. These changes are a decrease in the cholesterol and in the inorganic phosphorus content of the blood. Professor Cathala of Paris said that a distinction must be made between the malignant (toxic) syndrome in the course of an acute infectious disease and the malignant forms of the disease. Dr Robert Clement and his co-workers reported a case in which the syndrome appeared on the fortieth day of diphtheria. After epinephrine, total epinephrine extract, ouabain and strychnine in large doses had been given, rapid improvement followed the injection of adrenal cortex extract. Dr Grenet of Paris reported cases of spontaneous recovery from a malignant (toxic) syndrome which appeared on the fiftieth day of diphtheria. Dr Ribadeau Dumas of Paris preferred the term "toxic syndrome" to "malignant syndrome." The essential lesions are hyperemia and hemorrhages in the vicinity of the third ventricle. As a rule one can do little in the way of treatment. Dr Caussade of Nancy reported four cases with three deaths, in which the chief symptoms were adynamia, coma and cyanosis. In two of the three fatal cases encephalitis or another infection was found at necropsy. In addition there was marked hyperemia of all the viscera.

#### MEGACOLON AND DOLICHOCOLON

The pathogenesis of megacolon was the subject of the first part of a paper by Prof. Paul Rohmer and Dr. Albert Vallette of the University of Strasbourg pediatric clinic. Recent contributions to our knowledge of dysfunction of the autonomic innervation of the intestine have created renewed interest in megacolon. The most convincing evidence has been furnished by the results of operations on the abdominal sympathetic nerves. The authors collected reports of seventy-one cases, in sixty-one of which the condition had been either completely relieved or at least greatly improved after operation on the sympathetic nerves; four operations gave only partial improvement, two were failures and four patients died. Paessler collected 117 cases of idiopathic megacolon which had been treated by sympathectomy; in eighty-five there was cure or marked improvement, in 12 per cent failure and in 3 per cent death following operation. These results demonstrate the predominant influence of the sympathetic nerves on megacolon (Hirschsprung's disease), because in a large percentage of cases operative elimination of this influence led not only to a clinical cure or marked amelioration but also to a cure from the anatomic standpoint. Adamson and Aird in 1932 showed experimentally that division of the nerves of Eckard (parasympathetic innervation) is followed by typical megacolon and that the colon returns to its normal volume after division of the two lumbar sympathetic nerves. The occasional association of megacolon and megabladder also speaks for hyperfunction of their common sympathetic innervation (hypogastric plexus). Megacolon may now be regarded as due to some abdominal vagosympathetic dysfunction the origin of which is still obscure. It can be due to various peripheral and central causes. Its congenital origin can be explained by the fact that the organism in the fetal and neonatal period in general shows a predisposition to hyper-sympathicotonic states.

The second part of the paper was devoted to dolichocolon. In spite of the resemblance clinically of this condition to megacolon, there is a difference as to both the pathologic process and the pathogenesis. By dolichocolon is meant an abnormal elongation of the colon which should be considered as a congenital malformation. It is observed rarely in infants and children and most commonly in adults. As a rule dolichocolon does not give rise to symptoms in children, but there have been reported cases in which pain and fever predominated the clinical picture resembling that of appendicitis, cases in which vomiting was the dominant symptom, and, finally, cases in which the clinical picture was that of intestinal obstruction. The origin is still obscure. The treatment is medical unless complications occur. The surgical aspects of megacolon and dolichocolon were discussed by Dr. Marcel Boppe of Paris. One can assume as a working hypothesis that either hyperfunction of the sympathetic nerves or hypofunction of the parasympathetic nerves is responsible for megacolon. If the former exists, the most logical procedure would be division of the inhibitory sympathetic fibers to allow the motor action of the parasympathetic nerves to be free to function. If the second hypothesis is true, it is logical to operate on the involuntary sphincters, i. e. to do a sphincterectomy.

The author collected reports of 119 operations on the sympathetic nerves for megacolon, ten of which he himself observed. All the patients were children less than 15 years of age. There were nine operative deaths and seventeen failures. The author's impression was that for older children the mortality is very low after division of the sympathetic fibers. Although the operation has a favorable influence on peristalsis, this is rather uncertain and often only transitory. His conclusion was that it was too early to evaluate the results of operations on the sympathetic nerves in the treatment of megacolon.

In view of the high mortality and complications of one step colectomy, this operation has been discarded by most surgeons.

in favor of segmentary colectomy performed in stages. Only sigmoidectomy or splenic hemicolectomy in three stages are to be retained as feasible procedures.

### BERLIN

(From Our Regular Correspondent)

Nov. 29, 1938

#### Campaign Against the Misuse of Narcotics

Crime Commissioner W. Thomas, director of the national police antinarcotic center, lectured on the misuse of narcotics before the fifth congress of the European Association of Mental Hygiene at Munich. The national center has its headquarters in the national police headquarters, Berlin. It functions as a clearing house of information for all police problems, German and international, relating to narcotics. The master card index contains some 9,000 cards, more than 2,200 of which represent the records of addicts who are criminals or whose addiction has been discovered in connection with crime. The card index is arranged so as to provide information on addicts according to occupation and according to type of addiction. The center has established throughout the reich fifteen branches known as centers for the collection of information relating to drug addiction. A police net is thus spread over the entire country. Public prosecutors also communicate any pertinent data to the center.

The center keeps abreast of pending proceedings in the criminal courts, provides expert medicolegal testimony and sends its officers to assist local police authorities in difficult cases. It also seeks greater unification of antinarcotic laws.

Besides combating illicit traffic in narcotics the bureau is instrumental in the apprehension of individual addicts who seek to obtain narcotics illegally by forged prescriptions and other fraudulent means. It is a notorious fact that in 1928 there were an estimated 8,000 drug addicts in Germany, so if as mentioned, 2,200 addicts are classified as criminals, every fourth addict has already run afoul of the law and an increase in drug addiction will lead to an increase in crime unless combative measures are instituted.

#### COMMITMENT TO INSTITUTIONS

Accordingly, as Thomas states, further legal restrictions are being carried out by the Nazi government. A criminal narcotic addict can now be committed to a hospital for mental diseases if public safety so demands. A criminal addict can also be sentenced to undergo deprivation treatment in lieu of a regular statutory penalty for his offense. Furthermore, a suspension for any period up to five years of the right to pursue a certain occupation may be imposed on an addict. Such suspension often is tantamount to an order to change one's occupation, and this provision is one of the most drastic measures in force. Special institutions to which drug addicts may be committed by the courts do not exist.

Among the addicts to whom the mentioned provisions for commitment apply, the small group of physician addicts deserves special attention. A doctor is held to have violated the antinarcotic law if, among other things, he prescribes narcotics for himself "under medically unjustifiable" circumstances, e. g. in order to satisfy an abnormal craving. If the addicted doctor shows no disposition to undergo treatment or to curtail his abuse of the power of prescription, the police, in collaboration with the health authorities, go into action. Within the last four years sixty physicians have been detained in institutions by the courts for considerable periods on account of drug addiction. That this rigorous procedure is effective is attested by the fact that of the doctors released only a few have thus far recidivated although many have been at liberty for years.

If medicolegal opinion decides for the commitment to an institution of a law-breaking addict, the court can order the

prisoner committed on the same day to the hospital section of the examining prison or to any suitable institution. Deprivation therapy is immediately initiated, unmitigated by the use of any palliatives. "The addict is granted no respite from the sufferings incident to deprivation, consequently, the frightful recollection of the cure will remain with him and act as a deterrent." For some months after the first stage of deprivation the patient's habits are slowly changed, and this period is succeeded by an equally long stage of reeducation. The courts are also empowered to commit for treatment the addict whose mental condition on repeated examination so warrants, even if he is not considered a criminal. Such commitments may be either immediate or delayed.

#### RELEASE ON PROBATION

The 'release on probation' of a committed addict is usually considered only after six months has passed since commitment. Experience has shown that deprivation treatment of shorter duration virtually never leads to permanent cure. The patient undergoes an extremely careful examination before a court hearing on the question of release takes place. If expert opinion is favorable the court may grant a release on probation subject to certain 'obligations.' This means that the person released must report regularly for follow-up examination for eighteen months. He reports every fortnight or so at first and then at gradually greater intervals. The police take part in the supervision of erstwhile addicts. Should suspicion of recidivation arise, an intensive investigation is made, inquiry is made at pharmacies and among the person's acquaintances. Should the person actually backslide, a simple court order suffices to cancel his release on probation and to commit him to an institution.

The national center possesses a card index record of commitments and surveillance covering the entire reich. From 1934 to 1937, 289 persons were committed to institutions by court order on account of addiction to narcotics. Of this number 128 were released on probation, ninety-one had to serve out longer sentences and ten died. The number of persons finally released from supervision namely those considered cured, could not be determined, since data concerning them are incomplete. Thomas stated that among the 289 addicts only twenty-seven were known to have recidivated. A difficult problem is presented by those addicts who are not punishable under criminal law but who refuse to submit voluntarily to deprivation therapy. Attempts at supervision by relatives are seldom successful.

#### German Clinics at Prague University

There are two universities at Prague, the German University, one of the oldest in Europe, and the Charles University which is Czech. The years since the establishment of the Czechoslovak state have been marked by numerous disagreements between the two institutions. The German clinics and institutes in particular have complained of their lack of funds and especially of the inadequacy of the aids and subsidies received from the government. During the recent period of political change in Czechoslovakia the German newspapers and medical journals reported the closing of eight of the German university clinics, together with the arrest of certain members of the medical and nursing staffs. It was also stated that care of the patients in these clinics had been assumed by the Czech clinics.

Lately, more precise information has appeared in the German medical press with regard to these occurrences. September 26 the surgical, the first and second medical, the psychiatric neurologic, the otorhinologic and the dermatologic clinics of the German university were discontinued and taken over by the Czechs. October 25 the Czech ministry of education and public health decreed the restoration to their post of the ousted members of the clinical staffs. All these had meanwhile left Prague.

## ITALY

(From Our Regular Correspondent)

Nov 30, 1938

## Congress of Neurosurgeons

The third National Congress of the Società radio-neurochirurgica italiana recently met at Pisa. Professor Ayala, president of the executive committee, in his inaugural speech reviewed the progress of neurosurgery. Modern interpretations of the symptoms of nervous diseases enable neurologists in the majority of cases to make a diagnosis which is verified and sometimes modified by roentgenologists. At the same time refinements in surgical techniques enable surgeons to perform delicate and successful operations on the nervous system which could not have been done a few years ago. Francesco Durante, an Italian surgeon, reported in 1884 a successful operation for removal of a tumor from the frontal lobe. The patient survived the operation for twenty years. The modern operations for diseases of the central nervous system are entirely different from those performed in Durante's time. The so called operative surgery of the nervous system after Chipaut and surgery after prescriptions, according to Cushing's phrase, are no longer in use. Modern operations on the nervous system are mainly to obtain functional restoration of the neuropsychic faculties of the patients. They progress with the greater appreciation of the differences between the nervous system of men and that of experimental animals. The problem of the cerebral localizations in man can be interpreted through the knowledge offered by surgery of the nervous system.

The official topic of the congress was "Diagnostic and Therapeutic Criteria in Cases of Acute Craniocerebral Trauma." Professors Mario Lapidari, Virginio Porta, Mucchi and Carnevali Ricci were the speakers. Trauma from bullets and foreign bodies of violent properties was excluded.

## SURGICAL ASPECTS OF CRANIOCEREBRAL LESIONS

Professor Lapidari said that the seriousness of craniocerebral lesions is not necessarily proportional to that of the lesions of the extracranial soft parts. A diagnosis of the intensity of craniocerebral lesions cannot be made from the external lesion. The treatment of the wound is of surgical importance. The speaker advised immediate treatment, which consists in complete cleaning of the wound, removal of bruised edges, coagulated blood, mortified tissues and foreign bodies, and partial or complete suturing of the wound. Partial suture, occasionally with application of drainage, is indicated in the case of contaminated wounds which are cared for in the first few hours after trauma. The speaker believes that the pathogenic mechanism of fractures of the cranium is different in man and in experimental animals. Therefore the schematic theories on the subject which are based on experimental trauma are far from being exact. Cranial lesions result from different violent actions which take place in succession in the course of trauma. They act on the cranium in different ways. Making a diagnosis of cranial fracture from the clinical symptoms alone is difficult. Still more difficult is the diagnostic interpretation of pain, tumefaction and other local phenomena in the case of exposed cranial fractures with small wounds. The discharge of cerebrospinal fluid through the nose, mouth or ear and the late appearance of ecchymosis on the inclined points of the base are signs of confirmatory diagnostic value with fractures of the base. A certain and grave sign of fracture is collections of air under the skin or under the periosteum of bones which are covering pneumatic cavities, such as the frontal sinuses and the mastoid. Hemorrhages through the nose and mouth have no diagnostic significance. Hemorrhages through the ear are a decisive symptom when they are associated with immediate deafness, facial paralysis and elimination of cerebrospinal fluid through the ear. Fractures of the base do not demand special surgical treatment unless there are complications. The most serious complication is the development of purulent meningitis secondary to fracture of bones over

the natural cavities of the base or secondary to exposed fracture of the vault. The best treatment in such cases is Zeller's, which consists in daily withdrawal of the purulent cerebrospinal fluid and substitution of air (artificial pneumo encephalon) in association with the administration of hypotonic solutions by phlebotomy. Surgical intervention is contraindicated in the presence of cerebral lesions which cause symptoms of diffuse intracranial pressure. Operative trauma aggravates the conditions caused by craniocerebral trauma, and there are doubts as to whether or not the operation will give satisfactory results. It is advisable to administer treatment aimed to diminish hypertension of the cerebrospinal fluid, such as intravenous injections of hypertonic solutions, intestinal derivation and lumbar puncture. The last is effective when the cerebrospinal fluid is replaced by air, the substitution being controlled by a manometer.

## ROENTGENOLOGIC ASPECT OF CRANIOCEREBRAL TRAUMA

Professor Mucchi said that in making the x-ray study of the brain and the cranium in cases of craniocerebral trauma, encephalograms, cerebral arteriograms and iodoventriculograms are necessary. Encephalograms are contraindicated only in rare cases. Cerebral arteriograms are indicated when hemorrhage is suspected. In making a diagnosis of cranial fracture the two lateral and two sagittal projections, the two projections of Schuller and the demaxial, frontonuchal and axial projections are necessary. The fractures which most frequently show in roentgenograms of the cranium are those of the temporal and parietal bones, those of the frontal and occipital bones show less frequently. Fractures of the petrous bone are frequent. Fractures of the anterior cranial fossa and isolated fractures of the base are rare. Encephalographic examination requires the use of at least 100 cc of air. Cerebral edema prevents the passage of air to the subarachnoid spaces which correspond to the involved part of the brain. Internal hydrocephalus can be shown within four or five days after trauma. Cerebral ischemia is shown during encephalographic examination by the passage of air to the subdural spaces because of the presence of a laceration of the arachnoid or some other cause.

## LESIONS OF THE INTERNAL EAR

Prof. Carnevali Ricci discussed the diagnostic and therapeutic criteria of lesions of the internal ear from closed cranial trauma. The most frequent observation is laceration of the tympanic membrane which follows fracture of the temporal bone. A characteristic aspect, aside from the presence of perforation, is the presence of hyperemic zones at the membrane. Otorrhagia is a frequent symptom of fracture of the petrous bone. Elimination of cerebrospinal fluid through the ear takes place in about 4 per cent of the cases. Functional alterations of the labyrinth take place in some cases and are evidenced by dizziness, nystagmus and, occasionally, changes in hearing. The problem of the treatment of fracture of the petrous bone is unsolved. As a rule operation is contraindicated when suppurative otitis media existed before or developed after the fracture.

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Marriages

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FREDERICK NIMROD THOMPSON, Newport News, Va., to Miss Frances Willett Edwards of Miami, Fla., Sept 29, 1938

PROSSER HARRISON PICOT, Richmond, Va., to Miss Elmyra Davidson Williams of Wytheville, Va., Sept 3, 1938

FRED G. WOODRUFF, High Point, N. C., to Miss Margaret Lewis Thompson at Winston-Salem, Oct 13, 1938

FREDERICK ROBERT KLENNER, Winston-Salem, N. C., to Miss Annie Hill Sharp at Greensboro, Oct 12, 1938

HUGH GRIGSBY WHITEHEAD JR. to Miss Natalie Contee Whiting, both of Baltimore, Sept 24, 1938

CHARLES HOWARD MOORE, Philadelphia, to Mrs. John Maitland Driven of New York, Oct 15, 1938

## Deaths

**Floyd Elwood Keene** ☉ Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1904, William Goodell professor of gynecology at his alma mater and professor of gynecology at the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania, member and past president of the American Gynecological Society, past president of the Philadelphia Obstetrical Society, fellow of the American College of Surgeons, served during the World War, gynecologist to the Hospital of the University of Pennsylvania, Bryn Mawr (Pa.) Hospital, Abington (Pa.) Memorial Hospital and the Chestnut Hill Hospital, aged 57, died, Nov. 15, 1938, at his home in Wynnewood, Pa.

**Joseph Millen King** ☉ Los Angeles, University of Southern California College of Medicine, Los Angeles, 1895, clinical professor of medicine at his alma mater, fellow of the American College of Physicians, past president and secretary of the Los Angeles County Medical Society and the Southern California Medical Association, past president of the Los Angeles Clinical and Pathological Society and the California Medical Association at various times on the staffs of the Hollywood Hospital, California Lutheran Hospital and St. Vincent's Hospital, aged 66, died, Oct. 7, 1938.

**Philip Samuel Stout** ☉ Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1904, associate professor of otology at the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania, member of the American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otological Society, fellow of the American College of Surgeons, served during the World War, on the staff of the Jefferson Hospital and the Graduate Hospital, aged 61, died Nov. 3, 1938, in St. Luke's and Children's Hospital, of heart disease.

**George Franklyn Inch** ☉ Ypsilanti, Mich., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1895, member of the American Psychiatric Association, at one time assistant medical superintendent of the Kalamazoo (Mich.) State Hospital, consulting neuropsychiatrist to the U. S. Veterans Bureau, 1920-1926, formerly superintendent of the Traverse City (Mich.) State Hospital, consulting psychiatrist to the Butterworth Hospital, Grand Rapids, since 1931 medical superintendent of the Ypsilanti State Hospital, aged 65, died, Nov. 29, 1938, of heart disease.

**Joseph Coolidge Palmer**, Syracuse, N. Y., Syracuse University College of Medicine, 1903, member of the Medical Society of the State of New York, professor emeritus of hygiene, sanitation and clinical pediatrics at his alma mater, member of the American Academy of Pediatrics, director of health of the city public and parochial schools, served during the World War, on the staff of the Syracuse Memorial Hospital, aged 63, died, Oct. 27, 1938, in the Hospital of the Good Shepherd, Syracuse University, of hypertrophy of the prostate and heart disease.

**William Moore Guilford**, Lebanon, Pa., University of Pennsylvania Department of Medicine and Surgery, Ann Arbor, 1852, member of the Medical Society of the State of Pennsylvania, oldest alumnus of the University of Pennsylvania, past president of the Lebanon County Medical Society, Civil War veteran, for many years member of the city board of health for many years on the staff of the Good Samaritan Hospital, aged 106, died, Dec. 10, 1938, of pneumonia.

**John Henry Neff** ☉ Charlottesville, Va., University of Virginia Department of Medicine, Charlottesville, 1910, professor of urology at his alma mater, member of the Southern Surgical Association, American Association of Genito-Urinary Surgeons, American Urological Association and the Clinical Society of Genito-Urinary Surgeons, past president of the Virginia Urologic Society, on the staff of the University of Virginia Hospital, aged 51, was found dead, Nov. 9, 1938, in a pond.

**Ulysses J. Grim**, Waukegan, Ill., Rush Medical College, Chicago, 1891, professor emeritus of otorhinolaryngology, Loyola University School of Medicine, Chicago, member of the American Academy of Ophthalmology and Otolaryngology, fellow of the American College of Surgeons, on the staffs of the Illinois Eye and Ear Infirmary and the Mercy Hospital, Chicago, aged 72, died, Oct. 8, 1938, in St. Therese's Hospital, of heart disease.

**Benton Elkins Longwell** ☉ Johnstown, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1899, past president and secretary of the Cambria County Medical Society, fellow of the American College of Surgeons, on the

staff of the Conemaugh Valley Memorial Hospital, at one time member of the board of health and school board of West Mount, aged 64, died, Oct. 11, 1938, of acute pyelonephritis.

**George C. Webster Jr.**, Chester, Pa., Jefferson Medical College of Philadelphia, 1913, member of the Medical Society of the State of Pennsylvania, served during the World War, on the staff of the J. Lewis Crozer Home for Incurables and Homoeopathic Hospital, aged 50, died, Oct. 23, 1938, of cardiovascular sclerosis, multiple cerebral hemorrhage and chronic nephritis.

**William Ide Tomlinson**, Philadelphia, Hahnemann Medical College and Hospital of Philadelphia, 1903, associate professor of obstetrics at his alma mater, fellow of the American College of Surgeons, on the staffs of the Hahnemann Hospital and the Broad Street Hospital, aged 57, died, Oct. 14, 1938, of coronary thrombosis, pulmonary embolism and lobar pneumonia.

**Walter Kempster Gray** ☉ Milwaukee, University of Arkansas School of Medicine, Little Rock, 1918, member of the American Urological Association, served during the World War on the staffs of the Mount Sinai Hospital and the Columbia Hospital, aged 58, died, Oct. 20, 1938, of an injury to the right leg.

**John Wesley Ellis**, Lampasas, Texas, St. Louis University School of Medicine, 1905, member of the State Medical Association of Texas, served during the World War, aged 61, died Oct. 26, 1938, in the Veterans Administration Facility, Legion of arteriosclerosis.

**Charles Ransom Draper**, Medford, Mass., University of Vermont College of Medicine, 1888, member of the Massachusetts Medical Society for many years on the staff of the Lawrence Memorial Hospital, aged 75, died Oct. 25, 1938, of hypertensive heart disease.

**Harris M. Branham**, Brunswick, Ga., College of Physicians and Surgeons, Baltimore, 1888, member of the Medical Association of Georgia for many years chairman of the county board of health, aged 76, died, Oct. 28, 1938, of cerebral hemorrhage and chronic myocarditis.

**Charles Monroe Kennedy** ☉ Camden, Ind., Medical College of Indiana, Indianapolis, 1905, bank president, at one time county coroner, aged 63, died, Oct. 28, 1938, in the Cass County Hospital, Logansport, of coronary occlusion and pulmonary embolism.

**William Moore**, New Albany, Ind., University of Louisville (Ky.) Medical Department, 1884, member of the Indiana State Medical Association, on the staff of St. Edwards Hospital, aged 86, died, Oct. 8, 1938, of cerebral hemorrhage and acute bronchitis.

**Ignatius L. Goodfried** ☉ New York, Baltimore University School of Medicine, 1898, formerly on the staff of the Mount Sinai Hospital, aged 61, died Oct. 24, 1938, in the Beth David Hospital, of myocarditis, chronic bronchiectasis and carcinoma of the liver.

**Otto Carl Ahlers** ☉ Sherman, Texas, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1897, chairman of the board of trustees of the Wilson N. Jones Hospital, aged 66, died, Oct. 30, 1938, of cerebral hemorrhage.

**Frank Eliot Stetson**, South Dartmouth, Mass., Harvard University Medical School, Boston, 1897, formerly member of the board of health of New Bedford, served during the World War, aged 69, died, Oct. 20, 1938, of coronary sclerosis.

**Frank Blaney Eaton**, Portland, Ore., Cooper Medical College, San Francisco, 1875, aged 86, died, Oct. 10, 1938, in a hospital at Glendale, Calif., of cerebral hemorrhage.

**Charles Ellsworth Hewitt**, Mystic, Conn., Hahnemann Medical College and Hospital of Philadelphia, 1893, aged 83, died, Oct. 1, 1938, of pulmonary hemorrhage.

**Franklin Arthur Heckler**, Columbus, Ohio, Ohio Medical University, Columbus, 1895, aged 71, died, Oct. 17, 1938, in the Grant Hospital, of cerebral hemorrhage.

**John Thomas Stanford**, Philadelphia, Howard University College of Medicine, Washington D. C., 1895, aged 78, died, Oct. 30, 1938, of cerebral hemorrhage.

**John M. Johnson**, Frankfort, Ind., Curtis Physio Medical Institute, Marion, 1894, aged 80, died, Oct. 21, 1938, of carcinoma of the stomach.

**Humie Zebie Lee Horton**, Apex, N. C., Medical College of Virginia, Richmond, 1923, aged 41, died, Oct. 27, 1938, of acute myocarditis.

**Isaac N. Rogers**, Rogersville, Mo., St. Louis Medical College, 1872, aged 88, died, Oct. 12, 1938, of bronchopneumonia.

## Bureau of Investigation

### AN OBESITY CURE FRAUD

Nancy Hatch and Youthful Face and Figure, Inc.,  
Barred from the Mails

The "obesity cure" racket is not what it used to be. A few years ago there was a veritable flood of fakes—most of them merely worthless but some of them viciously dangerous—sold to the overweight by those who were literally living on the fat of the land.

Among the more conspicuous humbugs in the fat-cure field were certain pastes and soaps that were sold under the claim that, by rubbing them on the body surface, adipose tissue could be effaced. While the preposterousness of such claims was obvious to physicians, the "stylish stout" with a strongly developed "will-to-believe" fell hard for them. It was useless to tell such people that there was no paste or soap that, rubbed on the body, would remove fat. The advertisements in certain magazines and newspapers said that they would—and that was that.

Among some of the paste or soap types of obesity cures that were investigated by the Bureau of Investigation of the American Medical Association and the results published either in this department of THE JOURNAL or in *Hygienics* were the following:

**Absorbit**—A paste consisting of lard oil beeswax and a small amount of ox bile.

**Lutol**—A paste containing 10 per cent soap and 90 per cent water.

**Folt's Reducing Soap**—An artificially colored soap containing a minute amount of iodine.

**LaMar Reducing Soap**—A soap to which small amounts of saffron and potassium iodide had been added.

**Morlene**—A gelatinized mixture of alcohol soap sodium iodide and sugar.

**Nature's Way Reducing Cream**—Petrolatum mineral oil beeswax, epsom salt baking soda and alum.

**Stendiform**—An emulsion of casein oil of turpentine and white vinegar.

It is doubtful whether any of the fakes just listed are still advertised, although some of them may still gather dust on the druggists' shelves. But that external obesity "cures" are not yet entirely extinct is evident from the facts given not many weeks ago in a memorandum to the Postmaster General from the office of the Solicitor to the Post Office Department, recommending the issuance of a fraud-order against a concern doing business under the trade names "Nancy Hatch" and "Youthful Face and Figure, Inc."

The information that follows is from the memorandum just referred to or from material in the files of the Bureau of Investigation of the American Medical Association. The fraud in question was conducted by Mrs. Nancy Hatch Herbert and her son John L. Hatch. The business was started about 1930 and was incorporated in 1937 and capitalized at \$10,000. Stock to the amount of \$7,500 was issued and was held by the Herbert woman and her son John L. Hatch. Victims were obtained in the orthodox way—by advertising in those magazines and newspapers that obviously do not have the welfare of their readers at heart. A typical advertisement is reproduced herewith.

Some of the earlier advertisements were even more blatant. One stated that Dr. Hatch's Reducing Cream—later called Dr. Hatch's Formula Massage Cream—would cause the overweight to reduce even though you "Eat what you like, take no exercise or drugs." Still another advertisement, instead of giving the name of the product and the address at which it could be obtained, was run in editorial style and was ballyhooed by the "Beauty Department" of *Mother's Home Life*, Winona, Minn. Those who wrote to the "Beauty Department" were sent the Hatch advertising circulars.

Purchasers of the Hatch nostrum (\$1 for a half-pound package) received a jar of pinkish paste and some dietary instructions. This in spite of the fact that the obese public was led to believe from the Hatch advertising that dieting and exercise were unnecessary when Dr. Hatch's Formula Massage Cream was used. Government chemists analyzed the "cream" and reported that it was more than 99 per cent soap and water with a dash of epsom salt and a trace of iodine. There should have been money in the sale of soap at \$2 a pound!

The quacks who put out this fraud had a physician appear as a witness for them at the government hearing. One K. Arvid Enlind, M.D. According to the records Dr. Enlind was born in 1873 and holds a diploma from the College of Physicians and Surgeons of Baltimore, 1893, he was licensed in Connecticut in the same year, in New York in 1907 and in the District of Columbia in 1931. He is not a member of the American Medical Association. The files of the Bureau of Investigation of the American Medical Association show that in 1912 Dr. K. Arvid Enlind was endorsing "Vegatal Crackers" for "autointoxication and constipation."

In 1936 the National Better Business Bureau, a militant crusader against fraudulent advertising, wrote to the Bureau of Investigation of the American Medical Association and asked for information regarding "Youthful Face and Figure Institute," as the concern was then known. The Better Business Bureau stated that the "Institute" had sent it a statement signed K. Arvid Enlind, M.D., reading as follows:

"It is my opinion that Dr. Hatch's Formula Massage Cream contains elements which have definite reducing properties when applied to the surface of the body. These elements are Iodine and Epsom Salt, and have an oxidizing effect on the superficial fat. This cream is absolutely harmless to anyone regardless of their physical condition."

At the Post Office hearing Dr. Enlind testified that he did not know the percentage of the various ingredients used in the Dr. Hatch's Formula Massage Cream but that he was sure that this soap-and-water paste would cause a reduction in weight if rubbed on the body. In fact, on cross examination he testified

**REDUCE**

**SAFELY QUICKLY**  
by EXTERNAL METHOD  
LOSE 12 POUNDS IN 4 WEEKS  
OR IT COSTS NOTHING!

N. dress, limited diet or exercise. For it relieves your  
looks and ends your life. The doctor's drive and it rid-  
superstition! (at the) safe way that does not hurt the body functions.  
Originally prescribed by doctor for his wife then I made a good job of it  
now it is for YOU!

**PROFIT BY THESE AMAZING EXPERIENCES!**  
"I have lost 45 pounds and think your cream is wonderful!" L. P. No. Carol A.  
"I had wonderful results!" Joe 30 pounds! Mrs. O. B. S. P. ana.  
"I shed 35 lbs. in 4 weeks!" J. O. H. ex. 32. f. reduction. J. M. 25  
pounds and feel as good as new person." H. C. P. New York.

**MONEY BACK GUARANTEE! ACT TODAY!**  
If you do not lose 12 pounds in 4 weeks, I'll be first of Cream to follow you di-  
rections your money will be refunded! Write for full details today! \$1.00

O. H. A. F. M. Cream sent C.O.D. also postage  
Send Cash or Money Order YOUTHFUL FACE AND FIGURE INSTITUTE, D. P. F. W. 3  
513 24th St. N. New York City

ADVERTISEMENTS PLEASE MENTION JULY MOTION PICTURE 75

that the only effective ingredients in the paste were the soap and water! As a matter of social hygiene it may be admitted that any one who needs to reduce weight by using soap and water should not be deterred. But the result can be accomplished much more cheaply and efficiently by taking a bath.

In order, presumably, to catch the gullible both coming and going, the Hatch quackery also included a preparation to be taken internally called "Slimmets." The Hatch concern was reported in 1937 by the Federal Trade Commission to have stipulated that it would discontinue advertising that either the "Cream" or "Slimmets" would remove adipose tissue without the need of dieting. But apparently the Federal Trade Commission was not taken very seriously, as the company was still making such representations as late as March 1938 when cited by the Post Office Department.

Not long ago that department debarred from the mails a fraud that was supposed to cure errors of refraction and make the use of glasses unnecessary. It was brought out at the hearing that the exploiter of the fraud wore glasses! In the same spirit of *tu quoque*, the memorandum of Acting Solicitor Calvin W. Hassell to the Postmaster General in the Hatch case brings out the fact that although Mrs. Nancy Hatch Herbert and her medical witness, Dr. Enlind, both testified that they used the "cream" yet "Despite this fact, when they took the witness stand, it was evident they were both considerably overweight."

On the recommendation of the Acting Solicitor who had studied the evidence and was convinced of the fraudulence of the scheme the Postmaster General on July 11, 1938, issued a fraud-order debarring from the mails "Youthful Face and Figure, Inc.," and "Nancy Hatch" and their officers and agents as such.



## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### HEADACHE AFTER SPINAL ANESTHESIA

To the Editor—Headache is a not infrequent complication following spinal anesthesia. Can you enlighten me as to the present consensus concerning the etiology and treatment of this condition?

M. D. Pennsylvania

ANSWER—According to Pelouse (Postspinal Anesthetic Headache, *Illinois M J* 67 372 [April] 1935) headache may be expected in from 15 to 25 per cent of cases after diagnostic spinal punctures and in only about 3 per cent after spinal anesthesia, if the careful present day technique is used. The headache seems to be the result of prolonged seepage of spinal fluid from the puncture wound in the dura and arachnoid. Other factors, such as sex, weight, temperament, amount of fluid withdrawn, difficulty of inserting the needle, the presence or absence of fresh blood in the fluid withdrawn, the position of the patient during puncture, the pressure of fluid and the drug used are not the causes of headache. Two types of headache are cited: type A, that caused by decrease of cerebrospinal fluid and type B, that caused by increase of fluid. With loss of fluid the brain rests uncushioned on the venous plexus at the base of the skull, causing venous congestion and a resulting headache. One author suggested that the formation of fluid is speeded up during seepage and when the hole finally closes excess secretion continues for a time, causing increased cerebrospinal pressure and headache. Headache of type B caused by increased fluid is usually ascribed to a mild meningitis. In cases of headache of type A, lumbar puncture shows decreased fluid pressure and a decreased value for globulin and decreased cell count. In cases of headache of type B, a puncture will show increased fluid pressure with an increased amount of globulin and an increased cell count. Type A headaches are relieved by lowering the head, and usually no sedative will relieve them sufficiently for the patient to be erect and work. Type B headaches are not relieved by lowering the head but are relieved by drugs. Besides position, headaches of type A are best treated by quiet, sedatives, forcing of fluids by mouth, intravenous administration of hypotonic saline solution, ephedrine and solution of posterior pituitary. Some investigators advocate intraspinal administration of physiologic solution of sodium chloride or 1 per cent dextrose solution, the latter giving more lasting benefit. Treatment of headaches of type B demands sedatives, recumbency, limited amounts of fluids, diuretics, cathartics and repeated lumbar punctures.

One of the kindest things one can do for a patient who has headache after lumbar puncture is to assure him that the headache will not be permanent. The patient often becomes so alarmed that the headache is aggravated by his worry. It is probable that headache would occur after lumbar puncture in many cases were it not for the fact that the patient's head is not raised until two or three weeks after the operation. In general the incidence of headache of this type probably is not less than 5 per cent. Headache after lumbar puncture usually may be considered a contraindication to the subsequent use of spinal anesthesia.

### PSORIASIS AND ALLERGY

To the Editor—A married woman aged 37 has had psoriasis badly for at least twenty years. The lesions were especially severe under the breasts causing her a great deal of discomfort. She had treatments including x-rays by a competent dermatologist which eased the condition slightly but not much. She also has had hay fever due to ragweed sensitivity. This past season I induced her to try some ragweed pollen desensitization treatment. I followed the usual course of immunization using Squibb's pollen extract and after about the fifth injection she noticed that her psoriasis was improved and after the tenth injection it has entirely disappeared and has not recurred as yet. As a rule the lesions would be much worse at this time of year when her hay fever was worse although she has the psoriasis all the year round. Could there be any connection between the psoriasis and the ragweed sensitivity? I would appreciate any information as to the possible mechanism of the effect of the ragweed pollen extract on the psoriasis.

ERNEST P. SMITH, M.D., Cohocton, N. Y.

ANSWER—The relationship between psoriasis and such allergic conditions as hay fever has been considered by many workers. The fact that this patient's psoriasis cleared up during a course of injections of pollen extract does not, of course, prove that psoriasis is an allergic condition. Several possibilities exist.

First, spontaneous remission may have occurred. Second, pollen extracts, which contain protein, may have acted nonspecifically. Many cases of psoriasis have been temporarily relieved by such nonspecific protein therapy as injections of boiled milk. The third possibility is that psoriasis may actually be an allergic disease. The fact that most patients with psoriasis improve in the summer, especially after exposure to sunlight, speaks against any relationship to pollen, which, of course, is prevalent only in warm weather. This does not prove that psoriasis may not be related to some nonpollen form of allergy.

Zeidler (*Wien med Wchnschr* 81 877 [June 27] 1931) found that some patients with psoriasis and hay fever had relief from their cutaneous condition by injections of pollen extract. He showed that normal persons give uniformly negative reactions to pollen extracts, patients with psoriasis frequently give positive tests for pollens, clinically 22 per cent of his psoriatic patients had nasal symptoms typical of hay fever or rhinitis.

Brock (*Munchen med Wchnschr* 77 2225 [Dec 26] 1930) believes that asthma, gout and psoriasis are often associated and calls the triad 'visceral gout'. He found that treatment for gout brought on improvement in the asthma and psoriasis.

Mienicki and Ryll-Nardzewski (*Dermat Wchnschr* 97 1688 [Dec 2] 1933) believe that psoriasis is allergic and report that patients with psoriasis react with anaphylactoid shock to intracutaneous injections of an antigen. They used emulsion vaccine and cultures of *Staphylococcus aureus* and had positive reactions in one third of the cases.

From a study of the literature no definite conclusions can be made at the present time, it would seem that the burden of proof rests on those who are attempting to put psoriasis in the group of allergic conditions.

### PNEUMOCOCCUS ANTIGEN IN CCC CAMPS—SULFAPYRIDINE IN PNEUMONIA

To the Editor—1. Will you please tell me what the results of army antipneumococcus vaccine are which I understand has been used in the CCC camps for some time? 2. Also have you any reports on the use of a sulfanilamide derivative in the treatment of pneumonia?

THOMAS J. WEST, M.D., Pasadena, Calif.

ANSWER—1. The results of experiments using a pneumococcus antigen in CCC camps during the winter of 1936-1937 have recently been published (Ekwurzel, G. M., Simmons, J. S., Dublin, L. I. and Felton, L. D. VIII Report on Field Tests to Determine the Prophylactic Value of a Pneumococcus Vaccine, *Pub Health Rep* 53 1877, 1891 and 1892 [Oct 21] 1938). The report concludes:

(a) Thus the findings of the 1936-37 experiments are consistent with the impressions gained from the other preliminary experiments. Taking all the experiments together, it appears that this or a similar antigen may prove to be a useful tool for the control of pneumonia incidence. However, this statement must be qualified by the two considerations set forth under b and c below. It should be mentioned incidentally, that there were too few deaths upon which to base any conclusions regarding the effect of the antigen on the case fatality from pneumonia.

(b) The present experiments provide no indication as to the length of time for which the inoculations of antigen may influence the pneumonia morbidity rates.

(c) There is some indication that the antigen may be most effective for adolescents and that it loses its effectiveness with advancing age. It was found in the New England camps that at ages under 20, the pneumonia incidence rate in the control group was 27 times that in the inoculated group, at ages 20 to 24, the ratio was 14, and at ages 25 to 49, the inoculated enrollees actually experienced a higher rate than the control group.

It is safe to accept the conclusion that "the results of the present surveys indicate the need for additional investigations."

2. The sulfanilamide derivative referred to is probably 2-(p-aminobenzenesulfonamido) pyridine, for which the Council on Pharmacy and Chemistry has coined the name sulfapyridine (see page 49, this issue). The product was introduced also under the unfortunate names Dagenan and M & B 693. Whitby (Chemotherapy of Pneumococcal and Other Infections, *Lancet* 1 1210, 1212 [May 28] 1938) reported on experiments in mice. If one were to apply strictly the mouse experiments of Whitby a man of average weight would have to be given 90 Gm of sulfapyridine a day for six days. However, by giving from 1 to 15 Gm of sulfapyridine six times a day by mouth, concentrations as high as 6 or 8 mg per hundred cubic centimeters have been obtained in the blood. The report of Evans and Gaisford (Treatment of Pneumonia with 2-(p-Aminobenzenesulfonamido) Pyridine, *Lancet* 2 14 [July 2] 1938) is unconvincing because their cases were not typed nor otherwise adequately classified.



The apparently favorable effect may have been due to chance in sampling, and one group may have contained many more older patients and the other more patients with less virulent types. In "Pneumococcal Septicemia" by Dyke (*Lancet* 2 621 [Sept 10] 1938) the type was undetermined, it was not pneumococcus I, II, III or VII. Dyke and Reid (Treatment of Lobar Pneumonia with M & B 693, *Lancet* 2 1157 [Nov 19] 1938) reported eight cases of patients of various ages and with various types of the disease, in some the type was not determined. Flippin and Pepper reported two cases in young men with pneumococcus type I and pneumococcus type VIII (The Use of 2-[*p*-Amino-benzene-sulfonamido] Pyridine in the Treatment of Pneumonia, *Am J M Sc* 196 509 [Oct] 1938).

Since its introduction, too short a time has elapsed for adequate study, and at the present time there is no conclusive evidence that sulpyridine is of value in the treatment of the pneumonias in man, though informal reports made so far indicate encouraging results.

Every one agrees that different pneumococci produce pneumonias with characteristic mortality rates. It is poor medicine to compare two groups of 100 cases of acute pulmonary inflammation or pneumonia without reference to the type of pneumococcus, if it is the cause, or the other factors which determine the fatality rate.

To reach a conclusion concerning the value of this or other therapy for pneumonia, one must learn whether among the patients who receive the treatment more lives are saved and whether there is less bacteremia and fewer complications than among those from whom it is withheld. So far the product has not been licensed by the Federal Food and Drug Administration for sale in interstate commerce.

The advisory committee on pneumonia control of the New York State Department of Health believes that the evidence of the safety and therapeutic value of sulpyridine in the treatment of any of the various types of pneumococcal pneumonia is at the present time inconclusive. According to a resolution adopted by the committee at a meeting December 16, the committee further believes that the distribution of this drug should be restricted to experimental centers having facilities for careful study of toxicity and therapeutic efficiency until adequate evidence of the safety of the use of the drug and its therapeutic efficiency has been obtained. Members of the advisory committee are Drs. Russell L. Cecil, New York, chairman, Donald B. Armstrong, Peter Irving and Ralph S. Muckenfuss, New York, Rufus I. Cole, Mount Kisco, Thomas P. Farmer, Oliver W. H. Mitchell, Syracuse, Clayton W. Greene, Buffalo, George M. Mackenzie, Cooperstown, William S. McCann, Rochester, George H. Ramsey, White Plains, and Augustus B. Wadsworth and Arthur W. Wright, Albany.

#### DRIED PITUITARY SNUFF FOR PEPTIC ULCER

*To the Editor*—A large number of people in this locality have read the press reports from the doctors of the University of Texas in the treatment of peptic ulcers with the snuff cure (pituitary glands). It appears from the press report that about 90 per cent of the patients or in other words of the sixty patients who have used the snuff fifty four have been relieved and the x-ray examinations showed no evidence of a peptic ulcer. Is this publicity authentic?

J. S. COLLINS M.D. Wabasha Minn.

*To the Editor*—Have you any information about the use of posterior pituitary substance in powder form intranasally in the treatment of peptic ulcer? Where can it be obtained?

JANE LOCKWOOD, M.D. Greenwich Conn.

*To the Editor*—Will you please send me some information about an article appearing in *Time* by M. Hill Metz, M.D. and Robert W. Lackey, Ph.D. from Baylor University on the use of ground dried pituitary to snuff in treatment of ulcer? All the ulcer patients in town must have read it. Is its value proved?

JOHN L. SULLIVAN M.D. Elyria Ohio

**ANSWER**—Drs. Metz and Lackey of Baylor University reported a method of treatment of peptic ulcer by inhalation of the dried powder of posterior pituitary extract. This powder was sprayed on the nasal mucous membranes of patients definitely diagnosed with ulcer and they noted improvement in a certain number of cases. They also gave subcutaneous injection of the extract. Posterior pituitary extract is of known value in diabetes insipidus. They noted that a number of their ulcer-bearing patients have an increased urinary output with an increased night volume of low specific gravity, however, to a lesser extent than in diabetes insipidus. These urinary symptoms disappeared when treatment with posterior pituitary extract as outlined was given, and in addition there was relief from the ulcer symptoms. In a group of forty-two patients marked relief was noted in from one to eight days. Seven patients with chronic lesions continued to have slight symptoms after one month. The mode of action is not known. Fluoroscopic exami-

nation revealed a decrease in tone in the entire viscus and a reduction in spasm and motility. Therefore the stomach empties more slowly. This work is still on an experimental basis and cannot be suggested as an approved method of therapy today. The articles by Metz and Lackey appeared in the *Dallas Medical Journal* 24 46 (April) 1938 and the *Texas State Medical Journal* 34 214 (July), 295 (Aug) 1938.

#### TREATMENT OF SONNE DYSENTERY

*To the Editor*—A white man aged 27 gives a four months history of recurrent fever, general aching, cramps of the bowel and frequent loose slightly blood tinged stools. He has worked except for short periods of illness but has not felt well any of the time. The laboratory reported isolation of *B. dysenteriae* Sonne. Other routine and special tests were negative. I am unable to locate specific serum. Facilities make autogenous serum practically impossible. Can I obtain the specific serum anywhere? Will an autogenous vaccine effect a cure when used in conjunction with local therapy? Is there any report of the use of sulfanilamide in the treatment of the dysenteric group? M.D. New York.

**ANSWER**—There is no Sonne specific antidysenteric serum manufactured. A polyvalent serum that contains Sonne strain antibodies is obtainable from Sharp and Dohme in 20 and 50 cc ampules and is for intravenous use. Sensitivity to horse serum should be ruled out before the treatment is undertaken and, if it is required, desensitization should be performed. The serum should be given daily intravenously the dosage being increased from 10 to 50 cc daily. Thereafter subcutaneous injection of all autogenous vaccine of 1,000 million organisms per cubic centimeter should be started. The initial dose of 0.05 cc. is increased by that amount three times a week for three weeks. Thereafter biweekly or weekly injections with a maximum dosage of 1 cc. should be given. During the course of the treatment the causative organism may disappear from the stool although some bowel symptoms may persist. The treatment must be followed out until all symptoms have disappeared completely. Favorable case reports in which sulfanilamide has been used have not been found.

#### REFRACTORY GONORRHEAL VAGINITIS IN YOUNG GIRL

*To the Editor*—A girl aged 10 years had gonorrheal vaginitis with a moderate discharge in April 1938. The treatment has been as follows: 1. From April 28 to May 30 ten injections of 2,000 units of theelin. Clinical improvement followed but smears were positive. 2. From May 30 to June 29, 50 grains (3.25 Gm.) of sulfanilamide the first and second days 40 grains (2.6 Gm.) from the third to the seventh day and 30 grains (2 Gm.) from the eighth to the twenty first day. The sulfanilamide had to be discontinued for a few days because of fever. 3. From June 30 to August 20 theelin suppositories 2,000 units (thirty). 4. From August 20 to October 11 2 per cent mild protein silver instilled into the vagina nightly. In spite of this treatment smears continue to show gram negative and a few gram positive diplococci but practically no pus cells. Clinically there is only slight redness. A few years ago a sister, three years older had the disease but smears are continually negative for her. She was treated among other things the parents state with phenylmercuric nitrate. What strength should be used? The source of infection seems to be at school. What is your recommendation for further treatment? Is it apt to be contagious now? M.D., Indiana.

**ANSWER**—It must first be decided whether the present status indicates a persisting gonorrheal infection or whether it is due to chemical irritation from too much treatment. "Gram-negative diplococci" are not necessarily gonococci. The accepted standard for a positive diagnosis is the finding of more than ten typical gram-negative diplococci intracellularly in the same slide, and two or more within the same cell.

If a positive diagnosis has been made by this standard, the treatment at this stage consists in eradicating the focus responsible for the persistence of the infection. To eliminate an exogenous focus the entire family, male and female, must be examined for gonorrhea. Reinfection in the school can be avoided by the use of underclothing or bloomers which protect the vulva adequately, and by avoiding contact of the vulva with toilet seats. Endogenous foci are usually found in the urethra, rectum or cervix by means of local inspection and smears taken from these locations. Gonorrheal proctitis and urethritis usually respond to locally applied protein silver compounds. Examination of the cervix is not difficult through a lighted No. 30 endoscope. Cervical erosions or granulations often indicate active infection and respond to several applications of 5 per cent silver nitrate.

If no foci are found, complete cessation of treatment is indicated because of the probability that the persistence of the infection, either specific or nonspecific, is due to overtreatment. Strenuous activity should be avoided during this rest period. If after six weeks the smears are still positive, the most hopeful treatment is the instillation of protein silver in a water soluble

base, such as tragacanth or gelatin. The technic of this treatment is described by Reichert, Epstein Jung and Colwell in the *American Journal of Diseases of Children* (54:459 [Sept.] 1937). Phenylmercuric nitrate ointment 1:1,500 occasionally gives good results. It produces a local irritation in about 2 per cent of the cases. As long as gonococci are present in the smears, the condition should be considered to be contagious.

It must be remembered that gonorrheal genital infection in girls subsides spontaneously at an early stage of puberty.

### PAROXYSMAL TACHYCARDIA

*To the Editor*—A youth aged 18 had an attack of paroxysmal tachycardia while playing football. He had never had any illness prior to this attack and as far as he knew was in good physical condition. The duration of the attack was 219 hours. Normal rhythm was resumed suddenly. What is the longest record for the duration of an attack of paroxysmal tachycardia? Diagnosis was made by five electrocardiographic tracings. Any information as to the average duration of these attacks will be appreciated for this is the longest one I have any knowledge of. The patient was given about 25 grains (1.6 Gm.) of digitalis the first two days as it was thought to be auricular flutter; then he was given small doses of quinidine by mouth. Six days before normal rhythm was established he was given 40 grains (2.6 Gm.) of quinidine in twenty-four hours and the following day he was given 50 grains (3.25 Gm.) with no effect. Two days following he did not get any quinidine and thirty-six hours before normal rhythm returned he was given 5 grains (0.3 Gm.) of quinidine every hour.

M. D. GEORGI

*ANSWER*—The average duration of attacks of paroxysmal tachycardia would probably be measured in minutes, although it has never been calculated. It is highly probable that many cases of extremely short duration are never seen by physicians and this would of course, materially affect any calculation of the average duration. It is usually expressed as varying from a few seconds to a few hours. Only rarely do attacks last longer than from ten to fourteen days. There are two cases on record which in their later years were electrocardiographically characteristic, which lasted fifteen and forty-three years respectively. The propriety of the word "paroxysmal" was properly questioned by the authors who discussed these cases but in one of them a transient reversion to a normal rhythm occurred after a coronary occlusion. A few attacks with durations measured in months are recorded in the literature.

### CELLULITIS OF FACE

*To the Editor*—I would appreciate information on the use of roentgen therapy in acute cellulitis of the face particularly in the butterfly area. Is this method of treatment desirable in preference to incision and drainage? A recent case in which there was edema of one entire half of the face complicating an initial acute cellulitis has prompted this inquiry.

JOHN M. SMITH, M.D., Port Neches, Texas

*ANSWER*—It is the consensus at present that furuncles and cellulitis of the upper lip, nose and middle portion of the face should be treated conservatively. Ayres published the replies to a questionnaire sent to surgeons and dermatologists. The majority believed that incisions and manipulation were to be discouraged. The use of moderate doses of x-rays in these cases is often distinctly helpful and at times causes a speedy involution of furuncles and carbuncles. For technic and methods see "X-Rays and Radium in Diseases of the Skin" by G. M. MacKee, Philadelphia, Lea & Febiger, 1938. Pertinent material to this discussion is contained in an answer to a previous query (Face Infections and Intracranial Complications, THE JOURNAL, Sept. 24, 1938, p. 1231).

### COLOSTOMY

*To the Editor*—What percentage of colostomies close up and what percentage remain as a fistula?

T. J. H. GORRELL, M.D., Chicago Heights, Ill.

*ANSWER*—A well performed colostomy will remain open until it is closed. The exception would be a cecostomy in which a tube was inserted into the bowel to decompress it in acute obstruction, after removal of the tube such a colostomy will usually close. In the performance of a permanent colostomy the bowel is brought outside the abdomen so that the mesenteric border of the bowel between the afferent and the efferent loop forms a support which diverts the fecal stream outward and prevents it entering the distal loop. This type of colostomy will remain permanently open.

### BITTER SKIN FROM RUBBING ALCOHOL

*To the Editor*—The answer to the question of M. D. Ohio regarding bitter skin from drugs (THE JOURNAL, Oct. 29, 1938, p. 1684) may be found from the use of rubbing alcohol for and following the bath. This preparation leaves a persistent and bitter taste which resists even ordinary soap and water.

JOHN V. BARROW, M.D., Los Angeles

## Medical Examinations and Licensure

### COMING EXAMINATIONS

#### STATE AND TERRITORIAL BOARDS

ALABAMA	Montgomery	June 20-22	Sec. Dr. J. N. Baker	517 Dexter Ave.	
ALASKA	Juneau	March 2	Sec. Dr. W. W. Council	Box 561	
ARIZONA	Phoenix	Medical (Regular)	Little Rock	June 8-9	
		Medical Board of the Arizona Medical Society	Dr. L. J. Kohn	by 317 State Line	
ARIZONA	Phoenix	Medical (Felicite)	Little Rock	June 8-9	
		Sec. Dr. Clarence H. Young	1415 Main St.	Little Rock	
CALIFORNIA	San Francisco	Written examinations	Los Angeles	Feb. 6-9	
		San Francisco	July 10-13	and Sacramento	
		Oct. 16-19	Oral examinations	(required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California)	
	Los Angeles	Jan. 25	San Francisco	March 22	
	Los Angeles	April 11	and San Francisco	Nov. 15	
		Sec. Dr. Charles B. Pinkham	470 State Office Bldg.	Sacramento	
CONNECTICUT	New Haven	Feb. 11	Prerequisite to license examination	Address State Board of Healing Arts	
	New Haven	Medical (Regular)	Hartford	March 14-15	
	Hartford	March 28	Sec. Dr. Thomas P. Murdock	147 W. Main St.	
	Meriden	Medical (Homeopathic)	Derby	March 14	
	Sec. Dr. Joseph H. Evans	1488 Chapel St.	New Haven		
DELAWARE	Dover	July 11-13	Sec. Medical Council of Delaware	Dr. Joseph S. McDaniel	
		229 S. State St.	Dover		
DISTRICT OF COLUMBIA	Washington	Jan. 9-10	Sec. Comm. Gen. to Licensure	Dr. George C. Ruhland	
		203 District Bldg.	Washington		
FLORIDA	Jacksonville	June 19-20	Sec. Dr. William M. Rowlett	Box 786	
	Tampa				
GEORGIA	Atlanta	June	Joint Sec. State Examining Boards	Mr. R. C. Coleman	
	Atlanta	111 State Capitol	Atlanta		
HAWAII	Honolulu	Jan. 9-12	Sec. Dr. James A. Morgan	48 Yerkes Bldg.	
IDAHO	Boise	April 4-7	Dir. Bureau of Occupational Licenses	Mr. D. R. Cruikshank	
	Boise	355 State Capitol Bldg.	Boise		
ILLINOIS	Chicago	Jan. 24-26	Superintendent of Registration Department of Registration and Education	Mr. Homer J. Byrd	
	Springfield				
INDIANA	Indianapolis	June 20-22	Sec. Board of Medical Registration and Examination	Dr. J. W. Bowers	
		301 State House	Indianapolis		
IOWA	Des Moines	Jan. 10	Dir. Division of Licensure and Registration	Mr. H. W. Greife	
	Capitol Bldg.	Des Moines			
MAINE	Portland	March 14-15	Sec. Board of Registration of Medicine	Dr. Adam P. Leighton	
	Portland	192 State St.	Portland		
MASSACHUSETTS	Boston	March 14-16	Sec. Board of Registration in Medicine	Dr. Stephen Rushmore	
	413 F. State House	Boston			
MICHIGAN	Ann Arbor	and Detroit	June 14-16	Sec. Board of Registration in Medicine	Dr. J. Earl McIntyre
	100 W. Allegan St.	Lansing			
MINNESOTA	Minneapolis	Jan. 17-19	Sec. Dr. Julian F. DuBois	350 St. Peter St.	
	St. Paul				
MONTANA	Helena	April 4-5	Sec. Dr. S. A. Cooney	216 Power Block	
NEBRASKA	Omaha	Jan. 10-11	Dir. Bureau of Examining Boards	Mrs. Clark Perkins	
	State House	Lincoln			
NEVADA	Carson City	Feb. 6	Sec. Dr. John E. Worden	Capitol Bldg.	
	Carson City				
NEW HAMPSHIRE	Concord	March 9-10	Sec. Board of Registration in Medicine	Dr. Fred E. Clow	
	State House	Concord			
NEW JERSEY	Trenton	June 20-21	Sec. Dr. Earl S. Hallinger	23 W. State St.	
NEW MEXICO	Santa Fe	April	Sec. Dr. Le Grand Ward	135 Sena Plaza	
NEW YORK	Albany	Buffalo	New York and Syracuse	Jan. 23-26	
	Chief Bureau of Professional Examinations	Mr. Herbert J. Hamilton			
	315 Education Bldg.	Albany			
NORTH CAROLINA	Raleigh	June 19	Sec. Dr. William D. James	The Hamlet Hospital	
OREGON	Portland	Feb. 25	Corvallis	July 8 and Portland	
	Oct. 28	Sec. State Board of Higher Education	Mr. Charles D. Byrne	University of Oregon	
	Eugene				
PUEBLO RICO	San Juan	March 7	Sec. Dr. O. Costa	Mandry Department of Health	
SOUTH DAKOTA	Pierre	Jan. 17-18	Director of Medical Licensure	Dr. B. A. Dyer	
	State Board of Health	Pierre			
VERMONT	Burlington	Feb. 14	Sec. Board of Medical Registration	Dr. W. Scott Nye	
	Underhill				
WASHINGTON	Seattle	Jan. 9-11	Dir. Department of Licenses	Mr. Harry C. Huse	
	Olympia				
WEST VIRGINIA	Charleston	March 6-8	Sec. Public Health Council	Dr. Arthur E. McClue	
	State Capitol	Charleston			
WISCONSIN	Madison	Jan. 10-14	Sec. Dr. Henry J. Gramling	7703 S. Dayton Bldg.	
	Milwaukee				
WYOMING	Cheyenne	Feb. 6	Sec. Dr. G. M. Anderson	Capitol Bldg.	

#### NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL December 31, page 2210.

### Georgia October Examination

Mr. R. C. Coleman, joint-secretary, State Examining Boards reports the written examination held by the Georgia State Board of Medical Examiners at Atlanta, Oct. 11-12, 1938. The examination covered ten subjects and included 100 questions. An average of 80 per cent was required to pass. Five candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.
Emory University School of Medicine		(1933-3)
Tulane University of Louisiana School of Medicine		(1938)
Harvard University Medical School		(1936)

**Connecticut Homeopathic Report**

Dr Joseph H Evans, secretary, Connecticut Homeopathic Medical Examining Board, reports the written examination held at Derby, July 12, 1938. The examination covered seven subjects and included seventy questions. An average of 75 per cent was required to pass. One candidate was examined and passed. Two physicians were certified for endorsement after an oral examination. The following schools were represented:

School	PASSED	Year Grad	Per Cent
New York Medical College and Flower Hospital		(1937)	78.9
School	PASSED	Year Endorsement Grad	of
New York Homeopathic Medical College and Flower Hospital		(1928)	New York
Hahnemann Med College and Hospital of Philadelphia		(1921)*	Delaware

\*License has not been issued

**Connecticut July Examinations**

Dr Thomas P Murdock, secretary, Connecticut Medical Examining Board, reports the written examination held at Hartford, July 12-13, 1938. The examination covered nine subjects and included seventy questions. An average of 75 per cent was required to pass. Forty-two candidates were examined, thirty-one of whom passed and eleven failed. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Georgetown University School of Medicine		(1937)	75*
76.4 77.5			
Loyola University School of Medicine		(1937)	76.3
Northwestern University Medical School		(1938)	76.2
Rush Medical College		(1937)	76.3*
University of Maryland School of Medicine and College of Physicians and Surgeons		(1938)	76.4
Harvard University Medical School	(1935) 79.4	(1936)	77.8
Tufts College Medical School	(1937) 79.6 83.6*	(1938)	75 77.3*
Cornell University Medical College		(1938)	79.4
New York University College of Medicine	(1937) 75	(1938)	84.3
Jefferson Medical College of Philadelphia		(1936)	75
(1937) 75 77.6* (1938) 75*			
Temple University School of Medicine		(1937)	79.6
University of Vermont College of Medicine		(1937)	75.8
79.4 (1938) 84.4			
Queen's University Faculty of Medicine		(1937)	75
University of Toronto Faculty of Medicine		(1930)	75.5
Medizinische Fakultät der Universität Wien		(1932)	75
Friedrich Wilhelms Universität Medizinische Fakultät Berlin		(1920)	75.2
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia		(1934)	76.3
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1935)	75

School	FAILED	Year Grad
St. Louis University School of Medicine		(1937)
Creighton University School of Medicine		(1937)
Université de Paris Faculté de Médecine		(1926)
Friedrich Wilhelms Universität Medizinische Fakultät Berlin		(1922)
(1936)		
Ludwig Maximilians Universität Medizinische Fakultät München		(1922)
Universität Rostock Medizinische Fakultät		(1936)
National University of Athens School of Medicine		(1930)
Regia Università degli Studi di Padova Facoltà di Medicina e Chirurgia		(1934)
Regia Università di Napoli Facoltà di Medicina e Chirurgia		(1936)
Osteopathy		

Twenty-eight physicians were successful in the oral examination held for endorsement applicants at Hartford, July 26. The following schools were represented:

School	PASSED	Year Endorsement Grad	of
Stanford University School of Medicine		(1929) N	B M Ex
Yale University School of Med (1934) (1936)	(1936)*	(1937) 2) N	B M Ex
Georgetown University School of Medicine		(1935) N	B M Ex
Harvard University Medical School		(1936) N	B M Ex
Tufts College Medical School		(1937) 2) N	B M Ex
Columbia University College of Physicians and Surgeons		(1936) N	B M Ex
Cornell University Medical College		(1929) New York	(1909) New York
(1934) 2) (1935) N	B M Ex		
Long Island College Hospital		(1906)	New Jersey
Syracuse University College of Medicine		(1934)	New York
University of Rochester School of Medicine		(1935)	New York
University of Oregon Medical School		(1935)	California
University of Pennsylvania School of Medicine		(1934) N	B M Ex
Woman's Medical College of Pennsylvania		(1922) N	B M Ex
Medical College of Virginia		(1930)	Virginia
Mt. Quabbin University School of Medicine		(1938) N	B M Ex
University of Toronto Faculty of Medicine		(1932)*	New York
National University of Ireland		(1923)	New Jersey

\*License has not been issued  
† Examined in surgery

# Book Notices

**The Chemistry of the Amino Acids and Proteins** Edited by Carl L. A. Schmitt M.S. Ph.D. Professor of Biochemistry University of California San Francisco Cloth Price \$7.50 Pp 1031 with 259 illustrations Springfield Illinois & Baltimore Charles C Thomas 1938

It is a surprising fact, considering the important part which proteins play in all types of biologic phenomena, that there are so few books, especially in English, dealing with this important class of substances. One reason for this lack of satisfactory books on the subject is undoubtedly that most of the work on the physicochemical properties of amino acids and proteins, which forms the basis for modern protein chemistry, has been done within the last twenty years. Another reason is that the subject is so vast, and is developing so rapidly, that there are few persons competent to handle it adequately. In this volume the latter difficulty has been surmounted by dividing the work among sixteen contributors whose scientific interests lie in the field of amino acids and proteins. The book contains eighteen chapters, many of which are further subdivided into numerous sections. The broad scope of the work may perhaps be best indicated by listing the chapter headings, as follows: historical, the constitution and synthesis of the amino acids, the isolation of the amino acids from proteins, methods of analysis and reactions of the amino acids and proteins, relation of the amino acids to products of biochemical importance, peptides, peptidases and diketopiperazines, the chemical constitution of the proteins, molecular weights of the proteins, certain chemical and physical characteristics of the proteins, optical properties of amino acids and proteins, amphoteric properties of amino acids and proteins, electrochemistry of amino acids and proteins, combination of amino acids and proteins with acids, bases, heavy metals and other compounds, membrane equilibria, some thermodynamical considerations of amino acids, peptides and related substances, dipolar ionic structure and solubility of amino acids, peptides and proteins, relation of proteins to immunity, the role of proteins in nutrition. As indicated by these chapter headings, the book covers almost all of the main divisions of protein chemistry. The subject matter, as well as the extensive bibliographies at the end of each section, should be of great value in stimulating further work in this important field. This volume will be found interesting and useful not only by students of protein chemistry but by all others interested in obtaining a better understanding of the part played by amino acids and proteins in life processes.

**Krankheiten und Hygiene der warmen Länder. Ein Lehrbuch für die Praxis.** Von Prof. Dr. P. Mühlens, Prof. Dr. E. Nauck, Doz. Dr. H. Vogel und Flottenarzt Prof. Dr. H. Ruge. Fourth edition. Paper. Price 43 marks. Pp 564 with 438 illustrations. Leipzig: Georg Thieme 1938.

This revised and enlarged edition of the standard German manual on tropical medicine and hygiene is especially welcomed, since the third edition (1930) has long been out of print. It also constitutes a posthumous tribute to Professor Reinhold Ruge, who died in 1936 during the preparation of the new edition. Drs. Nauck and Vogel are new collaborators, whose original contributions respectively in tropical pathology and helminthology entitle them to write with considerable authority. Prof. Erich Martini has taken over the sections on venomous animals and arthropods.

The volume is divided into nine sections in addition to a preliminary chapter on tropical hygiene and one on examination of the blood, both of which were written by Professor Ruge. Section I is entitled "Infektionskrankheiten" and contains a long chapter on malaria (Mühlens, Nauck) and shorter chapters on diseases due to trypanosomes (Ruge), leishmaniasis (Mühlens), amebic dysentery (Mühlens), spirochetosis (Mühlens) and virus diseases, Rickettsia infections and Bartonella infections (Nauck). Section II deals with deficiency diseases (Nauck) and section III with bacterial infections (Ruge). Section IV presents the subject of helminthiasis (Vogel) and diseases caused by arthropods (Martini). Section V is devoted to a consideration of dermatology and venereal diseases (Ruge). Section VI presents information on venenation due to animals (Martini) and to plants (Ruge). Section VII presents other tropical diseases (Ruge), section VIII, surgery in the tropics and section IX,

distribution of the principal cosmopolitan diseases in the tropics (Ruge). There is a rather complete subject index but an author index is lacking.

The chapter on tropical hygiene is a well balanced, compact consideration of the essential extrinsic and intrinsic factors governing man's life being in tropical lands. The chapter on blood is a brief syllabus on the origin and differential characters of the blood cells, preparation of blood for total and differential counts, hemoglobin index, hemoglobin mass and other laboratory analyses.

In the chapter on malaria Professor Mühlens describes in considerable detail the human and mosquito phases of the life cycle, including information on the structure and habits of the more important malarial transmitters. Epidemiology and pathologic anatomy of the disease are briefly presented and the symptomatology and diagnosis techniques authoritatively reviewed. In the extensive consideration of therapeutics there is detailed information on the administration of quinine plasmochin and atabrine, together with their respective efficiencies in tertian, quartan and estivo tertian malaria. Therapeutic prophylaxis and symptomatic therapeutics supplement this important part of the chapter. The preventive phase of the subject presents especially the problem of drainage, Paris green and oil treatment of water as larvicidal methods, screening and educational campaigns as necessary intrinsic attacks on the parasite. Included in this chapter are also a comprehensive discussion of black-water fever and a brief consideration of malaria in the monkey.

In similar thorough fashion although in somewhat briefer form there are considered trypanosomiasis and Chagas' disease, visceral, cutaneous and mucocutaneous leishmaniasis, amebic dysentery with the complication of liver abscess, balantidial dysentery and flagellate infections of the bowel, louse borne and tick-borne relapsing fever, various infectious rickettsiae (Weil's disease), yellow fever, dengue, paratyphoid fever, typhus, Rocky Mountain spotted fever, Japanese fever, verruga peruana, smallpox and psittacosis.

The deficiency diseases of sprue, beriberi, pellagra and related clinical entities are probably given too little consideration, but the bacterial diseases of bacillary dysentery, undulant fever, cholera, tularemia and plague are adequately presented.

The section on parasitic worms is prefaced by a few paragraphs on orientation and on consideration of techniques for recovery of helminth ova. These infections include the three types of schistosomiasis, pulmonary distomatiasis, hepatic and intestinal distomatiasis, tapeworm infections, hookworm disease, ascariasis, strongyloidiasis, whipworm infection and an especially valuable consideration of the filarial infections and dracunculosis. Entirely too little space is devoted to arthropods of medical importance.

In the section on cutaneous and venereal diseases of the tropics are to be found a full consideration of leprosy and of granuloma inguinale and briefer reference to the mycoses and the poorly understood malformation of the cutaneous, osseous and cartilaginous structures. Among the venereating animals are brief references to coelenterates, chilopods, scorpions, spiders, scabie mites, ticks and venomous insects, stinging fishes, and a more extensive treatment of poisonous snakes. In the short section on other tropical diseases are found tropical macrocytic anemia, sickle-cell anemia and tropical splenomegaly. The sections on surgery in the tropics and cosmopolitan diseases in the tropics have apparently been added for the sake of completeness, but they detract rather than add to the value of the volume.

In an attempt to evaluate as well known and as important a manual as is the present contribution from the Hamburg school, one is first struck with the painstaking, thorough way in which the subject of human diseases in the tropics has been presented and the accurate, authoritative information which is found in almost every chapter. Only in one respect is the subject as a whole possibly subject to criticism, namely the lack of balance in the presentation of the subject matter. A chapter entitled "Amebic Dysentery" would more appropriately have been entitled "Amebiasis," since it includes a consideration not only of acute (i.e. dysenteric) cases but also of subacute, chronic and carrier states, as well as amebiasis of the liver and other organs. The volume is splendidly printed and has an abundance of well selected line drawings, charts, photographs and photomicrographs.

**Nutrition in Health and Disease** By Ienna F. Cooper, B.S., M.A., M.H.F., Chief, Department of Nutrition, Montefiore Hospital, New York City; Edith M. Harber, B.S., M.S., Lecturer on History of Cookery, Teachers College, Columbia University, New York; and Helen S. Mitchell, B.A., Ph.D., Research Professor of Nutrition, Home Economics Division, Massachusetts State College, Amherst, Massachusetts. Seventh edition. Cloth. Price \$3.10. Pp. 704 with 101 illustrations. Philadelphia, Lippincott & London, J. B. Lippincott Company, 1938.

The appearance of a seventh and greatly revised edition, within ten years after the original publication, bespeaks the popularity of this textbook on the principles of nutrition and practice of dietetics for nurses. The subject matter is intended to be covered in two courses, the one on the principles of nutrition and cookery and the other on diet in disease. Each chapter concludes with a list of questions the correct answers to which will serve as a summary and review. The last fifty pages of the book provide in tabular form information regarding the composition of foods and other useful information. There is also provided a concise description of procedures concerned with the management of diabetes, such as tests for sugar and acetoacetic acid in the urine and the technique of administering insulin. There is no discussion of prothrombin, zinc, insulin, however.

There are numerous illustrations and many tables throughout the text. A valuable feature is the large number of recipes, covering nearly a hundred pages and providing detailed instructions for the preparation of small amounts of foods, usually one serving. Following the directions for each dish there is a table of ingredients. This shows the amount of each ingredient in terms both of common measures and of approximate weight in grams. The amount of protein, carbohydrate and fat that each ingredient provides is also listed together with the number of calories. The text has a suitable index. Any person who masters the contents of this book would have a sound knowledge of the principles of nutrition and dietetics.

**Sammlung psychiatrischer und neurologischer Einzeldarstellungen** Herausgegeben von Prof. Dr. A. Bostroem und Prof. Dr. J. Lange. Band VII. Die Psychologie und Psychopathologie der Hysterie. Von Dr. Robert Einker. Paper. Price 4.20 marks. Pp. 63. Leipzig, Georg Thieme, 1935.

The author reviews the current theories of hysteria and points out the flaws in each. He then postulates his own thesis that hysteria is a disturbance of "goal oriented activity." This peculiar concept is a descriptive pronouncement which does not further our knowledge of the dynamics of hysteria and its origin. His therapy consists in educational methods during childhood to strengthen goal seeking activity. He is not sure that therapy is possible for adults.

**The Chemical Analysis of Foods and Food Products** By Morris B. Jacobs, Ph.D., Chemist, Bureau of Food and Drugs, Department of Health, City of New York, 1928. Cloth. Price \$6. Pp. 537 with 56 illustrations. New York, D. Van Nostrand Company, Inc., 1938.

Methods of food analysis have been developed in order to obtain information about the composition of foods for nutritional and dietetic purposes, to aid in the standardization of production and manufacture of products, and for regulatory purposes to protect the people against deleterious, harmful or adulterated foods. This book was written to give a "systematic coverage to the salient facts of the chemical analysis of foods and food products." There is first a discussion of general methods and physicochemical methods of analysis, followed by chapters on coloring matters, preservatives and metals in foods. There follow separate chapters on various classes of foods, including milk and cream, milk products, oils and fats, sugar foods and carbohydrates, gums, cereals, starch and other polysaccharides, jams, jellies and fruit, spices, flavors and condiments, non-alcoholic beverages and allied products, alcoholic beverages, meat, meat products, fish and eggs, vitamins and inorganic determinations. Many of the methods of analysis described are taken from the description of methods of the Association of Official Agricultural Chemists, often without proper credit being given.

From the nutritional point of view this volume as well as many other volumes on food analysis, is somewhat disappointing. For example, there is described by the present author the method for determining the alkalinity of the ash of foods by titration of the ash. It was shown by H. C. Sherman more than thirty years ago that this method is inadequate and gives

misleading or inaccurate information. There is no point in retaining this now outmoded technique of determining the alkalinity of the ash of foods.

The author seems somewhat unfair in criticizing the Association of Official Agricultural Chemists because it has not described as yet, in its official publications, several methods which the author points out are included in this book. It is well known that the Association of Official Agricultural Chemists is thoroughly abreast of the times in its studies of methods of analyzing food products. The association publishes official methods only after they have been given thorough study and found suitable.

While the present author describes several methods for the determination of lead in foods, only one method is described for copper. The carbamate method, which is probably used more than any other for the determination of the small traces of copper that occur in foods, is not described. There may be a description of a method for the determination of the iron content of foods in the book, but the reviewer was unable to find it though he searched particularly. The word "iron" does not appear in the index. In a book which purports to be a collection of modern methods, one would think that there would be a description of a suitable method for the determination of iron, possibly even a method for the determination of inorganic iron.

The author describes in considerable detail of procedure for the detection and determination of milk solids in bread. This involves the analysis of bread for lactose and butter fat. It is realized, of course, that a useful procedure of food analysis is to identify a substance by selecting some characteristic ingredient which can be readily determined. There is justification, therefore, for a method of estimating the amount of milk solids in a food by determination of lactose and butter fat. From the nutritional point of view, however, the chief value of adding milk to bread is the improvement in the protein and calcium content of the bread. It would seem therefore that a calcium determination, possibly in conjunction with the analysis of lactose, would give more useful information than the determination of the lactose and butter fat. But then the book does not describe a method for calcium.

The book despite its imperfections should prove to be a useful volume to all persons concerned with the analysis of foods and food products.

**Pneumococcus Types in South Africa. A Study of Their Occurrence and Distribution in the Population and the Effect Thereon of Prophylactic Inoculation.** By David Ordman B.A. M.B. Ch.B. The South African Institute for Medical Research, Johannesburg. Publications of the South African Institute for Medical Research No. XLIII Vol. IV. Edited by the Director. Paper. Pp. 27 with 10 illustrations. Johannesburg: The Institute. 1938.

This little pamphlet contains some interesting information concerning the investigations on pneumonia which have been under way in South Africa for a number of years. In 1913 Lister reported, independently of Dochez and Gillespie, a biologic classification of pneumococci based on bacteriologic studies of pneumonia among the mine workers of South Africa. The various types were designated by the letters of the alphabet, A, B, C and so on. In this report Ordman correlates the South African alphabetical types with the American numerical types and generously consents to use the American classification in all future reports. It is interesting to note that in South Africa pneumococcus types I, II and III are the dominant types just as they are in America and Europe. Types V, VII, VIII and XIV are also fairly common in South Africa. A polyvalent pneumococcus vaccine containing types I, II, III, V, VII, XII and XIV was employed by Ordman for vaccinating the natives who were working in the mines. The vaccine caused a 75 per cent reduction in the incidence of type I pneumonia and a 42 per cent reduction in the incidence of type II pneumonia. The incidence of type III pneumonia was not affected by the vaccine.

**Bouquets of Rhyme. Variegated Nuances of Lyrical Diapason.** By O. E. Harvey M.D. Cloth. Price \$2. Pp. 96. New York: Aron House Publishers. 1938.

This collection of poems written by a busy practitioner constitutes a creditable amateur literary effort. Although there is considerable variation in quality, the author may be congratulated on his initial contribution in this difficult field.

**The Fundamentals of Internal Medicine.** By Wallace Mason Yater A.B. M.D. M.S. Professor of Medicine and Director of the Department of Medicine, Georgetown University School of Medicine, Washington D.C. Cloth. Price \$9. Pp. 1021 with 255 illustrations. New York & London: D. Appleton Century Company, Incorporated. 1938.

This volume differs from most other textbooks of medicine in its condensed discussions and in the fact that it includes material on diseases of the skin, ear, eye and other specialties which the author and his collaborators believe to constitute a necessary minimum of the knowledge of the internist or general practitioner. The book is excellently illustrated. While many details have been sacrificed to simplification and space requirements, it may be anticipated that the book will be popular with medical students and many practitioners.

**Praxis der Tuberkulosekrankheit und ihrer Behandlung.** Herausgegeben von Dr. med. habil. Hellmuth Delst, Oberstabsarzt der Heilstätte Übereuth im Allgäu. Mit einem Geleitwort von Prof. Dr. O. Müller. Paper. Price 16 marks. Pp. 212 with 90 illustrations. Leipzig: Johann Ambrosius Barth. 1938.

The first part of this volume contains a general consideration of tuberculosis. There is a good discussion of the diagnosis, prognosis and treatment. Under treatment the various special procedures, such as artificial pneumothorax and intrapleural pneumonolysis, are discussed at considerable length. Various complications in pulmonary tuberculosis are considered. Nearly fifty pages is devoted to tuberculosis in children, in which the evolution of the disease is presented. Most of the illustrations are made from roentgenograms. Unfortunately, this volume does not contain a bibliography.

**Introduction to Diseases of the Chest.** By James Maxwell M.D. F.R.C.P. Assistant Physician and Demonstrator of Practical Medicine, St. Bartholomew's Hospital, London. Cloth. Price 12s. 6d. Pp. 328 with 95 illustrations. London: Hodder & Stoughton Limited. 1938.

This is an elementary discussion of diseases of the chest. It is written for the medical student and makes no attempt to discuss rare or obscure topics. As is usual in books on this subject, considerable space is devoted to physical diagnosis and history taking. The text deals almost entirely with the clinical aspects of the subject, probably too much so for the average medical student. Even suitable prescriptions for cough mixtures are included. The sections on history and physical examination are followed by one on special investigations. This includes sputum, blood, pleural fluid and an excellent chapter on radiology of the chest. The section on diseases of the respiratory tract commences with chapters on the diseases of the nose, mouth and larynx. Chapters on each of the important diseases of the bronchi, lungs, pleura, mediastinum and diaphragm follow. The clinical descriptions are, in general, excellent. Reproductions of roentgenograms, of which there are a profusion, are well done and add much to a book on this subject. The chief criticism of this book is with regard to therapy. Frequently a number of methods of treatment are mentioned without any discussion of the merits of each. In the important chapter on lobar pneumonia, only a small paragraph at the end is devoted to specific serum therapy. The author states that "it is doubtful whether, in the average case, anything is to be gained by giving serum." In this and in certain other instances the text is not thoroughly abreast of the time. As a whole, however, this book can be recommended as a sound clinical discussion of the subject.

**Le traitement des rigidités extra pyramidales par la médication belladonna à hautes doses.** Par le Docteur Jean Roux Delimal. Paper. Pp. 79. Paris: Librairie E. Le François. 1938.

The author introduces the subject by discussion of the Solanaceae and their alkaloids and especially the acids and bases found in belladonna. He emphasizes particularly the preparation of the wine of belladonna according to Raef's method, which has been used in the Bulgarian treatment so highly considered in Italy. The method of using belladonna and atropine is also discussed, together with the dangers and the accidents that sometimes occur, the tolerance to the drug and, finally, the therapeutic results. The high tolerance for atropine in parkinsonism (20 mg. or more) is particularly stressed. The author contends that the so called Bulgarian treatment, which is the wine of belladonna combined with what appear to be charcoal pills, laxative and chewing gum, is distinctly favored over atropine itself. The author points out that extrapyramidal disorders accompanied by hypertonus

are particularly benefited, while those of pyramidal type are, if anything, made worse. The mechanism of action is discussed. As an exposition of a practical method of treating extrapyramidal hypertonus this Paris thesis has some value, but it cannot be considered adequate on account of the lack of discussion of other drugs that have been found useful in this condition and for the very inadequate study of the mechanism of the effects.

**Statistical Methods Applied to Experiments in Agriculture and Biology**  
By George W. Snedecor, Director of the Statistical Laboratory of Iowa State College, Ames, Iowa. Second edition. Cloth. Price \$3.75. 1935. 184 pp. Ames, Iowa: Collegiate Press, Inc. 1935.

There seem to be no remarkable changes in this revision of a book issued originally in 1937. It is claimed to be suitable for those without a knowledge of higher mathematics, but most physicians would find it rather heavy going.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Birth Control Contraceptive Articles as Articles of Indecent or Immoral Use, Contraception as Against Public Policy**—Lantec Laboratories, Inc., was engaged in the sale of devices and preparations for the prevention of conception. Its president undertook to design and perfect a universally adaptable contraceptive diaphragm that could be marketed through drug stores. The defendant and his brother were employed to aid in the development of such a diaphragm. Their contract of employment provided that any applications for patents for articles covered by the contract, filed by the defendant or his brother during the life of the contract or five years thereafter, should be assigned to the plaintiff corporation on its request. The contract terminated about Aug. 1, 1931. Thereafter, on Nov. 2, 1935, the defendant filed an application for a patent for "a pessary or vaginal diaphragm and an applicator therefor." The plaintiff contended that the application covered an invention to which it was entitled under the contract and instituted an action to compel the inventor to assign the application to it. The trial court dismissed the complaint, holding that the application did not come within the terms of the contract. The plaintiff corporation thereupon appealed to the appellate court of Illinois, first district, second division.

Although the record from the trial court raised no question as to whether the contract was not against public policy and therefore void, the appellate court on its own motion discussed that aspect of the case at length and apparently gave weight to its conclusion with respect thereto, in rendering judgment. The subject matter of the contract, said the court, was the invention of a contraceptive device that any woman could obtain without consulting a physician or a clinic, the invention of an article that could be sold through drug stores to any woman, married or single, who called for it. No direction or prescription from a physician would be required, to show that the article was to be used for the cure or prevention of disease. The plaintiff's brief frankly stated that the nature of the device and the manner in which it was to be sold would enable a woman to obtain the article as she would "medical and personal supplies, over the counter."

The national policy of the United States with respect to the matter of contraception, the court pointed out, is clear. The federal criminal code provides that every article or thing designed, adapted or intended for preventing conception or for any indecent or immoral use, and every article, instrument, substance, drug, medicine or thing which is advertised or described in a manner calculated to lead another to use or apply it for preventing conception, is not admissible to the mails. This prohibition has been on the statute books for sixty-five years, the court continued, and despite repeated efforts to have the law amended or modified, Congress has refused to change it. Furthermore, the tariff act of 1930 prohibits the importation of any article whatsoever for the prevention of con-

ception. It is true that a federal court has held that the tariff act does not bar from the country articles employed by physicians in the practice of their profession, for the prevention of conception, when necessary to protect the patients' health or to save them from infection. *United States v. One Package*, 86 F. (2d) 737. But, the Illinois appellate court pointed out, in rendering that decision the United States circuit court of appeals conceded that it departed from the letter of the law. And although the Illinois appellate court recognized that it had been held that in a prosecution under the federal criminal code for mailing an article for contraceptive purposes it is necessary to prove not only that the article mailed was designed and adapted for contraceptive purposes but to prove also that it was intended for preventing conception, the Illinois court nevertheless pointed out that the public policy of the United States, as expressed in the statute governing the matter, has not been changed by Congress.

The criminal code of Illinois declares illegal the sale of any model, cast, instrument or article of indecent or immoral use. While no mention is made in the code specifically of articles to prevent conception, it does include "any instrument or article of indecent or immoral use." The federal criminal code the court pointed out, places contraceptive devices in the class of articles for "indecent or immoral use." It has frequently been held that the purpose of the federal statute was to exclude from the mails publications and articles deemed injurious to public morals.

In view of the subject matter of the contract before the court in the present case and of the manner in which the contraceptive device that forms the subject matter of the contract was to be sold, it seems clear, said the Illinois appellate court, that if a person were to use the mails to deliver the contraceptive device in question to drug stores, to be sold in the manner planned by the plaintiff, he would be guilty under the criminal code of the United States. He would also be guilty under the criminal code of Illinois, that code being broad enough to cover the indiscriminate sale of contraceptive devices through drug stores. It certainly could not be reasonably contended, the court thought, that sales so made might not tend to corrupt the morals of young unmarried persons. Would not the indiscriminate sale of contraceptive devices to such persons, the court asked, constitute the sale of an "article of indecent or immoral use?"

The maxim that he who comes into equity must come with clean hands, said the court, is of ancient origin and broad application. It is the expression of the elementary and fundamental conception of equity jurisprudence. An analogous situation was presented in the present case, in the opinion of the appellate court, when equity opened its door to settle the dispute between these "sordid traffickers in contraceptives." Without passing, however, on the validity of the contract in its relation to public policy, the appellate court contented itself with affirming the judgment of the trial court in favor of the defendant, which reached the conclusion that the contract between the parties did not cover the device for which the defendant filed an application for a patent.—*Lantec Laboratories, Inc. v. Clark (Ill.)*, 13 N. E. (2d) 678.

## Society Proceedings

### COMING MEETINGS

American Academy of Orthopedic Surgeons, Memphis, Tenn., Jan. 15-19  
Dr. Carl E. Badgley, 1313 East Ann St., Ann Arbor, Mich., Secretary  
American Orthopsychiatric Association, New York, Feb. 23-25  
Norvell C. La Mar, 149 East 73d St., New York, Secretary  
American Society of Anesthetists, New York, Feb. 10  
Dr. Paul M. Wood, 131 Riverside Drive, New York, Secretary  
Annual Congress on Industrial Health, Chicago, Jan. 9-10  
Dr. C. M. Peterson, 535 North Dearborn St., Chicago, Secretary  
Annual Congress on Medical Education and Licensure, Chicago, Feb. 13-14  
Dr. W. D. Cutter, 535 North Dearborn St., Chicago, Secretary  
Eastern Section American Laryngological, Rhinological and Otolological Society, Boston, Jan. 11  
Dr. Frank E. Kuttredge, Masonic Temple, Nashua, N. H., Chairman  
Middle Section American Laryngological, Rhinological and Otolological Society, Sioux City, Iowa, Jan. 19-20  
T. R. Gittins, Davidson Bldg., Sioux City, Iowa, Chairman  
Society of Surgeons of New Jersey, Newark, Jan. 28  
Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary  
Southern Section American Laryngological, Rhinological and Otolological Society, New Orleans, Jan. 14  
Dr. Francis E. LeJeune, Maison Blanche, New Orleans, Chairman  
Western Section American Laryngological, Rhinological and Otolological Society, Spokane, Wash., Jan. 29  
Dr. Frederic G. Sprunt, Medical Arts Bldg., Spokane, Wash., Chairman



## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

#### American Journal of Medical Jurisprudence, Boston

1 145 216 (Nov.) 1938

- Fingerprints—An Infallible Method of Identification J E Hoover Washington D C—p 145
- Psychiatry and the Criminal Law L S Colvane Detroit—p 152
- Mental Disorders in the Course of Bullet Wounds of the Brain Their Medicolegal Relationship M Rinkel Brookline Mass—p 157
- The Postmortem Examination in Homicides M Helsen New York—p 165
- \*Medicolegal Aspect of Carbon Monoxide Poisoning with Special Reference to Its Effect on the Heart H G Beck Baltimore—p 177
- A Neglected Phase of Medical Practice W G Moran Worcester Mass—p 182
- The Harrison Narcotic Act and the Practitioner H J Anslinger, Washington D C—p 184

**Medicolegal Aspect of Carbon Monoxide Poisoning**—Beck divides carbon monoxide poisoning into three groups: acute asphyxiation, acute asphyxiation with delayed or secondary symptoms and chronic poisoning. From a medicolegal standpoint the first group does not present a difficult problem, as death resulting from acute asphyxiation is either accidental or suicidal. The second and third groups arouse much controversy in adjusting claims for disability. In the second group the patient apparently recovers from acute asphyxiation, but in the course of several days to a week acute symptoms often of a severe character will develop, usually referable to the central nervous system or the heart. These cases ultimately manifest symptoms of encephalitis or other organic cerebral lesions or coronary thrombosis and myocardial insufficiency due to lesions caused by the anoxemia. The patients may die during the early stages of the sequels of acute poisoning or they may recover sufficiently to resume their accustomed occupation. Unfortunately, in the course of such a sequence of events carbon monoxide in its etiologic relations may be easily overlooked and the illness is ascribed to other causes. Thus, only by a careful history and a thorough knowledge of the underlying pathologic processes associated with anoxemia can the significance of carbon monoxide be ascertained definitely as a contributing factor. Many persons who live in houses or work in offices heated by open gas heaters without ventilating flues, or drive in closed automobiles with defective engines and exhausts, suffer from the daily exposure to sublethal or mildly noxious quantities of the gas. This constitutes the third group. The most familiar symptoms are those due to mere oxygen want. Even the milder forms of chronic carbon monoxide poisoning are subject to the same complications and sequelae as those occurring in acute asphyxiation. The symptoms and after-effects of a given blood saturation will be more severe if there has been a long exposure to a low concentration than if there has been a short exposure to a high concentration. When these facts become generally recognized by the profession, legal experts should have less difficulty in procuring workmen's compensation for disability incurred from carbon monoxide, especially after recovery from acute asphyxiation. The chapter on carbon monoxide poisoning in its relation to industrial medicine must be revised so as to incorporate the recent knowledge gained through clinical observation and experimental studies. The tendency to cause death and disability from the remote effect of acute poisoning and the chronic effect of slow but persistent poisoning must be more generally recognized. Not until this view is accepted by the profession and offered as testimony can industrial commissions or courts be expected to render just decisions for compensation.

#### American Journal of Public Health, New York

28 1269 1368 (Nov.) 1938

- Opportunities and Responsibilities of the Health Officer in Connection with the Federal Housing Acts C E A Winslow, New Haven, Conn—p 1269
- Administrative Control of Food Handlers and Places Dispensing Food and Drinks Katherine Marden, J M Curry L J Horowitz and B G Horning Hartford Conn—p 1277
- Projection of Public Health Engineering in New York State W H Larkin Middletown N Y—p 1285
- Time Study of Morbidity and Mortality in the United States Navy J M Wheelis Jr, Washington D C—p 1291
- Progress Under the Operation of Title VI of the Social Security Act C E Waller, Washington D C—p 1298
- \*Fleas as Vectors of Plague C R Eskey San Francisco—p 1305
- Tenure of Office for Health Officers J W Mountain and E H Pennell Washington D C—p 1311
- Population Growth—Its Vital Statistics and Public Health Aspects W S Thompson, Oxford Ohio—p 1319
- Practical Experience with Scherer Rapid Field Test for Pasteurization D M Roger New York—p 1325
- Health Maintenance in Industry C D Selby, Detroit—p 1328

**Fleas as Vectors of Plague**—Eskey points out that of twenty different species of fleas infected with plague in the laboratory only eleven species, nine of which were collected from wild rodents, transmitted the disease to guinea pigs, only a portion of fleas fed on plague infected guinea pigs a few hours before the animals died were infected, and of those infected only a small percentage transmitted the plague to other guinea pigs. Flea bites are not infectious until the masses formed by *Pasteurella pestis* cause obstruction of the esophagus. This condition may develop in a few days or not for more than four months. Few fleas ever infect more than one animal and blocked, infectious fleas generally die within forty-eight hours of the time there is evidence of obstruction to their stomachs. Infected fleas are constantly excreting virulent coccobacilli in their feces, which may survive for as long as four weeks in the dried excreta so that rodents are exposed to infection from the feces as well as the bites of fleas. There is always a possibility of human beings contracting bubonic plague from blocked fleas present on wild rodents in regions in which sylvatic plague exists, but these fleas are not nearly so dangerous to man as the domestic rat fleas *Xenopsylla cheopis*.

#### Annals of Internal Medicine, Lancaster, Pa

12 577 738 (Nov.) 1938

- \*Clinical and Experimental Observations on Focal Infection with an Analysis of 200 Cases of Rheumatoid Arthritis R L Cecil and D M Angevine New York—p 577
- Concerning Differentiation Between Bronchial Asthma versus Cardiac Disease and Possible Ill Effects from Administration of Excessive Amounts of Epinephrine in the Former Condition F M Smith and W D Paul Iowa City—p 585
- The Treatment of Liver Disease A M Snell Rochester Minn—p 592
- Congenital Malformations of the Pulmonic and Aortic Valves D W Ingham Rochester Minn—p 609
- Some of the Recent Biochemical Concepts of Gastric Secretion and Their Application to Clinical Medicine L Martin Baltimore—p 614
- Saccular Aneurysm of the Thoracic Aorta Clinical Study of 633 Cases R H Kampmeier Nashville Tenn—p 624
- \*Liver Function in Hyperthyroidism as Determined by the Hippuric Acid Test E C Bartels Boston—p 652
- Gonorrheal Endocarditis Report of Three Cases One Treated with Fever Therapy L H Hoyt and H A Warren Boston—p 675
- Buckling of the Right Common Carotid Artery in Hypertension R Arrillaga Torrens and B T Horton Rochester Minn—p 688
- Some Desirable Supplements to the Present Trends in Medical Investigation R I Lee Boston—p 692

**Focal Infection and Rheumatoid Arthritis**—In a study of 200 consecutive cases of rheumatoid arthritis, Cecil and Angevine found definite evidence of focal infection in 20 per cent and a questionable focus in 10 per cent. This is a great contrast to the high incidence of focal infection found in clinic patients ten years ago. Only nineteen patients had a history of an acute infection of the upper part of the respiratory tract such as coryza, pharyngitis or influenza preceding the onset of the arthritis. A smaller number of cases came on after psychic trauma, childbirth, puerperal fever, physical injury or operation. The tonsils had been removed in forty-six per cent of the cases because of arthritis, although only about 15 per cent gave any history of tonsillitis or sore throat. The operation had no effect on the course of the disease in eighty-six



cases, caused a severe exacerbation in two and temporary improvement in four. In no instance was the course of the disease arrested or the patient cured. In one instance the operation on infected tonsillar stumps appears to have been the precipitating cause of the onset of the arthritis. Because of arthritis fifty-two patients had had some, and in many instances all, of their teeth extracted. There was no benefit in forty-seven, and three patients reported a flare up of the pain in their joints following the extractions. Thirty patients gave a history of sinus disease and twelve had been treated for sinusitis before coming under the authors' observation. The treatment was of no benefit in ten and there was an exacerbation of the disease in two. When first seen by the authors, twenty-seven patients had an infection of the tonsils or remaining tonsillar stumps. Twenty of these patients were treated, thirteen remained unimproved or became worse and temporary improvement occurred in only seven. This improvement lasted from one week to several months. At the time of examination only eleven of the 200 patients gave evidence of an active sinus infection. Five of these cases were treated all without benefit. In the three cases in which additional dentistry was performed there was no benefit. The authors stress the fact that a more conservative attitude should prevail regarding the treatment of tonsils, teeth and sinuses in rheumatoid arthritis. A complete revision of the focal infection theory should be made. Undoubtedly there are cases of infectious arthritis which result from focal infection. However, as far as typical rheumatoid arthritis is concerned, chronic focal infection apparently plays a comparatively unimportant part.

**Liver Function in Hyperthyroidism.**—Bartels determined the hepatic function in 148 cases of clinical hyperthyroidism by the hippuric acid excretion test suggested by Quick. Seventy-eight patients had primary hyperthyroidism permitting a subtotal thyroidectomy, thirty-nine had primary hyperthyroidism requiring a two-stage operation, and thirty-one had adenomatous goiter with hyperthyroidism permitting a subtotal thyroidectomy. Hepatic function determinations were obtained on the day after admission, on the day prior to operation (from eight to fourteen days being taken for preoperative treatment) and on the sixth or seventh postoperative day. Tests were again performed on forty-two patients three months postoperatively when they returned for their metabolic check up. In the group of seventy-eight patients the average hippuric acid excretion on admission was found to be 2.3 Gm. The average admission basal metabolic rate was plus 36 per cent. Of the entire group only ten patients had determinations above the accepted normal of 3 Gm. After the usual preoperative period the average hippuric acid was 2.55 Gm and the average basal metabolism plus 22 per cent. Three months postoperatively the average basal metabolic rate was minus 3 per cent and the average hippuric acid excretion was 3.34 Gm, with 85 per cent of twenty patients now having normal excretions. In the group of thirty-nine patients the average basal metabolic rate was plus 54 per cent and the average hippuric acid excretion 1.88 Gm. Only one patient had a normal value for the hippuric acid excretion. Preoperatively to the first stage the basal metabolic rate fell to an average of plus 36 per cent and the average hippuric acid excretion increased to 2.33 Gm. Postoperatively a slight drop occurred in the average hippuric acid excretion. At the time of the second stage the average basal metabolic rate was plus 21 per cent with the average hippuric acid excretion 2.51 Gm. Postoperatively the average hippuric acid excretion was 2.66 Gm. At the three months check up the average basal metabolism was minus 7 per cent in sixteen patients with the average hippuric acid excretion 3.12 Gm, at which time 77 per cent had normal determinations. In the thirty-one cases of adenomatous goiter with hyperthyroidism the average basal metabolic rate on admission was plus 36 per cent and the average hippuric acid excretion 2.27 Gm (only seven normal). Postoperatively the hippuric acid excretion was 2.36 Gm, with 16 per cent of the cases being normal. At the three months check up an average metabolic rate of minus 5 per cent and a hippuric acid excretion of 3.34 Gm was obtained in six patients. A close relationship seems to exist between the level of the basal metabolism and the hippuric acid excretion. The duration of the hyperthyroidism

was not a potent factor in determining the degree of reduced hepatic function. Patients having acute hyperthyroidism were found to develop degrees of impairment of the liver in a few months, whereas patients with milder types showed little change even over a period of years. This observation is corroborated by the fact that, whereas the average duration of the disease in the group of cases of primary hyperthyroidism in which a subtotal thyroidectomy was done was ten months and in the group of adenomatous goiters twenty-one months, the hippuric acid excretion in these two groups was found to be the same. The absence of weight loss or a history of previous iodine administration was usually noted in conjunction with a normal hepatic function test on admission. No apparent relationship was demonstrated between the level of the liver function and the degree of postoperative pulse and temperature response. A close relationship was found to exist between the blood cholesterol and the hippuric acid excretion. The use of a high carbohydrate diet apparently improved hepatic function as indicated by increased hippuric acid excretion.

## Archives of Surgery, Chicago

77 865 1064 (Dec.) 1938

- Cranial Venous Sinuses. Correlation Between Roentgenograms of Occipital Bone and the Queckenstedt (Tobey-Ayer) Test. B. Woodhall, Durham, N. C., and A. F. Seeds, Portland, Ore.—p. 865
- Evolution of Treatment of Fracture of Neck of Femur. P. Cordasco, Montclair, N. J.—p. 871
- Arterial Occlusion with Aseptic Necrosis of Bone. E. F. Hirsch, Chicago—p. 926
- Adherent Posterior Duodenal Ulcer. J. W. Hinton, New York—p. 944
- Stereocephalic Teratoma in the Adult. Report of Case. J. G. Love and F. P. Moersch, Rochester, Minn.—p. 949
- \*Sterilization of the Air in the Operating Room by Bactericidal Radiation. Results in Over 800 Operations. D. Hart, Durham, N. C.—p. 956
- End Results in Cases of Fibrosarcoma of Extremities. E. M. Bick, New York—p. 973
- Sensitization and Desensitization of Rabbits to Heteroplastic Transplants of Thyroid Tissue. J. D. Bisgard, Omaha—p. 981
- Atypical Carcinoma of the Large Intestine. J. Rabinovitch and M. Federer, Brooklyn—p. 994
- Ovarian Tumors and Diagnosis of Acute Appendicitis. P. Bernstein, New York—p. 1004
- \*A New Surgical Mask. Bacteriologic Air Filter. L. Arnold, Chicago—p. 1008
- Solitary Xanthoma (Lipoid Granulomatosis) of Bone. M. S. Burman and S. E. Sinberg, New York—p. 1017
- Sixty-Seventh Report of Progress in Orthopedic Surgery. J. G. Kubas, S. M. Roberts, R. J. Joplin, W. A. Elhston, F. W. Ilfeld, G. G. Bailey, Boston; J. A. Freiberg, Cincinnati, and J. E. Milgram, New York—p. 1033

**Sterilization of Air in Operating Room.**—Hart analyzes the results obtained in a total of 456 clean primary incisions and eighty-six reopened clean incisions out of more than 800 operations performed in a field of bactericidal radiation. The other operations had a potential source of infection, and data on them were not used for the statistics. The operations were gastric or intestinal resections, cholecystectomies, appendectomies and amputations of gangrenous extremities. A striking improvement in the postoperative course of these patients has been evident. Unexplained infections in primary incisions have been almost, if not entirely, eliminated. More striking than this reduction in the number of infections has been the reduction in the elevation of temperature following operation and the shortening of the duration of this postoperative elevation. The postoperative course of the patients has been improved. They show less reaction in every way, there is less tenderness in the incision, and the period of convalescence is reduced. The author concludes that postoperative wound infections have been reduced more than 85 per cent. The occasional death from wound infection has been eliminated. The number of patients with a postoperative temperature above 100.4 F has been reduced in thoracoplasties from 68 to 30 per cent, in radical mastectomies from 46 to 34 per cent and in inguinal herniorrhaphies from 36 to 22 per cent. The number of patients with a temperature above 99.5 F for more than four days after operation has been decreased in thoracoplasties from 78 to 22 per cent, in radical mastectomies from 54 to 21 per cent and in inguinal herniorrhaphies from 46 to 14 per cent.

**New Surgical Mask.**—Arnold found that a craped wadding (cellucotton) made of wood cellulose is an efficient mask and air filter material. This material is more effective, as bacteria

are prone to adhere to it even after washing, than the cotton gauze generally used in surgical masks. The greatest source of oral bacterial flora in the experiments that he performed was escape or deflection of the expelled air during talking, above the mask laterally to and on each side of the nose. Covering the nose and mouth with an impermeable material deflects the expired air all round the edges of the mask, and the atmospheric pollution is the same as if no mask were worn. The problem is one of prevention of atmospheric pollution by filtration, similar to removal of bacterial pollution from water by filtration methods. The author feels that his experiments show the effectiveness of cellulocotton as an air filter. The next problem is to prevent air containing bacterial flora of the upper part of the respiratory tract from leaking round the edges of the mask. He is convinced that if all the expired air can be forced through the cellulose wadding filter the bacteria will remain on the cellulose fibers.

### Florida Medical Association Journal, Jacksonville

25 213 264 (Nov.) 1938

- Prefrontal Lobotomy in Involuntal Melancholia J G Lyerly Jacksonville—p 225  
Insulin Shock Therapy at Florida State Hospital A L Huskey Chattahoochee—p 229  
Acute Conditions Within the Abdomen R D Ferguson Ocala—p 233  
Complications Following Cauterization of the Cervix J M Dell Jr Gainesville—p 237  
Appendicitis J D Hagood Clearwater—p 239

### Georgia Medical Association Journal, Atlanta

27 419 460 (Nov.) 1938

- Mortality and Treatment of Lobar Pneumonia J D Gray and M C Fulton Augusta—p 419  
Serum Treatment of Pneumococcal Pneumonia T L Ross Macon—p 421  
Surgical Treatment of Empyema C H Richardson Macon—p 423  
Clinical Observations of Use of Sulfanilamide R M Harbin Jr, Rome—p 429  
Arthritis in Syphilis J S New and J W Brittingham Augusta—p 435  
Gradenigo Symptom Complex Case Report J A Smith Macon—p 437  
Neglected Case of Arthritis Report of Case T Toepel Atlanta—p 438  
Cardiospasm D T Carr Atlanta and P P Vinson Richmond Va—p 440  
Chronic Undermining Ulcers Case Report C R Andrews Jr Canton—p 446

### Journal of Allergy, St Louis

10 1104 (Nov.) 1938

- \*Studies on Immunology of Hay Fever A Confirmation of Blocking Substance Formation by Pollen Treatment B Use of Lyophilic Serum in Study and Treatment P H Langner Jr and R A Kern Philadelphia—p 1  
Vitamin C Deficiency Sensitivity to Neorphenamine and Anaphylactic Shock M B Cohen Cleveland—p 15  
Preservation of Reaginogenic Serum by Lyophilization L Tuft L J Wenger and J J Frankel Philadelphia—p 27  
Fractionation of Skin Sensitizing Serum by Means of Neutralization and Dilution V L Cohen Buffalo—p 32  
Effect of Testicular Extract (Reynolds Spreading Factors) on Human Skin A Romanoff New York—p 36  
Incidence of Air Borne Fungus Spores II Hormodendrum Alternaria and Rust Spores O C Durham Chicago—p 40  
\*Sighing Dyspnea Clinical Syndrome C K Maytum Rochester Minn—p 50  
May Fly as an Exciting Cause of Seasonal Allergic Coryza and Asthma S J Parlato Buffalo—p 56

**Immunology of Hay Fever**—Langner and Kern confirm, by means of the intracutaneous passive transfer technic, the presence of an inhibiting substance (blocking or inhibiting antibody) in the serum of treated hay fever patients and report observations on the passive transfer of this inhibiting substance to untreated hay fever patients by means of "immune" serum that, for convenience of handling and preservation, has been lyophilized. Dried serum of hay fever patients treated with specific pollen extract was found to contain the blocking substance first described by Cooke and his associates. Treatment of patients with active hay fever by means of dried immune serum gave results sufficiently encouraging to warrant further application and refinement of this procedure as an additional method of treatment for selected cases of hay fever.

**Sighing Dyspnea**—Maytum declares that sighing respiration is a normal reaction to fatigue and mild emotional states, yet it is possible for sighing respiration to assume considerable

clinical importance and to produce a definite clinical syndrome. The condition is a functional disorder. This syndrome has not infrequently been mistaken for asthma and some patients with this syndrome have been submitted to extensive allergic investigation. In 1929 White and Hahn reported that it was a very rare symptom in heart disease and that when it was present it was not due to the heart disease but to nervous excitability. "Shortness of breath" or the inability to take a deep breath is the chief symptom of the patients. A feeling of constriction, tightness, weight or pain is usually present in the thorax, and palpitation is a frequent symptom. Fatigue and nervousness are common, and many of the patients have recently been subjected to some nervous shock or to cares and worries of considerable magnitude. Anxiety regarding their state of health is almost always present. Sighing dyspnea occurs more often among women than among men, and it usually occurs in the more active years of life. Sighing dyspnea is definitely a functional disorder of respiration and is not caused by organic disease. Treatment in these cases is based entirely on an adequate explanation to the patient of the underlying mechanism and the method by which attacks are produced. It should be explained as a normal reaction to fatigue and emotional stress. Sedatives may help to control existing nervous irritability. Hyperventilation tetany, if present, can be controlled in a few minutes by the administration of carbon dioxide. It is also helpful to demonstrate how easy it is for the patient to bring on an attack of tetany by voluntary overbreathing.

### Journal of Lab and Clinical Medicine, St Louis

24 111 224 (Nov.) 1938 Partial Index

- Plethysmographic Studies with Special Reference to Waves of Respiration S J Martin F S Marcellus and P Sykowski Albany, N Y—p 111  
Neutropenia Following Sulfanilamide Report of Case H W Jones and C P Miller Chicago—p 121  
\*Diagnosis of Hypertensive Cardiovascular Disease Without Hypertension Note E H Schwab and D L Curb Galveston Texas—p 125  
Nature of Anti Pernicious Anemia Principle IV Search for Nitrogenous Bases Isolation of Choline H R Jacobs Chicago—p 128  
\*Studies on Mechanism of Leukocytosis A Nettleship Nashville Tenn—p 130  
Achlorhydria in Leukemia O O Meyer Madison Wis—p 135  
Effect of Heat on Hemolytic and Skin Necrotizing Factors in Staphylococcus Toxin R H Rigdon Nashville Tenn—p 142  
Correlation of Histologic Structure with Clinical Features II Case of Malignant Neoplasms O C Gruner Montreal—p 152  
Toxicity Therapeutic Activity and Mode of Action of Sulfanilamide in Experimental Streptococcal Infections of Rabbits J A Kolmer H Brown and Anna M Rule Philadelphia with assistance of Mary F Werner—p 164  
Rapid and Simplified Method of Extracting Urinary Erogen S L Leiboff and A B Tamis New York—p 178  
Stability of Kline Antigen Emulsions E L Breazeale and R A Greene Tucson Ariz—p 181  
Complement Fixation Test in Chancroidal Infection E S Sanderson R B Greenblatt and Elizabeth Baethke Augusta Ga—p 185  
Triaxial Correlation of Hematologic Indexes Its Significance in Classification and Treatment of Anemias K Kato Chicago—p 191  
Note on Some Presumptive Tests for Bence Jones Protein G M Decherd Jr and K L Dickens New Orleans—p 210  
\*Comparative Study of Laughlin Test for Syphilis R O Muether and J E Greutter St Louis—p 212

**Cardiovascular Disease Without Hypertension**—Schwab and Curb subjected seven patients with established hypertensive cardiovascular disease whose blood pressure had fallen to normal or subnormal levels to the cold pressor test and observed the blood pressure response. In five instances the typical hypertensive type of response was obtained. This suggests that the application of such a procedure to patients of this type would materially aid in the clarification of the etiologic cardiac diagnosis.

**Leukocytosis**—Nettleship tested, in rabbits, two of the possible causes of leukocytosis: withdrawal of leukocytes from the blood stream or the presence of an irritant in the blood. The withdrawal of leukocytes, either by venipuncture or into an abscess area, cannot account for leukocytosis. In acute experiments silver nitrate injected intracutaneously cannot be found in the blood or internal organs. It is recovered in large amounts from the area of injection. Silver nitrate injected intracutaneously causes necrosis accompanied by a primary leukopenia followed by marked polymorphonuclear leukocytosis. Egg albumin injected into nonsensitized animals diffuses from the

injection site and causes a leukopenia. Injected into sensitized animals, egg albumin does not diffuse into the blood stream. Peripheral necrosis occurs with a concurrent well defined leukocytosis.

**Laughlin Test for Syphilis**—Muether and Greutter compared the efficiency of the Laughlin test for syphilis by performing this test and the Kahn and Kline tests on 1,000 serums. The Kahn test was the most accurate test in their hands, giving only one false positive reaction and two false negative reactions in 1,000 cases. The accuracy of the Laughlin test increased with experience. If 1,000 cases are divided into two groups it is found that nineteen, or about 80 per cent, of the false positive tests fall in the first 500 cases tested while eight or about 55.5 per cent, of false negatives occurred in the first 500 cases. These analyses of the cases, as two groups, strengthen the authors' belief that the Laughlin test is quite accurate in untreated cases but is more readily reversed by treatment than are other tests. The Laughlin test is a clean, quick and economical test, with a fairly definite end point. The ability to determine the strength of the reaction on the basis of a time factor rather than on a quantitative basis is a distinct advantage, as there seems to be little reason to report any serologic test for syphilis by a series of plus signs. The test for syphilis is far better reported as negative, positive or doubtful. The Laughlin test requires a certain skill and training and it is not a test to be used casually in general practice. It might well be used by the large laboratories in which suitable controls can and will be done frequently.

### Journal of Pharmacology & Exper Therap, Baltimore

61 243 354 (Nov.) 1938 Partial Index

- Action of Ergometrine on Isolated Human Uterus A. D. McLaughlin, Toronto—p. 243  
Renal Excretion of Sulfanilamide in Dogs D. F. Green, J. B. Allison, New Brunswick, N. J. and M. I. Morris, Stelton, N. J.—p. 263  
Oxygen and Carbon Dioxide Changes in Arterial and Venous Blood in Experimental Spinal Anesthesia: Remarks on Choice of Blood Anesthetics for Blood Gas Studies S. J. G. Nowak and Virginia Downing, Boston—p. 271  
Inactivation and Elimination of Picrotoxin J. M. Dille, Seattle—p. 319  
Cardiac Depression by Barbituric Acid Derivatives: Study of Relative Antidotal Action of Certain Cardiac Stimulants R. I. Johnston, Cincinnati—p. 330

### Journal of Urology, Baltimore

10 551 736 (Nov.) 1938 Partial Index

- Hydronephrosis of Infancy and Childhood: Report of Case Followed for Twelve Years H. M. Spence, S. S. Baird and P. F. Luecke, Dallas, Texas—p. 577  
Renal Neoplasm, Clinical Study H. A. Fowler, Washington, D. C.—p. 581  
\*Vesical Bilharziasis: Case Report D. A. Campbell, Ann Arbor, Mich.—p. 598  
Radical Therapy of Bladder Carcinoma—Five Year Results—Failures—Future Therapy B. S. Barringer, New York—p. 606  
Studies on Cystocele and Urinary Incontinence in the Female by Use of Cystograms and Urethrograms J. D. Miller, Grand Rapids, Mich.—p. 612  
Sarcoma of Prostate and Adjacent Retrovesical Structures E. Hess, Erie, Pa.—p. 629  
\*Histologic Study of Effect of Sex Hormones on the Human Prostate R. A. Moore and A. M. McLellan, New York—p. 641  
Use of Diothane Hydrochloride in Urologic Cases J. W. Ferrin, Chicago—p. 666  
Comparison of Colloidal Protective Values of Urines from "Stone Formers and Normal Urines C. Ferguson, Stapleton, N. Y.—p. 672  
Sulfanilamide in Clinical Gonorrhea: Study of Sixty Cases H. Schoenrich, Baltimore—p. 684  
Studies in Use of Sulfanilamide in Gonorrhea: I. Experimental Observations S. A. Vest, Justina H. Hill, H. C. Harrill and Anne C. Pitts, Baltimore—p. 698  
Id. II. Clinical Observations S. A. Vest, H. C. Harrill, Justina H. Hill and Anne C. Pitts, Baltimore—p. 716

**Vesical Bilharziasis**—Campbell discusses the bilharzial involvement of the lower part of the urinary tract and reports a case of approximately twenty years' duration. In spite of the extensive involvement of the bladder and lower part of the right ureter, and long duration of the disease, remarkable results were obtained with the use of two courses of intravenous fuadin.

**Effect of Hormones on Prostate**—Moore and McLellan studied microscopically the response on surgically enucleated prostatic tissue in ten presenile men, five after the injection of an androgen and five after the injection of an estrogen. The

testosterone propionate and the theclol benzoate were injected intramuscularly. Testosterone propionate, in from 285 to 1,125 mg doses for from twelve to ninety five days, the dose employed, had no significant effect on the prostatic epithelium or stroma. The failure to avert the physiologic process of senile involution by endocrine therapy indicates that senile involution of the prostate is not solely the result of diminution in secretion of androgens but involves a more complicated process, the nature of which must await further investigation. It is also possible that senile involution is an irreversible process. Either of these assumptions is valid despite the fact that the morphologic appearance of the prostate in senility and after castration is similar. The injection of from 15,000 to 140,000 international units of theclol benzoate in from ten to thirty-one days produced conspicuous alteration in the urethral and ductal epithelium but little if any change in the tissues of blem hypertrophy. As a basis for future work, an estrogen results in an exaggeration in the prostate of some of the most characteristic microscopic changes associated with benign hypertrophy: metaplasia and hyperplasia of the epithelium of the ducts and hypertrophy of the lymphoid tissue. On the negative side there is no evidence of the new formation of nodules and no evidence of the active growth of the formed nodules. The observed migration of leukocytes through the urethral and ductal epithelium after injections of an estrogen opens a new approach to the much disputed problem of chronic prostatitis. It may be that some of the cases of so called chronic prostatitis are the result of altered hormone states in which there is estrogenic preponderance.

### Kansas Medical Society Journal, Topeka

70 457 500 (Nov.) 1938

- Lung Abscess H. W. Palmer, Wichita—p. 157  
The Electrocardiograph: Its Value and Indications F. J. McEwen, Wichita—p. 462  
Gunshot Wound of the Head C. V. Black, Pratt—p. 464  
Surgery in the Diabetic C. Wilson, Emporia—p. 465  
Appendical Abscess Localized at Umbilicus M. A. Walker and G. R. Peters, Kansas City—p. 468  
\*Use of Cervicomic Acid in Treatment of Whooping Cough: Preliminary Report E. L. Vermillion and G. E. Stafford, Salina—p. 469

**Ascorbic Acid in Whooping Cough**—Vermillion and Stafford used ascorbic acid in the treatment of twenty six cases of whooping cough confirmed in most instances by a high leukocytosis and lymphocytosis. The first sixteen patients were given 15 mg tablets of ascorbic acid, ten tablets daily the first three days, eight tablets daily the next three days and six daily until symptoms subsided entirely. The medication seemed to be strikingly effective in relieving and checking the symptoms in all but two of the patients, who apparently received little if any relief. The authors' opinion is that ascorbic acid should be given further trial in all cases of whooping cough regardless of the age of the patient or the length of time already elapsed since the original symptoms.

### Maine Medical Journal, Portland

20 235 260 (Nov.) 1938

- \*Metropathia Haemorrhagica F. Albright, Boston—p. 235  
Painful Conditions of the Heel E. M. Tower, Waterville—p. 239

**Hemorrhagic Metropathia**—Albright stresses the fact that in the treatment of hemorrhagic metropathia emphasis should be placed on nonspecific therapy. The condition generally develops in the run down individual. Iron therapy should usually be employed, as anemia predisposes to the condition and the condition leads to an anemia. Attention to diet and general hygiene are most important. Underlying conditions such as foci of infection and tuberculosis should be looked for. Until more is known, massive doses of vitamins are justified. Radical therapy is not necessary. The alternative may be a drawn out and tedious affair, but the condition finally clears up in most of these patients. In most cases it is desirable to perform at least one curettage to confirm the diagnosis and to rule out uterine cancer. The periodic administration of progestin is a simple method of producing periodic menstruation and preventing endometrial hyperplasia until such time as the underlying disturbance in the ovarian cycle is corrected. It is not the purpose to correct the underlying trouble with this pro-

cedure but merely to take care of one of its complications. In carrying out this treatment at the Ovarian Dysfunction Clinic, the author has given in the neighborhood of 5 mg. of progesterone in oil intramuscularly daily for six days every six weeks. Gonadotropic substance often causes cessation of bleeding in hemorrhagic metropathia and not too infrequently completely corrects the condition. The follicle stimulating hormone either alone or with the gonadotropic substance can be tried in an effort to produce a corpus luteum.

### New England Journal of Medicine, Boston

219 777 818 (Nov. 17) 1938

- Surgical Significance of Urinary Incontinence in Infants and Children T H Inman and J H Moore Boston—p 777  
Seasonal Aspects of Asthma and Hay Fever in New England with Special Reference to Sensitivity to Mold Spores H N Pratt Boston—p 782  
\*Observations on Sulfanilamide Therapy in Pneumonia and Meningitis Due to Type III Pneumococci J F Sadusk Jr New Haven Conn—p 787  
Medicolegal Aspects of Diabetes Mellitus and Hyperinsulinism S Warren Boston—p 791  
Paraganglioma (Chromaffinoma Pheochromocytoma) of Adrenal Gland Simulating Malignant Hypertension Report of Case R S Palmer and B Castleman Boston—p 793  
Acute Brucellosis with Bacteremia and Oral Lesions Treatment with Immune Human Blood Mary A Poston and E E Menefee Durham N C—p 796  
Progressive Electrocardiographic Changes in Pericarditis C P Roberts and F T Fulton Providence R I—p 798

219 819 864 (Nov. 24) 1938

- Henry Pickering Bowditch and Development of the Harvard Laboratory of Physiology F W Ellis Newton Centre Mass—p 819  
Primary Cancer of the Lung D S King Brookline Mass—p 828  
The Problem of Syphilis on Wards of a Large General Hospital H H Merritt and M Moore Boston—p 834  
Unexpected Death in Early Life S Farber Boston—p 836  
Treatment of Dangerous Reactions to Novocain S Gilman Boston—p 841  
Practical Aspects of Child Guidance Critical Analysis of 500 Cases C Stein Palmer, Mass—p 844

**Sulfanilamide in Pneumonia and Meningitis**—Sadusk reports two fatal cases of type III pneumococcus meningitis treated with sulfanilamide. The blood cultures in both were positive but became sterile following sulfanilamide therapy, although both patients died. In one case the spinal fluid also became sterile. Nine patients of 53 years of age or more, save one who was 18 with type III pneumococcus pneumonia, were treated with sulfanilamide. All the nine patients recovered and were discharged from the hospital in good condition. The further use of sulfanilamide in type III pneumococcus infections, until more data can be obtained for analysis, is suggested.

### New Jersey Medical Society Journal, Trenton

35 649 708 (Nov.) 1938

- Diagnosis and Treatment of Some Common Skin Conditions in Children B M James Newark—p 653  
Peripheral Arterial Disease W A Steel Philadelphia—p 659  
Skull Fracture in the Chronic Epileptic Its Effect on Frequency of Convulsions M Scott Philadelphia—p 664  
\*Rocky Mountain Spotted Fever C A Pons S C De Pons and W A Sweet Asbury Park—p 666  
Cerebral Hemorrhage in the Newborn Maternal Welfare Article Number Thirty One W Shanik Asbury Park—p 671

**Rocky Mountain Spotted Fever**—Pons and his associates cite seven cases of Rocky Mountain spotted fever from Monmouth County. All the patients contracted the infection in the locality. Six additional cases in which Rocky Mountain spotted fever was suspected were eliminated on the basis of a single negative Weil-Felix reaction. There is reason to believe that with repeated agglutination tests and animal inoculations the diagnosis of the disease might have been confirmed in some. Unless the clinicians become thoroughly familiar with the disease and insist on more corroborative laboratory data, cases of typhus and Rocky Mountain spotted fever are going to be misdiagnosed. As in typhoid, the agglutination test may be positive in the absence of infection, and conversely it may be negative in the presence of infection. Rocky Mountain spotted fever is such a clearcut clinical entity that the diagnosis on purely clinical manifestations is justifiable under some circumstances.

### New York State Journal of Medicine, New York

38 1427 1484 (Nov. 15) 1938

- The Doctor at the Crossroads N B Van Etten, New York—p 1427  
Problems in Kidney Pathology A Plaut New York—p 1432  
Acute Lymphatic Leukemia Report of Case Showing Unusual Number of Monocytes H C Thompson Jr Albany—p 1437  
Clinical Evidence for Cerebral Vasomotor Changes F Kennedy, S B Wortis and H Wortis New York—p 1441  
Hyperparathyroidism Results Obtained Through Early Diagnosis and Treatment C J Handron Troy—p 1449  
Childhood Pneumonia Complications and Mortality C J Leslie New York—p 1454  
The Future of the Hospitals E H L Corwin, New York—p 1458  
\*Benzedrine Sulfate and Cigaretts Effect on Skin Surface Temperature C Sland New York—p 1462  
Chronic Tetany with Characteristic Roentgen Ray Findings W B Rawls New York—p 1464

**Amphetamine Sulfate and Cigaretts**—Saland gave three patients with parkinsonian postencephalitis and four arteriosclerotic patients amphetamine sulfate. This caused a rise in the systolic blood pressure in all cases, a slowing of the pulse in five and a drop in the cutaneous surface temperature in six. Readings of the cutaneous surface temperature were taken following the smoking of cigarette in sixteen cases—three parkinsonian, four arteriosclerotic, four thrombo-angitis obliterans and five normal subjects. In none of these subjects, was there any consistent effect produced on the cutaneous surface temperature.

### Southern Surgeon, Atlanta, Ga

7 489 586 (Dec.) 1938

- \*Studies of Adrenals by X Rays in Adrenal-Genital Syndromes G F Cahill New York—p 489  
Advantages of Perineal Urethrotomy in Prostatic Resection R M Nesbit Ann Arbor Mich—p 501  
Some Considerations on Wound Healing W D Gatch Indianapolis—p 505  
Sudden Occlusion of the Brachial Artery Case Report E Boling Atlanta Ga—p 517  
Brun Abscess with Gross Rupture into the Lateral Ventricle J E J King New York—p 521  
Operating Room Diagnosis of Uterine Bleeding A E Hertzler Halstead Kan—p 541  
Management of Complicated Fractures of the Forearm W B Owen Louisville Ky—p 554

**The Adrenals in Adrenal-Genital Syndromes**—For the differential diagnosis between adrenal-genital syndromes with and without tumors, Cahill presents a method of visualizing the adrenal by x-ray. He uses a modified method of Carelli. With the patient on his side and a pillow under the opposite flank, the upper flank is sterilized. An area below the twelfth rib and between the outer border of the erector spinae muscle and the reflection of the peritoneum is injected with a dermal bleb of procaine hydrochloride and the subcutaneous tract is injected. A lumbar puncture needle is then introduced and as it passes through the transversalis fascia a change of resistance is noted and it enters the perirenal fascia. The needle is aspirated to assure avoidance of a blood vessel and is then attached to a sterile tube with a sterile cotton filter and an inflatable rubber bag. From 250 and 500 cc of air is slowly forced by hand through the cotton and needle into the perirenal fascia. A deep sense of fullness by the patient in the flank is assurance that the proper planes have been reached. A roentgenogram is taken and the air is localized. It may be displaced upward by manual pressure or by a rowing motion as described by Mencher. The air slowly diffuses, and series of roentgenograms are taken for twenty-four hours. The air may pass up through the mediastinum to the neck or may descend down the psoas to the thigh, and it takes from six to ten days to absorb. The value of such a procedure can be estimated only after its use in a considerable number of cases. Of fifty-seven cases of either adrenal cortical tumor or of the adrenal-genital syndrome, bilateral "airograms" were taken in fifty-five. The procedure has also been used in other adrenal conditions and for various obscure renal and abdominal conditions in more than 130 cases. Of the fifty-five cases in which airograms were taken there were seven males and forty-eight females. Among the seven males was an adult without demonstrable endocrine symptoms who showed a rounded shadow in front of the left kidney and apparently connected with the lower end of a long thin adrenal. The tumors causing these shadows were confirmed at operation. There were two children both with *macrogenitosomia praecox*,

average figure is from five to six times lower than that of normal subjects and every patient in whom active epidemic dropsy was diagnosed showed this lowered output. The urinary output of chlorides was also definitely lower in these patients. Obviously the patients are retaining a portion of the ingested salt, as many of the patients were taking the same diet as they had taken before they were attacked by this disease. The retention of chlorides is further proved by the fact that the concentration of chlorides in blood was increased during an attack of the disease. It is advisable, therefore, to decrease the amount of salt taken with the diet, in cases of epidemic dropsy. In the two cases in which the calcium excretions were examined they were found to be 225 and 172 mg per hundred cubic centimeters of the urine respectively. These values are small even when compared with the lowest values (61 mg) recorded for normal Bengalee subjects.

### Irish Journal of Medical Science, Dublin

No 151 615 692 (Oct.) 1938

- Michael Chaney, M.D. (Blind Actor and Playwright) T. P. C. Kirkpatrick—p. 645  
Cyclopropane Anesthesia V. J. Keating—p. 664  
Cancer of the Colon S. Pringle—p. 669  
Radiology of Gastrointestinal Tract (Value of Cooperation) S. J. Boland—p. 670  
Recent Trends in Treatment of Diabetes Mellitus S. C. Werch—p. 674

### Journal of Mental Science, London

81 893 1146 (Nov.) 1938

- Diagnosis and Prognosis in Psychiatry Follow Up Study of Results of Short Term General Hospital Therapy of Psychiatric Cases J. H. Masserman and H. T. Carmichael—p. 893  
Studies on the Brain Phosphatases H. H. Fleischacker—p. 917  
Observations on 200 Dartmoor Convicts J. J. Lander—p. 960  
The Iron Content of the Human Brain H. A. H. Finkes—p. 980  
Psychopathy and Psychoses Associated with Alcohol I. Minski—p. 985  
Medial Luminal Prolonged Narcosis R. S. Wilson and S. W. Gillman—p. 991  
Agenesis of the Corpus Callosum J. S. Lloyd and J. N. Jacobson—p. 995  
\*Cardiac Complications in Cardiazol Treatment Observations in Four Cases A. Dick and W. McAdam—p. 999  
\*Mechanism of Cardiazol Convulsion J. A. F. Denysen and D. J. Watterson—p. 1002  
Methods of Estimating Intelligence and Personality and Their Applications J. M. Blackburn—p. 1008

**Cardiac Complications from Metrazol**—In the course of using metrazol in the treatment of twenty nine cases of mental disorders Dick and McAdam observed auricular fibrillation in three and temporary heart block in one. However all the patients treated had healthy hearts at the beginning of treatment.

**Mechanism of Metrazol Convulsion**—From their experimental results on thirty-two patients undergoing or about to undergo metrazol convulsions, it appears to Denysen and Watterson that the effects of metrazol on the circulation occur solely through the vasomotor center. The chief of these effects is vasoconstriction. Experiments with amyl nitrite and histamine demonstrate that vasodilatation antagonizes the action of metrazol, as under appropriate conditions it prevents the convulsion from occurring. The conclusion is that the convulsion itself is due to a vascular spasm.

### Journal of Physiology, London

91 187 280 (Nov. 14) 1938

- \* Liberation of Histamine and Formation of Lysocithin like Substances by Cobra Venom W. Feldberg and C. H. Kellaway—p. 187  
A New Arrangement for Registration of Diaphragm Movements R. Meier and R. Muller—p. 227  
Formation of Lysocithin and of Muscle Stimulating Substance by Snake Venoms W. Feldberg, H. F. Holden and C. H. Kellaway—p. 232  
Effects of Cabbage Extracts on Carbohydrate Metabolism A. D. Macdonald and L. Wislicki—p. 249  
Time of Functional Closure of Foramen Ovale in the Lamb A. E. Barclay and K. J. Franklin—p. 256  
Suprarenals and Transmission of Activity of Sympathetic Nerves of the Cat J. Secker—p. 259

### Lancet, London

2 1095 1150 (Nov. 12) 1938

- Chemotherapy of Bacterial Infections L. Whitby—p. 1095  
Pulmonary New Growths Pathology, Diagnosis and Treatment R. C. Brock—p. 1103  
Relief of Pain in Laryngeal Tuberculosis, with Special Reference to Ionization V. Cotton Cornwall—p. 1109  
Analysis of the Normal QRS Deflection A. Hill—p. 1110  
Nitrous Oxide in Midwifery New Machine J. E. Elam—p. 1113

### Archives des Maladies du Cœur, Paris

31 985 1178 (Oct.) 1938

- Double Stellectomy in Angina Pectoris Result After Nine and One Half Years R. Ierliche and R. Fontaine—p. 985  
Phlebitis of Extremities with Gangrene Audier and Haimovici—p. 992  
Influence of Acute Coronary Thrombosis on Electrocardiogram of Brachioflex R. Fischer—p. 997  
\* Gonococcic Endocarditis Clinical Study in Course of Two Observed Cases A. Gelbfisz and Zera—p. 1010  
Arterial Occlusion After Intravenous Injection A. A. Boon and G. A. Lindenboom—p. 1019  
Constancy of Mean Arterial Pressure I. D. Klimentko—p. 1073

**Gonococcic Endocarditis**—After reviewing the literature on gonococcic endocarditis, Gelbfisz and Zera discuss the localization and the pathologic anatomy. Then they report the clinical histories of two cases. In both of these the acute endocarditis coincided with gonococic urethritis, but the gonococic endocarditis was at no time accompanied by articular symptoms. These facts seem to be in disagreement with the opinion that arthropathy is the most frequent complication of gonorrhea. In both cases the intermittent type of temperature was maintained throughout the entire duration of the disease, and the disorder had a malignant aspect with an acute and rapid course, it resisted all attempts at treatment. The symptoms of the endocardial localization appeared in the two patients only during the last period of the disease. The valvular lesions consisted of characteristic polypous vegetations. Taking into consideration their own observations and those reported by others, the authors stress the following points: 1 In the course of gonorrhea, cardiovascular complications may develop which, if localized in the heart, usually attack the valves (gonococcic endocarditis). Involvement of the myocardium and of the pericardium is rare. 2 The endocardial manifestations may develop unexpectedly in the course of articular attacks or in the absence of articular complications. 3 Their course is usually malignant and becomes manifest in a grave septicemic syndrome with fatal evolution. More rarely the evolution is benign and results in chronic valvular defects. 4 The anatomopathologic lesions observed most frequently by all authors are polypous proliferations on the endocardium (polypous endocarditis). 5 The ages of the patients differ greatly (from 19 to 65 years). 6 The time which elapses between the gonococcic infection and the appearance of the endocarditis varies between three weeks and fourteen years. 7 The evolution of gonococcic endocarditis extends over a period of from ten days to thirteen weeks, but one author (Kawachi) observed a case which lasted two years. The authors emphasize that, in cases of endocarditis of obscure origin, gonococcic endocarditis should be thought of.

### Bruxelles-Medical, Brussels

10 71 107 (Nov. 20) 1938

- Treatment of Adnexitis by Anesthetic Blockage C. Daniel—p. 71  
\* Prophylactic Treatment of Urinary Lithiasis E. Tant—p. 74  
\* Investigations on Fixation of Gonadotropic Hormones in Serum of Normal Pregnant Women and in Those with Hyperemesis G. Iegrand—p. 84

**Prophylactic Treatment of Urinary Lithiasis**—Tant shows that in order to arrive at an effective prophylactic treatment of urinary lithiasis it is necessary to take into account the three chief causes of this disorder. The first of these is the deposit of an excess of urinary substances. This excess can be provoked by foods or else it may be due to a defective metabolism. The second cause is the excessive precipitation in the urine under the influence of the urinary  $pH$ . The third cause is local and is probably associated with a chronic irritation of the urinary passages which provokes the crystalline precipitation and the formation of calculous concretions. In view of these three causal factors, the prophylactic treatment must aim to diminish the excessive urinary deposits, it must bring the urinary  $pH$  into a zone where precipitations cannot be produced and it must dissolve and eliminate the uric acid that has been retained in the organism. To reduce excessive urinary deposits, it is necessary to avoid certain foods. The author gives tables indicating the purine and oxalic acid contents of various foods. He then lists the foods that may be taken and those which have to be avoided by patients who are

subject to the formation of urinary calculi. Regarding the role assumed by the  $pH$  of the urine in the formation of urinary calculi, he says that uric acid precipitates in the urine when the  $pH$  is below 5.7. For this reason it is important for persons with a tendency to urinary lithiasis that the  $pH$  of their urine is always kept above 5.7. A vegetarian diet has a tendency to raise the  $pH$ . However, if the  $pH$  values rise above 6.6 or 6.8, phosphatic calculi may be formed. This shows clearly that the  $pH$  of the urine of patients with lithiasis must be kept under constant control. The dietetic restrictions alone are not sufficient; they must be complemented by other hygienic measures such as exercise in the open air. Violent exercises and physical fatigue should be prevented, however. Rest and meals should be taken at regular hours. Constipation is to be avoided. Discussing the medicinal treatment, the author says that it must aim to maintain an alkaline reaction in the urine and to render soluble and eliminate the uric acid accumulated in the organism. He suggests that acidity might be counteracted with sodium bicarbonate. The elimination of the uric acid is facilitated by an abundant diuresis. Since many patients with urinary lithiasis are subject to oliguria, the physician should prescribe a definite amount of fluid that is to be taken by the patient. To facilitate abundant diuresis he recommends that patients be given two large glasses of certain mineral waters half an hour before rising in the morning. Between meals the patient should also take mineral waters or a diuretic infusion. Further the author discusses the use of alkaline salts, of acid medication, of lithium salts, of salicylic acid, of methenamine, of piperazin, of cinchophen and finally of vitamin A.

**Gonadotropic Hormone in Serum of Normal Pregnancy and During Hyperemesis**—Legrand demonstrates that in the course of normal pregnancy the gonadotropic hormone is absorbed by the proteins of the maternal blood serum. However, in women with hyperemesis gravidarum there exists, in addition to this absorbed hormone, a large quantity of hormone which is not absorbed by the serum albumins but is free. The presence of this nonabsorbed hormone seems to be related to the development of the symptoms of hyperemesis gravidarum. The author reports the clinical histories of two women with hyperemesis gravidarum. The serum of these women contained large quantities of free gonadotropic hormone.

### Gynécologie et Obstétrique, Paris

38 241 320 (Oct.) 1938 Partial Index

\*Hemorrhagic Pachysalpingitis H. Paucot and H. Bedrine—p. 241  
Colposcopy and Early Diagnosis of Cancer of Cervix Uteri C. Waegel—p. 248

Influence of Shortness and Coiling of Umbilical Cord on Uterine Contractions and on Dilatation of Cervix F. Faugere—p. 260  
Endometrioma with Gravidic Reaction F. Holtz—p. 278  
Results of Ten Years of Roentgen Therapy of Cancer of Cervix Uteri W. P. Plate—p. 280

**Hemorrhagic Pachysalpingitis**—Paucot and Bedrine do not maintain that hemorrhagic pachysalpingitis is more frequent than ectopic pregnancy, but they think that the systematic microscopic examination of hematosalpinx will disclose new cases of hemorrhagic pachysalpingitis. They report the history of a woman, aged 30, who presented symptoms which necessitated a laparotomy. After describing the observations in the course of the operation they give a detailed description of the macroscopic and microscopic aspects of the removed uterine tube. They stress the absence of the histologic characteristics of pregnancy, for there was no decidual transformation of the connective tissue and no signs of syncytium of Langhans. Discussing the existing microscopic changes they cite among others the fact that the hemorrhage is diffuse and involves the entire thickness of the tube and that the serosa is thickened and participates in the general hypertrophic reaction of the entire organ. Especial attention is given to the vascular changes, because they help to throw light on the pathogenesis. The authors say that they do not believe that the pathogenesis of hemorrhagic pachysalpingitis is uniform and that the infection with banal microorganisms is always responsible for its appearance. In the reported case there were several factors which spoke against such a pathogenesis and indicated that syphilis or hereditary syphilis played a part

The authors regard the condition more as a syndrome than as a definite disease and thus they differ with Bazy, who affirms that hemorrhagic pachysalpingitis has an absolute autonomy. They consider it as an anatomic reaction to various infections (bacterial or specific) of the uterine tubes. Finally they suggest that, as regards the etiology, hemorrhagic pachysalpingitis may perhaps be related to hemorrhagic pachymeningitis, for they were surprised by the similarity of the vascular lesions in these two processes.

### Presse Médicale, Paris

46 1681 1704 (Nov. 16) 1938

\*Loss of Chloride and Vomiting L. Binet, D. Bargeton and J. Lacorne—p. 1681

\*Difficulty of Transformation of Carotene (Provitamin A) into Vitamin A in Course of Various Pathologic Conditions Therapeutic Consequences R. H. Monceaux—p. 1683

**Loss of Chloride and Vomiting**—Reports on hypochloremia and particularly on the part played by vomiting in its development, which were presented at the French medical congress (held in Marseilles in November), and observations on a woman with uncontrollable vomiting of pregnancy, induced Binet and his associates to study the role of vomiting in the loss of chlorides. They describe the clinical history of the woman and in diagrams they indicate the loss of chloride in the vomit, the changes in the chloride content of the blood and so on. The results of the chemical studies on the urine, the vomit and the blood induced the authors to employ in addition to other therapeutic measures also rechloridation in the form of daily intravenous injections of 20 cc of a 10 per cent solution of sodium chloride. After this treatment was instituted the vomiting gradually decreased. The authors recall an earlier report (1928) which likewise recommended the administration of sodium chloride in cases of uncontrollable vomiting of pregnancy. In the second part of this paper they describe their studies on the mechanism of the loss of chlorides by the process of vomiting. They made perfusion experiments on isolated lungs and stomachs and found that the blood perfusing the lung is not deprived of much of its chloride, however, the blood perfusing the stomach presents a constant and considerable impoverishment in chloride, which amounts to from 30 to 45 per cent. Regarding the therapeutic significance of these observations, they say that a severe loss in the chloride content of the organism should be counteracted by the administration of chloride. In acute cases, hypertonic solutions of sodium chloride should be given by intravenous injection. In this connection the authors direct attention to studies on dogs which revealed that, whereas the slow intravenous injection of 20 cc of a 10 per cent solution of sodium chloride was well tolerated, the rapid injection of 20 cc of a 30 per cent solution resulted in circulatory collapse.

**Transformation of Carotene into Vitamin A**—Monceaux points out that animal experiments have demonstrated that carotene administered in the form of a tested solution is capable of curing and preventing the disorders that are caused by a deficiency of vitamin A. However, the clinical problem is not as simple, for, whereas the healthy organism may be able to transform carotene into vitamin A, it is not so in numerous pathologic conditions. The author first directs attention to carotenemia, which is accompanied by yellow pigmentation of the skin simulating icterus. It occurs in tuberculous, cancerous, diabetic and obese patients and in children. It is due to the fact that the carotene is not properly oxidized. To counteract this carotenemia the physiologic activity and particularly the oxidative process must be augmented. Another disorder, which leads to defective utilization of carotene, with or without pigmentation, is hepatic insufficiency. It is possible that a hepatic insufficiency is a factor also in some of the aforementioned conditions of hypercarotenemia. Moreover it is probable that insufficient transformation of carotene into vitamin A will result in a deficiency of the A factor and may be followed by such disorders as hemeralopia, xerosis, pyodermitis and diarrhea. It has been proved also that the small quantities of carotene which are absorbed in the foods are entirely insufficient to supply the liver with the A factor, it is necessary to ingest massive doses. The author thinks that in view of the frequency of insufficient transformation of



carotene into vitamin A the treatment with the provitamin carotene should be abandoned and replaced by the administration of vitamin A in its direct and natural form as it is provided by certain types of fish. In this form it can be perfectly assimilated and kept in reserve. Moreover, it has been established that the growth factor of animal origin has an action that is twenty times more potent than pure carotene. Regarding the posology, the author says that studies by Busson disclosed that, if the organism's reserves are exhausted, the vitamin must be given in large doses daily for a long period. It is necessary to administer from 6,000 to 6,500 units of the natural vitamin A either in a single dose or in fractionated doses in the course of the day.

### Archivio Italiano di Chirurgia, Bologna

49 201 300 (Aug.) 1938 Partial Index

- Crossed Dystopia of Kidneys P Cizzummi—p 201  
Large Hematoma of Renal Loxa from Spontaneous Rupture of Adrenal R Ascoli—p 225  
Resection and Arthrodesis in Tuberculosis of Knee Joint S Mondolfo—p 241  
\*Epidural Sacral Route in Administration of Tetanus Antiserum C Tangari—p 268

**Tetanus Antiserum Epidurally**—Tangari points out the importance of the epidural sacral route for the introduction of tetanus antiserum in cases of grave tetanus. The injections are made at the hiatus sacralis with the patient in the prone position and by using a needle longer than ordinarily used in spinal puncture. The author used Behring's antiserum which was administered in daily doses of from 150,000 to 200,000 international units. Two daily injections of antiserum in doses of 20,000 international units each are administered to the patient, one of which is made in the subarachnoid space through the hiatus sacralis and the other in the epidural sacral space. The remaining dose of antiserum is administered to the patient in intravenous and intramuscular injections. A local treatment which consists in local disinfection of the wound, applications of alcohol pads, isolation of the patient from light and noise and the administration of purgatives and of light milk diet, is also given. The fifteen patients who recovered out of the group of sixteen who had the treatment did not suffer from paralysis or nervous complications. According to the author, the administration of antiserum through the sacral epidural route has the following advantages: 1. Lumbar puncture, which cannot be performed in cases of grave opisthotonos, can be replaced by puncture at the dorsal sac through the hiatus sacralis. Consequently the antiserum can be introduced in the subarachnoid space, even in grave opisthotonos. 2. The toxin diffuses itself down to the cauda equina and up to the nervous roots. Consequently the passage of the toxin to the subarachnoid space and to the nervous centers is blocked by anatomy. The duration of the contractures and the evolution of the disease are shortened. The treatment is not followed by complications. The technique is easy. The epidural sacral route has been resorted to, up till now, in the treatment of tetanus from wounds of the lower extremities, which are the most frequent and dangerous. It seems advisable to resort to it in the prevention of tetanus which is indicated in the presence of suggestive wounds of the lower extremities.

### Bollettino d'Istit Sieroterapico Milanese, Milan

17 631 710 (Oct.) 1938 Partial Index

- Is Agglutinability of H Agglutinins of Typhoid Bacilli Prevented by Vi Antigen? L Molina—p 631  
Properties of Fresh Blood Serum Factors Which Determine Blood Coagulation F Ferranti and A Torrini—p 642  
\*Bactericidal Power of Blood Serum Against Gonococcus in Normal Persons and in Gonorrhea in Course of Bacterial Vaccine Treatment G De Aldo—p 662  
Diagnostic Value of Most Common Cultural Methods for Identification of Diphtheria Bacillus V Lanza—p 673

### Bactericidal Power of Blood Against Gonococcus—

De Aldo made determinations, in vitro, of the bactericidal power of the blood of eleven normal persons and of nineteen patients suffering from gonorrhea. In the patients the determinations were made before and in the course of the administration of a bacterial vaccine which contains gonococci, streptococci, staphylococci and Bacillus coli. The author found that the bactericidal power of the blood against the gonococcus is more intense in persons who are ill than in normal persons.

It increases in acute urethritis in men as soon as seven days after development of the infection and still more as complications (prostatitis and epididymitis) develop. It is more intense in chronic than in acute forms of gonorrhea in women. It increases in the blood of patients of either sex after administration of bacterial vaccines by either the intravenous or the subcutaneous route and still more as the vaccinal treatment advances. According to the author the administration of bacterial vaccines increases the forces of defense of the individual against the gonococcus as well as the general and humoral immunity of the patients.

### Bol. Academia Nacional de Medicina de Buenos Aires

249 400 (Aug.) 1938 Partial Index

- New Progress of Physiopathology of Muscles C Frugoni—p 267  
Monosymptomatic Primary Cardiac Rheumatic Fever R A Bullrich and D Snider—p 285  
Histophysiology of Parathyroid Glandular Graft P Rojas and F J Manfredi—p 303  
Surgical Treatment of Detachment of Retina H Arruga—p 397

### Monosymptomatic Primary Cardiac Rheumatic Fever

—Bullrich and Snider say that rheumatic fever may develop with pain in the heart or in the precordial region as the only symptom of the disease, whereas articular symptoms may or may not be present. Monosymptomatic primary cardiac forms of rheumatic fever are frequent. In these forms the alterations of the electrocardiogram, especially those which show disturbances of the auriculoventricular conduction, may be the only sign of the disease aside from cardiac or precordial pain. The authors emphasize the importance of making electrocardiograms for an early diagnosis because of the fact that the disease rapidly regresses by early administration of large doses of sodium salicylate. The drug is prepared in an isotonic solution (232 Gm per thousand cubic centimeters) and administered in daily doses varying from 16 to 23 Gm, by enema and by the drip method. Discontinuation of the treatment is indicated by normalization of the electrocardiogram (or, in the presence of organic lesions which give electrocardiographic irreversible tracings, by disappearance of the auriculoventricular disturbances). As a rule pain subsides rapidly in the course of the treatment and fever disappears in from four to seven days. The electrocardiogram returns to normal (or shows disappearance of the auriculoventricular disturbances) in two or three weeks unless there are irreversible lesions. Even in this case further bouts are prevented by early administration of liberal doses of sodium salicylate. The treatment can be considered as a diagnostic and therapeutic test of rheumatic fever and also as a test of value for differentiating rheumatic fever from endomyocarditis caused by focal infection which does not subside by sodium salicylate treatment. The clinical and electrocardiographic study of six cases is reported. Four cases in the group were of the cardiac monosymptomatic form.

### Nervenarzt, Berlin

11 553 608 (Nov. 15) 1938

- New Law on Marriage with Regard to Hereditary Psychic Disturbances K Beringer—p 553  
Athetosis and Tremor Their Physiologic Mechanism and Their Modification by Surgical Measures P C Bucy—p 562  
\*Gastrogenic Psychoses W Scheid—p 568  
Casuistics on Narcolepsy Clinical Aspects and Their Therapeutic Significance W Behrmann—p 577  
Symptomatic Convulsions and Focal Infection K Hansen—p 583

### Gastrogenic Psychoses—

Scheid reports the clinical histories of two patients in whom "obscure" forms of dementia developed. Both patients presented symptoms of funicular spinal disorders. Pernicious anemia could be excluded. Examination disclosed in both patients an achylia gastrica. An earlier examination of the first patient had revealed hematologic changes of a type which is characteristic for hypochromic anemia, but in the meantime these changes had been largely counteracted by suitable treatment. In the second patient a moderate secondary anemia still existed at the time of the psychiatric observation. In this patient the achylia was caused by a gastric scirrhus. In both patients the mental disturbances could be identified as "gastrogenic" psychoses. The author points out that by correspondingly directed internistic examinations it might be possible to detect more cases of this type among the psychoses of obscure etiology. He thinks that



particularly among the cases of unexplained dementia there are doubtless some "gastrogenic psychoses." Moreover, the psychoses of pernicious anemia, which are more readily recognized on account of their clear symptoms, can be classified with the gastrogenic psychoses.

## Zeitschrift f Geburtshilfe u. Gynakologie, Stuttgart

118 1204 (Nov 11) 1938 Partial Index

- Experimental Investigations on Peristalsis of Human Oviducts During Various Phases of Cycle and of Pregnancy W Breipohl—p 1  
Presence of Vitamin C in Placenta W Neuweiler—p 27  
Ectopic Pregnancy in Genital Tuberculosis W Reifferscheid—p 38  
\*Estimation of Hydremia Factor in Thrombosis and Embolism G Schafer—p 50  
Narrow Pelvis E Puppel—p 75  
Action of Close Range Roentgen Irradiation on Tumor Tissue W Shreier and H Huber—p 107

**Hydremia in Thrombosis and Embolism**—Schrifer says that changes in the vascular walls, in the form of varicose deformities in the network of the pelvic veins, play a part in the frequent thromboses after gynecologic prolapse operations. Although such varicose deformities are also frequent in pregnant and puerperal women, the incidence of thrombosis is much less during the puerperium and even after surgical deliveries than is the case after gynecologic operations. The author sees the cause of this physiologic protection against thrombosis on the one hand in the rapid venous backflow after the delivery of the child, and on the other hand in the hydremia which is already present before birth and which is increased immediately after. The author devotes the second part of his paper to the nature and action of hydremia and the third part to the clinical and hematologic estimation of hydremia in obstetrics and in surgical gynecology. Summarizing his observations, he says that hydremization is evidently of value in the prevention of postoperative thrombosis and embolism. This prophylactic action of hydremia is explained by a number of clinical observations. In adipose and cachectic patients in whom the water exchange is impaired, the danger of thrombosis and embolism is great, as is the case also in the presence of high temperatures and during the stage of premenstrual inspissation of the blood, however, in puerperal women and in patients who have been given large amounts of fluid the tendency to thrombosis and embolism is surprisingly low. In the course of the clinical and hematologic studies on hydremia the author investigated the action of an artificial postoperative dilution of the blood, induced by venesection and subsequent filling up with sodium chloride solution. With this method it was possible to reduce the incidence of thrombosis and embolism in cases of myoma and in benign tumors of the ovaries and of the adnexa. Further studies were concerned with determining the degree of hydremia by measuring the dry residues, the specific gravity in the total blood and in the serum, the viscosity of the blood serum and the hemoglobin and erythrocyte values. These investigations were made on seventy-nine parturient women and on 149 women undergoing gynecologic operations. Regarding the prognostic significance of the hydremia, the author says that in the women who underwent gynecologic operations and who were subject to embolism the hydremia values were near the lower limits of normality, but that these values did not permit the estimation of the dangers from thrombosis and embolism before the operation.

## Novyy Khirurgicheskii Arkhiv, Dnepropetrovsk

41 311 460 (No 163) 1938 Partial Index

- Ketosis Accompanying Surgical Pain P V Ryzkov—p 311  
Treatment of Nonpenetrating Skin and Muscle Gunshot Injuries B E Linberg—p 320  
Treatment of Retroperitoneal Abscess N G Sosnyakov—p 331  
\*Form Localization and Motor Function of Stomach After Resection for Ulcer I A Shekhter—p 346  
\*Roentgenologic Diagnosis of Chronic Appendicitis O Plisan and E Gringauz—p 358  
Operative Treatment of Cancer of the Stomach I Ya Slonim—p 363  
Hazards of Protein Therapy K V Stroykova—p 372

**Stomach After Resection for Ulcer**—Shekhter reports postoperative roentgenologic studies of sixty cases in which partial gastric resection was performed for ulcer. Observations on eleven patients were begun on the twentieth post-

operative day and were continued for three months. Ten of this group were studied for periods lasting two, three and five years. Observations on the remaining forty-nine patients were begun at a later period. The author concludes that resection brings about a marked alteration in the form and the tonus of the stomach depending on the type of resection and postoperative adhesions. Many patients with postoperative adhesions do not exhibit any complaints or objective signs. From a roentgenologic point of view, the first method of Billroth and its Haberer modification are to be considered preferable as far as motor function is concerned. Following these operations, food passes in the normal physiologic direction and there is established in most cases of the first Billroth operation and in all of the Billroth-Haberer operation a rhythmic evacuation of the stomach contents. The second method of Billroth leaves a smaller stomach and is characterized by filling of the afferent loop of the anastomosis and by accelerated emptying. The Finsterer modification of the second method of Billroth does not guarantee against the filling of the afferent loop. Shortly after the resection considerable inflammatory edema of the mucosa is observed, resulting in narrowing of the anastomotic stoma and retarded evacuation. This edema disappears in uncomplicated cases in the course of three months, leading to the restoration of the type and time of evacuation characteristic for the given type of resection.

**Chronic Appendicitis**—Plisan and Gringauz studied roentgenologically 142 cases of chronic appendicitis in which operative intervention was later resorted to. The patients were given barium sulfate orally from eight to ten hours before the commencement of roentgenologic observation, which was repeated several times in the course of the next two or three days. The appendix was visualized in ninety-five (67 per cent). Definitely localized tenderness was present in sixty-three (66.8 per cent). The authors consider x-ray study a valuable method in arriving at diagnosis of chronic appendicitis. Persistent irregular filling observed on repeated examination suggests a pathologic state. Failure to fill with the use of correct technic constitutes another important sign of chronic appendicitis. Strictly localized tenderness of the appendix combined with loss of its motor function and limitation of motion when combined with the foregoing signs is pathognomonic of chronic appendicitis.

## Nederlandsch Tijdschrift v Geneeskunde, Amsterdam

82 5281 5364 (Oct 29) 1938 Partial Index

- Benign Tumors of Small Intestine F S P Van Buchem—p 5288  
Practical Apparatus (Face Tent) for Administration of Oxygen Simple Method for Collecting Blood for Determination of Oxygen J K Kraan and H W Mook—p 5293  
\*Tumors with Hollow Peduncle a Treacherous Type of Gastric and Intestinal Cancer B J Mansens—p 5297  
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**Cancers with Hollow Peduncle**—On the basis of case histories, Mansens describes a peculiar type of gastric and intestinal cancer. In one patient, a man aged 68, the rectal examination disclosed about 9 cm above the sphincter a tumor with a central crater and apparently a short peduncle. The tumor was movable against the basis. Since the patient refused a laparotomy, it was decided to remove the growth by way of the anus. The tumor, which was about the size of a cherry, was cut by diathermy. After the operation the patient had peritonitis and died. The necropsy revealed large quantities of fecal masses in the small pelvis and a defect of considerable size in the rectal wall. Examination of the removed tumor disclosed an adenocarcinoma that had grown deep into the muscularis. The portion extending beyond the muscularis had a papillary character. The entire thickness of the muscularis as well as the serosa was found in the removed portion, that is, the surgeon had unknowingly removed a portion of the intestinal wall. The author further cites two cases of gastric tumor in which the gastric wall was drawn up into the tumor so that the growth seemed to have a peduncle, which in these cases consisted of the tissues of the gastric wall. If the apparent peduncle of these tumors is sectioned

a large opening results, as was the case in the aforementioned fatal case of rectal carcinoma. In the stomach this is not so serious, because an extensive resection is usually made. The author regards the peculiar growth of papillary carcinomas as the factor that is responsible for this treacherous type of tumor.

### Acta Medica Scandinavica, Stockholm

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- Conditions Resembling Achondroplasia and Chondro-Osteodystrophia (Brailsford) A. Engel—p. 1  
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Sedimentation Speed of Erythrocytes in Pulmonary Tuberculosis C. Lossati—p. 149

**Hyperchloremia and Hyperazotemia in Hemorrhage from Peptic Ulcer**—Borst says that several investigators observed an increase of urea in the blood of patients suffering from massive hemorrhage into the digestive tract but that, as regards the cause of this hyperazotemia, the opinions are divided. At the author's clinic it was observed that the majority of the patients with hemorrhage into the digestive tract who had marked azotemia showed hyperchloremia but at the same time an extremely low excretion of sodium chloride in the urine. In order to obtain a better insight into the cause of this azotemia and hyperchloremia a special study was made of all patients suffering from recurrent massive gastric hemorrhages. The three most extensively studied cases are reported. Summarizing his observations, the author says that the hyperazotemia that appears with massive bleeding into the digestive tract is due to an increased formation of urea from the blood within the intestine. Should the patient be insufficiently fed, catabolism of body protein takes place, during the bleeding, however, it is slight, since the blood within the intestine serves as nourishment. Toxic destruction of body protein did not occur in the reported cases. The hyperazotemia leads to relative polyuria, as a rule the urine output surpasses the fluid intake. The urea concentration of the urine remains maximal until the posthemorrhagic blood dilution has restored the volume of the circulating blood. If the patient, by repeated massive bleeding or by operation, develops shock, both the diuresis and the maximum urea concentration of the urine drop and the urea content of the blood rises still more. The drop in the urea clearance is more marked than that of the blood pressure. The clearance is possibly the best measure for the severity of the shock. The posthemorrhagic blood dilution is retarded by high diuresis with a restricted fluid intake, by low albumin content of the blood, and especially by damage to the capillaries caused by operative shock. As long as the posthemorrhagic blood dilution is still in progress, the kidneys excrete practically neither sodium nor chlorides, if sodium chloride is administered, the sodium chloride content of the blood plasma rises far above the normal. In this period the urine carries much potassium, whereas the potassium content of the blood is normal or reduced. The retention of sodium chloride and the increased excretion of potassium form, in all probability, part of a regulating mechanism established for the purpose of restoring the normal filling of the arterial system by way of an augmentation of the total extracellular fluid and therefore of the blood plasma. Possibly this same mechanism is encountered in all situations in which the arterial system is incompletely filled. Regarding the treatment the author says that, following massive hemorrhage, the body must be aided in its effort to restore the amount of circulating blood (1) by restoring as far as possible the loss of erythrocytes and plasma protein, for this purpose the drip transfusion can be strongly recommended, and (2) by administering fluid until the urea concentration of the urine drops below the maximum and the chloride content rises, the presence of edema

is no contraindication for a liberal administration of fluid. Salt may be given only when the sodium chloride content of the blood plasma is not elevated. Carbohydrates should be administered as soon as possible so as to prevent body protein destruction by marfanism. In the presence of vomiting or other signs of gastric retention, the author gives a 5 per cent solution of dextrose subcutaneously, otherwise 10 per cent case sugar with a few drops of orange juice by mouth. This latter is well tolerated by most patients.

### Nordisk Medicinsk Tidskrift, Stockholm

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- Tuberculous Epididymitis E. Ljunggren—p. 1687  
Relation of Serologic Test for Syphilis at Birth Comparative Investigations on Venous Blood from Umbilical Cord and Retrolental Blood by Wassermann Reaction Kahn Standard Membrane Clotting and Muller's Clotting Reactions T. M. Vogel and H. Anker—p. 1695  
Significance of Collateral Circulation in Embolectomy as Illustrated in Some Cases of Operatively Treated Recurrent Embolism in Extremities K. F. Croth—p. 1700  
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Occurrence of Histamine in Feces in Patients with Asthma G. Nyström and J. Tomenius—p. 1709

**Tuberculous Epididymitis**—Ljunggren states that tuberculous epididymitis usually has a chronic course but is acute in about 17 per cent of the cases. Differential diagnosis between the chronic cases and the so called chronic epididymitis may be difficult. Palpation by the rectum often gives decisive results for the diagnosis of tuberculous epididymitis, since tuberculous changes in the prostate and seminal vesicles can be established in about two thirds of the cases. Such changes in the prostate can sometimes be demonstrated by urethrography. X-ray examination of the epididymis does not as a rule give valuable information for diagnosis. As renal tuberculosis occurs simultaneously with tuberculous epididymitis in about one fourth of the cases, intravenous pyelography is advised. If epididymectomy can be carried out, it is the method of choice in tuberculous epididymitis, and it is advised in every more pronounced chronic epididymitis suspected to be tuberculous, for long expectant treatment, the author says, entails the risk that the testis may become infected if the process is tuberculous. He emphasizes the importance of long continued careful dietetic hygienic treatment after the operation, to promote the resistance of the organism to the tuberculous infection in the body, and of constant control for at least three years.

### Ugeskrift for Læger, Copenhagen

100 1195 1228 (Oct 27) 1938

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Inguinal Lymphogranuloma with Recovery Following Treatment with Sulfamizide B. Pontoppidan—p. 1205  
Sterile Solutions of Sodium Bicarbonate for Treatment of Surgical Acidosis V. Aalkjær and E. P. Nielsen—p. 1206  
Cases of Orbital Complications Mainly Originated from Nasal Sinusitis J. Røed—p. 1208

**Serum Treatment of Pneumococcal Pneumonia**—Brastrup and his co-workers discuss the result of type specific serum treatment in seventy six cases of lobar pneumonia (in forty children, thirty-six adults), representing practically all the pneumonias in Skive and its vicinity from January to August 1938, 70 per cent were type I, 17 per cent type VII. The total mortality was 39 per cent, the mortality in the uncomplicated cases 14 per cent. The authors say that attainment of the best results depends on understanding and support on the part of the practicing physician with consequent earliest possible hospitalization, earliest possible type determination in the hospital laboratory and the administration of large doses. They advise from 40,000 to 60,000 units for children under 13, from 160,000 to 220,000 for adults, and as far as possible one large single dose, individualization is necessary. The inconveniences and dangers of serum sickness, they find, are not grave enough to hinder the application of serum treatment in any case of lobar pneumonia. Transportation to the hospital in the first days of illness is without harmful effects of consequence.

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## LEUKEMOID REACTIONS OF THE MYELOID TYPE

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By the term leukemoid reaction is meant a blood picture that closely resembles or is indistinguishable from, that of the various types of leukemia. At necropsy, however, leukemic changes in the organs and tissues of the body are lacking. Reactions of the leukemoid type have been recognized for many years, and it is now known that they occur with a wide variety of pathologic conditions. Our experience leads us to believe that they are much more frequently encountered than was formerly thought. Since it is essential that these reactions be distinguished from the leukemias, it is important that practitioners in all branches of medicine have a general idea concerning those diseases with which leukemoid reactions may be encountered.

In attempting to group these leukemoid reactions, we realize that some of them might well be placed under two headings. As time goes on, however, other groups of cases will undoubtedly be described in which this type of reaction occurs so that the classification is not complete.

### INFECTIONS

*Pyogenic Type*—The majority if not all of the bacterial infections are associated with quantitative and qualitative alterations in the blood picture. The type of cellular reaction that develops varies with the type of organism causing the infection. Since the scope of this paper is restricted to leukemoid reactions of the myeloid type, no attempt will be made to discuss the lymphatic reactions of pertussis, typhoid fever, infectious mononucleosis and certain other diseases.

Most acute and many chronic infectious diseases, especially those due to the pyogenic bacteria, are accompanied by neutrophilic leukocytosis. The eosinophils and basophils are reduced in number or are entirely absent, and the number of lymphocytes is diminished. The lymphocytopenia usually is relative rather than absolute. The qualitative blood picture is characterized by a "left shift" in the nuclei of the neutrophils, alterations in the cytoplasm, "toxic" granulation, increased basophilia and in some cases vacuolation. The degree of left shift in the nuclear pattern appears to be dependent on the virulence of the infecting organisms, the resistance of the host, the extent of the infection and

the reactivity of the bone marrow. As a general rule, the more severe the infection the greater the number of immature forms observed in the circulation. In cases of an overwhelming infection the bone marrow may ultimately fail to respond to the demand placed on it and leukopenia may be observed. A left shift in the neutrophils, however, is almost invariably demonstrable in the blood in these cases. The finding of myelocytes and promyelocytes in the circulating blood of patients with a severe infection is rather common, more rarely leukoblasts and even myeloblasts may be observed. This is not as infrequent an occurrence as was formerly believed. Leukemoid reactions with immaturity of the leukocytes going back to the stem cells have been reported<sup>1</sup> or have been observed by us in cases of pneumonia, pyelonephritis, peritonitis, empyema, pulmonary abscess, osteomyelitis, septicemia, puerperal sepsis and mastoiditis. Downey, Major and Noble<sup>2</sup> reported a case of appendical abscess with suppurative phlebitis of the portal system and the subsequent formation of abscesses in the liver, in which a pronounced leukemoid reaction was observed.

The following case exemplifies the development of a leukemoid reaction during the course of a severe infection.

CASE 1—A white man aged 55 came to the Mayo Clinic in 1927 because of extensive osteomyelitis involving the lower half of the right tibia and of the right fibula. He was emaciated and had a marked pallor. The value for hemoglobin was 38 per cent (Dare) on admission, the erythrocytes numbered 2,220,000 and the leukocytes 30,600 per cubic millimeter of blood. Eight days later a septic type of fever developed, the temperature ranging from 97 to 103 and 105 F daily. An enlarged spleen was noted.

The left kidney was explored, and a perinephritic abscess was found and drained. The patient continued to have a septic type of temperature curve postoperatively, and finally, shortly before his death, the leukocyte count rose to 133,000. The value for hemoglobin was 45 per cent. The erythrocytes numbered 2,520,000 per cubic millimeter, and the differential count revealed the following percentages: lymphocytes 0.4, neutrophils 90.2, monocytes 1.8, neutrophilic metamyelocytes 2.4, neutrophilic myelocytes 3.4, neutrophilic promyelocytes 1.6 and leukoblasts 0.2. Examination of blood smears showed a severe toxic-infectious blood picture with myeloid immaturity to the stem cells. At necropsy multiple abscesses were found in the spleen, prostate gland and both kidneys.

Leukemoid reactions are comparatively common with acute infections or acute exacerbations of chronic infections, occurring more frequently in children than in adults. As a general rule they can be distinguished

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1 (a) Krumbhaar, E. B. Leukemoid Blood Pictures in Various Clinical Conditions. *Am J M Sc* 172: 519-533 (Oct.) 1926. (b) Fitz Hugh Thomas, Jr. Leukemoid Blood Reactions. Differential Diagnosis of Conditions Which May Simulate the Leukemias. *Pennsylvania M J* 35: 290-293 (Feb.) 1932.  
2 Downey, Hal, Major, S. G. and Noble, J. F. Leukemoid Blood Pictures of the Myeloid Type. *Folia haemat* 41: 493-511 (July) 1930.

from myelogenous leukemia with little difficulty on the basis of both the clinical picture and the hematologic data. The site of the infection is in most cases evident. The presence of a toxic-infectious blood picture is of considerable aid in diagnosis. It is not pathognomonic, however, for one may occasionally encounter it in cases of myelogenous leukemia with or without a secondary infection.

**Nonpyogenic Type**—With subacute bacterial endocarditis one may find myeloid immaturity in the circulating blood, and toxic changes or a left shift in the neutrophils may be lacking.

**Tuberculosis**—There are a number of reports in the literature of cases of tuberculosis in which, prior to postmortem examination, the diagnosis was either acute or chronic myelogenous leukemia. At the time of necropsy, however, there was no evidence of leukemia and the "leukemic" blood picture was explained on the basis of the tuberculosis.<sup>3</sup> In these cases myeloid tuberculosis was not found in the bone marrow, so that it would seem probable that the leukemoid reaction was due to toxemia. In those cases in which myeloid involvement of the bone marrow occurs, it would seem likely that the appearance of young forms in the circulating blood might be due to irritation of the cells of the marrow.

#### BLOOD DYSCRASIAS OR RETICULO-ENDORITIAL DYSRASIA

**Hemolytic Anemias**—The hemolytic anemias are accompanied by signs in the peripheral blood of increased regenerative activity of the bone marrow. If the process of hemolysis is acute the leukocytes and blood platelets in the circulation are increased and examination of stained blood films discloses large numbers of reticulated erythrocytes, polychromatophilia, anisocytosis, nucleated erythrocytes and more rarely, younger forms of the erythrocytic series. Immature cells of the myeloid series not infrequently are observed and in some cases are comparatively numerous. Leukemoid reactions of the myeloid type have been observed during the "crises" of congenital hemolytic icterus and sickle cell anemia, in association with the acute hemolytic anemia of Lederer, paroxysmal hemoglobinuria and the hemolytic anemias due to poisoning by chemical substances, and in rare cases of hemolytic anemia of indeterminate origin.

The following is a case in point.

**CASE 2**—A white woman aged 28 was admitted because of marked weakness, pallor and nervousness. There was no history of jaundice, and the pallor had been noticed for only a fortnight. The thyroid gland was palpable. The edge of the liver extended 4 cm below the costal margin. Splenic dullness was increased, although the edge of the spleen could not be palpated. On admission the value for hemoglobin was 41 Gm per hundred cubic centimeters and the erythrocyte count was 930,000 per cubic millimeter of blood. Morphologic examination showed extremely active regeneration, the reticulated erythrocytes being 85 per cent of the total number of cells. The remaining erythrocytes were deeply stained, spherical microcytes. Many normoblasts were present. The corrected leukocyte count was 16,800 per cubic millimeter. A differential count revealed the following percentages: neutrophils 60.6, lymphocytes 22.6, monocytes 7.6, eosinophils 0.3, metamyelocytes 4, myelocytes 1.3, promyelocytes 2 and leukoblasts 1.6. A fragility test showed hemolysis beginning in a 0.5 per cent sodium chloride solution and complete in a 0.36 per cent solution. The concentration of serum bilirubin was 13 mg per hundred cubic centimeters. Subse-

quently the edge of the spleen became palpable. On the basis of the enlarged spleen, the blood picture and three fragility tests showing increased hemolysis of erythrocytes, a diagnosis of hemolytic jaundice was made. Further observation raised the question of exophthalmic goiter, two basal metabolism determinations giving values of plus 27 per cent and plus 25 per cent.

Splenectomy was performed with the erythrocyte count at 1,010,000. The spleen weighed 882 Gm. Two months later the value for hemoglobin was 121 Gm and the erythrocyte count was 3,230,000 and the leukocyte count 8,800. Morphologically there was marked microcytosis and increased regeneration, the percentage of reticulated erythrocytes being 10. Nine months later thyroidectomy was performed for exophthalmic goiter, the basal metabolic rate being plus 49 per cent. Convalescence was uneventful and the patient has remained in good health.

In most cases of congenital hemolytic jaundice the diagnosis may be made readily on the basis of a history of recurrent attacks of jaundice, a relevant family history, splenomegaly, the characteristic blood picture and increased fragility of the erythrocytes to hypotonic saline solution. This case is of unusual interest, however, because the myeloid immaturity associated with an elevated leukocyte count, splenomegaly and an increased basal metabolic rate might well have led one to make an erroneous diagnosis of chronic myelogenous leukemia. In addition, except for a small number of microcytes, there was generalized macrocytosis due to the markedly increased regeneration of the erythrocytes. There was no history of jaundice and the value for serum bilirubin was not elevated at the time of admission. The family history was not pertinent. The diagnosis of hemolytic jaundice was made on the basis of the characteristic microcytosis associated with increased regeneration of the erythrocytes and the occurrence of a period of increased destruction of blood while the patient was under observation. The finding of increased fragility of the erythrocytes to hypotonic saline solution was helpful, although this phenomenon may be observed in rare cases of leukemia.

**Pernicious Anemia**—With this condition one may see leukemoid reactions at two different times.<sup>4</sup> They occur first when the patient is in relapse and particularly when the erythrocyte count falls below 2,000,000 per cubic millimeter of blood. The degree of immaturity varies, myelocytes and promyelocytes being present when the erythrocyte count is above this level. With an erythrocyte count of 2,000,000 or less, immaturity to the myeloblast may not infrequently be found. At times this immaturity is so marked that the question of leukopenic myelogenous leukemia arises. As a rule the microcytosis and the persistence of increased lobulation in the neutrophils enable one to distinguish the condition from myelogenous leukemia. Occasionally, however, these signs, particularly the macrocytosis, are absent, so that one must depend on the clinical history as an indication for the institution of treatment with potent material. There are also instances of myelogenous leukemia in which there is rather marked macrocytosis, but in these the leukocytosis and the immaturity are usually much more marked than one would expect in association with pernicious anemia and the increased lobulation in the neutrophil is absent.

In either spontaneous or induced remissions of pernicious anemia the leukocyte count increases at the time the reticulated erythrocyte response occurs. A value of 27,500 leukocytes per cubic millimeter of blood during a spontaneous remission has been reported, and one of our patients had a leukocyte count of 22,500.

3 Custer R. P. and Crocker W. J. The Myeloleukaemoid Blood Picture Associated with Tuberculosis. *Folia haemat.* 46: 359-366 (March) 1932.

4 Heck F. J. Myeloid Immaturity in Pernicious Anemia. *Am J Clin Path.* 2: 443-448 (Nov.) 1932.

during an induced remission. If the blood smear is first seen at this time, the number of immature cells will be found to be increased, and if leukocytosis is present the question of myelogenous leukemia is raised. If in addition there is splenomegaly, as there may be in from 40 to 50 per cent of cases of severe pernicious anemia, the difficulty in diagnosis is increased. The problem can be settled by the injection of adequate quantities of potent material and by observation for a period of two weeks. If the pernicious anemia is adequately treated, all the immaturity will disappear by the end of this time, whereas this does not happen in association with chronic myelogenous leukemia. It is important that relatively large amounts of potent material be given, for in several instances there has been no response in the blood when amounts of liver extract were injected that would ordinarily bring about an optimal response of reticulated erythrocytes.

The following is an illustrative case.

**CASE 3**—A man aged 54, admitted Jan 3, 1930, complained of weakness and loss of sensation in his feet. A diagnosis of pernicious anemia had been made eleven months previously, and he had improved satisfactorily under liver therapy. A relapse had followed discontinuance of the liver therapy. On admission the value for hemoglobin was 20 per cent and the erythrocytes numbered 1,010,000 and the leukocytes 1,800 per cubic millimeter. The patient was given a diet containing half a pound (0.2 Kg) of raw swine stomach a day, but after a day this was changed to Lilly's liver extract 343, eight vials a day being given after the first day. On January 6 before treatment was begun, the leukocyte count was 3,100 per cubic millimeter and the differential count showed the following percentages: neutrophils 75.8, lymphocytes 20.8, monocytes 1.8, eosinophils 1.2, promyelocytes 0.2 and leukoblasts 0.2. On January 14, eight days later, the leukocytes numbered 22,600 and the differential count showed the following percentages: neutrophils 37.2, lymphocytes 9, monocytes 5.2, eosinophils 5.2, basophils 0.4, metamyelocytes 14.2, myelocytes 11.6, promyelocytes 13, leukoblasts 3.6 and myeloblasts 0.6. By January 15 fifteen days after the beginning of treatment, the differential count was normal.

This case demonstrates the leukemoid reaction associated with untreated pernicious anemia as well as the reaction occurring during the height of the response to treatment and coincident with the response in the reticulated erythrocytes.

**Polycythemia Vera**—Leukemoid reactions are not uncommon with polycythemia vera. Elevated leukocyte counts are observed almost invariably in patients with this disease, the counts usually ranging from 10,000 to 30,000 cells per cubic millimeter of blood. Counts above 30,000 occur not infrequently, and counts in excess of 100,000 have been reported. More rarely, normal or low leukocyte counts are observed. Although immature myeloid elements are seen in the peripheral blood of only a relatively small proportion of patients, they occur far more frequently than was formerly believed. Most of the patients die as a result of some complication of the disease, but isolated reports have appeared of cases of long-standing polycythemia in which anemia gradually developed and the full-blown picture of myelogenous leukemia was present.<sup>5</sup> The

following case is of interest because of the opportunity to observe the patient over a prolonged period.

**CASE 4**—A white man aged 56, who came to the clinic first in 1917, was found at that time to have an enlarged spleen extending 2 cm below the costal margin. The value for hemoglobin was 100 per cent (Dare), the erythrocytes numbered 7,640,000 and the leukocytes 9,000 per cubic millimeter of blood. A differential count revealed 90 per cent neutrophils, 7 per cent lymphocytes, 0.3 per cent eosinophils and 2.7 per cent basophils. A diagnosis of polycythemia vera was made.

The patient returned to the clinic in 1928, eleven years later, because of weakness and epigastric discomfort after meals. Examination disclosed an enormously enlarged spleen extending to the pubis. The value for hemoglobin was 60 per cent (Dare), the erythrocyte count was 4,640,000 and the leukocyte count 110,000 per cubic millimeter. A differential count revealed the following percentages: lymphocytes 5, neutrophils 82, eosinophils 2, basophils 4, metamyelocytes 0.5, myelocytes 1, promyelocytes 4 and leukoblasts 1.5. The blood viscosity was 1.57. The total plasma volume was 4,145 cc, or 67 cc per kilogram, and the whole blood volume was 8,300 cc, or 133 cc per kilogram. The basal metabolic rate was plus 38 per cent. After a course of radium and roentgen therapy the patient was much improved, the spleen having been greatly reduced in size.

The patient was seen on several occasions in the course of the next two years, the values for hemoglobin and for erythrocytes and leukocytes remaining elevated and the spleen enlarged and myeloid immaturity continuing to be present in the blood smears. The patient died in 1930. Necropsy was not performed.

It is beyond the scope of this paper to enter into a discussion as to whether one is justified in terming the diagnosis in such cases polycythemia vera with a leukemoid reaction or genuine chronic myelogenous leukemia. In the majority of cases of polycythemia vera there are no immature myeloid cells in the peripheral blood stream. Furey<sup>6</sup> found that from 9 to 10 per cent of a series of 120 patients with polycythemia vera had young myeloid elements in the circulating blood either at the time they were first seen or subsequently during the polycythemic phase before treatment was instituted.

As has been said, it is a well established fact that certain patients with polycythemia vera have anemia eventually and chronic myelogenous leukemia finally. At necropsy there is myeloid metaplasia in the spleen, liver and various other organs. Other patients with polycythemia vera, like patient 4, have splenomegaly, an elevated leukocyte count and myeloid immaturity in the circulating blood but not anemia. Zimmermann<sup>7</sup> observed a case of this kind in which death occurred at a time when the erythrocytes numbered 6,230,000 and the leukocytes 63,650 per cubic millimeter and young myeloid elements were present in the peripheral blood. At necropsy myeloid metaplasia was found in the spleen and liver. A few cases have been reported in which the condition began with the picture of chronic myelogenous leukemia and terminated with that of polycythemia.<sup>8</sup> Thus there is considerable evidence in support of the view that polycythemia vera is a disease of the bone marrow analogous to myelogenous leukemia and that both diseases are the result of neoplastic involvement of the erythrogenic and leukogenic cells in the marrow. However, in view of the fact that such a relationship has not been conclusively proved, and because the majority of patients with polycythemia vera do not exhibit immature myeloid elements in the blood

5 Minot G R and Buckman T E. Erythremia (Polycythemia Rubra Vera). *Am J M Sc* 166 469-489 (Oct.) 1923. Pendergrass E P and Pancoast H K. The Close Relationship of the Erythrogenetic and Leukogenetic Functions of the Bone Marrow in Disease. Report of a Case of Erythremia (the Roentgen Ray Treatment of Erythremia). *Am J M Sc* 163 797-818 (June) 1922. Hay John and Evans W H. Acute Eosinophilic Leukemia and Eosinophilic Erythroleukemia. *Quart J Med* 22 167-190 (Jan) 1929. Klump T G and Hertig A T. Erythremia and Myelogenous Leukemia. Report of Cases Presenting Aspects of Both Diseases. *Am J M Sc* 183 201-209 (Feb) 1932. Brieger H and Förschbach J. *Zur Pathologie der Erythremie*. *Klin Wchnschr* 1 845-848 (April 22) 1922.

6 Furey E D. Personal communication to the authors.

7 Zimmermann Oskar. *Zur Kasuistik der Erythremie mit Uebergang in Leukämie*. *Klin Wchnschr* 13 696-699 (May 12) 1934.

8 Winter Karl. *Ueber Polyzthämie mit und ohne Milztumor*. *Med Klin* 2 1017-1023 (July 5) 1908. Ghiron. *Condizionazioni sopra un caso eritro-leucemia*. *Folia haemat*. 22 135 (July) 1924.

## HARBORVIEW DIVISION

ture of the disease in roentgenograms of the skull, pelvis, ribs and long bones. The leukocyte count was 3,900 per cubic millimeter, and the differential count revealed the following percentages: lymphocytes 35.6, monocytes 7.3, neutrophils 45.6, basophils 0.6, metamyelocytes 4, myelocytes 0.3, promyelocytes 5, leukoblasts 0.3 and myeloblasts 1.3.

The diagnosis of multiple myeloma in this case appears to have been justified on the basis of the roentgenographic evidence and the Bence Jones proteinuria. Since necropsy was not performed, the possibility of metastatic carcinoma in the bone marrow arising from an undetermined primary site cannot be excluded with certainty.

**Osteosclerosis**—Osteosclerosis and Albers-Schonberg disease may produce a marked leukemoid reaction. One of Mettler and Rusk's<sup>12</sup> patients with osteosclerosis had been treated for three years for chronic myelogenous leukemia, there were anemia, splenomegaly and a typical picture of chronic myelogenous leukemia morphologically. As a rule the degree of immaturity is not marked, but in this case the smears showed 64 per cent myeloblasts before termination of the disease. In some instances roentgenographic examination of the bones discloses thickening of the cortex or the changes associated with Albers-Schonberg disease. Biopsy of the bone marrow shows an increase in fibrosis in the marrow. Aspiration of the marrow and examination of the material would probably fail to show the presence of such a fibrotic change.

## MISCELLANEOUS CONDITIONS

**Diabetic Coma**—This is commonly associated with leukocytosis and a leukemoid reaction. The myeloid immaturity disappears promptly after the institution of measures for control of the diabetes. The following case is illustrative.

**CASE 11**—A man aged 52 was admitted to the hospital in profound diabetic coma. The initial value for blood sugar was 882 mg, and the carbon dioxide-combining power was 7.8 cc per hundred cubic centimeters of blood. The leukocyte count was 25,000 per cubic millimeter. A differential count showed 84.4 per cent neutrophils, 9.7 per cent lymphocytes, 0.3 per cent basophils, 2.3 per cent monocytes, 2.3 per cent metamyelocytes, 0.7 per cent myelocytes and 0.3 per cent promyelocytes.

The patient died within twenty-four hours after admission. Necropsy showed no lesion which would account for the leukemoid reaction.

**Chemical Poisoning**—Leukemoid reactions of the myeloid type occur rarely in cases of chemical poisoning. Downey, Major and Noble<sup>2</sup> observed leukemoid reactions in three patients, all in the same family, each of whom had dermatitis associated with a relatively severe systemic reaction following the application for scabies of an ointment, supposed to contain mercury, over the skin of the entire body. Leukocytosis associated with a left shift to the stem cells was observed in the blood in each case.

Leukemoid reactions likewise have been observed in cases of mustard gas poisoning<sup>1a</sup> and in occasional persons who have been poisoned by phenylhydrazine, as in the following case.

**CASE 12**—A man aged 52 whose condition had been diagnosed as polycythemia vera on the basis of episodes simulating petit mal and elevated values for hemoglobin and erythrocytes was given 0.2 Gm of phenylhydrazine hydrochloride orally

each week. Studies of blood volume had not been performed. At his examination at the clinic six months later the value for hemoglobin was 121 Gm and the erythrocytes numbered 4,080,000 and the leukocytes 7,200 per cubic millimeter. The differential count showed 26 per cent lymphocytes, 65 per cent monocytes, 63 per cent neutrophils, 1 per cent eosinophils, 0.5 per cent basophils, 0.5 per cent metamyelocytes, 1 per cent myelocytes and 1.5 per cent promyelocytes. Erythrocytic regeneration was increased. The blood viscosity, hematocrit values and blood volume were normal. Phenylhydrazine therapy was discontinued, and the patient was examined three months later. The blood volume was normal and examination of the blood gave negative results at that time, the myeloid immaturity having disappeared from the circulating blood during the interim. It was felt therefore that the myeloid immaturity was the result of the phenylhydrazine therapy and that polycythemia vera was not present. A final diagnosis of petit mal was made.

**Indeterminate Leukemoid Reactions**—Not all leukemoid reactions can be satisfactorily classified. In our material we noted that in 1934 one patient had a leukocyte count of 45,000 per cubic millimeter with the morphologic picture ordinarily associated with chronic myelogenous leukemia. She was known to have had myeloid immaturity in 1933. Resection of the stomach had been carried out for a gastric ulcer, but when the patient was seen in 1934 there was nothing to suggest a lesion that would account for a leukemoid reaction. A diagnosis of chronic myelogenous leukemia was made and the patient was given roentgen therapy. In 1938 the blood was normal in every respect. The patient died after exploration for an obstructing lesion of the colon. At necropsy there was no evidence of myelogenous leukemia. The normal blood picture and the lack of evidence of leukemia at necropsy make it necessary to classify the condition in a case of this kind as an indeterminate type of leukemoid reaction.

## COMMENT

The importance of differentiating leukemoid reactions from the leukemias is obvious. In most cases this differentiation can be made on the basis of the clinical observations. The hematologic picture may or may not be of additional aid in diagnosis. The total leukocyte count is of relatively little or no diagnostic significance unless it is in excess of 100,000 cells per cubic millimeter of blood. Leukocyte counts above this are observed rarely with conditions other than the chronic forms of leukemia. It should be remembered that many patients with leukemia, including the chronic variety, have total leukocyte counts which fall either within or below the range for normal persons. In a study previously made by one of us, approximately 40 per cent of all patients with acute leukemia and 10 per cent of all patients with chronic leukemia seen at the Mayo Clinic from 1928 to 1933 inclusive had leukocyte counts below 10,000 cells per cubic millimeter.<sup>13</sup>

## SUMMARY

Leukemoid reactions occur commonly with infections, with blood dyscrasias and diseases of the reticulo-endothelial system, with diseases in which there is invasion and irritation of the bone marrow (as in metastasis to bone), with conditions in which there is an increased demand on the bone marrow (such as severe and sudden loss of blood) and with chemical poisoning. Occasionally cases are encountered in which no satisfactory explanation for the leukemoid reaction can be made.

<sup>12</sup> Mettler S. R. and Rusk G. Y. Fibrosis of the Bone Marrow (Myelofibrosis) Associated with Aleukemoid Blood Picture. Report of Two Cases. *Am J Path* 13: 377-388, 1937.

<sup>13</sup> Heck F. J. Unpublished data.



As a rule, because of associated morphologic or clinical observations, differentiation of the leukemoid reaction from chronic myelogenous leukemia on a clinical basis is simple. There are instances, however, in which the differentiation cannot be made satisfactorily on the basis of present knowledge. We should again like to stress the necessity for the correlation of the history, physical appearances and laboratory data in making the diagnosis in cases in which leukemoid reactions are present.

#### ABSTRACT OF DISCUSSION

DR HARRY A WICKOFF, San Francisco. This subject is always with us in the sense that throughout the work of the day the more closely one studies the reports of ordinary blood examinations as they come from the laboratory the more often one sees leukemoid or what one considers leukemoid reactions, especially in association with the infections. Of course, as the authors pointed out, one can well obtain the clinical data in such cases, so that the pictures seen ordinarily in routine work are easy to evaluate, if not on morphologic aspects at least with the help of the available clinical data. I had the advantage of having looked over the authors' paper in advance of the reading and had time to think of one or two of the things I had seen myself that rather parallel the cases mentioned. As Dr Krumbhaar pointed out in 1926, conditions associated with leukemoid reactions are of two general kinds: those that are really difficult to differentiate from leukemia and those that have only hematologic similarity. It is with the first group that both the clinical pathologist and the clinician are mostly concerned, and naturally Drs Heck and Hall considered some cases of such conditions in their paper. Their discussion of these cases is helpful. Conditions of the second type (those that have only a hematologic similarity) are an important and constant matter of consideration in any laboratory where large numbers of blood examinations are made. Usually they present little difficulty in evaluation especially when clinical data are available. I recall a case of polycythemia in which the following levels were reached: red cells 7,500,000 per cubic millimeter, hemoglobin 175 Gm per hundred cubic centimeters and white cells 19,250 per cubic millimeter, with 85 per cent neutrophils, moderate myelocytosis and moderate normoblastosis. Massive splenomegaly developed. Four years afterward the red cell count was 4,100,000, the hemoglobin content was 112 Gm and the white cell content was 17,100, with 72 per cent neutrophils and 7 per cent myelocytes. The spleen was still very large. After five years the red cell count had fallen to 3,000,000, the hemoglobin content to 10 Gm and the white cell count to 15,100, with 4 per cent basophils and 16 per cent myelocytes. The level for platelets, which had formerly been well elevated but within normal limits had fallen below 200,000 per cubic millimeter. Cells in the blood stream more primitive than myelocytes were not noted, and the bone marrow obtained from the sternum at about this time showed an extensive erythroblastic proliferation with somewhat less intensive granulopoietic hyperplasia at the myelocytic level.

DR NATHAN ROSENTHAL, New York. Drs Heck and Hall have reported an unusually interesting group of cases. It is remarkable that such leukemoid reactions occur with so many different diseases, cognizance of which will prove to be of some importance in diagnosis. I have had similar experience, such that the diagnosis was difficult when I saw the patient for the first time. It seems that leukemoid reactions occur with three main conditions: first, with unusual forms of infection, especially in cases of pyonephrosis in which the mass may be mistaken for the spleen if it is on the left side, second, with acute hemolytic anemia, especially of the Lederer type, and, third, with polycythemia. With polycythemia the leukemic blood picture may be present at the same time as the erythremia, or it may develop when the polycythemia becomes spent, which is usually in a terminal phase of this disease. The cases of osteosclerosis in which the bone marrow becomes fibrotic offer some difficulty in diagnosis unless sternal biopsy is made during life. In such cases there are usually a sec-

ondary enlargement of the spleen and development of a leukemic blood picture. Some authorities even consider the disease leukemia with secondary or terminal myelofibrosis. Recently I have had exceptionally good results in differentiating leukemoid blood pictures from true leukemia by studying the bone marrow obtained by sternal puncture. It is possible that this may be a helpful procedure for the establishment of an early diagnosis.

DR FRANK J HECK, Rochester, Minn. We did not have time to present all the statistical data we should like to have given, but in a practice such as ours, where we see the patient once, make a diagnosis and see him no more in as high as 30 or 40 per cent of instances, the patient may show a leukemoid reaction when he has metastatic bone involvement. I should like to emphasize the point Dr Rosenthal has made. Cases of osteosclerosis are extremely rare, but sternal biopsy is of course necessary in them, since sternal puncture will fail.

#### THE COURSE AND TREATMENT OF THROMBOPENIC PURPURA

NATHAN ROSENTHAL, M.D.

NEW YORK

Thrombopenic purpura is characterized by uniformity in its blood picture but presents marked variations in its severity and clinical course from acute to chronic.

The study on which the present article is based comprised 153 cases observed over ten years (1926 to 1936). The following typical blood conditions were noted in this group: (1) absence of anemia, unless considerable bleeding had taken place, (2) absence of abnormalities in the leukocytic picture and (3) marked diminution in the number of platelets. In addition, the bleeding time was prolonged, clot retraction was absent and a positive capillary resistance reaction present.

Symptoms of bleeding were present in all cases, these included easy bruising, spontaneous ecchymosis, purpura, epistaxis and bleeding gums. There was considerable variation, however, in the amount of bleeding, which frequently was severe at first but usually was mild in cases of more chronic disease. Bleeding was especially severe when associated with menorrhagia and occasionally with cerebral hemorrhage.

During the period of observation of such a large group of cases there was an opportunity to evaluate the various kinds of treatment advocated for this disease. Included among our 153 cases are fifty cases in which treatment was with snake venom, reports of which have previously been published.<sup>1</sup> Recent cases under observation have not been included in the present report, as sufficient time has not elapsed for a proper follow-up. Symptomatic purpura as the result of leukemia, subacute endocarditis and various forms of splenomegaly have not been considered in this communication.

#### CLASSIFICATION OF CASES

*According to Age*—The incidence of the condition in this series during the first decade of life was remarkable, 29 per cent. This is in approximate agreement

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1. Peck S. M. and Rosenthal Nathan. Effect of Moccasin Snake Venom (*Anistrodon piscivorus*) in Hemorrhagic Conditions. *J. A. M. A.* 104: 1066 (March 30) 1935. Peck S. M., Rosenthal Nathan and Erl L. A. The Value of the Prognostic Venom Reaction in Thrombocytopenic Purpura. *ibid.* 106: 1783 (May 23) 1936. Purpura. Classification and Treatment with Special Reference to Treatment with Snake Venom. *Arch. Dermat. & Syph.* 35: 831 (May) 1937.



with observations in the collected cases of Wintrobe, Hanrahan and Thomas,<sup>2</sup> who reported 36.2 per cent for the same age period. During the next three decades the average incidence was about 17 per cent, it occurs less frequently after the fortieth year. The acute form is encountered more often during infancy and childhood, whereas the chronic form occurs more frequently during adult life. Between the ages of 1 and 20 years, and especially during the first decade of life spontaneous recovery occurred in an unusually large number of instances (thirty-three cases compared with nine in adult life, excluding cases of drug idiosyncrasy). There have been no recurrences in these cases, which have been under observation from three to ten years. The absence of recurrences is of especial importance and should be kept in mind in gauging the effect of any form of treatment in children. The period of recovery varied from two weeks to seven months, and in one case (in which there was associated rheumatic fever) to as long as two years.

Classification of Cases

	Birth to 20 Years	21 Years and Over	Total
I Spontaneous recovery			
A Acute idiopathic	22	8	30
B Acute with infection	4	1	5
C Acute postinfectious	7	0	7
D Drug idiosyncrasy	1	10	16
II Acute			
A Fatal (without operation)	4	2	6
B Splenectomy			
1 Well	1	3	4
2 Died	2	1	3
III Neoplastic involvement	0	7	7
IV Chronic			
A Under observation	13	23	36
B Fatal (without operation)	0	3	3
C Splenectomy			
1 Well	12	13	25
2 Improved	2	1	3
3 Died			
(a) Postoperatively	1	3	4
(b) Late	1	3	4
Totals	70	83	153

The following two cases are typical examples of spontaneous recovery.

CASE 1—L. M., a boy aged 5 years, was first seen Feb. 21, 1927, the mother having noted that the child's body was covered with black and blue spots. Examination of the blood showed no anemia, the platelets numbered 10,000, the bleeding time was twenty-five minutes and there was no clot retraction. The child's condition was otherwise unaffected. During the following three months there was a decrease in the number of platelets, which then returned to normal, and the purpuric manifestations disappeared. There has been no recurrence.

CASE 2—D. W., a boy aged 13 years, was admitted to the service of Dr. M. H. Bass July 22, 1935. He was brought from a camp in Maine because of epistaxis and the presence of numerous ecchymoses and purpura scattered over the skin and mucous membranes. Examination of the blood showed hemoglobin 65 per cent, red cells 4,300,000, white cells 10,000, platelets 50,000, a differential count of nonsegmented neutrophils 5 per cent, segmented neutrophils 56 per cent, eosinophils 4 per cent, lymphocytes 30 per cent and monocytes 4 per cent, bleeding time nine minutes, coagulation time fourteen minutes, capillary resistance reaction positive and no clot retraction.

Within a week the purpura began to fade and the patient made a complete spontaneous recovery.

According to Cause.—In taking the histories in these cases special inquiries were made with respect to infection and the taking of drugs or food as possible causes.

Infection may incite an attack of purpura, especially in children, purpura may also appear during the convalescent period. It was associated with infection in eleven children and in one adult 24 years of age. In four cases the picture resembled infectious mononucleosis and one adult had purpura during the course of infectious mononucleosis. Cases of this kind were reported by Minot,<sup>3</sup> they may offer some difficulty in differentiation from leukemia. The following case is of some interest in this connection.

CASE 3—Acute infectious mononucleosis associated with purpura.

Dr. I. O., aged 24, seen about one week after the onset of illness, complained of sore throat, epistaxis, bleeding gums and widespread purpura more profuse over the lower extremities. The temperature reached 103 F. The pharynx was congested; there were no ulcerations; purpuric spots were scattered over the mucous membranes, and the gums appeared spongy and bleeding. Purpura and ecchymoses were present over the entire body. There was also generalized lymphadenopathy and the spleen was palpable. A diagnosis of leukemia was made on the basis of the clinical examination. Examination of the blood showed hemoglobin 88 per cent, red cells 4,600,000, white cells 1900, platelets 100,000, a differential count of nonsegmented neutrophils 14 per cent, segmented neutrophils 27 per cent, eosinophils 6 per cent, lymphocytes 30 per cent and monocytes 23 per cent, bleeding time normal, and capillary resistance reaction positive.

Purpura occurred in five cases after measles, chicken pox or scarlet fever and in two after an infection of the upper part of the respiratory tract. Purpuric manifestations were severe in one of these cases after measles, during the course of which a cerebral hemorrhage occurred, from which the patient gradually recovered. In two other cases transfusions, indicated because of excessive bleeding, were given. A typical example follows.

CASE 4—Postinfective purpura.

A. P., aged 2 years, was seen with the permission of Dr. B. S. Denzer and Dr. Herbert Gordon on May 6, 1930. After recovery from scarlet fever the child began to bleed from the nose and mouth, and large ecchymoses and purpura appeared all over the body. The condition was complicated by otitis media, which subsequently developed into acute mastoiditis. The child appeared pale and weakly ill. Examination of the blood showed severe anemia (hemoglobin 32 per cent and red cells 1,700,000), white cells 12,200 and platelets 90,000. There was a marked increase in the number of neutrophils, especially of the nonsegmented variety. The bleeding time was over one hour and the bleeding was controlled with difficulty. The coagulation time was forty-five minutes, the capillary resistance reaction was strongly positive, clot retraction was absent. Two transfusions were given on successive days and another small transfusion five days later. The platelet count became normal nine days after the onset of the purpura, and the bleeding time also returned to normal (two minutes). The child was operated on later for the mastoiditis and made an uneventful recovery.

Drug idiosyncrasy was responsible for the development of purpura in sixteen cases, in all of which the disease was at first regarded as idiopathic. Careful questioning, however, revealed that the following drugs had been taken: sedormid five cases, arsphenamine four cases, phenobarbital three cases, quinine two cases (including that of a newborn child), chrysarobin one case and a bismuth preparation one case. With one exception, all patients were adults and recovery was prompt after the drug was discontinued. In the cases of arsphenamine sensitivity transfusions were occasionally necessary.

<sup>2</sup> Wintrobe M. M., Hanrahan E. M. and Thomas C. B. Purpura Haemorrhagica with Special Reference to Course and Treatment. J. A. M. A. 109: 1170 (Oct. 9) 1937.

<sup>3</sup> Minot G. R. Purpura Haemorrhagica with Lymphocytosis. An Acute Type and an Intermittent Menstrual Type. Am. J. M. Sc. 192: 445 (Oct.) 1936.

The following case is of interest in connection with drug idiosyncrasy

CASE 5—Mrs E D, aged 63, admitted to the service of Dr B S Oppenheimer Sept 1, 1935, had noticed the appearance of black and blue spots, particularly on her arms and legs, for ten days. She soon began to suffer from bleeding from the nose and gums, and subsequently there was marked weakness. The patient appeared somewhat pallid, and blood could be seen oozing from her nose, ecchymoses and purpura were present over the entire body. There were moderately severe secondary anemia, marked thrombopenia, leukocytosis and polynucleosis, the bleeding time was twenty minutes and the capillary resistance reaction strongly positive, there was no clot retraction.

On admission to the hospital inquiry was made as to the use of drugs, and the patient stated that since the death of her husband she had become nervous and irritable and had been unable to sleep. She had been advised to take sedormid. This was taken every night for two weeks prior to admission to the hospital. Recovery was rapid after the drug was discontinued.

Food allergy seemed to play no role in cases of thrombopenic purpura. A diet rich in vitamins and with a high protein and high fat content was suggested by Kugelmass,<sup>4</sup> but in my experience its employment was not successful in controlling the bleeding or in increasing the platelet count. Food allergy as a factor in thrombopenic purpura as recently referred to by Squier and Madison,<sup>5</sup> did not seem to play a part in this series.

The association of purpura and neoplasm, especially involving the bone marrow, is not common. This occurred in only seven cases. In one case the purpura occurred after the removal of a malignant tumor of the ovary and in two cases was associated with multiple myelomatosis. In another, multiple myeloma became manifest after the removal of the spleen, the condition having previously been regarded as chronic purpura. In a more recent case multiple myeloma was detected early by sternal puncture.

The cases of idiopathic disease, however—both acute and chronic—comprised the majority of the series. No cause could be found in these cases for the diminished number of blood platelets, which is responsible for the bleeding tendency. As the platelets undoubtedly are derived from the fragmentation of the cytoplasm of megakaryocytes, these giant cells should be studied in various forms of purpura. In the majority of cases of thrombopenic purpura the sternal marrow showed a normal or increased number of megakaryocytes.<sup>6</sup> Lawrence and Knutti<sup>7</sup> found a marked diminution in some cases, and in my experience this megakaryocytopenia in the bone marrow appeared to be of bad prognostic import. Zitzmann<sup>8</sup> applied the term megakaryophthisis to this scarcity of giant cells.

Weakness in maturation or fragmentation of megakaryocytes may be considered an important factor in the pathogenesis of the disease. Willi<sup>9</sup> reported diminished platelet formation in smears of sternal bone marrow in cases of purpura. I have confirmed this

observation. The functions of the spleen in inhibiting, possibly by means of a hormone, this platelet formation, according to Frank,<sup>10</sup> and in destroying or removing the platelets from the blood, according to Kaznelson,<sup>11</sup> are also of great importance. The former factor is possibly of greater importance, as it is unusual to find a considerable increase of platelets in splenic smears in cases of purpura. In some cases the spleen may act as an aggravating factor and its removal restores the platelets to normal qualitatively, although not quantitatively in some cases, according to Brill and Rosenthal.<sup>12</sup>

*According to Course*—The course of thrombopenic purpura may be either acute or chronic. The symptoms may be mild or severe in both types, so that it is sometimes difficult to predict at the outset whether the disease is of the acute or chronic form.

*Acute Disease* A review of cases of acute disease shows them to fall into three groups. The first group represents the acute type in children and occasionally in adults, idiopathic or occasionally associated with some form of infection, resembling glandular fever, or occurring after the subsidence of an infection or a manifestation of drug idiosyncrasy. Recovery is spontaneous in these cases (fifty-eight). The second group constitutes the beginning of a chronic type, it usually starts as a mild form. As treatment continues—with either transfusions or snake venom—recovery fails to occur and there is a persistence of symptoms associated with thrombopenia. The disease may become severe during early observation, so that more radical measures, such as splenectomy, may have to be advised. That procedure may account for some of the good results obtained in the treatment of so-called acute disease. In the third group are cases of the markedly acute type, with severe bleeding and rapid development of anemia. The patient becomes somewhat toxic, and leukocytosis and polynucleosis develop. Hemorrhages may be found in the fundi, these being unusual in benign forms of purpura. The cases run a rapidly fatal course and survival does not occur if splenectomy is done. Postmortem examination shows vascular changes with generalized small intravascular thrombi. More detailed reports of this group were presented by Baehr, Klemperer and Schiffrin<sup>13</sup> and by Friedberg and Gross.<sup>14</sup> Another fatal form of acute purpura is associated with a pronounced diminution in the number of megakaryocytes ("megakaryophthisis") in the bone marrow. In one case of this type splenectomy was performed without influencing the bleeding, which became more profuse. In this case and in two others of this type intracutaneous injections of snake venom induced violent reactions. Fortunately the acute form is not frequent, but its recognition is important from a prognostic standpoint.

*Chronic Disease* Cases of this type formed the larger group which required treatment. In some of these the condition was mild and required no special therapy. In one patient the disease was discovered accidentally. She was admitted to the hospital for dia-

4 Kugelmass I N. Clinical Control of Chronic Hemorrhagic Spots in Childhood. *J A M A* 102: 204 (Jan 20), 287 (Jan 27) 1934.

5 Squier T L and Madison F W. Thrombocytopenic Purpura Due to Food Allergy. *J Allergy* 8: 143 (Jan) 1937.

6 Vogel Peter, Erfi L A and Rosenthal Nathan. Hematological Observations on Bone Marrow Obtained by Sternal Puncture. *Am J Clin Path* 7: 436 (Sept) 498 (Nov) 1937.

7 Lawrence J S and Knutti R E. The Bone Marrow in Idiopathic Thrombopenic Purpura. *Am J M Sc* 188: 37 (July) 1934.

8 Zitzmann Kurt. Isolierte Megakaryophthise als Ursache einer essentiellen Thrombopenie. *Folia haemat* 56: 129 (Dec) 1936.

9 Willi H. Ueber den Bau und die Funktion der Megakaryocyten und ihre Beziehungen zur thrombopenischen Purpura. *Folia haemat* 53: 426 (Aug) 1935.

10 Frank E. Die essentielle Thrombopenie (Konstitutionelle Purpura Pseudo haemophilie). *Berl klin Wchnschr* 52: 454, 490 1915.

11 Kaznelson P. Verschwinde der hamorrhagischen Diathese bei einem Falle von Essentielle Thrombopenie (Frank) nach Milzextirpation. *Wien klin Wchnschr* 29: 1451 1916.

12 Brill N E and Rosenthal Nathan. Treatment by Splenectomy of Essential Thrombocytopenia (Purpura Haemorrhagica). *Arch Int Med* 32: 939 (Dec) 1923.

13 Baehr George, Klemperer Paul and Schiffrin Arthur. An Acute Febrile Anemia and Thrombocytopenic Purpura with Diffuse Platelet Thromboses of Capillaries and Arterioles. *Tr A Am Physicians* 51: 43 1936.

14 Friedberg C K and Gross Louis. Nonbacterial Thrombotic Endocarditis Associated with Acute Thrombocytopenic Purpura. *Arch Int Med* 58: 641 (Oct) 1936.

betes, but ecchymotic spots were found on the lower extremities. The bleeding time was normal and clot retraction was present, but the platelets were found to be diminished to 90,000. Since then she has had mild episodes of bleeding.

In seventy-two cases of chronic disease the symptoms were somewhat more severe. In some of these blood transfusions were required, and in forty-three splenectomy was performed because of persistence of bleeding or repeated exacerbations. It has been my custom to advise splenectomy in all cases of chronic disease because it may be dangerous to temporize. This is brought out in the following case.

CASE 6—L. P., a Negro aged 42, admitted to the Harlem Hospital Jan 18, 1932, stated that he had had blood spots on the skin ever since he was 10 months old. He had previously been admitted to other hospitals and had been advised to have his spleen removed. On this admission he complained of severe headache, he was drowsy and only at times responded to questions. Ecchymoses and purpura were present. There was considerable rigidity of the neck. He died nine days after admission. His blood picture was typical of thrombopenic purpura. There was no doubt that cerebral hemorrhage was responsible for his death.

A recurrent type of purpura was present in three cases of chronic disease. Symptoms occurred when thrombopenia developed. Severe attacks of bleeding occurred in one case and splenectomy had to be performed. Up to the present time this patient has been free of purpura.

#### TREATMENT

Except for splenectomy, the treatment of thrombopenic purpura is, on the whole, unsatisfactory—if one excludes the form occurring in children and the acute form in some adults. It has been my experience, as previously stated, that the incidence of spontaneous recovery from acute disease of idiopathic or infectious type and especially from that due to drug idiosyncrasy is considerable (38 per cent). As one reviews the various reports of successful medical treatment of purpura, one notes that conclusions as to certain forms of therapy are usually based on a few cases, which are likely to be in instances of this particular group. I have noted that these so-called successful remedies usually fail to cure chronic purpura. My experience coincides with that of Vaughan,<sup>15</sup> who tried various therapeutic agents, including ascorbic acid (intravenously and orally), roentgen irradiation to the spleen and citrin (so-called vitamin P of Szent-Gyorgyi) in a case of chronic purpura, without success.

Some of the suggested means of treatment employed for thrombopenic purpura will now be discussed.

1 *Ascorbic Acid*—In the use of vitamin C for purpura, Engelkes,<sup>16</sup> Vogt<sup>17</sup> and Lorenz<sup>18</sup> obtained good results in apparently acute disease, whereas in the cases of chronic disease reported by Davidson,<sup>19</sup> Wright and Lilienfeld<sup>20</sup> and Stephens and Hawley<sup>21</sup> no effect

was noted. My own observations based on the study of ten cases of chronic disease, indicate practically no improvement from this form of treatment. Finkle<sup>22</sup> found no evidence of vitamin C deficiency in chronic purpura.

2 *Sesame Oil or Fat-Soluble T Substance*—According to Schiff and Hirschberger,<sup>23</sup> sesame oil increases the number of circulating blood platelets. I was, however, unable to confirm this observation. Sherman<sup>24</sup> also has recently employed it in ten cases of chronic purpura, without success. No effect on either symptoms or blood platelets resulted from its use.

3 *Liver Extract*—This has an exceptionally good effect on thrombopenia in pernicious anemia, for this reason its use has been suggested in cases of purpura. Satisfactory results have been reported for acute disease, but Witts<sup>25</sup> obtained no satisfactory results in five cases of chronic disease.

4 *Parathyroid Extract*—Lowenburg and Ginsburg<sup>26</sup> reported good effects in two children following the injection of parathyroid extract. Mathewson and Cameron<sup>27</sup> failed to obtain similar results with this type of treatment. In five cases of chronic and two of acute disease in the present series, no beneficial effect on the bleeding tendency or the platelet count was noted.

5 *Blood Transfusion*—This is of great importance in the presence of severe symptoms. It is thus possible to tide patients over a critical period until splenectomy can be performed. It may be of value for children with acute disease, and in such instances recovery may be hastened. On the other hand, the use of repeated small transfusions in chronic disease has practically no effect on its course.

6 *Roentgen Irradiation*—Results of treatment with this agent have been summarized by Vaughan,<sup>15</sup> who collected twenty-five cases, mainly of the acute forms, and noted that in many this treatment was beneficial. So-called cure or improvement, however, seemed to occur mainly in acute disease. Mettier, Stone and Purviance<sup>28</sup> reported some success in chronic disease following massive roentgen irradiation of the spleen. There was a marked increase in blood platelets within forty-eight hours to normal or above normal, with relapse occurring later. No improvement from this form of treatment was reported by Jones, Tocantins and Smith<sup>29</sup> (six cases), Davidson<sup>19</sup> (three cases), Vaughan<sup>15</sup> (one case) or Bassen<sup>30</sup> in four cases of the present series. Symptoms became exaggerated in some cases. In one instance reported by Jones and his associates<sup>29</sup> a cerebral hemorrhage occurred during roentgen therapy.

15 Vaughan, J. M. Treatment of Thrombocytopenic Purpura. *Brit M J* 2 842 (Oct 30) 1937.

16 Engelkes, H. Treatment of Hemorrhagic Disorders with Vitamin C. *Lancet* 2 1285 (Dec 7) 1935.

17 Vogt, E. Ueber die Behandlung gynäkologischer Blutungen mit Vitamin C. *München med Wchnschr* 82 263 (Feb 14) 1935.

18 Lorenz, E. Zur Vitaminbehandlung der Werlhofischen Krankheit. *Wien klin Wchnschr* 49 1195 (Sept 25) 1936.

19 Davidson, L. S. P. Classification and Treatment of the Purpuras. *Proc Roy Soc Med* 30 715 (Jan 27) 1937.

20 Wright, I. S. and Lilienfeld, Alfred. Pharmacologic and Therapeutic Properties of Crystalline Vitamin C (Cevitamic Acid) with Especial Reference to Its Effects on Capillary Fragility. *Arch Int Med* 57 241 (Feb) 1936.

21 Stephens, J. J. and Hawley, E. E. The Relationship of Vitamin C to the Hemorrhagic Diatheses. *J Lab & Clin Med* 22 173 (Nov) 1936.

22 Finkle, Philip. Vitamin C Saturation Levels in Body in Normal Subjects and in Various Pathological Conditions. *J Clin Investigation* 16 587 (July) 1937.

23 Schiff, E. and Hirschberger, C. Thrombocytosis by a Hitherto Unknown Substance—The Fat Soluble T Factor. *Am J Dis Child* 53 32 (Jan) 1937.

24 Sherman, Irving. Personal communication to the author.

25 Witts, L. J. Inefficiency of Liver Treatment in Essential Thrombocytopenia. *Lancet* 1 809 (April 11) 1931.

26 Lowenburg, Harry and Ginsburg, T. M. Induced Hypercalcemia Its Possible Relation to Thrombocytopenic Purpura. *J A M A* 106 1779 (May 23) 1936.

27 Mathewson, F. A. L. and Cameron, A. T. An Apparent Instance of Parathormone Inactivity. *Canad M A J* 36 141 (Feb) 1937.

28 Mettier, S. R., Stone, R. S. and Purviance, Katherine. The Effect of Roentgen Ray Irradiation on Platelet Production in Patients with Essential Thrombocytopenic Purpura. *Haemorrhagica Am J M Sc* 191 794 (June) 1936.

29 Jones, H. W., Tocantins, L. M. and Smith, R. M. Splenic Irradiation in the Treatment of Purpura. *Haemorrhagica Ann Int Med* 11 1311 (Jan) 1938.

30 Bassen, F. A. Failure of Irradiation of the Spleen with Roentgen Rays in the Treatment of Essential Thrombocytopenic Purpura. *J Mount Sinai Hosp* 4 461 (Jan Feb) 1938.

**7 Snake Venom**—In previous studies<sup>1</sup> in this connection, Peck and I found that moccasin venom is of considerable value in the treatment of nonthrombopenic forms of bleeding. In certain cases of acute thrombopenic purpura good results were obtained, not entirely attributable to treatment. Nevertheless, the treatment is ineffective in cases of acute purpura accompanied with fever, leukocytosis and polymucleosis or with megakaryophthisis. Reactions in some cases after intracutaneous injection of venom are violent, and its use by this method is contraindicated. For chronic disease however, especially in patients who refuse to submit to splenectomy, I have found snake venom to be of some therapeutic value.

It may be of prognostic importance also, especially in the selection of cases requiring splenectomy. It has been noted that a reversal from a positive to a negative reaction to intracutaneous injection of snake venom is usually associated with improvement. The persistence of a positive reaction usually indicates the ineffectiveness of venom treatment and, in a small percentage of cases, the possibility of failure to react to splenectomy.

Since the last report<sup>1</sup> was published, additional cases of chronic purpura have confirmed my opinion that in only about 50 per cent of cases does symptomatic improvement follow the use of snake venom. In no case have I found a change in the number of platelets. In only a few has a tendency toward diminution in bleeding time been observed but more frequently I have seen improvement in the condition of capillaries indicated by the capillary resistance test. On the whole, in my opinion, the remedy is to be regarded only as palliative.

**8 Splenectomy**—Recent attempts have been made to weed out cases of acute or apparently chronic disease in which splenectomy is contraindicated. Intracutaneous use of venom and sternal puncture are of considerable value for this purpose. The appearance of a violent reaction from intracutaneous injection of venom, such as excessive hemorrhagic reaction or the appearance of bullae or exaggeration of the purpuric state, may be a definite contraindication to operation. This reaction is found in severe types of acute purpura previously mentioned. A marked diminution of megakaryocytes in the bone marrow is also a definite contraindication to splenectomy.

During the period of observation covered in this report forty-three splenectomies were undertaken, the results being compatible with those previously collected and reported by Eliason and Ferguson,<sup>31</sup> by Giffen<sup>32</sup> and by Wintrobe, Hanrahan and Thomas.<sup>2</sup> Seven of the patients had acute purpura, and of these three died after operation and four recovered. Thirty-six patients had the chronic type. Of these twenty-five remained well and three have improved, there were four postoperative deaths resulting from peritonitis or subphrenic abscess, and four patients died later after a recurrence of symptoms. It is noteworthy that in the last-named cases no accessory spleens were found post mortem and many megakaryocytes were present in the bone marrow. Slight attacks of bleeding or purpura may occur in a few cases within the first year following the operation. In most instances, however, there is complete recovery from symptoms.

The variations in the platelet reactions following splenectomy indicate that there are different factors responsible for the underlying purpura. Clinical and hematologic recovery may take place in 50 per cent of the cases. In a few of these there is a thrombocytolytic factor, as shown by the finding of many platelets in the splenic smears, substantiating Kaznelson's<sup>11</sup> theory. Similar recovery may take place in other cases in which no platelets are found in splenic smears, indicative of an inhibitory factor arising in the spleen, as Frank<sup>10</sup> suggested. In an equally large group clinical recovery occurs but the blood platelets do not return to normal. In such instances a failure of platelet formation associated with an aggravating factor in the spleen must be considered. The number of megakaryocytes in the bone marrow seems to bear no relation to the platelet count after splenectomy.

**9 Ligation of the Splenic Artery**—An operation of this type was performed by Berg<sup>33</sup> on two of my patients, but with no success. In one the purpuric manifestations persisted, although the spleen was found to be completely shrunken when a second operation (splenectomy) had to be done. In the other, with chronic disease, ligation of the splenic artery was ineffective in controlling the bleeding. The patient died before secondary splenectomy could be undertaken. Although my conclusions are based on only two cases, this operation must be considered a hazardous undertaking in the treatment of purpura.

#### COMMENT

From a study of 153 cases it appears that purpura haemorrhagica may be divided into four main groups:

1 Acute purpura, idiopathic or associated with infection or a postinfectious state or with drug idiosyncrasy followed by recovery, occurring mainly in children. Patients (fifty-eight) with this type have remained well or have shown no tendency to recurrence. Good results are obtained in this group with all forms of therapy. It is particularly desirable to refrain from splenectomy in children until there is definite proof that the condition is chronic.

2 Acute purpura, of severe form, especially if associated with fever and leukocytosis. In this condition hemorrhages in the fundi and occasional cerebral hemorrhages may occur. This type is usually refractory to all forms of treatment and may show severe reactions from either intracutaneous or subcutaneous injections of snake venom. Splenectomy should be avoided if diagnosis of the underlying toxic condition resulting in intravascular thromboses is suspected.

3 Megakaryophthisis, or diminution of giant cells in the bone marrow. This type is usually acute and responds to neither medical nor surgical treatment. The reaction to intracutaneous injection of venom is severe.

4 Chronic purpura. This type presents marked variations with respect to severity of symptoms, number of blood platelets and number of megakaryocytes in the bone marrow, these may vary in number, namely from 11 to 500 per cubic millimeter. It may also be refractory to most forms of medical treatment and only in a certain number of cases may show symptomatic improvement from the use of snake venom. Symptoms may become severe, necessitating splenectomy. In the majority of cases the outcome may be predicted on the basis of the reaction to intracutaneous venom. Good

<sup>31</sup> Eliason E. L. and Ferguson L. K. Splenectomy in Purpura Haemorrhagica. *Ann. Surg.* 96: 801 (Nov.) 1932.

<sup>32</sup> Giffen H. Z. Essential Thrombocytopenic Purpura. *Internat. Clin.* 46: 95-119 (Dec.) 1936.

<sup>33</sup> Berg A. A. Unpublished data.

results are also generally obtained in cases in which a persistently positive venom reaction is followed by splenectomy and a small percentage of patients recover from the operation but continue to show purpuric symptoms, at times severe

#### SUMMARY

One hundred and fifty-three cases of purpura haemorrhagica have been classified, and the importance of age, causation and especially the course of the disease was observed

A high incidence (38 per cent) of spontaneous recovery is noted in acute disease

At present no medical treatment can be regarded as specific. Snake venom and blood transfusions are the only acceptable means of palliative treatment for chronic purpura

Splenectomy is the curative form of treatment in the majority of cases of chronic purpura, it is contraindicated in some of the acute forms

### THE USE OF CONCENTRATED LIVER EXTRACTS IN PERNICIOUS ANEMIA

A SURVEY OF THE MAINTENANCE TREATMENT OF ONE HUNDRED AND SEVENTY-SIX PATIENTS UNDER CONTINUOUS OBSERVATION FOR FROM SIX MONTHS TO SIX AND A HALF YEARS

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The problem of maintaining, over long periods, normal erythrocyte levels in patients with pernicious anemia is one which presents itself to every physician who has such a patient to treat. In the larger hospitals and medical centers many data concerning this problem have been assembled, and from time to time some of these have been published.

Since the purpose of this paper is to present the results of maintenance treatment of the patient with pernicious anemia by parenteral injection of liver extracts over relatively long periods, perhaps a fairly comprehensive review of the literature pertaining to the results obtained by this means will be of value. It was pointed out in the early reports<sup>1</sup> of the use of intramuscular injections of liver extract that observation over long periods is necessary in order to establish the average maintenance dose. Six months may be considered the shortest period over which patients must be observed in order that the data may be of value, for shorter periods are likely to be too greatly influenced by the quantity of anti-pernicious anemia substance administered during initial treatment. Data assembled from published work which most nearly conform to this principle are presented in table 1.

From a consideration of table 1 it is apparent that published data concerning the value of liver extract for parenteral use in the maintenance of normal erythrocyte levels is practically limited to those extracts prepared by one company. The data presented with regard

to the other extracts are incomplete in one or another detail necessary for proper evaluation of their maintenance value. This is particularly true of those extracts of foreign make for which data are lacking either as to the amount of whole liver from which the extract is prepared or as to the level at which the erythrocytes were maintained. The data presented by Isaacs and his collaborators<sup>2</sup> are not clear in respect to either condition, although these authors apparently considered a normal erythrocyte level to be between 4,000,000 and 4,500,000 cells per cubic millimeter. There is practically universal agreement in authoritative data in the literature that an erythrocyte level of about 5,000,000 cells per cubic millimeter is satisfactory for purposes of maintenance, and furthermore maintenance at levels distinctly below this cannot be considered comparable to maintenance at or about 5,000,000, for distinctly more anti-pernicious anemia substance is required to maintain the higher levels. It is also rather universally agreed that only by maintenance at or about the 5,000,000 level is it possible to insure the patient the best possible protection against the development of or progression of already existing neural disturbances.

The economic status of the patients included in the group reported by Connery and Goldwater<sup>3</sup> was poor, and since these patients were undoubtedly partaking of a diet deficient in certain of the substances necessary for proper nutrition it is to be expected that a shorter average interval between injections than that observed by us would be necessary for satisfactory maintenance. However, several patients in this group had their injections at four week intervals.

My reports from the Peter Bent Brigham Hospital blood clinic have consistently shown erythrocyte levels to be maintained at or about 5,000,000 cells per cubic millimeter with intramuscular injections of one vial or 3 cc. of a solution of liver extract (Lederle) at intervals between injections of from three and one half to four weeks. A previous report<sup>4</sup> based on observation of a group of patients for from six months to one year showed that similar erythrocyte levels were maintained with injections of one vial or 1 cc. of a more highly concentrated liver extract (Lederle) given at intervals of approximately three weeks. This extract was undoubtedly used too conservatively, since as will be noted later in this paper, the average interval between injections when considered over much longer periods, from six months to three years, is approximately the same as in the case of the 3 cc. concentrate, or between three and four weeks. There is little doubt that the longer the period of maintenance treatment the more accurate will be the data available for evaluation of the amount of anti-pernicious anemia substance present. Hartfall<sup>5</sup> recently recorded an interval of four weeks between injections of one vial, or 1 cc. of liver extract (Lederle). Hartfall's period of observation was from three to eleven months.

An effort has been made by a committee appointed for revision of the United States Pharmacopeia to rate the various manufactured substitutes for whole liver

From the Medical Clinic of the Peter Bent Brigham Hospital. Read before the Section on Pharmacology and Therapeutics at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 16, 1938.

1. Murphy W. P. The Parenteral Use of Liver Extract in Pernicious Anemia. *J. A. M. A.* 98: 1051 (March 26) 1932. Connery J. E. and Goldwater L. J. Parenteral Use of Liver Extract in the Treatment of Pernicious Anemia. *ibid.* 98: 1060 (March 26) 1932. Murphy<sup>2</sup>

2. Isaacs Raphael, Sturgis C. C., Goldhamer S. M. and Bethell F. H. Use of Liver Extract Intravenously in the Treatment of Pernicious Anemia. *J. A. M. A.* 100: 629 (March 4) 1933.  
3. Connery J. E. and Goldwater L. J. Parenteral Liver Therapy in Pernicious Anemia. *Ann. Int. Med.* 7: 1117 (March) 1934.  
4. Murphy W. P. Maintenance of Normal Blood in Pernicious Anemia by Means of Intramuscular Injections of a Solution of Liver Extract. *Am. J. M. Sc.* 116: 271 (Aug.) 1933. Exhibit from Section on Practice of Medicine in the Scientific Exhibit American Medical Association, Cleveland, June 1934. (*J. A. M. A.* 102: 1590 (May 12) 1934).  
5. Murphy W. P. Treatment of Pernicious Anemia with Intramuscular Injections of a Highly Concentrated Solution of Liver Extract. *Am. J. M. Sc.* 131: 597 (May) 1936.  
6. Hartfall J. Experiences with a Concentrated Whole Liver Extract. *Lancet* 2: 317 (Aug. 7) 1937.

According to their anti-pernicious anemia potency, to be expressed in terms of units. A unit is defined as that amount of material which when given daily (during the period of initial treatment when the blood is in relapse) will produce a satisfactory hemopoietic response. On the basis of tests carried out according to the stipulations of this committee, the two extracts which have been used by us for determining the maintenance value as reported in this paper have received ratings of 10 units per vial for the 3 cc preparation and of 15 units per vial for the 1 cc more concentrated one. A vial of each of these extracts is derived from 100 Gm of whole liver. When the preparations are considered on the basis of the committee's rating, one is led to believe that there is a difference in their efficiency, so far as their ability to produce a satisfactory hemopoietic response during relapse of the blood is concerned. The advantage is in favor of the 1 cc concentrate, one vial of which should supply sufficient anti-pernicious anemia substance for fifteen days, whereas a vial of the 3 cc material is sufficient for ten

who have been treated with the 3 cc concentrated extract (Lederle). Treatment of this group has continued for from six months to six and one-half years. The second group includes thirty-one clinic patients who have received the 1 cc concentrate (Lederle) for from six months to three years. The patients in these two groups have been essentially regular in their response and faithfulness to treatment. They have, however, had the usual complications which may be expected in a group of patients of their age with pernicious anemia.

The third group includes twelve clinic patients who either had complications known definitely to influence their requirement of anti-pernicious anemia substance, such as myxedema, severe arthritis or acromegaly, or were not faithful to their treatment.

Table 2 shows the results obtained in the first group, who received at the intervals shown one vial of the 3 cc concentrate, prepared from 100 Gm of liver and with an anti-pernicious anemia potency of 10 U S P units.

TABLE 1—Maintenance Treatment by Means of Parenteral Injections of Liver Extract

Year Published	Author	Number of Patients	Interval Between Injections Weeks	Material Used	Amount of Liver From Which Obtained, Gm	Erythrocyte Level Maintained Millions	Period of Observation Months
1931	Günzelen M. Deutsche med Wchn schr 57 1926 1931		2 3	Campolon 10 cc	20 30		
1932	Köhler H. München med Wchn schr 79 23 1932		1 0	Hepacton 2 3 cc			
1933	Alt H L. Proc Soc Exper Biol & Med 30 1933	4	2 8	Lederle 3 cc	100	5 0	10 11
1933	Isaacs and others	56	4 0	Own make* 20 cc	100 12 1/2	4 0-4 5	10 17
1933	Murphy 4	79	4 0	Lederle 3 cc	100	5 3	6 16
1934	Shultz P. Acta med Scandinav 82 393 1934	3	2 0	Hepsol 5 cc		4 0 5 2	3 10
1934	Murphy 4	89	4 0	Lederle 3 cc	100	5 1	6-30
1934	Connery and Goldwater 3	38	2 3	Lederle 3 cc	100	4 3 0 0	24
1936	Murphy 5	21	3 0	Lederle 1 cc	100	5 26	6-12
1937	Hartfall 6	20	4 0	Lederle 1 cc	100		3-11

\* Prepared from Eli Lilly & Co. and Parke Davis & Co. powdered liver extract for peroral use.

days only. Although the tests of the maintenance value of these two extracts reported herein do not confirm the difference in the unit rating reported by the committee, the fact that the 1 cc concentrate has by it received the higher value supports our belief that the anti-pernicious anemia value of the 1 cc extract is at least as great as that of the 3 cc extract.

In assembling the data for this report we decided to consider erythrocyte levels of 4,500,000 cells per cubic millimeter as the lower limit for inclusion in the period of maintenance treatment. That is, after initial treatment of the patient during relapse of the blood, intensive therapy was continued until the erythrocyte level reached 4,500,000 after which it was considered that the period of maintenance had begun.

One hundred and seventy-six patients were included in the entire survey, and the observations were made over periods varying from a minimum of six months up to six and one-half years. In all instances the extract has been given at intervals which have been determined as the most satisfactory for each individual patient.

The series of patients has been divided into three groups. The first group includes 133 clinic patients

Table 3 is similar to table 2, except that the patients received at the intervals shown one vial of the 1 cc concentrate derived from 100 Gm of liver and with an anti-pernicious anemia potency of 15 U S P units.

From a comparison of tables 2 and 3 it is obvious that the two extracts are approximately equal in their ability to maintain average normal erythrocyte levels.

For further analysis of the data obtained in these two groups of patients, table 4 has been arranged to show the dispersion of treatments by means of one vial of either extract through intervals from one week up to seven or eight weeks.

From an analysis of the data presented it may be seen that one vial of either the 1 or the 3 cc liver extract contains sufficient anti-pernicious anemia substance to maintain the blood of the average patient in a hospital outpatient clinic for from three to four weeks in a normal state. As shown in table 4, over 60 per cent of the patients treated with the 3 cc extract have received injections of one vial at intervals of from three to five weeks, and of those treated with the 1 cc extract over 50 per cent have received one vial at the same intervals. In these two groups of patients there has not been at any time a marked drop below the average erythrocyte level of about 5,000,000 cells, as shown in tables 2 and 3. In a rare instance the count

7 United States Pharmacopeia Anti Anemia Preparations Advisory Board Report on Liver Products New England J Med 218 620 (April 7) 1938



has dropped for brief periods slightly below this desired level because of the occurrence of an acute infection, extraction of a tooth or some other complication which might favor the need for amounts of anti-pernicious anemia substance greater than that just necessary for maintenance at or about 5,000,000 cells per cubic millimeter. That such a drop has occurred only rarely in this rather large group of patients observed for relatively long periods is due to the fact that an effort

TABLE 2—Intervals Between Injections of One Vial or 3 Cc. of Liver Extract for the Maintenance of Normal Erythrocyte Levels in 133 Patients with Pernicious Anemia

Number of Patients	Duration of Maintenance Weeks	Interval Between Injections, Weeks	Average Erythrocyte Count Millions
15	26-52	4.3	5.10
20	53-101	9	5.11
19	102-156	3.2	4.98
16	157-208	3	4.99
22	209-260	3.6	4.90
40	261-312	1.9	5.01
2	313-361	3.4	4.95

has been made to give constantly amounts of anti-pernicious anemia substance greater than that just necessary to maintain the 5,000,000 level.

Except for the complications which have occurred in association with the pernicious anemia, as previously reported,<sup>8</sup> the patients have remained in excellent health, have usually been able to carry on their work, whatever its nature, and have experienced complete arrest of progression of neural disturbances which may have been present when treatment was started. In no case have neural disturbances developed during the adequate regimen of treatment shown.

It has been pointed out in previous reports from this hospital<sup>9</sup> that although some patients may be maintained in a satisfactory state of health while receiving injections of one vial of either of these extracts at intervals greater than four weeks, unless they are so situated that they may be closely followed, with erythrocyte counts at frequent intervals, it is best to give injections

TABLE 3—Intervals Between Injections of One Vial, or 1 Cc. of Liver Extract for the Maintenance of Normal Erythrocyte Levels in Thirty-One Patients with Pernicious Anemia

Number of Patients	Duration of Maintenance Weeks	Interval Between Injections, Weeks	Average Erythrocyte Count Millions
10	26-52	3.3	5.10
4	53-101	3.9	5.26
15	102-156	3.2	5.18
2	157-208	3.9	5.21

at shorter intervals in order to insure an adequate supply of anti-pernicious anemia substance at all times. It is well to reemphasize the well established fact that each patient presents an individual problem in respect to the determination of the amount of anti-pernicious anemia substance necessary to maintain the most satisfactory state of health. The amount necessary is determined on the basis of erythrocyte counts at intervals determined by the trend of the erythrocyte levels on several suc-

cessive counts and of the patient's physical condition, with particular reference to the amount of neural disturbance observed, if present.

Some difference of opinion exists in regard to the value of liver or effective substitutes in the prevention and arrest of the neural disturbances occurring in pernicious anemia. This question has been discussed elsewhere<sup>10</sup> in considerable detail so need not be considered in detail here. An analysis of the literature concerning this question indicates that the general consensus bears out our belief that the use of sufficient anti-pernicious anemia substance to maintain the blood at all times in a normal state with 5,000,000 or more erythrocytes per cubic millimeter will prevent the development of neural difficulties, that it will invariably arrest their progress if present when treatment is started and that improvement in the evidences of neural disturbance will occur in all cases. The degree of improvement will depend on the duration and extent of the damage present before adequate therapy is established. The more pessimistic reports have invariably dealt with groups of patients who have received insufficient treatment to maintain a normal condition of the blood, not commonly because of the use of inadequate amounts of peroral liver extract.

TABLE 4—The Actual Intervals Between Injections for the Patients in Tables 2 and 3

3 Cc. Concentrate		Interval Between Injections, Weeks	1 Cc. Concentrate	
Number of Patients	Percentage of Group		Number of Patients	Percentage of Group
1	0.7	1.2	1	3.2
22	16.5	2.3	9	29.0
50	7.6	3.4	10	37.2
2	2.1	4.5	6	19.4
17	12.8	5.6	2	6.0
4	3.1	6.7	3	9.1
4	3.1	7.8		

It has been suggested recently, but without evidence to support the suggestion, that the more concentrated and refined liver extracts lack some substance or substances which are present in whole liver or the less refined extracts that are necessary for the best results in prevention or improvement of neural disturbances, and that the more concentrated extracts may therefore be less effective than the cruder extracts for this purpose. Although it is possible that such an extract might be prepared in the chemical laboratory by fractional partition of the substances known to be effective in the treatment of pernicious anemia, our experience over many years with whole liver and liver extracts has shown no less effectiveness in this regard in the highly refined and concentrated 1 cc extract than in the cruder extracts or in whole liver. In fact the most striking and complete prevention or arrest of neural damage has been observed in those patients who have received the more concentrated extracts. This is no doubt due to the more intensive treatment which these patients have received because of the ease of administration and the inexpensiveness of treatment, both of which have made the results the most complete and satisfactory of any obtained by the various means available. Arrest and improvement of neural disturbances have been as striking in patients treated with the 1 cc concentrate as in the group treated with the 3 cc extract.

8 Murphy W. P. and Howard I. M. An Analysis of the Complications Occurring in a Series of Patients with Pernicious Anemia. *Rev. Gastroenterol.* 3: 98 (June) 1936.  
9 Murphy W. P. Rational Treatment of the Anemic Patient. *Ann. Int. Med.* 7: 939 (Feb.) 1934.

10 Murphy, W. P. *Anemia in Practice*. Philadelphia: W. B. Saunders Company.

The twelve patients composing the third clinic group have so far been left out of the discussion because their condition or treatment has been unusual in some respect. A detailed discussion of this group need not be included in this paper, but brief mention of several cases may be of interest. Three members of this group have myxedema in association with the pernicious anemia, and in each the blood has been maintained in a normal state by the use of somewhat greater than average amounts of extract, together with thyroid and iron medication. One patient had acromegaly with glycosuria, hypertension and cholelithiasis but in spite of this was maintained with little difficulty in fairly satisfactory condition for several years, until death occurred from pneumonia. One other patient with typical evidence of pernicious anemia who was not included in the group is of interest only as a curiosity. Since return of her blood to a normal state following treatment during relapse with extract derived from 1,100 Gm of liver, she has maintained a normal erythrocyte level during eight years without further therapy. This case will be reported in detail elsewhere. It has been impossible to maintain the blood of one of this group of patients in a normal state with injections of one vial, or 3 cc, of extract at weekly intervals, in spite of the fact that there is no demonstrable reason for a need for unusual amounts of extract except that her dietary intake is deficient in some respects. No doubt larger amounts of extract would produce the desired result although she has remained in excellent health in spite of a subnormal erythrocyte count. Several patients included in this group have failed to follow up their treatment continuously and so have failed to maintain their blood in satisfactory condition.

It is possible to determine from the data presented the average amount of anti-pernicious anemia substance received by each group and each patient during their course of treatment.

For patients treated with the 3 cc extract a total of 19,212 cc (6,404 vials of 3 cc capacity) derived from 640,400 Gm of liver has been administered during a total of 23,766 weeks. Each patient has therefore received weekly an average of 0.81 cc of extract derived from 26.9 Gm of whole liver.

TABLE 5—Amount of Anti-Pernicious Anemia Substance Required at Various Ages

Number of Patients	Age Years	Average Interval Between Injections, Weeks	Average Erythrocyte Count Millions
5	30-39	4.1	5.25
26	40-49	3.9	5.16
41	50-59	3.6	5.09
65	60-69	3.7	5.03
26	70-79	3.5	4.87
1	80-89	2.4	4.59

Similar figures for the patients receiving the 1 cc concentrate show that 883 cc of extract derived from 88,300 Gm of liver has been given over a total of 2,950 weeks. Each patient has therefore received weekly an average of 0.3 cc of the more concentrated extract derived from 29.9 Gm of whole liver.

Were one to apply the method of the Committee for Revision of the Pharmacopeia in determining the unit rating of each extract for maintenance, each of these would be found to contain between 20 and 25 units of anti-pernicious anemia potency. At any rate it is obvious that extremely small quantities of these extracts are needed for maintenance, because of which injections

of one vial may be used to advantage at intervals of about three and one-half weeks in place of more frequent or larger doses of the less highly concentrated ones. This is particularly true of the more highly concentrated 1 cc material. For the patient this means less discomfort, less inconvenience and less expense than is possible with the use of extracts of lower concentration and potency, and except for the remnant in a few of disturbances due to neural damage and the disturbances caused by complications the patients have remained in an excellent state of health.

The question as to what influence the age of the patient may have on the amount of anti-pernicious

TABLE 6—Amount of Anti-Pernicious Anemia Substance Required According to the Sex of the Patient

Number of Patients	Average Interval Between Injections, Weeks	Average Erythrocyte Count Millions
100 women	3.6	5.06
64 men	3.8	5.23

anemia substance necessary for maintenance has been raised and is answered according to our experience by the data presented in table 5. In this table the average interval between injections of one vial of either liver extract for ages by decades is shown for the 164 patients included in groups 1 and 2. A slightly greater amount of anti-pernicious anemia substance has been necessary to maintain a somewhat lower average erythrocyte level in those patients over 70 years of age than in those below this age. This difference is not striking or conclusive evidence that age in itself has a definite bearing on the amount of anti-pernicious anemia substance necessary. Arteriosclerotic changes and other complications which influence the need for this substance are common in the older age group. The one patient above the age of 80 is now 86 after six years of treatment, has marked hypertension, myocarditis and generalized arteriosclerosis and yet remains in fairly satisfactory health.

The relative average requirements of anti-pernicious anemia substance for men and women are shown in table 6.

Again the difference in the amount of anti-pernicious anemia substance necessary for maintenance of the two groups is too slight to be of significance.

#### SUMMARY

One hundred and seventy-six clinic patients have been treated with intramuscular injections of liver extract during periods ranging from six months to six and one-half years.

Of these, 133 have received an injection of one vial, or 3 cc, of liver extract (Lederle) at average intervals of 3.7 weeks in order to maintain the erythrocyte count continuously at a level of about 5,000,000 cells per cubic millimeter.

Thirty-one of the group have received an injection of a vial, or 1 cc, of a more highly concentrated liver extract (Lederle) at average intervals of 3.6 weeks in order to maintain the erythrocyte count continuously at a level of about 5,000,000 cells per cubic millimeter.

Neither age nor sex definitely influences the amount of anti-pernicious anemia substance necessary for maintenance.

It has been demonstrated that the intramuscular injection of 1 cc of liver extract, containing 15 U S P units of anti-pernicious anemia potency (Lederle),

administered at intervals averaging approximately three and one-half weeks is sufficient to maintain a normal state of the blood and to prevent or arrest neural damage. This method of therapy is of particular value in respect to prevention and arrest of disturbances caused by neural damage.

Treatment should be individualized according to each patient's needs, determined on the basis of the patient's clinical condition and erythrocyte counts made at desirable intervals.

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## THE TREATMENT OF IRON DEFICIENCY ANEMIAS

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The results obtained by the administration of iron to patients with certain types of secondary anemia are nearly as spectacular in many instances as the effect of liver extract in pernicious anemia. The rapid increase in hemoglobin which follows its use has served to focus attention on iron therapy but has also emphasized the fact that many problems concerning the mechanism of its action are still unsolved. Iron has been raised to the status of a specific remedy, but this has been accomplished more by the better selection of cases for its use than by the introduction of more efficacious preparations. Its routine and somewhat perfunctory use in all cases of secondary anemia has been superseded by the more rational administration of adequate amounts in properly selected cases.

It is well recognized that insufficient iron for hemoglobin formation will lead to anemia of the hypochromic type, characterized by microcytosis and hypochromia of the individual cells, by a low color and volume index and by a low mean corpuscular hemoglobin concentration. This is frequently referred to as iron deficiency anemia. The most common form results from chronic hemorrhage. It occurs whenever the prolonged loss of iron, in the form of hemoglobin, is more rapid than its replenishment from the dietary intake and is encountered most frequently in cases of peptic ulcer, hemorrhoids and menorrhagia.

The cause of idiopathic hypochromic anemia is fundamentally the same.<sup>1</sup> In this syndrome the blood loss is frequently unrecognized menorrhagia, so that no history of excessive bleeding can be obtained from the patient. The achlorhydria or hypochlorhydria, which is present in practically all patients, interferes with the proper absorption of iron from the food,<sup>2</sup> so that a blood loss which might otherwise be of little significance assumes increased importance. In some instances even the normal menstrual blood loss seems to be sufficient to produce an iron deficiency when there

is a disturbed gastric secretion. The hypochromic anemia of pregnancy appears to be identical with the idiopathic form except for the manner in which the iron stores are depleted.<sup>3</sup> In cases in which the anemia is associated with pregnancy the maternal iron supplies are depleted by the fetal requirements rather than by hemorrhage, while the achlorhydria prevents their replacement. In many instances the anemia persists after a single pregnancy or after repeated pregnancy, and then presents features characteristic of the idiopathic form. A diet deficient in iron may lead to the same hypochromic, iron deficiency type of anemia. In our experience this is more frequently a contributing factor than the sole cause of severe anemia. A diet with a low iron content is of greater significance when the patient has achlorhydria, and as a result it frequently plays a part in the development of idiopathic hypochromic anemia and the hypochromic anemia of pregnancy. The restricted diet and excessive administration of alkalis<sup>4</sup> to patients with peptic ulcer interfere with the replenishment of their iron stores.

It is with these types of iron deficiency anemia regardless of how they are produced, that iron therapy is particularly effective and the recognition and classification of these anemias as a separate group with a common mode of therapy has been a distinct advance.

A second factor which has tended to produce a more satisfactory and more uniform response to iron therapy in recent years has been the more general administration of adequate amounts of iron. There has been much discussion as to the most efficacious iron preparation and the amount of iron to be administered, but the present consensus, based on extensive clinical experience, favors the use of inorganic iron in large doses. The reason for the greater effectiveness of excessive amounts of iron as compared with smaller amounts has not been satisfactorily explained<sup>5</sup> and the answer cannot be given until the mode of action of the iron has been ascertained. It has been assumed, since we are dealing with a group of anemias which are apparently due to an iron deficiency, that the administered iron acts solely as a replacement therapy. A further assumption has been that large amounts of iron must be administered in order to insure the absorption of a sufficient amount to replace the deficiency. Recent experimentation has cast some doubt on the truth of these assumptions.

In order to ascertain the amount of iron which is retained and utilized, a series of detailed balance studies were carried out in which the iron intake, the iron excretion and the hemoglobin regeneration were accurately studied. Iron in the form of iron and ammonium citrates, 3 Gm daily, was administered orally to ten patients with hypochromic anemia.<sup>6</sup> This dose represents the equivalent of 500 mg of metallic iron and is only half of the commonly recommended dose. It was found that 32.6 per cent of the administered iron was retained, representing a daily retention of from 72 to 368 mg. In eight of the patients who were followed over a sufficiently long period for the hemoglobin response to be of significance (table 1), it was found that approximately 2 per cent of the administered iron was used in the formation of hemo-

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1 Wintrobe M M and Beebe R T Idiopathic Hypochromic Anemia *Medicine* 12 187 (May) 1933 Heath C W and Patel A J The Anemia of Iron Deficiency *ibid* 16 267 (Sept) 1937 Fowler W M and Barer Adelaide P The Etiology and Treatment of Idiopathic Hypochromic Anemia *Am J M Sc* 194 625 (Nov) 1937

2 Wits L J Simple Achlorhydric Anemia *Guy's Hosp Rep* 80 253 (July) 1930 Faber Knud and Gram H C Relations Between Gastric Achylia and Simple and Pernicious Anemia *Arch Int Med* 34 658 (Nov) 1924 Wough T R Hypochromic Anemia with Achlorhydria *ibid* 47 71 (Jan) 1931

3 Strauss M B Chlorotic Anemia of Pregnancy *Am J M Sc* 180 818 (Dec) 1930 Strauss M B and Castle W B Studies on Anemia of Pregnancy *ibid* 185 539 (April) 1933

4 Kellogg Frederick and Mettler S R Effect of Alkaline Therapy for Peptic Ulcer on Utilization of Dietary Iron in Regeneration of Hemoglobin *Arch Int Med* 58 278 (Aug) 1936

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6 Fowler W M and Barer Adelaide P Retention and Utilization of Orally Administered Iron *Arch Int Med* 59 561 (April) 1937

globin and that of the iron actually retained only 6.3 per cent was used in hemoglobin formation. In five of these patients the hemoglobin response was between 0.09 and 0.117 Gm per hundred cubic centimeters of blood daily, and in three it was below this amount. There was no correlation between the amount of iron retained and the rapidity of hemoglobin formation. The optimal hemoglobin response has been set arbitrarily as a rise of 1 per cent daily when the initial level is below 50 per cent of normal,<sup>7</sup> but the response obtained in these five patients might be considered satisfactory even though the amount of iron and ammonium citrates was only half the recommended dose.

Similar balance studies were carried out on patients receiving 1 Gm of iron and ammonium citrates daily, or from 160 to 180 mg of metallic iron.<sup>8</sup> The daily retention of iron varied from 26 to 114 mg a day, and for the entire group 26.6 per cent of the administered iron was retained. In three patients under observation for eighteen or more days the hemoglobin increase ranged from 0.08 to 0.15 Gm daily and the iron retention from 42.6 to 82.8 mg (table 2). This retention is greatly in excess of the amount of iron actually used in hemoglobin formation. Moore<sup>9</sup> has shown that the iron content of the blood plasma is increased after the oral administration of iron and that this is the method of transport within the body. Where this excess iron is stored has not been definitely proved, although it presumably goes to the liver, spleen and other reticulo-endothelial tissues.<sup>10</sup> That such large amounts of iron are retained is contrary to the common belief, but this has been substantiated by other investigators. Brock and Hunter<sup>11</sup> found a retention of from 4 per cent to 32 per cent of the intake when varying amounts of several different iron preparations were administered. Reimann and Fritsch<sup>12</sup> obtained as high as 53.8 per cent retention from small doses of ferrous chloride.

TABLE 1—Iron Retention and Utilization When 3 Gm of Iron and Ammonium Citrates Was Given Daily

Patient	Average Daily Iron Retention, Mg	Iron Retained per Cent	Average Daily Hemoglobin Increase Gm	Iron Utilized per Cent
1	308.0	71.3	0.037	1.09
2	266.9	51.4	0.056	1.62
3	261.2	50.5	0.117	3.42
4	225.2	43.6	0.117	3.41
5	18.0	36.4	0.041	1.20
6	151.0	31.6	0.092	2.90
7	140.8	27.8	0.113	3.20
8	72.6	14.0	0.095	2.77

The lack of correlation between the amount of iron retained and the hemoglobin regeneration, as well as a comparison between the large percentage of iron retained and the small percentage utilized, does not support the idea that iron is acting purely as a form of replacement therapy. The results of the balance

studies also show that the administration of large amounts of iron is not necessary for adequate retention and that the retention of extremely large amounts of iron is not necessary to secure adequate hemoglobin regeneration in all cases.

No correlation was noted between the degree of anemia and the amount of iron retained, and anemic subjects did not retain more than those without anemia.<sup>13</sup> An absence of hydrochloric acid in the gastric contents decreased the absorption of iron from

TABLE 2—Iron Retention and Utilization When 1 Gm of Iron and Ammonium Citrates Was Given Daily

Patient	Average Daily Iron Retention, Mg	Iron Retained per Cent	Average Daily Hemoglobin Increase Gm	Iron Utilized per Cent
1	82.8	45.1	0.151	12.4
2	41.7	27.1	0.082	7.5
3	42.6	23.2	0.100	8.2

the dietary intake, but when large amounts of iron were administered achlorhydria had no effect on the retention of iron or on the regeneration of hemoglobin.<sup>13</sup> The addition of copper to a small dose of iron and ammonium citrates resulted in a diminished retention but an increased utilization of iron, but when copper was added to a larger dose of iron it had no effect.<sup>14</sup> In neither instance was the hemoglobin regeneration more rapid than with iron alone. The addition of an orally administered liver extract to the iron and ammonium citrates had no appreciable effect on either the retention of iron or the rapidity of hemoglobin formation.<sup>14</sup>

The results of these experimental studies on a relatively small group of patients cannot be interpreted as evidence that the administration of large doses of iron is never indicated. It is obvious that sufficient iron must be supplied to form new hemoglobin, and these investigations have shown that this amount can be retained from small doses of iron. The function of the excess iron, which apparently increases the rapidity of the hemoglobin formation, is not clear. It has been shown that small doses of iron will suffice for adequate hemoglobin formation in many patients, whereas with others a large amount must be administered. Heath<sup>7</sup> and Witts<sup>15</sup> have emphasized the fact that patients do not all respond similarly to the same amount of iron, so that an optimal dose, applicable in all cases, cannot be defined. In order to obtain a satisfactory response in all patients it is necessary to give as a routine an amount of iron considerably above that needed by many. The larger amounts are particularly advisable for those who cannot be followed by frequent hemoglobin determinations and also for those with a severe degree of anemia.

The first demonstrable effect of iron therapy is an increase in the number of reticulocytes. The rise is slower and the height of the reticulocyte crisis is lower than in pernicious anemia treated with liver. It has been shown that the increase is inversely proportional to the hemoglobin level and the erythrocyte count at the beginning of treatment.<sup>16</sup> The reticulocytosis will

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13. Barer Adelaide P. and Fowler W. M. Influence of Gastric Acidity and Degree of Anemia on Iron Retention. *Arch Int Med* 59: 785 (May) 1937.

14. Barer Adelaide P. and Fowler W. M. Influence of Copper and a Liver Fraction on Retention of Iron. *Arch Int Med* 60: 474 (Sept) 1937.

15. Witts L. J. Discussion on the Treatment of the Anemias. *Proc Roy Soc Med* 26: 607 (March) 1932.

16. Minot G. P. and Heath C. W. The Response of the Reticulocytes to Iron. *Am J M Sc* 183: 110 (Jan) 1932.

ordinarily be evident before there is a significant change in the hemoglobin content and this may be used as an indication of whether or not the amount of iron being administered is adequate, but the final and best criterion on which to judge the efficacy of an iron preparation is the hemoglobin response.

Strauss<sup>17</sup> has recommended the following amounts of the commonly used iron preparations: iron and ammonium citrates 6 Gm daily, reduced iron 3 Gm, pills of ferrous carbonate 4 Gm and ferrous sulfate 1 Gm (table 3). Even with these doses the condition is occasionally refractory and still larger amounts are necessary, although in many instances smaller doses will suffice. It has been shown that an amount of iron in divided doses is more effective than the same amount in a single dose.<sup>18</sup> The drug is best given during or immediately after a meal, so as to lessen the gastrointestinal irritation which occasionally accompanies its administration. Even with these precautions a few patients complain of abdominal cramps and diarrhea, and we have encountered a few in whom no preparation, no matter how coated or how administered, can be tolerated. On the whole, the soluble preparations are more apt to cause gastrointestinal symptoms, and

patients with achlorhydria. Ferrous carbonate is given in pills, and it is advisable that they be freshly prepared since oxidation to an insoluble form may occur. Since the pills commonly contain 5 grains (0.3 Gm), it requires twelve or more daily. Ferrous sulfate is given in the form of pills with various types of coating to lessen the irritation. Because of the smaller bulk required they are especially popular, but they have a tendency to cause gastric irritation. Ferrous chloride, which has been shown to give a high percentage of retention and utilization<sup>21</sup> may be given in 0.5 Gm capsules or in solution in a simple syrup. Although it is effective when given in relatively small amount, it is also one of the compounds that are the most irritating to the gastrointestinal tract.<sup>2</sup>

There are on the market innumerable preparations of iron which may be used but none seem to possess a distinct advantage over these common forms. There is no apparent need for the addition of vitamins, liver extract or other metals to a simple iron preparation in the ordinary case, and in our experience the intramuscular administration of iron has not been effective.<sup>1</sup>

#### CONCLUSION

The recent increased popularity of iron in the treatment of certain types of anemia has been brought about more by a better selection of cases for its use than by any improvement in the mode of administration.

Balance studies have shown that large amounts of iron are retained by the body even when relatively small doses are being administered and that a satisfactory hemoglobin response is obtained in many instances with small doses.

The commonly used iron preparations given by mouth are satisfactory without the addition of other metals or other substances.

TABLE 3—Iron Therapy Recommended Doses\*

Drug	Daily Dose Gm	Iron Content Mg
Iron and ammonium citrates	6	1,000
Reduced iron	3	2,700
Pills of ferrous carbonate	4	360
Ferrous sulfate	1	200

\* Strauss<sup>17</sup>

we have given reduced iron with success to many patients who could not tolerate other forms.

The form in which iron is to be administered is of minor significance, and each physician is prone to have a favorite preparation. The effectiveness does not depend on the amount of metallic iron which is being administered, since soluble forms are better utilized than insoluble preparations with the same iron content. Ferrous salts are more efficient than ferric salts,<sup>19</sup> and Wits<sup>20</sup> expressed the opinion that the efficiency of any iron preparation depends on its ability to liberate ferrous ions. From the patient's standpoint the smaller effective dose of the ferrous compounds is a distinct advantage. Iron and ammonium citrates has been one of the most popular preparations in this country and is administered in capsules, in aqueous solution or in syrup. When it is given in solution the teeth must be protected against discoloration by the use of a drinking tube. Reduced iron is less active therapeutically when considered in terms of its metallic iron content, but the actual dose, in bulk, is relatively small and gastrointestinal symptoms are seldom encountered. It is administered in capsules, and the recommended dose contains 2,700 mg of metallic iron as compared with 1,000 mg of iron in the 6 Gm of iron ammonium citrates. Reduced iron acts by the formation of ferrous chloride in the stomach, so that it is somewhat less effective in

#### ABSTRACT OF DISCUSSION

ON PAIERS OF DR ROSENTHAL, DR MURPHY AND ISABEL HOWARD, AND DRS FOWLER AND BARER

DR L W DIGGS, Memphis, Tenn. In the treatment of severe anemia and hemorrhagic diseases and shock due to acute loss of blood, transfusion is the therapeutic procedure of choice. Blood is, however, expensive and volunteer donors are often difficult to obtain. In large charity hospitals unable to purchase blood from professional donors, many patients die from lack of blood. In such institutions the blood bank offers a partial solution of the problem. For several months at the John Gaston Hospital in Memphis a blood bank has been maintained and more than 200 transfusions have been given. There have been an appreciable number of febrile reactions of varying degrees of severity and one sudden death, but in the majority of cases there have been no reactions. Lives have been saved and emergency operations made possible. To have on hand blood of all types for immediate use, from 15 to 20 liters of blood should be stored at all times. With this amount of capital it is necessary to use the blood at the rate of 2 liters a day in order that the oldest blood may be used before hemolysis occurs. My associates and I have used blood as old as 15 days without reaction but prefer to use it within ten days after it is drawn. The labor involved in the collection, culture, storage, matching and dispensing of the blood and the keeping of the records is not to be minimized. We have been dependent on rotating laboratory interns and student nurses for part of our work but do not recommend this system to others, for the material dealt with is too valuable and the skill required too great to be entrusted to inexperienced persons. Some one responsible person should be in charge, preferably a technician.

17 Strauss M B The Pharmacopoeia and the Physician Use of Drugs in the Treatment of Anemia J A M A 107 1633 (Nov 14) 1936

18 Bethell F H Goldhamer S M Isaacs Raphael and Sturgis C C The Diagnosis and Treatment of Iron Deficiency Anemias J A M A 103 797 (Sept 15) 1934

19 Wits L J Discussion on the Therapeutic Uses of Iron Proc Roy Soc Med 24 543 (March) 1931 Fullerton H W The Treatment of Hypochromic Anemia with Soluble Ferrous Salts Edinburgh M J 41 99 (Feb) 1934 Wits<sup>18</sup>

20 Wits L J The Therapeutic Action of Iron Lancet 1 1 (Jan) 1936

21 Brock and Hunter<sup>11</sup> Fullerton<sup>19</sup>  
22 Dameshek William Primary Hypochromic Anemia West Virginia M J 30 193 (May) 1934  
23 Fowler W M and Barer Adelaide P Retention and Utilization of Parenterally Administered Iron Arch Int Med 60 967 (Dec) 1937

or a graduate nurse thoroughly trained in bacteriologic methods and in surgical technique. Trained personnel should be available for twenty-four hour duty, for volunteer donors usually come to the hospital after working hours and blood for emergencies is needed at all times. The blood bank is a new development and there is much to be learned about the possibilities and dangers of preserved blood. Perhaps better methods of preservation can be discovered. Before the blood bank can be approved for general use it must be tried out in a number of hospitals and the results critically evaluated.

DR T. W. MADISON, Milwaukee. The problem of pathologic hemorrhage has interested Dr. Squier and me for some time. We have attempted to approach it from the standpoint of both the pathologic and the etiologic mechanisms involved. Cases in which pathologic hemorrhage occurs fall roughly into three groups. First there are those in which hemorrhage is the result of increased capillary permeability, as seen typically in scurvy. Vitamin C deficiency, endocrine disturbances and allergic reactions are the more common causes of the capillary changes. Second there are the cases in which hemorrhage is due to a defect in the mechanism of coagulation of the blood without capillary changes. The two best clinical examples are the bleeding due to prothrombin deficiency in obstructive jaundice and that which occurs in hemophilia. Third there is the large group in which there is a defect in both the capillary permeability and the mechanism of coagulation. Most cases in the third group are instances of what is known clinically as purpura. So far as treatment is concerned, one has to be guided by pathologic and etiologic mechanisms. The use of vitamin C when increased capillary permeability is due to deficiency of that vitamin is of course specific. The fruit juices are more effective than the synthetic vitamin C. Prothrombin deficiency is still best dealt with by blood transfusions, though administration of vitamin K with bile may prove to be a simpler approach. By transfusing at thirty-six to forty-eight hour intervals one can maintain the prothrombin above the critical level in the majority of instances. The problem of the treatment of purpura is by far the most puzzling. In our opinion vitamin deficiency does not enter into the problem of purpura. The matter of infection, as Dr. Rosenthal's statistics have shown, is exceedingly important. Endocrine factors are of importance but difficult to evaluate. It is our belief that the matter of allergic influences is of the greatest importance in certain cases of purpura, both thrombopenic and nonthrombopenic. We like to think of thrombopenic and nonthrombopenic purpura as differing not in kind but in degree. Transfusions remain the most satisfactory means of keeping persons with purpura alive until their bleeding stops. Empirically, splenectomy has furnished a fairly satisfactory means of controlling the curious underlying mechanism and is at times life saving. We have been able to control satisfactorily true thrombocytopenic purpura in a group of cases by the ordinary allergic approach.

DR FRANK J. HECK, Rochester, Minn. While in the main I agree with what Dr. Murphy has said, there are a number of points on which I cannot but disagree. I have never been able to understand the difference in normal counts as presented, for instance, by the work of Wintrobe and the average counts as seen in normal males. Only rarely are normal males with erythrocyte counts of 5,000,000 or above seen. Therefore I do not feel that in the treatment of patients with pernicious anemia physicians can be guided by that criterion. I am perfectly willing for my patients to have, or want them to have, 4,500,000, but in many of them I have been unable to obtain a count of 5,000,000, even after increased intramuscular use of liver extract. Second, the Pharmacopeia Committee has made a distinct advance by setting up unitage, and yet I cannot accept all of the ideas, as I know many physicians cannot. The hardest thing for me to accept is Why does Lederle's 1 cc preparation contain 15 units and the 3 cc preparation made from the same amount of material contain only 10? The other point I should like to bring out is this. It is known that different patients respond differently to the same amount of liver extract and therefore that point must be taken into consideration in determining unitage. I have used intramuscular liver extract particularly Lederle's extensively but my results do not agree with those of Dr. Murphy on this point. I cannot carry my

patients an average of 39 weeks by the use of a single injection of either the 1 or the 3 cc preparation. Whether this is due to climatic or dietetic differences, I cannot explain. As far as improvement in neurologic symptoms is concerned, I agree heartily with Dr. Murphy. It is true that a certain group of patients with advanced combined sclerosis show little improvement. Yet over a period of years, by proper therapy, with both liver extract and physical therapy and exercise, a great majority of these patients can be made into useful citizens. I should like to make a point with regard to the use of various extracts. Until some large institution compares various extracts in a large enough series of cases of disease of the same degree of severity, I do not feel that individual extracts should be emphasized too greatly. I cannot but feel that there may be a point for the less pure extracts.

DR C. B. WRIGHT, Minneapolis. I am in agreement with the last speaker. I see younger men who are relying too much on 1 cc doses of extract and do not carefully study food idiosyncrasy and the question of whether the diet is sufficient. Having started originally on raw liver therapy, I feel that if the patient can take calf's liver without any difficulty he should do so two or three times a week. This is an exceedingly valuable adjunct in the treatment of pernicious anemia. In addition, I give 1 cc of concentrated extract every three weeks as a rule. My experience is that every three weeks is often enough, provided liver is added to the diet, in most cases. I find cases that do not react to this dose and require much more intensive liver therapy. I don't think any available agencies in the handling of these patients should be neglected.

DR RUSSELL L. HADEN, Cleveland. This program was entirely invitational, and each author is interested in every other phase of blood dyscrasia. Transfusion is the common denominator of all treatment. It has been my experience that that is the sheet anchor of treatment of the hemorrhagic diseases. It makes no difference whether transfusion is done by the direct or by the indirect method. In our institution my associates and I do it both ways, and I cannot see any difference in the final results. I went over a fairly large group of cases of thrombopenic purpura from our clinic to see in what percentage we had advised splenectomy. Our figures showed roughly one fourth. Dr. Rosenthal told me his figures were about the same. He has emphasized well that in these younger people one ought to be conservative. Too often spleens have been removed for thrombopenia when the cause of thrombopenia was leukemia. Pernicious anemia is a deficiency disease, due to the lack of something. I do not believe that true pernicious anemia can be separated from the other deficiency diseases. It is the experience of all who have been interested in deficiency diseases that the use of crude extracts is important, as Dr. Wright has said. Dr. Heck has brought up the interesting question of what I once called the geographic variation in the red blood cell count. I have never been able to determine whether it is geographic or technical. I agree with Dr. Murphy that a red blood cell count of 5,000,000 in pernicious anemia is perfectly safe. I am also sure that many patients, as Dr. Heck has said, who do not have a count of 5,000,000 are perfectly safe. I still think the one criterion which can be depended on is the size of the red blood cell, because with a deficiency of the substance that is protected against pernicious anemia the cell gets larger, and this can be detected easily by measurements of volume. I have wondered, in the treatment of pernicious anemia, why the patient is given just enough. After all, liver extract is cheap as compared with the seriousness of the disease. I have given a large dose of liver extract and always have depended on a potent preparation. If a patient comes in without neurologic involvement and follows the physician's advice, it is the physician's fault if a neurologic lesion develops. The reason is that he should have very intensive therapy. I insist that he eat liver as much as possible, at least once a week, as Dr. Wright has emphasized. As I have carried patients five, six, seven and eight years, I have found them to be more difficult to control. One has to depend here entirely on parenteral therapy. With regard to iron therapy, why give a preparation such as reduced iron, in which less than 1 per cent will be used, when there are preparations, such as ferrous sulfate in which, say, 10 per cent is used and which are exceedingly cheap.



DR EDWIN E. OSGOOD, Portland, Ore. Certain practical points with regard to purpura haemorrhagica are worth stressing. Accurate differentiation from the other diseases which may produce the syndrome is the first essential in sound therapy. Transfusion and splenectomy are the most important methods available for the treatment of the disease. I plan to give three or four transfusions in the twenty-four hours preceding the splenectomy and have a typed donor available in the operating room. The same number of transfusions spread over three or four days may not control the bleeding. With milder disease transfusion alone may control the bleeding until spontaneous recovery occurs, but donors should be typed as soon as the diagnosis is made and not after a severe hemorrhage occurs. Another point often overlooked is that the bleeding time is a far more satisfactory routine preoperative criterion than the coagulation time, for purpura haemorrhagica rather than hemophilia is the common cause of excessive bleeding at operation. Adequate therapy in anemia must be based on an accurate diagnosis. This diagnosis should include the degree, the type and the cause of the anemia. Physicians are perhaps more indebted to Dr. Haden than to any one else for reemphasizing the importance of the color, volume and saturation indexes in the classification of anemia for therapeutic purposes. In hypochromic microcytic anemia adequate amounts of inorganic iron, as Dr. Fowler emphasized, will lead to dramatic recovery, but the cause of the chronic hemorrhage usually present should be investigated and treated too. In microcytic anemia adequate amounts of anti-pernicious anemia principle are essential. It is rarely necessary to give the two to the same patient. In normocytic anemia benefit from either iron or liver is rare. Transfusions and removal of the cause are the therapeutic methods of choice. Since neither iron nor liver produces toxic effects in large doses and since too small doses may do harm, I prefer to err on the side of giving too large a dose. The diagnosis of the type and cause of the anemia should be made before treatment is started except in desperately sick patients, because the most difficult cases to diagnose are those in which a little iron and a little liver have been given—just enough to alter the blood picture but not enough to correct the anemia. Dr. Haden made a remark to the effect that, unless patients fail to cooperate, a uniformly good response to adequate amounts of liver can be expected in microcytic anemia. I am sure that he will agree with me, however, that it should be part of the physician's responsibility to educate the patient sufficiently in the nature of the disease so that he will cooperate.

DR HAROLD W. JONES, Philadelphia. I wish to emphasize that for the good of the community county medical societies should control commercial blood banks. "Werthof's disease" is a misnomer, because Werthof was not the first to describe purpura. My experience differs from that of Dr. Rosenthal in two ways. 1. I have not had good results with moccasin venom. 2. A larger percentage of my patients have been either temporarily or permanently benefited by transfusions. Like Dr. Murphy, I use Lederle's liver extract in the treatment of pernicious anemia. My aim is to give one 3 cc dose intramuscularly each month. To maintain the red blood cell count at about 5,000,000 it is necessary to give some patients weekly injections. Since I have used intramuscular injections, none of my properly controlled patients have had symptoms of cord change. For those who already have cord change, I have used fever therapy in addition to large doses of liver extract and vitamin B. Excellent results were obtained. Dr. Haden mentioned the mistake of removing the spleen in patients with leukemia diagnosed as purpura. I have knowledge of one patient with a condition diagnosed as leukemia who actually had essential thrombopenia. No treatment was given and the patient died. In the treatment of idiopathic hypochromic anemia my results have been similar to those of Dr. Fowler. Many patients with a condition formerly diagnosed as secondary anemia and now placed under the heading of hypochromic anemia have not responded to iron or iron and acid until copper was added. A few patients seem to do better with courses of injections of iron and liver extract. Occasionally I have met patients in whom no result was obtained by any form of treatment until some so-called focal infection was removed. Repeated small transfusions seem to be the only method of bringing about satisfactory results in some cases.

DR NATHAN ROSENTHAL, New York. I should like to make a few remarks concerning my own experience. Considerable interest has been shown in blood banks. These have been instituted in three hospitals in New York City, namely Bellevue, Kings County and Mount Sinai. In the last hospital the plan is proving successful, although the period of observation has been rather short. The reactions seem to be not much greater than with fresh citrated blood, namely about 3 per cent have chills. Apparently more reactions, such as those as a result of urticaria, were noted. It is important to note that commercial blood banks are not permitted in New York City. In fact, permission must be obtained from the department of health before this new and, I believe, important addition of the institution may be undertaken. I thank Dr. Madison for his discussion of the purpuric problem. I believe that there are different, distinct types of purpura. The main group is thrombocytopenic purpura. It is undoubtedly a disease of the megakaryocytes. It may be idiopathic and result in recovery, either spontaneously or following splenectomy. It may also be due to known causes, especially drugs—arsphenamine, sedormid (allyl-isopropyl acetyl carbamid), phenobarbital, quinine and, lately, chlorzoxime. After the drug is stopped there is spontaneous recovery. A clear distinction must be made between these forms of purpura and Schoenlein-Henoch purpura. The latter is not a disease of the megakaryocytes and blood platelets but is some peculiar vascular disturbance. It may be of an allergic type. The cause is unknown but, as I have pointed out, definite impairment of the vascular elastic tissue may occur. As a result, the purpura may persist for a long time in the lower extremities as so-called orthostatic purpura. Another form of purpura is known as chronic hereditary thrombasthenia, or pseudohemophilia. This is a somewhat rare condition and is the result, possibly, of a functional disturbance of the platelets although they are not diminished in number. The blood picture in this disease is not constant and it may be discovered only after repeated examination of the patient's blood.

DR WILLIAM P. MURPHY, Boston. This has been one of the most interesting and instructive discussions of the blood dyscrasias that I have had the privilege to attend. There is no form of therapy which is more urgent at times than transfusion and no form the use of which is more widely abused. A transfusion should be carried out with the care of a surgeon but with the skill of a physician. It is almost never necessary to cut down on the vein of either recipient or donor, and this should not be done, particularly in those patients who may be dependent on repeated transfusions for maintenance of life. Transfusions should be performed only by skilled operators. Certainly they should not be turned over to the untrained house staff but should always be done by or under the supervision of one thoroughly skilled both in the preparation for and the technique of giving them. Dr. Fowler's paper interested me particularly for the reason that it emphasizes the need for more careful and complete studies concerning the use of iron as a therapeutic agent. Because of the publication of incomplete studies and at times inaccurate data, there is much confusion in respect to the amount of the various iron salts desirable for best results and the most desirable salt to use. Knowledge in these respects has advanced little beyond that of Dr. Blaud as early as 1832. Greater care should be observed in drawing conclusions as to the comparative value of various doses of the different iron salts, for as yet there is not conclusive evidence that one of several popular salts is effective in distinctly smaller doses than is any of the others. Optimal doses should be given in all instances. Dr. Wright has well emphasized the importance of controlling all the details of the patient's life and therapy for the best results in the treatment of pernicious anemia. No condition which comes to the care of the physician requires a greater display of knowledge and the application of a greater amount of skill, with the possible exceptions of diabetes and arthritis, than does pernicious anemia. Dr. Heck has taken exception to my emphasis on the use of a particular parenteral liver extract for the control of pernicious anemia. If treatment is to be carried out under controlled experimental conditions, I order to evaluate the relative efficiency of various extracts, I should agree with him. But for the practical control of the disease by the general practitioner only those extracts of known anti-pernicious anemia potency should be used in any case, and

this single extract which has the greatest amount of potency will produce the best result with the least inconvenience and expense. An effort should be made to maintain the erythrocyte count at a normal level at all times.

DR W M FOWLER Iowa City With regard to vitamin K, it has been my privilege to follow closely the work of Drs Smith, Brinkhouse and Warner at the University of Iowa on this subject. They developed a method of titrating the prothrombin content of the blood and found that when it gets below 50 per cent of their accepted normal the patient is a potential bleeder. To such patients we have been administering vitamin K, extracted from alfalfa, with excellent results, particularly in cases of hepatic disease and of jaundice. It is a great advance in the control of pathologic hemorrhage in these particular conditions. With regard to the questions brought up about our paper, Dr Harden and I have previously discussed the matter of gastric irritation following the administration of iron. We have found gastrointestinal irritation in some persons with all the forms of iron that we have used. I realize that the question of copper and liver or liver extract in addition to iron is controversial. I can only say that in our experience in patients with hypochromic anemia characterized by iron deficiency we have not found the administration of copper or liver extract necessary. We have been able to control this type of anemia without the administration of these other substances.

## MODE OF ACTION, CLINICAL USE AND TOXIC MANIFESTATIONS OF SULFANILAMIDE

### FURTHER OBSERVATIONS

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In this communication we will report further observations on the mode of action of sulfanilamide in the treatment of experimental infections and will discuss methods of therapy with sulfanilamide and the toxic manifestations which sometimes arise during the course of sulfanilamide therapy.

### THE MODE OF ACTION OF SULFANILAMIDE

A year ago we<sup>1</sup> reported that "experimental evidence shows that bacteriostasis is the only demonstrable factor in the process which leads to the control of *Clostridium welchii* infection in mice treated with sulfanilamide" and that "observations made by us in experimental streptococcal infections in mice treated with sulfanilamide also could be interpreted as evidence that bacteriostasis plays a role in the control of this type of infection."

In our preliminary report<sup>2</sup> we noted that sulfanilamide in a concentration of 1:10,000 exerted a definite bacteriostatic effect in broth cultures inoculated with small numbers of beta hemolytic and alpha and gamma streptococci, pneumococci of types I and II,

several varieties of neisseriae, *Micrococcus tetragenus*, *Haemophilus influenzae* and *Haemophilus haemolyticus*. The growth of staphylococci, *Eberthella typhi*, *Bacterium paratyphosum* A, *Bacterium paratyphosum* B, *Bacterium enteritidis*, Flexner's bacillus, Shiga's bacillus and several other gram-negative bacilli was not affected by this concentration of the chemical.

During the past year we<sup>3</sup> have observed that increased concentrations of sulfanilamide in broth cultures killed small inoculums of micro-organisms which were merely slowed in their rate of multiplication in a 1:10,000 concentration of the drug. In the course of these investigations it was noted that with the same concentrations of sulfanilamide markedly different effects could be obtained by varying the culture medium. Thus, one medium would enhance the action of sulfanilamide on a susceptible bacterium, while another would inhibit the action of the drug.<sup>4</sup> We have observed that high concentrations of sulfanilamide will exert either a bacteriostatic or a bactericidal effect in broth cultures seeded with small inoculums of streptococci, staphylococci, *Escherichia coli* communis, *Escherichia communior*, *Shigella dispar*, *Bacillus pyocyaneus*, *Bacillus proteus*, *Bacillus aerogenes*, pneumococci, *Eberthella typhi* paratyphoid bacilli and certain other micro-organisms. These observations lead us to believe that in vitro sulfanilamide may affect a wide range of micro-organisms, and it is likely that its mode of action in vitro is the same regardless of the type of bacterium under investigation.

Osgood<sup>5</sup> advanced the hypothesis that "the major action of sulfanilamide on the beta hemolytic streptococcus seems to be a neutralization of the toxins." However, Neter,<sup>6</sup> Gross and his co-workers,<sup>7</sup> Huntington<sup>8</sup> and Kemp<sup>9</sup> subsequently showed that sulfanilamide is essentially without action on the hemolysin, fibrinolysin and erythrogenic toxins of the hemolytic streptococcus. We have observed that high concentrations of sulfanilamide in the blood do not alter positive reactions to the Dick test in human beings. Osgood also stated that sulfanilamide "appears to inactivate a certain fraction of freshly prepared *Perfringens* hemotoxin in vitro." Our experience has been that in guinea pigs and mice inoculated with lethal doses of botulinus toxin death is hastened by treatment with sulfanilamide. Recently Osgood and Brownlee<sup>10</sup> modified their original view as to the mode of action of sulfanilamide, and they now state that "the major action of sulfanilamide is on toxins or aggressins which are responsible for the virulence of the organism and which render it relatively immune to the bactericidal substances present in normal human serum and in monkey serum, but not present in the serum of the mouse." They cite as an example of this type of action the fact that in their experience "sulfanilamide alone has only a slight bacteriostatic effect on pneumococcal infections in marrow cultures or broth cultures, but sulfanilamide plus type specific antipneumococcus serum is far more effective than either alone." Our experience shows that sulfanilamide has a definite bacteriostatic effect in beef infu-

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The sulfanilamide used in the experimental procedures was supplied by Abbott Laboratories and the Winthrop Chemical Company, Inc. The 4,4'-diamino diphenyl sulfone was prepared by Dr. George Raiziss of the Dermatological Research Laboratories. The antipneumococcus rabbit serum was prepared by Lederle Laboratories, Inc.

1 Bliss, Eleanor A. and Long, P. H. Observations on the Mode of Action of Sulfanilamide. *J. A. M. A.* **109**: 1524 (Nov. 6) 1937.

2 Long, P. H. and Bliss, Eleanor A. Para-Aminobenzenesulfonamide and Its Derivatives. *J. A. M. A.* **108**: 32 (Jan. 2) 1937.

3 Bliss, Eleanor A. and Long, P. H. Unpublished observations.

4 Dr. F. H. Marshall Jr. and his associates simultaneously observed this phenomenon.

5 Osgood, E. E. Culture of Human Marrow. *J. A. M. A.* **110**: 349 (Jan. 29) 1938.

6 Neter, Erwin. Personal communication to the author.

7 Gross, Paul, Cooper, F. B. and Lewis, Marion. *Proc. Soc. Exper. Biol. & Med.* **35**: 275 (March) 1938.

8 Huntington, R. W. Jr. *Proc. Soc. Exper. Biol. & Med.* **35**: 328 (April) 1938.

9 Kemp, H. A. Communication to the Dallas County Medical Society, April 14, 1938.

10 Osgood, E. E. and Brownlee, Inez E. The Mode of Action of Sulfanilamide. *J. A. M. A.* **110**: 1770 (May 21) 1938.

sion broth cultures inoculated with small inoculums of type I pneumococci and that the addition to such cultures of ten units of type I antipneumococcus serum does not enhance the bacteriostatic action of sulfanilamide. These in vitro and in vivo experimental results do not substantiate Osgood's hypothesis.

Since our previous observations<sup>1</sup> on the action of sulfanilamide on certain experimental infections, we have been studying the effect of the drug on pneumococcal peritonitis in mice. We had previously observed<sup>11</sup> that sulfanilamide did not cure mice of experimental pneumococcal infections which had been initiated by the intraperitoneal injection of 100 minimal lethal doses of highly virulent type I, II or III pneumococci. However, we were able to cure about 20 per cent of mice similarly infected if 4-4' diamino diphenyl sulfone was used instead of sulfanilamide as the chemotherapeutic agent.<sup>12</sup>

In the present instance the effects of therapeutic doses of sulfanilamide and 4-4' diamino diphenyl sulfone on

Our purpose in using the heavy inoculums was to enable us to see and count pneumococci in the peritoneal exudates examined immediately after infection had taken place. At this time from one to thirty pneumococcal units (a unit being 1 coccus, pair or chain) were noted to ten oil immersion microscopic fields in the specimens of peritoneal exudate, stained with Way's stain. Repeated experiments with the three types of pneumococci showed definitely that the multiplication of the pneumococci in the peritoneal exudates is slow in mice treated with sulfanilamide or the sulfone compound than in the controls and that both of these compounds seem to be acting as purely bacteriostatic agents in changing the normal course of the infection.

It is noteworthy that the observed bacteriostasis (which is more marked in the mice treated with the sulfone compound) is unaccompanied by any especial degree of phagocytosis. In this report the observation differs from that made on the peritoneal exudates from mice infected similarly with hemolytic streptococci or

TABLE 1—The Effect of Sulfanilamide, 4-4' Diamino Diphenyl Sulfone and Type I Antipneumococcus Serum on the Peritoneal Exudates of Mice with Experimental Type I Pneumococcal Peritonitis

Mouse	Inoculum Pneumo- cocci	Total Dose Drug, Therapy	Time of Examination After Infection														
			15 Min		2 Hr		4 Hr		8 Hr		11 Hr		24 Hr		48 Hr		
			COIF	% P	COIF	% P	COIF	% P	COIF	% P	COIF	% P	COIF	% P	COIF	% P	
1†	700 000	Control	1	0	0	0	0	0	0	40	27	18	Dead				
2†	700 000	Control	1	0	0	0	35	0	0.2	1	0	11	0	6	0	0	
3	700,000	Control	0.5	0	Bloody fluid		00	2	∞	6	Dead						
4	700 000	Control	10	0	4	0	120	0	∞	4	Dead						
5	700 000	Sulfanilamide 40 mg.	0.3	0	4	0	5	1	40	—	200+	4	Dead				
6	700 000	Sulfanilamide 40 mg.	Bloody fluid		1	0	12	1	0	4	200	2	Dead				
7†	700 000	Sulfanilamide 40 mg.	0.5	0	0	0	2	0	1	11	0.7	22	0.1	4	0	1	
8†	700 000	Sulfanilamide 40 mg.	0.1	0	Bloody fluid		11	0	0.2	11	0	10	0	4	0	0	
9	700 000	Sulfone com- pound 6 mg	0	0	2	0	4	1	14	—	23	1	0.2	3	Dead		
10	700 000	Sulfone com- pound 6 mg	0	0	2	0	14	0	16	2	28	0	Dead				
11†	700 000	Sulfone com- pound 6 mg	10	0	1	0	2	0	0	5	0	1	0	1	0	0	
12†	700 000	Sulfone com- pound, 6 mg	0.6	0	1	0	9.1	0	0.2	18	0	14	0.2	6	Dead		

\* COIF = number of free pneumococci per oil immersion field  
† % P = percentage of phagocytes (polymorphonuclear leukocytes and monocytes) containing ingested pneumococci  
‡ Mouse inoculated with 200 units of type I concentrated antipneumococcus rabbit serum seven hours after infection

the peritoneal exudates of mice with experimental type I, II and III pneumococcal infections were investigated. The procedure followed in such a study is given in detail elsewhere.<sup>1</sup> Therapy was commenced one-half hour before the intraperitoneal injection of the infecting organisms and was continued at four hour intervals until three or four doses of the compounds had been given. Twelve mice were used in each experiment, one third serving as controls and another third being treated with sulfanilamide, while the remainder were treated with the sulfone compound. Immediately after infection, examinations of the peritoneal exudates were made, and these were repeated thereafter at suitable intervals. Heavy inoculums (from 700,000 to 3,500,000 organisms) of highly virulent type I, II or III pneumococci from twelve hour dextrose and blood broth cultures of mouse passage strains were used in each experiment.

*Clostridium welchii*. That the process was not the result of leukocytic damage by the infection or the therapy is shown in table 1.

In this experiment the mice were infected with type I pneumococci. Definite bacteriostasis could be noted in the treated group. After the infection was well established (at the seventh hour), two mice in each group received 200 units of type I antipneumococcus rabbit serum by the intraperitoneal route. This treatment with type-specific serum resulted in an immediate wave of phagocytosis in both the controls and the treated mice, thus showing clearly that the leukocytes were capable of phagocytizing the pneumococci if conditions were favorable. This type of experiment was repeated several times with both type I and type II antiserum with like results. If normal rabbit serum was substituted for the type-specific antipneumococcus serum no appreciable increase in phagocytosis was noted.

While no changes could be observed in the capsular structure of the pneumococci seen in stained exudates from the mice treated with sulfanilamide or the sulfone compound, certain definite alterations in the organisms

11 Long P H and Bliss Eleanor A South M J 30 479 (May) 1937  
12 Lemstone W H Bliss Eleanor A Ott E and Long P H Bull Johns Hopkins Hosp to be published

were observed when they were compared with the pneumococci seen in the exudates from the untreated control mice. During the first ten to twelve hours after inoculation, the pneumococci from the exudates of the treated mice tended to chain formation, while those in

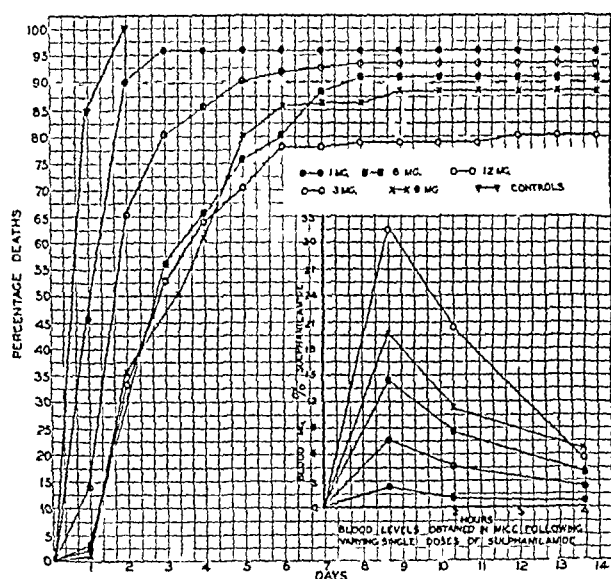


Chart 1—Deaths from experimental streptococcal infections in mice treated parenterally with varying amounts of sulfanilamide

the exudates of the controls multiplied rapidly as diplococci. Also in the exudates of the treated mice, while the capsular material appeared intact, a somatic element would occasionally be missing from the pneumococcus chain or such an element would be noticeably smaller than that of its adjacent cocci. However, after the twelfth hour such alterations in structure were not commonly observed. These variations from the normal would seem to be indicative of an alteration in the reproductive mechanism of the pneumococci. The experimental infections proceeded to their usual fatal termination in essentially the same manner in the treated and in the control mice. However, in the treated mice, death, instead of taking place from twelve to twenty hours after inoculation, as in the controls, was delayed to from twenty-four to forty-eight hours. This prolongation of life was directly correlated with the slower reproduction of the pneumococci in the peritoneal exudate. Therefore we consider these observations as strongly supporting our theory that sulfanilamide (and the sulfone compound) acts by inhibiting the multiplication of organisms in the tissues of the infected host.

#### THE USE OF SULFANILAMIDE IN THE TREATMENT OF BACTERIAL INFECTIONS

There is ample clinical evidence as to the value of sulfanilamide therapy in the case of hemolytic streptococcus infections in human beings.<sup>13</sup> Sulfanilamide also appears to have a definite place in the treatment of meningococci,<sup>14</sup> gonococci<sup>15</sup> and *Bacillus welchii*.<sup>16</sup>

<sup>13</sup> Colebrook Leonard, Buttle G A H and O'Meara R A Q. *Lancet* 2: 1323 (Dec 5) 1936. Long P H and Bliss Eleanor A. Para-aminobenzenesulfonamide and its derivatives. *Arch Surg* 34: 351 (Feb) 1937, *Ann Int Med* 11: 575 (Oct) 1937.

<sup>14</sup> Schwentker F F, Gelman Sidney and Long P H. The Treatment of Meningococcal Meningitis with Sulfanilamide. *J A M A* 108: 1407 (April 24) 1937.

<sup>15</sup> Dees J E and Colston J A C. The Use of Sulfanilamide in Gonococcal Infections. *J A M A* 108: 1855 (May 29) 1937.

<sup>16</sup> Bohlman H R. Gas Gangrene Treated with Sulfanilamide. *J A M A* 109: 254 (July 24) 1937.

infections, melitensis<sup>17</sup> and certain infections of the urinary tract.<sup>18</sup> Our experience leads us to believe that sulfanilamide is not highly effective in the treatment of pneumococcal lobar pneumonia, although it may be of some value in the treatment of other types of pneumococcal infections.<sup>19</sup>

While a considerable clinical experience will be needed before accurate standards of dosage for sulfanilamide can be established, certain experimental observations have a bearing on this question.

In chart 1 is shown the effect of varying amounts of sulfanilamide on the survival rate of mice experimentally infected with beta hemolytic streptococci. It is to be noted that the larger the dose of the drug the greater was the survival rate of the mice and that the average duration of life was longer for the more heavily treated mice.

In chart 2 may be seen the effects of a single daily dose of 10 mg of sulfanilamide, as contrasted with three divided doses of 3.3 mg a day, on the course of experimental hemolytic streptococcus infections in mice. The survival rate and the average duration of life were definitely better for mice treated with divided doses for three days than for mice receiving a single dose a day for three days, although in all instances the total dose was the same.

These experimental observations, showing increased survival rates with the larger doses and the importance of spaced doses as opposed to single doses of sulfanilamide, when coupled with our clinical observations made

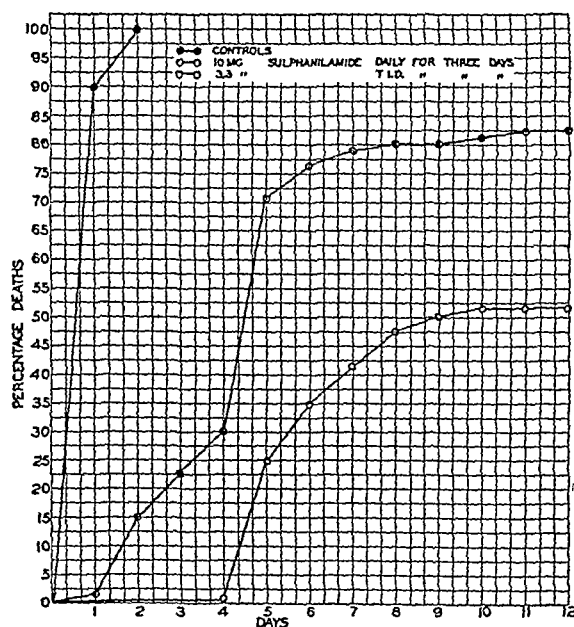


Chart 2—The effect of single daily doses and of divided daily doses of sulfanilamide the total amount of the drug being the same, on experimental streptococcal infections in mice

on 408 patients who were treated with sulfanilamide, lead us to believe that certain tentative standards of sulfanilamide therapy can be established for human beings.

<sup>17</sup> Francis A E. Sulfanilamide in the Treatment of Undulant Fever. *Lancet* 1: 496 (Feb 26) 1938.

<sup>18</sup> (a) Huber H G. *Munchen med Wchnschr* 83: 1014 (Dec 4) 1936. (b) Helmholz H F. A Comparison of Mandelic Acid and Sulfanilamide as Urinary Antiseptics. *J A M A* 109: 1039 (Sept 25) 1937. (c) Long P H and Bliss Eleanor A. Observations upon the Mode of Action and the Clinical Use of Sulfanilamide in Urinary Tract Infections. *South M J* 31: 308 (March) 1938.

<sup>19</sup> Allan W. *Am J M Sc* to be published.

In tables 2 and 3 are shown the amounts of sulfanilamide which we believe represent therapeutically effective doses for severe infections due to the streptococcus, meningococcus, gonococcus or Welch bacillus and for mild or moderately severe tissue infections for which sulfanilamide therapy is indicated. The dosage as outlined in these tables is based on the clinical response of

TABLE 2—The Amounts of Sulfanilamide Necessary to Establish Therapeutically Effective Blood Levels (from 10 to 15 Mg per Hundred Cubic Centimeters) Quickly in Patients Ill with Severe Hemolytic Streptococcus Meningococcus, Gonococcus Pneumococcus or Bacillus Welchii Infections

Weight of Patient		Initial Dose by Mouth		Maintenance Dose by Mouth Every 4 Hours (Day and Night)		Total Dose First 24 Hours		Total Daily Dose Sodium Bicarbonate	
Kg	Lb	Gm	Grains	Gm	Crains	Gm per Kg	Grains per Lb	Gm	Grains
70	150	4.8	80	1.2	20	0.15	1.2	3.6	60
60	125	4.2	70	0.9	15	0.15	1.2	3.0	50
45	100	3.0	50	0.9	15	0.15	1.2	1.0	50
35	75	3.0	50	0.9	15	0.23	1.8	1.0	50
23	50	3.0	50	0.6	10	0.26	2.0	1.8	30
11	25	1.8	30	0.3	5	0.20	2.2	0.9	15

408 patients to sulfanilamide therapy and on a study of the levels of the drug in the blood as measured by Marshall's method<sup>20</sup> in 126 of these patients.

With severe infections it is important to attain an effective level in the blood as soon as possible. We therefore advise that a large initial dose of sulfanilamide be given in order to bring about the desired level of 10 mg per hundred cubic centimeters as quickly as possible and that this level be maintained and increased by doses of the drug given at four hour intervals both day and night. The maintenance dose should be given until a marked clinical improvement in the condition of the patient is noted. It should then be decreased slowly day by day, but the administration should not be entirely discontinued until the patient is ready to be up and about. If this routine is followed, recurrences of infection will be rare. It is important to remember that the administration of sulfanilamide should be discontinued only under the most exceptional circumstances when there is a severe infection.

In the case of milder tissue infections, amenable to sulfanilamide therapy, levels of sulfanilamide in the blood of from 5 to 10 mg per hundred cubic centimeters are generally adequate to bring the infection under control. Here again it is important to maintain an even concentration of the drug in the tissues, and because of this a four hour schedule of doses is best if circumstances permit its use.

If the patient cannot swallow tablets, if vomiting is present or if there is any reason to believe that the absorption of sulfanilamide from the gastrointestinal tract might be faulty, the drug can be given by hypodermoclysis. In the preparation of sulfanilamide for parenteral use, a one-sixth molar solution of sodium lactate (18.67 Gm of sodium lactate per liter) and Hartmann's solution are the best solvents, although physiologic solution of sodium chloride can be used. It is best to use a 1 per cent solution of sulfanilamide, and this may be sterilized by boiling for three minutes.

The calculated daily dose is the same as that for the first day of the oral dose. The initial hypodermoclysis should contain one half of the calculated first day dose of sulfanilamide. Subsequent hypodermoclyses should be given at eight hour intervals and should contain one third of the calculated first day dose of sulfanilamide. The parenteral use of sulfanilamide is, however, a less satisfactory method of administering the drug, and in every instance as soon as the patient is able to take sulfanilamide by mouth at regular intervals its parenteral use should be discontinued.

There is no unanimity of opinion as to what constitutes the most satisfactory method of treating gonococcal infections with sulfanilamide. However, one thing seems certain, and that is that this type of therapy is always more successful and the chance of cure greater<sup>21</sup> if the patient is hospitalized. The report of Mahony<sup>21</sup> points to the fact that large doses (12 Gm. every four hours) of sulfanilamide given for eight days to hospitalized patients bring about excellent results in the treatment of both acute and chronic gonococcal urethritis. The results obtained in the treatment of gonorrhea in the female by J. Herman Long indicate that a longer period of sulfanilamide therapy is needed for females than for males. He advises intensive treatment for a week followed by decreasing doses of sulfanilamide for three weeks. The complications of acute or chronic gonorrhea should be treated in the same manner as are the original manifestations of the disease.

For patients with gonococcal infections who have been treated with sulfanilamide the criteria of cure are not as yet well established. Our experience leads us to suggest that the minimal criteria of cure should be repeatedly negative results of clinical and laboratory examinations (cultures and smears) for at least six months after the cessation of therapy. If these requirements are adhered to as a routine, few symptomless carriers will be turned loose to infect the public.

TABLE 3—The Amounts of Sulfanilamide Necessary to Establish Therapeutically Effective Blood Levels (from 5 to 10 Mg per Hundred Cubic Centimeters) in Patients Ill with Mild or Moderately Severe Infections for Which Sulfanilamide Therapy Is Indicated

Weight of Patient		Calculated Daily Dose				Dose by Mouth Every 4 Hours (Day and Night)		Total Daily Dose Sodium Bicarbonate	
Kg	Pounds	Grams	Grains	per Kg	per Pound	Grams	Grains	Grams	Grains
70	150	5.4	0.03	90	0.6	0.9	15	3.6	60
60	125	5.4	0.09	90	0.7	0.9	15	3.6	60
45	100	5.4	0.12	90	0.9	0.9	15	3.6	60
35	75	4.2	0.12	70	0.9	1 of 1.2* 1 of 20†	24	2.4	40
23	50	3.6	0.16	60	1.1	0.6	10	1.8	30
11	25	1.8	0.16	30	1.2	0.3	5	1.0	15

\* One dose of 12 Gm followed by five doses of 0.6 Gm each twenty four hours

† One dose of 20 grains followed by five doses of 10 grains each twenty four hours

The successful treatment with sulfanilamide of infections of the urinary tract depends to a large degree on the obtaining and maintaining of a satisfactory concentration of sulfanilamide (nonacetylated) in the urine.<sup>22c</sup> Such a concentration cannot be obtained in patients who have moderate or marked impairment of

21 Mahony J F Communication to the American Neisserian Society May 16, 1936  
22 Long J H Personal communication to the authors

the renal function. Patients with impaired renal function must always be observed carefully while receiving sulfanilamide lest the drug accumulate in their tissues. We have noted that the following concentrations of sulfanilamide are generally effective in the control of infections of the urinary tract: for *Staphylococcus albus* infections from 50 to 100 mg per hundred cubic centimeters, for *Staphylococcus aureus* infections from 100 to 150 mg, for *Escherichia coli* infections from 200 to 250 mg, for *B. aerogenes* infections from 250 to 300 mg, for group B beta hemolytic streptococcus infections from 250 to 300 mg and for *Proctus* infections from 300 to 400 mg. Enterococcal infections of the urinary tract are unaffected by sulfanilamide therapy.<sup>23</sup>

Tables 2 and 3 show that the amount of sulfanilamide per pound or kilogram of body weight required to establish adequate levels of the drug in the blood is considerably greater for children than for adults. This variation is due to the fact that the fluid intake per kilogram of body weight is normally greater with children than with adults, and when fever is present this difference is even more marked. Sulfanilamide is excreted almost entirely in the urine.<sup>21</sup> Thus, the greater the volume of urine, the greater the excretion of sulfanilamide. This brings us to the question of how much fluid should be given to a patient who is receiving sulfanilamide. Our experience definitely shows that if large amounts of fluids are given, it is difficult to obtain and maintain effective levels of sulfanilamide because the drug is rapidly excreted. Because of this we do not force fluids too strenuously on a patient who is receiving sulfanilamide.

The question as to whether sulfanilamide should be given by the intrathecal route in cases of meningococcal, streptococcal or pneumococcal meningitis is not as yet settled. We do know that sulfanilamide easily passes over into the spinal fluid in about the same concentration as exists in the blood. Because of this we feel that intrathecal therapy with the drug is not necessarily indicated for meningeal infections. Sulfanilamide can be found in about the same concentration as exists in the blood in transudates and exudates in all the body cavities. It also penetrates into the pus in closed abscesses and is present in purulent discharges. In the treatment of purulent infections we have noted that recurrences are frequent if the administration of sulfanilamide is discontinued before a complete clinical cure has been effected. Thus, in cases of draining abscesses, of streptococcal osteomyelitis and of middle ear or mastoid infections the drug should be given for at least ten days after the patient is completely well.

While it seems best not to administer saline cathartics during the course of sulfanilamide therapy, no other drugs seem to be contraindicated. Acetylsalicylic acid, the barbiturates, digitalis, arsphenamine, ferrous sulfate and many other drugs may be used in conjunction with sulfanilamide if they are indicated. Sodium bicarbonate should always be administered when sulfanilamide is being given in order to prevent clinical acidosis from developing. The antidote for sulfanilamide is water, of which large quantities should be administered to the patient if it is desirable to free him of sulfanilamide rapidly.

#### THE TOXIC MANIFESTATIONS OF SULFANILAMIDE

In table 4 are recorded the incidence and types of toxic manifestations noted in the first 408 patients who were treated with sulfanilamide in the Johns Hopkins Hospital.

In our original report<sup>2</sup> we noted the occurrence of certain cerebral toxic effects in mice and human beings. Among the most common ones noted in human beings are anorexia, nausea, vomiting, dizziness and headache. Rarely have these manifestations been severe enough in ward patients to warrant discontinuing administration of the drug. In ambulatory patients these symptoms may constitute a serious problem. Alcohol is contraindicated during sulfanilamide therapy as it tends to accentuate the cerebral toxic manifestations. Patients who are receiving sulfanilamide should be warned against driving automobiles, because the dizziness and

TABLE 4—The Toxic Manifestations of Sulfanilamide Noted in the Treatment of 307 Adult Patients and 101 Children \*

Type of Infections, adult group	Type of Infections, children		
Streptococcal infections	Streptococcal infections	107	43
Other infections	Other infections	200	
Toxic Manifestation	Frequency, Adults	Frequency, Children	Comment
Dizziness, anorexia, nausea, vomiting	Anorexia common	Anorexia common	Rarely severe enough to warrant discontinuing use of sulfanilamide
Cyanosis	90 to 100%	90 to 100%	Of little clinical importance
Simple fever	9%	3%	Very important warning sign, always stop use of sulfanilamide
Dermatitis	1.6%	3%	Best to stop use of sulfanilamide
Acidosis	3.6%	2%	Can be prevented if sodium bicarbonate is given as a routine
Renal irritation	0%	0%	If renal function is low sulfanilamide is not excreted well
Jaundice (without anemia)	0.6%	0%	Stop use of sulfanilamide
Mild hemolytic anemia	Common	Common	Not dangerous, continue use of drug and observe patient carefully
Acute hemolytic anemia	2.9%	8.9%	In general stop use of sulfanilamide; drug may be given with multiple transfusions
Agranulocytic angina	0.3%	0%	Stop use of sulfanilamide

\* These 408 patients were kept in bed and under close observation during the major portion of their treatment with sulfanilamide.

decreased mental acuity sometimes seen may render them dangerous on the road.

The mechanism of the cyanosis noted in the course of sulfanilamide therapy is as yet unclear. Marshall and Walz<sup>25</sup> expressed the opinion that the formation of methemoglobin is always responsible for the cyanosis, while Wendell<sup>26</sup> stated that varying degrees of methemoglobinemia were found in 200 patients treated with sulfanilamide. Neither of these observers has noted sulfhemoglobin in the blood of cyanotic patients.

Simple fever unaccompanied by other toxic manifestations occurred frequently in our patients. Often one is asked how to differentiate the fever due to the drug from fever due to the infection. It is interesting to note in this respect that in only two of the patients in this series in whom fever developed as a toxic mani-

<sup>23</sup> Helmholz H F Proc Staff Meet Mayo Clin 12 244 (April 21) 1937 Bliss Eleanor A and Long P H New England J Med 217 18 (July 1) 1937 Long <sup>24</sup> Marshall E K Jr Emerson Kendall Jr and Cutting W C J Pharmacol & Exper Therap 61 191 (Oct) 1937

<sup>25</sup> Marshall E K Jr and Walz E M Bull Johns Hopkins Hosp 61 140 (Aug) 1937

<sup>26</sup> Wendell W B Personal communication to the authors April 1 1938



festation of sulfanilamide therapy was this question difficult to answer. All the other patients had one or more days of normal temperature before the drug fever developed.

The days of the occurrence of fever or dermatitis are shown in table 5.

In addition to simple fever due to sulfanilamide we have noted that almost all patients in whom dermatitis, acidosis, acute hemolytic anemia or agranulocytic angina developed also showed an early febrile response. This leads us to believe that the appearance of fever constitutes an important warning sign in the control of patients being treated with sulfanilamide and that administration of the drug should be promptly discontinued when an unexplained fever develops.

As simple fever is a fairly common toxic manifestation in the course of sulfanilamide therapy, the question of whether one may resume treatment with the drug after the fever has disappeared is of importance. Our observations show that it is impossible to predict whether a patient will have another febrile reaction if sulfanilamide therapy is resumed. However, because of the sharpness and intensity of the febrile reactions noted in certain patients after the resumption of sulfanilamide therapy, we believe it wise to administer a small test dose (0.3 Gm. or 5 grains) to patients who

TABLE 5—*The Development (by Days of Therapy) of Simple Fever and Dermatitis in the Course of Sulfanilamide Therapy in 408 Patients*

Day of therapy	1	2	3	4	5	6	7	8	9	10	11	12	13	14	20
Simple fever number of patients	4	3	3	1	6	5	2	2	1					1	
Dermatitis number of patients					2		"			2					1

have previously had a febrile response. If a sharp febrile response is noted within twelve hours it is unwise to continue giving the drug.

The dermatitis due to sulfanilamide is generally a maculopapular, "measly" eruption which may or may not be accompanied by fever or by a history of exposure to light. In some instances, however, we have noted multiform and urticarial lesions, scarlatiniform eruptions and purpuric rashes. It is generally wise to discontinue giving sulfanilamide if a rash occurs. Again, it is impossible to predict in the individual case whether or not an eruption will occur if sulfanilamide is administered a second time.

The routine administration of sodium bicarbonate with sulfanilamide will prevent the occurrence of clinical acidosis, which appears to be due to a loss of sodium and potassium in the urine.<sup>11</sup> We have not noted any evidence of renal damage or irritation which could be attributed to sulfanilamide. Simple jaundice (without anemia) occurred in two of our patients. With both, withdrawal of the drug resulted in a rapid clearing of the jaundice.

Anemia of the hemolytic type occurred frequently in this series of patients. Fortunately, in most of them it was mild and slow in developing. A drop in the hemoglobin content of from 10 to 20 per cent is common in the course of sulfanilamide therapy, especially if the treatment is prolonged for ten days or more. This slowly developing anemia is not accompanied by bilirubinemia, although increases in the reticulocyte count above normal limits are the rule after the hemo-

globin content begins to drop. Urobilin is almost constantly present in the urine. Our observations lead us to believe that this slowly developing, mild anemia is not a contraindication to the continuation of sulfanilamide therapy.

Acute hemolytic anemia<sup>27</sup> characterized by a rapid fall in the red blood cell count and the hemoglobin content, moderate to marked leukocytosis, marked reticulocytosis, bilirubinemia, urobilinuria and, in certain instances, porphyrinuria, occurred in 3 per cent of the adult patients and in 8.9 per cent of the children in this series. This type of toxic manifestation is one of the most serious encountered in the course of sulfanilamide therapy. It has generally been severe enough to necessitate one or more transfusions. It occurs within twenty-four to seventy-two hours after treatment is begun. The maximal anemia generally develops within three days after the hemolytic process is initiated. All the patients show a definite rise in temperature during the anemic phase. This toxic manifestation is more common in children than in adults. In three or four cases in which therapy with sulfanilamide was resumed after the hemolytic process had subsided, there was a recurrence of the acute hemolytic anemia.

The mechanism of this type of anemia is not as yet clearly understood, but it would seem to be the result of an idiosyncrasy toward sulfanilamide. There is no evidence that any one type of infection predisposes a patient toward this form of anemia. Experience has shown that, in general, the use of sulfanilamide should be discontinued if acute hemolytic anemia develops. However, if a patient is critically ill with an infection, the sulfanilamide may be given despite the acute hemolytic anemia if multiple transfusions are used to maintain a proper level of red blood cells and hemoglobin in the blood.

Agranulocytosis has been reported in the course of sulfanilamide therapy.<sup>28</sup> We observed one patient suffering from gonococcal arthritis and urethritis in whom this toxic manifestation developed toward the end of the third week of treatment. He showed the typical picture of agranulocytic angina. Treatment designed to rid him of sulfanilamide was immediately instituted, and within ten days he had made a complete recovery from this blood dyscrasia. The mechanism of the production of serious leukopenia and agranulocytosis by sulfanilamide is as yet unknown.

#### SUMMARY AND CONCLUSIONS

Further observations which we have made on the mode of action of sulfanilamide, both in vitro and in vivo, substantiate our earlier observations that the drug decreases the rate of multiplication of susceptible bacteria. We have been unable to confirm certain of Osgood's<sup>6</sup> observations regarding the antitoxic action of sulfanilamide. A study of the effects of treatment with this drug and with 4, 4' diamino diphenyl sulfone on the peritoneal exudates of mice suffering from experimental pneumococcal peritonitis shows that these chemotherapeutic agents may alter slightly the essential structure of the pneumococcus. However, the chief difference between the treated mice and the control mice was that, at any given observation, there were always definitely fewer pneumococci in the exudates from the

27 Harvey A. M. and Janeway P. A. The Development of Acute Hemolytic Anemia. *J. A. M. A.* 109: 12 (July 3) 1937. Kohn S. E. Acute Hemolytic Anemia During Treatment with Sulfanilamide. *ibid.* 109: 1005 (Sept. 25) 1937.  
28 Young C. J. Brit. M. J. 2: 105 (July 17) 1937. Jennings G. H. and Southwell Sander G. H. J. *Lancet* 2: 898 (Oct. 16) 1937.

treated animals than in those from the controls. Because of the absence of any appreciable degree of phagocytosis in the exudates from any of the groups of mice, we interpret this observation as meaning that the chemotherapeutic agents retarded the multiplication of the pneumococci in the treated mice. These observations complement our previous view<sup>1</sup> that sulfanilamide has a bacteriostatic action in the control of experimental *B. welchii* infections in mice.

The proper clinical use of sulfanilamide must, in our opinion, be based on a knowledge of the factors concerned in its absorption and distribution in the body. We believe that levels of sulfanilamide of from 10 to 15 mg per hundred cubic centimeters of blood are favorable for the control of severe infections. Lower levels (from 5 to 10 mg) are satisfactory for the control of mild or moderately severe infections. The maintenance of an even level is dependent on dosage over the entire twenty-four hour period. Administration of the drug should not be discontinued (unless severe toxic manifestations appear) until a clinical cure of the infection has been effected. Because of the possible toxic manifestations of the drug, patients receiving sulfanilamide should, whenever possible, be hospitalized.

This chemotherapeutic agent has many toxic effects, and because of them the patient should be carefully supervised while sulfanilamide is being administered. This supervision should consist of careful clinical observations, frequent and regular temperature recordings, a daily hemoglobin determination and a daily total white blood cell count. If these procedures are adhered to as a routine, the toxic manifestations of sulfanilamide will be noted in their inception. In conclusion, we cannot stress too strongly the fact that the patient who is receiving sulfanilamide needs the intelligent and careful supervision of a physician.

#### ABSTRACT OF DISCUSSION

DR FRANCIS SCOTT SMYTH, San Francisco. From a rather limited clinical acquaintance the conclusion has been reached that the dose of sulfanilamide may vary with the organism, the strain of the organism, the severity of the infection and the resistance of the patient. I should like to mention the treatment of meningococcic meningitis. I have questioned for some time whether the intrathecal administration is entirely scientific if the drugs or antisera are expected to reach the deeper sulci, where some of the pathogenic process is located. So with sulfanilamide, the drug is rapidly diffusible and should be administered by mouth, lumbar puncture being used only for drainage. The result has been entirely satisfactory to me. In contrast with Dr Schwentker's report that the level in the spinal fluid could not be raised high enough, I might say that the level in the spinal fluid was 22 mg per hundred cubic centimeters and the level in the blood 24, the titers being taken simultaneously. The authors mentioned the necessity of watching the kidney, which is important. I think perhaps practitioners who deal with children are inclined to stop the medication too early, particularly in otitis media and mastoid infections. I think we have pushed fluids because of a certain fear and again because the metabolism of the child would require a greater fluid intake. The authors did not mention methylene blue. The reports of Hartmann and Wendell strongly suggest that cyanosis deserves some consideration in the presence of pulmonary infection or of anemia. I have used it in a limited way. However, without going into the controversy about methemoglobinemia or the action of methylene blue, I believe that physicians should keep an open mind about the use of the substance, particularly before operation or for severely anemic patients.

DR THOMAS B COOLEY, Detroit. I have made no such careful study as the authors have and have only the experience of a large, rather undermanned clinic in which we cannot do

all the things we should like to. Our results in meningococcic infections have been so good that we have adopted sulfanilamide as our standard medication, using at present no serum at all. We are not having any epidemic, however, and there are only sporadic cases. The service in our hospital which has had the most striking results with sulfanilamide has been the otolaryngologic in the streptococcic complications of otitis media—mastoiditis, septicemia and meningitis. The effects here have been remarkable. I think that no one has been impressed with the desirability of using sulfanilamide as a routine in the treatment of the more transient disorders of the pharynx and nasopharynx, which ordinarily will not last more than three or four days. I should like to be able to discuss the dangers of the drug. We have seen almost none of them. The authors' figure of 10 per cent for hemolytic anemia surprised me. We have had no such results. This may be because we have not used such large doses. We seldom run our blood levels to 15 mg per hundred cubic centimeters. In most cases, with good results, the levels have been 10 mg or less per hundred cubic centimeters. We have had three patients with granulopenia. One came in with thrombopenia, and granulopenia developed within eighteen hours after the first dose of sulfanilamide. I do not suppose this to have been due to the drug. Another had transient leukopenia almost immediately after the beginning of administration. One patient, who had gone through prolonged septicemia, died finally in a state of agranulocytosis much like the aplastic anemia occasionally developing in the course of sepsis, and the marrow was of the same type. He had been intensively treated with sulfanilamide for a month but I am not inclined to believe that the drug was responsible for the blood picture. I have one small contribution to make regarding gonorrheal ophthalmia. In a series of thirty control cases and fifteen cases in which sulfanilamide was used the average stay in the hospital in control cases was 30.14 days and for those in which sulfanilamide was used 5.8 days. The younger the child, the larger the dose necessary to obtain a particular level. The two patients with very low levels had determinations in the early morning after a night without the drug, which was the practice in this series. It may be noticed too that the good results were obtained with generally low sulfanilamide levels, averaging a little under 5 mg per hundred cubic centimeters for the series.

DR PERRIN H LONG, Baltimore. There were a lot of things we didn't speak about this morning because of lack of time. We tried to stick as close as possible to the clinical side of the use of sulfanilamide. That there may be no misunderstanding, I shall state that my associates and I feel that the large doses of sulfanilamide are needed only in severe infections in which there is danger of death. To bring mild infections under control such large doses of the drug are not needed. I do not believe now that the intrathecal use of sulfanilamide is necessary in meningococcic meningitis. I think the patients can be treated by mouth if one is sure that the drug is being absorbed, and the only way to know this is by determining the level of sulfanilamide in the blood. We have used methylene blue in the control of cyanosis, but by and large in our experience cyanosis has never constituted a problem in the general therapy of the patient. We neglected to mention that in severe infections, in order to get the level in the blood up rapidly, we limit the intake of fluids to 3,000 cc a day in adults, and since we have been limiting fluids we have had much better results. With regard to Dr Cooley's suggestion that our frequency of hemolytic anemia was due to the large doses, I have recently been over all of the cases to date. We have had about twenty-eight or thirty cases in the hospital, and, strangely enough, there is little evidence that the amount of the drug had anything to do with the development of acute anemia, in the sense that high doses and low doses produced it about equally. An interesting thing is that four patients who had acute hemolytic anemia were given sulfanilamide again in the Johns Hopkins Hospital at a period of from two months to a year afterward. In three of the four patients the anemia developed on exactly the same day as in their previous course of sulfanilamide. The fourth patient for some unknown reason did not become anemic. Hence we think the anemia is more a manifestation of idiosyncrasy than of a direct effect of acute toxicity of the drug.

# THE PROBLEM OF DISRUPTION OF ABDOMINAL WOUNDS AND POST-OPERATIVE HERNIA

A REVIEW OF 9 000 CONSECUTIVE ABDOMINAL INCISIONS

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Occasional contributions have appeared on the subject of disruption of wounds for a long time, but more than forty articles have been found in the American literature alone during the last few years as evidence of its importance. Because of these articles, or for other reasons, there has been a recent renewed interest in the subject, and we can say undeniably that disruption and postoperative hernia are on the decrease. Since postoperative hernia is so intimately associated with disruption, one cannot be satisfactorily discussed without the other.

Jenkins<sup>1</sup> has reviewed the recent literature on wound disruption, bringing the reported cases up to date, and has added thirty-six cases from the University of Chicago surgical clinic to increase the number reported to 1,294. To these cases we have added forty-nine cases reported by Fallis<sup>2</sup> and twenty-two by Glenn and Moore,<sup>3</sup> with sixty-one of our own. A study of the data on these cases from many clinics reveals striking uniformity in the frequency of disruption (from 0.6 to 3 per cent) as well as in mortality (from 25 to 40 per cent). The etiologic factors are also similar, while the suggestions for remedying the condition are numerous.

In the study of this problem we have reviewed 9,000 consecutive abdominal incisions made in the surgical and gynecologic services of the John Sealy Hospital. Sixty-one disruptions and 160 postoperative hernias were recorded.

It is important to remark that our follow-up records of postoperative hernias are incomplete, and unquestionably a number have not been recorded. A somewhat higher percentage of hernias would therefore be nearer correct.

Almost two thirds of the patients operated on were females, thus accounting for the higher percentage of disruption in that sex. Approximately 65 per cent of the patients were between the ages of 25 and 50 years, but since this is the time during which most patients are subjected to surgical operations, age is not significant. Negroes showed relatively the same number of disruptions, but hernia occurred in a greater number.

Drainage of the peritoneal cavity through an abdominal incision predisposes to both disruption and hernia. This brings up the question of infection which made the drainage necessary. It is readily seen that in the cases in which drainage was done infected wounds more often developed. At this time we should like to

call attention to the importance of protecting the wound from soiling in operations in the presence of abdominal infection. It is possible to keep a wound clean and to secure primary healing in a large percentage of cases even though pus is encountered during the operative procedure.

Table 3 shows that thirty-nine of our postoperative hernias were in cases in which drainage was not done. These might probably be considered disruptions, since some degree of separation of the wound must have occurred during the postoperative period.

The most common causes of disruption and hernia are (1) infection and hematoma, (2) delayed wound healing, (3) faults of the suture material, including allergic reactions thereto and hypoproteinemia, and (4) coughing, vomiting and gaseous distention.

## INFECTION AND HEMATOMA

Infection was a contributing factor in disruption in 22 per cent of the 1,294 cases reviewed by Jenkins. In our series infection occurred in 60 per cent (table 4). It is common knowledge that low grade infection may be present without suppuration. Disintegration of

TABLE 1—Summary of the Collected Cases of Disruption

	Jenkins Collected Cases	Fallis	Glenn and Moore	Singleton and Blocker
Cases (total 14%)	1,294	49	22	61
Incidence %	0.25 to 3	0.64	0.55	0.67
Age	44	30-60	40-60	26
Sex %				
Males	7	50	91	27
Females	43	40	9	13
Disease necessitating operation, %				
Carcinoma	20		21	60
Biliary conditions	12	20.4	27	10
Appendicitis	6	16.3	30	11.5
Ulcer	10		130	
Gastric disease		14.3		2.50
Hernia	7			2.50
Gynecologic and obstetric conditions	18			6.5
Incisions %				
Upper	52	53	68	10
Lower	48	47	32	50
Drainage %	17	380	26.3	290
Infection %	22	20	27.2	60
Disruption day	8	6.9	0-11	9
Deaths	414	17	10	19
Mortality %	30	34	40.5	31.10

absorbable suture material is greatly hastened by infection. Howes and Harvey<sup>4</sup> demonstrated that within three to six days catgut of any size or preparation lost its tensile strength in the presence of infection. If silk or linen is used, the tissues readily cut through because of the softening and disintegration of the tissues sutured in the presence of infection. Hematoma is a generally recognized cause, not only by preventing union but by predisposing to infection.

## DELAYED WOUND HEALING

It is common knowledge that wound healing is delayed in patients showing emaciation, general debility or old age, and this is especially noticeable in patients with cancer. Records reveal that 25 per cent of disruptions occur in cases of malignant growth. As seen in table 4, 22.9 per cent of our cases can be classed as instances of delayed healing or nonunion.

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Read before the Section on Surgery, General and Abdominal, at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 17, 1938.

<sup>1</sup>Jenkins H. P. Clinical Study of Catgut in Relation to Abdominal Wound Disruption. Surg. Gynec. & Obst. 64: 648-662 (March) 1937.

<sup>2</sup>Fallis I. S. Postoperative Wound Separation. Review of Cases.

Surgery 1: 523-534 (April) 1937.

<sup>3</sup>Glenn Frank and Moore S. W. Disruption of Abdominal Wounds. Report of Twenty-Two Cases. Surg. Gynec. & Obst. 65:

16-22 (July) 1937.

<sup>4</sup>Howes E. L. and Harvey S. C. Strength of Healing Wounds in Relation to Holding Strength of the Catgut Suture. New England J. Med. 200: 1285-1291 (June 20) 1929.

FAULTS OF THE SUTURE MATERIAL

As pointed out by Howes and Harvey,<sup>1</sup> local exudative wound reactions causing edema result in softening not only of catgut but of the tissues which are being held by the suture

The holding power of a stitch is in direct proportion to the degree of condensation of connective tissues in the structure in which the stitch is placed. The holding power of the stitch decreases rapidly and more rapidly than does the strength of catgut



Fig 1—Modified Sloan incision showing the rectus muscles retracted laterally and the posterior rectus sheath and linea alba cut transversely in the direction of their fibers. UMB indicates umbilicus. (South Surgeon 3:235 [Sept.] 1934)

The controversy over catgut versus silk, linen or silver wire goes on without a decision. Although evidence continues to accumulate against catgut, it remains the suture material preferred by the greater number of surgeons. The desire for a material that would be

If we assume that their statement is true, the problem of selecting suture material becomes less difficult. Suture material only slightly stronger than the tissues sutured is preferable. Large or overstrong sutures strangle the tissues. Therefore, the approximation of nontraumatized noninfected tissues under tension without strangulation and with a minimum amount of suture material favors good union.

Rhoads, Hottenstein and Hudson<sup>5</sup> studied the decline in the strength of catgut after exposure to living tissue and concluded that "tanned, iodized catgut possesses more resistance to the action of tissue fluids than medium-hard chromic catgut. Also, it is much less affected by infection than medium-hard chromic or plain catgut."

Allergic Reactions—Sensitivity or allergic reaction to catgut as an argument against the use of this material for sutures has been seriously presented by several

TABLE 3—Incidence of Disruption and Hernia in Relation to Drainage

	Incisions	Disruptions		Hernias	
		No.	%	No.	%
Drained	1,816	18	0.99	121	6.6
Nondrained	7,184	43	0.59	39	0.54
Total	9,000	61	0.67	160	1.77

TABLE 4—Local Contributing Factors in This Series

	No.	%
Infection	37	60.7
Hematoma	10	16.4
No local cause (so called nonunion)	14	22.9
Total	61	

writers. Kraissl, Kesten and Cimiotti<sup>6</sup> discussed "The Relation of Catgut Sensitivity to Wound Healing" and in observations on guinea pigs and man said

Laboratory experimentation has demonstrated that guinea pigs may be sensitized to catgut. When this material is again intro-



Fig 2—Lateral transverse cutaneous incision

TABLE 2—Incidence of Disruption and Hernia According to Age Sex and Race

Age Decade	Disruptions	Hernias	Sex	Disruptions	Hernias
1st	1	3	Male	16	68
2d	6	11	Female	45	92
3d	18	46			
4th	14	37	Total	61	160
5th	13	31			
6th	5	22	Race		
7th	3	9	White	43	88
8th	1	1	Negro	18	72
Total	61	160	Total	61	160

absorbed resulted in the use of catgut by Physick as early as 1816. Lister in 1868 devised methods of sterilizing catgut, and further perfection of methods of sterilization has removed its most objectionable features. Jenkins<sup>4</sup> after clinical tests of the duration of tensile strength of catgut, concluded that "plain catgut lasts 5-6 days by tension-suture tests but that it becomes untied in the tissues in 2-3 days."

There is a definite place in the practice of surgery for absorbable suture material which can be depended on to maintain its tensile strength for at least ten to fifteen days.

duced into such an animal a marked local reaction usually occurs at the site of its introduction. This frequently results in a rapid absorption of the catgut and often disruption of the

5 Rhoads J E, Hottenstein H F and Hudson I F. Decline in Strength of Catgut After Exposure to Living Tissues. Arch Surg 34:377-397 (March) 1937.  
 6 Kraissl Cornelius J, Kesten Beatrice M and Cimiotti J. Grier. Relation of Catgut Sensitivity to Wound Healing. Surg Gynec & Obst 66:628-635 (March) 1938.

wound Clinical investigation reveals a definite incidence of sensitivity to this suture material as determined by skin tests done with appropriate solutions This incidence greatly increases with a history of allergy or a previous operation It is felt that when catgut is to be used the individual should be tested for sensitivity, particularly if he falls in [the latter] two groups

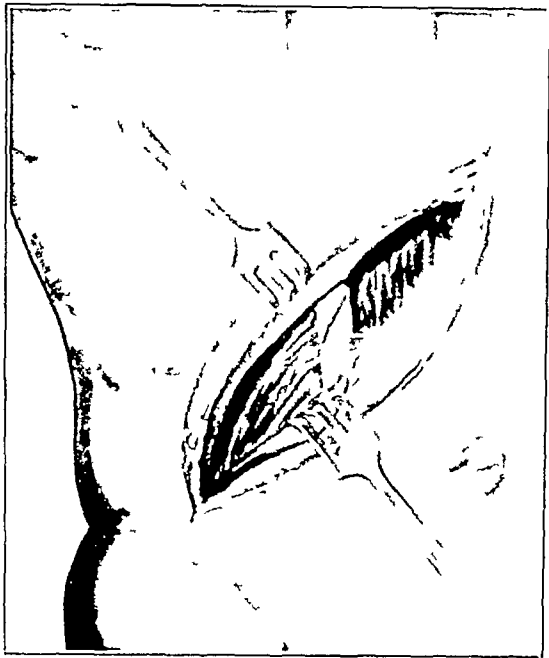


Fig. 3—Lateral transverse incision showing the anterior sheath of the rectus muscle and the external oblique fascia cut in the line of the incision

By this procedure one of the factors relating to disruption of wounds may be eliminated and in this way the incidence of this catastrophe may be reduced

These facts appear significant, but clinical observations have not coincided with them

*Hypoproteinemia*—Thompson Ravdin and Frank concluded from experimental and clinical observations that hypoproteinemia has a decided influence on the

TABLE 5—Incidence of the Disruptive Forces

	No	%
Vomiting and distention	26	42.6
Excessive coughing	23	37.7
Straining at stool	—	8.2
Gastric lavage	3	4.9
Tetanus	2	3.3
Convulsive seizure	2	3.3
	61	

healing of wounds and expressed the belief that the failure of wounds to heal is associated with the hypoproteinemic state, a condition which is present in many patients subjected to operation on the gastric, duodenal and biliary tracts They also found that in animals lyophile plasma is efficacious in the correction of hypoproteinemia and in that way prevents disruption of wounds

The controversy over suture material continues and, so far as we can see, unnecessarily From information available from the literature, substantiated by personal experience, we can say that suture material in excess

of the minimum in size and amount is not conducive to good wound healing The reaction of the tissue to excessive suture material is deleterious, and strangulation of tissue by excessive tension is the surest way to prevent healing The strength of the suture material need not be greater than the strength of the tissues sutured because the tissues (fascia) will cut through irrespective of the material used for sutures if tension is greater than the tissue will bear Reports show that, irrespective of the type of suture material used, disruptions may occur Catgut, plain, iodized or chromic, has been used in the cases we report, except in a few instances in which silk linen or silver wire was used Bearing in mind the foregoing information, we have for some time used No. 0 single or double chromic catgut for closing abdominal wounds, except with the McBurney incision where No. 1 plain catgut is used We are conscious of the revival of interest in the use of silk suture

COUGHING VOMITING AND GASEOUS DISTENTION

Coughing vomiting and gaseous distention are factors that cannot be disregarded as contributing to the occurrence of disruption and hernia The first is important since a severe postoperative cough is impossible to anticipate and difficult to control On the other hand, vomiting and gaseous distention can be anticipated and completely obviated by gastric suction We are convinced that gastric suction will absolutely prevent postoperative vomiting and distention if done as a routine efficiently in all cases during and after abdominal operations This has been our practice for the past

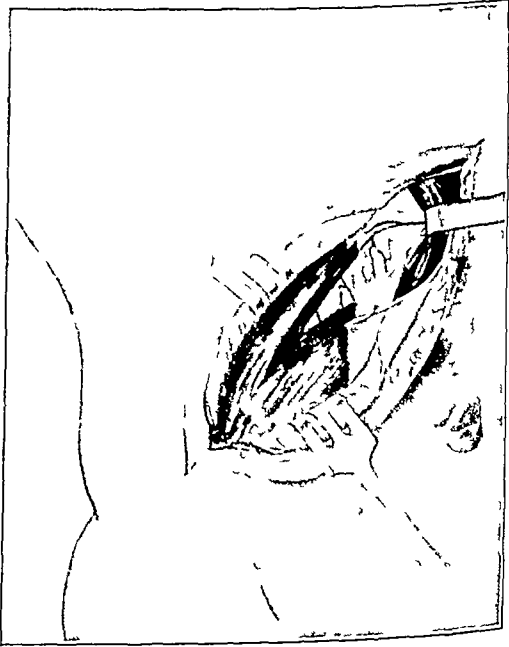


Fig. 4—Lateral transverse incision showing the rectus muscle retracted medially the posterior rectus sheath cut transversely in the line of its fibers and the internal oblique muscle the transversus muscle and peritoneum split in the line of the fibers of the internal oblique muscle

three years, the tube being passed before the anesthesia is started The results have been eminently satisfactory

ANATOMIC INCISIONS

Among the many causes of wound disruption and postoperative hernia we wish to call attention to one which is of the greatest importance, although appar

7 Thompson W D Ravdin I S and Frank Irving L Effect of Hypoproteinemia on Wound Disruption Arch Surg 36 500 518 (March) 1938

ently it has received little attention either in the literature or in actual practice. We refer to the use of nonanatomic incisions. We are convinced that generally too little consideration has been given to the anatomic structures of the abdominal wall in making abdominal incisions.



Fig 5—Lateral transverse incision showing closure of the posterior sheath of the rectus muscle, the internal oblique muscle, the transversus muscle and the peritoneum in one layer.

It is true that occasional disruption is possible irrespective of the type of incision used, but, on the other hand, certain commonly used incisions are much more prone to give trouble than others. This is particu-

TABLE 6—Review of 9,000 Consecutive Abdominal Incisions for Disruption and Hernia

Incision	No	Clean	Drained	Disrupted		Hernia	
				No	%	No	%
Nonanatomic							
Midline	4,464	3,715	749	36	0.80	87	1.93
Lower rectus	1,097	881	216	1a	1.37	28	2.55
Upper rectus	292	226	66	9	3.08	16	5.47
Total	5,853	4,822	1,031	60	1.02	131	2.24
Anatomic							
Pfannenstiel	29	29	0	0	0.0	0	0.0
McBurney	2,648	1,987	661	1	0.037	28	1.05
Modified Sloan	382	218	164	0	0.0	1*	0.26
Lateral transverse	88	68	20	0	0.0	0	0.0
Total	3,147	2,362	785	1	0.031	29	0.92

\* Omentopexy

larly true in the upper part of the abdomen, where the number of faulty wounds is relatively far greater than in the lower part. This is easily accounted for when one considers the anatomy of this region as it relates to the commonly used vertical rectus or midline incision. As a general proposition a surgeon hesitates to cut muscles or tendons across their fibers, but in the upper vertical incision this is done. The strength of the abdominal wall depends largely on muscles and fascia. The muscles terminate in fascia at various places, and this fascia will be found in abundance in those parts of the wall where stress is greatest. This can be seen in the sheaths of the rectus muscle, both

anterior and posterior. These sheaths are the tendinous continuations of the external, internal oblique and transversus muscles. It is also significant that the greatest tension is in a direction parallel with the fibers of the fascia. In the upper part of the abdomen, therefore, the direction of the fibers and the tension is largely in a transverse direction. The posterior rectus sheath is the tendinous continuation of the internal oblique and the transversus muscle, which are respiratory muscles and constantly in action, and during the acts of coughing and vomiting the strain on this fascia is great. It is too much to expect this structure (which is cut across in the usual vertical incision), sutured

TABLE 7—Review of 762 Incisions of the Upper Part of the Abdomen

	No	Disruption		Hernia	
		No	%	No	%
Vertical incisions	292	0	3.68	16	5.47
Transverse incisions	470	0	0.00	1*	0.21

\* Omentopexy

together with its fibers end to end, to withstand the postoperative strain which may be thrown on it regardless of the suture material or the way it is used. By splitting this fascia in a transverse direction in line with its fibers, preservation of the strength of the abdominal wall is guaranteed. Various types of transverse incision can be used with this objective in mind. The most satisfactory of these is the incision described



Fig 6—Lateral transverse incision showing closure of the external oblique muscle and the anterior sheath of the rectus muscle.

by Sloan.<sup>8</sup> We have used this incision slightly modified for ten years, with perfect satisfaction to us as well as to the patients. One of us described this incision previously.<sup>9</sup>

8 Sloan G A. New Upper Abdominal Incision. *Surg Gynec & Obst* 45: 678 (Nov.) 1927.  
9 Singleton Albert O. Improvement in Management of Upper Abdominal Operations Stressing Advantages of Anatomical Incision. *South M J* 24: 200-206 (March) 1931. Anatomical Importance of Fascia in Abdominal Wall. *South Surg* 3: 235-243 (Sept.) 1934.



Another type of transverse incision which we have found extremely satisfactory both for the security of the wound and for the easy access to the abnormality sought is a lateral transverse incision. This incision is used on the right side for operations on the biliary passages, and on the left side for operations on the splenic flexure of the colon, and particularly for splenectomy. The incision begins near the midline, from 3 to 4 inches above the umbilicus, extending obliquely downward and outward, just below the costal margin, almost to the iliac crest just posterior to the anterior superior spine. This is in the direction of the fibers of the internal oblique muscle. The anterior sheath of the rectus muscle is cut transversely and the muscle freed from the sheath for a short distance above and below. The incision is continued across the fascia of the external oblique muscle for 2 or 3 inches in line with the cutaneous incision and the external oblique muscle is retracted farther laterally. The rectus muscle is retracted toward the midline, and its posterior sheath is split from the linea alba laterally into the

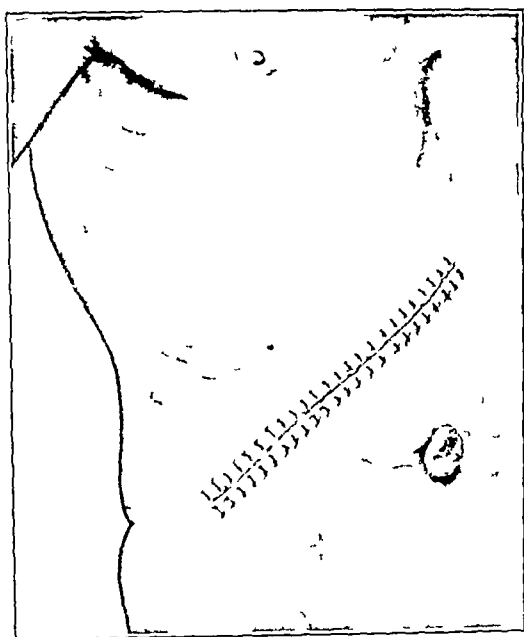


Fig. 7—Lateral transverse incision showing closure of the cutaneous incision

internal oblique and transversus muscles. The internal oblique muscle is split and the transversus and peritoneum cut in the same incision. This gives an advantageous exposure of the gallbladder, bile ducts, appendix and pyloric end of the stomach on the right side. The wound comes together and is quickly and easily sutured in layers without tension. The wound may be considered unanatomic in that the ninth and tenth intercostal nerves may be injured when cut or retracted out of the way. A numbness results over an area of skin below the incision for a few weeks but soon disappears. For splenectomy this incision has been the source of particular satisfaction. The largest spleens may be removed with excellent exposure, and perfect control of the situation is possible throughout the operation.

#### SUMMARY

Disruption of abdominal wounds and postoperative hernia are on the decrease. This is due primarily to a revival of interest in the subject, resulting in greater

care in making and closing wounds, another important factor is the more successful postoperative care due to the increasing use of gastric suction, obviating vomiting and gaseous distention, which have been serious contributing factors.

Disruption of wounds and postoperative hernia in the upper part of the abdomen, with their distressing consequences, can be almost completely eliminated by the use of carefully made anatomic incisions. As a rule busy surgeons are impatient to reach the diseased organ and resent the extra time and attention necessary to make the previously described anatomic incision. But the ease of closure, the feeling of security in regard to the wound and the added comfort of the patient more than compensate for the extra effort.

NOTE—Since the presentation of this paper at the San Francisco session we have discovered one small postoperative hernia in a lateral transverse incision which was drained following removal of a suppurative gallbladder.

#### ABSTRACT OF DISCUSSION

DR. R. L. SANDERS, Memphis, Tenn. The authors report a 31 per cent mortality following abdominal wall disruptions in their series of cases. A review of the literature a few years ago revealed an average of 39 per cent mortality in a large series of cases reported from a half dozen of our largest hospitals. A follow up of my own cases showing a too high percentage of postoperative hernias led me to try the transverse incision in the upper part of the abdomen. My results have been satisfactory and coincide in general with those reported by Drs. Singleton and Blocker. They discussed the causes for wound disruption and postoperative hernia, calling attention to all the important factors involved. They have emphasized the need for a proper anatomic incision. The busy surgeon in his effort to reach the disease within does not take sufficient time to make the anatomic approach. This splendid presentation should cause us to stop and think, for it may be the means of avoiding future catastrophes. In 1930 I made a study of 500 cases of cholecystectomy to determine the incidence of postoperative hernia. A large percentage of the wounds were drained. To my amazement, a hernia had developed in almost 10 per cent of them. It would probably surprise all surgeons if a similar follow up were made. Some type of transverse incision by way of the anatomic approach may be the answer to the problem of wound disruption and postoperative hernia. During the past five years I have been using several modifications of the transverse approach and to date have done 250 cases. As mentioned by the authors, Dr. Sloan was among the first to use the transverse principle without division of the muscles. I think Drs. Singleton and Blocker have modified the incision to great advantage. I find the incision a little tedious to make but easy to close. When the linea alba is divided the exposure is excellent, but if infection supervenes it may weaken at that point and produce a bulge later. I am convinced that the modified anatomic approach shown by the authors has merit.

DR. ALTON OCHSNER, New Orleans. The authors have shown by their statistics the value of transverse incisions. It is interesting in reviewing these statistics to see that 85 per cent of the disruptions they have had at the John Sealy Hospital occurred in the lower abdominal incisions, which is contrary to the results obtained in most institutions. Drs. Singleton and Blocker used the transverse incision in upper abdominal operations. My experience is limited to the lateral transverse, which I learned from Dr. Singleton, and it has been gratifying to see the exposure which I could get following this operation. Dr. Sanders called attention to the delayed healing which may be the result of infection, which of course delays healing, and also the use of inadequate suture material, which he aptly stressed. I should like to emphasize the importance of the use of silk. The authors minimized the importance of silk, I think, rather incorrectly. I began using silk

in persons who were debilitated, such as patients with carcinoma. I now use silk much more extensively. I feel that silk is particularly indicated in cases of infection. Ordinarily one would think of not using silk in the presence of an infection but I believe that in cases in which healing is delayed and in which rupture is likely to occur its use is especially indicated. If one does use silk, let me reiterate the points which Professor Halsted emphasized many years ago. One must use fine silk, only interrupted sutures are to be used and the knots cut short, and only small bits of the tissue are caught in the stitch. In spite of the teachings of Halsted and Whipple concerning the proper use of silk, most surgeons when beginning to use silk use it incorrectly and therefore obtain undesirable results. If one will use interrupted silk sutures, it is surprising how many frankly contaminated wounds and infected wounds will heal without any discharge. It is continuous silk in the presence of infection which is particularly dangerous.

DR C. R. STEINKE, Akron, Ohio. I want to ask the authors a question. In connection with the upper abdominal incision, they mentioned a good many hernias. My experience has been that many of these come from peptic ulcer, particularly perforated ulcers. I wonder whether the authors would give their suggestion how to overcome this and tell us what percentage of their hernias occur in perforated ulcer cases or operations on the duodenum and stomach. With the subcostal incision (Kocher), which I have been using a great deal recently, I have had good results and have never had a hernia although I have had a number of infections.

DR HUGH H. TROUT, Roanoke, Va. I cannot resist speaking of three points in which I have been particularly interested. The first is the use of silk. I have used silk for many years. In an effort to obtain a substitute for catgut I have worked with rayon and other cellulose compounds. Altogether I have done something over 300 experiments. As yet I have not been able to obtain an absorbable substitute. Most of us think the absorbability of catgut is regulated by either the tannic or chromic acid or size of the gut but there is a factor that the manufacturers as yet have not been able to control, namely the age of the animal from which the gut has been removed. For instance, if one kills an old ram of 8 or 10 years of age and takes his gut, twists it and tries to absorb it, one has a foreign body, no matter how small the material that is being employed. The third factor is one that Dr Harvey Stone spoke about at the recent meeting of the American Surgical Association, namely, the proper preparation of the patient. If debilitated patients in whom disruptions have occurred more frequently than in any other type of patient are properly prepared with transfusions as well as with chemical and water balance, I think one will find that no matter what type of suture or incision one uses there will be a decided decrease in the number of disruptions.

DR FRANK K. BOLAND, Atlanta, Ga. The manner of making the abdominal incision is an important factor in the complication which frequently becomes a catastrophe. Certainly the manner of closing the incision does not seem to make any difference in many cases, nor does the nature of the suture material. Not long ago the abdominal wound of a 6 year old boy, in whom I had used chromic catgut throughout, broke open on the sixth postoperative day with evisceration. Not a trace of the so called twenty day catgut remained. I suppose this was a case of allergic reaction. Probably such a result would not have occurred if I had used silk throughout. As mentioned by the authors, I believe one should give special attention to the transversalis fascia in closing abdominal incisions. It is a very stout tissue which sometimes is identified and sometimes not. Whenever recognized however, it should be included in the peritoneal suture or sewed separately. The commonest cause of disrupted clean abdominal wounds is failure to coapt the peritoneum completely. The slightest opening that remains between stitches leaves a loophole for the entering wedge of the omnipresent curiosity-seeking omentum, which may result only in an adhesion or may produce complete disruption. It is remarkable with what few symptoms a wound may break

open. Frequently the condition has existed for several hours before it is discovered. The patient makes no complaint, the chart looks normal and the trouble is first recognized when the nurse sees drainage on a heretofore dry dressing. Several years ago I removed the stitches, including through and through silkworm gut, from the wound of a stout woman whose gallbladder had been removed ten days previously and closed without drainage. The same night the wound disrupted with evisceration. An associate was called and promptly reclosed the wound, reinserting the silkworm gut sutures. I had heard nothing of the event when I visited the patient the next morning and called for the dressing tray to inspect the wound the day after taking out stitches. To my surprise the stitches were still present. I proceeded to remove them again about twelve hours after they had been put in the second time. The young doctor who had resutured the incision gave me the information with great excitement. We proceeded to strap the wound with adhesive plaster but the patient had no more trouble from it.

DR ALBERT O. SINGLETON, Galveston, Texas. I hardly think that operators appreciate the difference between some of the operative wounds we have described and the usual wound, particularly in the upper part of the abdomen. Here the lateral muscles are respiratory muscles and any coughing or vomiting puts a tremendous strain on them, and for that reason I do not believe that the posterior sheath of the rectus muscle ever holds in a vertical incision, except in the very smoothest convalescence and for that reason the postoperative hernia is apt to occur. The last upper vertical incision I made was six years ago in a doctor with a gangrenous gallbladder. He developed a cough, and the wound disrupted and I repaired it. He coughed more and it broke again, and I sewed it as best I could. A few days later I could see his intestine was under the skin and I put adhesive tape over his wound, and now he is walking around with a big hernia. We have had such remarkable satisfaction with a fairly large number of cases that I hardly see why any other incision should be used. The question of infection in perforated ulcers was raised. We have had these infected many times, but none of them failed to unite properly. I had one patient in whom I made the incision three times, finding anatomic structures easy to recognize and performing the operation just as well the third time as the first. Dr Ochsner called attention to the question of suture material, and that, of course, is a very active subject at the present time. There has been a revival in interest in the use of silk, and with the reputation that these men have for honesty it is difficult to ignore their claims. I am almost persuaded to use silk. I am reluctant to do so because I have had an apathy to silk and linen for a long time. I have felt that if they used the same care in the use of catgut as they used with silk, they could get very nearly the same results. It requires a more careful operation to use silk, much more so than to use catgut.

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**Bernard's Rural Laboratory**—Bernard's chief relaxation every year was a holiday which he took during August and September at his birthplace at Saint-Julien. Even here he did not entirely abandon his scientific pursuits. He had installed a makeshift laboratory in a shed and there he was in the habit of spending his mornings. He had a few retorts for simple chemical analyses and the neighboring swamp of Rigodiere provided him with frogs. Sometimes he would collect these "Jobs of the physiologist," as he called them, on his afternoon walks and bring them home in his pockets. The farmyard also furnished him with material for observation. He was at one time much interested in the career of a hen which dutifully mounted the nest and went through the motions of laying an egg with great regularity. When she left, cackling, it was found either that there was no egg or an egg without a yolk. In reporting the case history of this bird to Dr Davaine, his personal physician, Bernard said that the hen finally languished and died and when he performed an autopsy he found that there was obliteration of the upper extremity of the oviduct and the ventral cavity was filled with yolks which had escaped from the ovary. Dr Davaine, who was writing a memoir on anomalies in eggs, passed on this communication from his friend and patient to the *Societe de biologie* in 1860—Olmsted, J. M. D. Claude Bernard Physiologist New York, Harper & Bros., 1938.

# SURGICAL ASPECTS OF HYPOGLYCEMIA ASSOCIATED WITH DAMAGE TO THE LIVER

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AND

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One of the many important functions of the liver is concerned with carbohydrate metabolism. It is fairly well established that the liver makes and stores glycogen and liberates it to the blood stream as dextrose, through which mechanism the normal glycemic level is maintained. It has been shown that gross interference with the liver, such as surgical extirpation, massive destruction by poisoning or replacement of large amounts of liver tissue by tumor, greatly disturbs this function.

The experiments of Mann<sup>1</sup> on extirpation of the liver established the fact that this organ is absolutely essential to the maintenance of a normal blood sugar level. Several hours after total hepatectomy his animals had a definite train of symptoms on the basis of demonstrated hypoglycemia. Invariably the animals were temporarily restored to normal by intravenous injection of dextrose.

Recognition of the clinical state of hypoglycemia followed the introduction of insulin into diabetic therapy. Attacks of collapse and even coma were occasionally noted subsequent to the injection of insulin and were found to be associated with abnormally low blood sugar values.<sup>2</sup> Administration of dextrose restored the blood sugar levels to normal and promptly relieved the attacks. Familiarity with this condition soon led to the observation that similar states sometimes occurred without the stimulus of insulin injection. Harris<sup>3</sup> in 1924 first speculated on spontaneous hypoglycemia and offered the obvious hypothesis that the condition resulted from the overproduction of insulin within the body.

Normally the fasting blood sugar level ranges between 60 and 110 mg per hundred cubic centimeters. Values below 60 mg are usually considered abnormal and may be accompanied by symptoms.

The clinical manifestations of hypoglycemia are variegated and sometimes present bizarre pictures. Harris<sup>4</sup> has stressed the wide variations in the signs and symptoms of hypoglycemia. The milder attacks cause chiefly subjective manifestations, including sensations of extreme hunger, irritability and nervousness, fatigue, weakness, apprehension and blurring of vision. Trembling, profuse perspiration, pallor, tachycardia and palpitation may accompany these. In more severe attacks the reactions may simulate petit mal epileptiform seizures or the victim may appear to be intoxicated. Sometimes severe abdominal pain is noted. Loss of consciousness characterizes the most severe attacks, and the coma may be accompanied by convulsions. Sometimes objective neurologic disturbances are present. When consciousness is lost, the blood sugar value as a rule is below 40 mg per hundred cubic centimeters.

Undoubtedly hyperinsulinism does occur, but it is exceedingly difficult of proof, since there is no satisfactory method of determining insulin in the blood. Wilder and his associates,<sup>5</sup> in their carefully studied case of metastasizing carcinoma of the islet cells of the pancreas, first reported apparently proved hyperinsulinism. Biologic assay of the tumor and its metastases revealed the presence of insulin, and the histologic study of the tumor cells revealed the characteristics of islet cells. Since then, in a number of other cases pancreatic tumor has been found associated with attacks of hypoglycemia.<sup>6</sup> The tumor has for the most part been a small discrete adenoma, classified generally as carcinoma.

Disturbances of other endocrine organs have been shown to be responsible for hypoglycemic attacks. Anderson<sup>7</sup> has reported a case in which adrenal tumor (carcinoma) was associated with a pronounced hypoglycemic tendency. Pluriglandular endocrine disorders are sometimes associated with hypoglycemia, among other manifestations.<sup>8</sup> Cushing<sup>9</sup> as early as 1912 noted that pituitary disturbance may be accompanied by hypoglycemia.

In most discussions of the subject liver disease is considered among the possible etiologic factors, but the tendency has been to belittle the role of the liver in the etiology of spontaneous hypoglycemia. Undoubtedly this is partly due to the demonstration by Mann<sup>1</sup> of the tremendous reserve powers of the liver. It seems to have been the general feeling that any liver disease capable of causing hypoglycemic reactions must perforce be so extensive and destructive as to be perfectly obvious by its other manifestations and probably fatal.

Diffuse parenchymal damage of the liver has been found to cause hypoglycemia. Minot and Cutler,<sup>10</sup> studying carbon tetrachloride poisoning, found that among the striking results of massive damage to the liver was marked hypoglycemia. Cases of acute yellow atrophy associated with pronounced hypoglycemia appear in the literature.<sup>11</sup> Cross and Blackford<sup>12</sup> reported a case in which spontaneous hypoglycemia followed injury of the liver by arsphenamine. This case has become a classic reference in discussions of

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Because of lack of space this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints.

Read before the Section on Surgery, General and Abdominal at the Annual Session of the American Medical Association, San Francisco, June 17, 1938.

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the possible etiologic role of the liver in spontaneous hypoglycemia. Fatty degeneration of the liver associated with hypoglycemia in children has been discussed by Josephs<sup>13</sup>.

Nadler and Wolfer<sup>14</sup> reported a case of spontaneous hypoglycemia in which from 70 to 80 per cent of the liver was replaced by primary hepatic carcinoma. Despite careful antemortem studies and, later, post-mortem examinations no other cause than hepatic insufficiency could be found for the hypoglycemia. A similar case was subsequently observed by Crawford.<sup>15</sup>

In a publication by Collier and Troost<sup>16</sup> appearing in 1929, it was pointed out that disturbance of carbohydrate metabolism is present in various types of liver disease and can be demonstrated by as simple a procedure as the dextrose tolerance test. Observations were made on dogs partially dehepatized by repeated removal of large blocks of liver tissue and on a large number of patients suffering from various recognized diseases of the liver (cirrhosis, chronic biliary infections, arsenical hepatitis, syphilitic hepatitis and extensive carcinomatosis of the liver).

The conclusion was drawn that with marked injury to the liver the dextrose tolerance curve shows a fasting blood sugar level which is normal or low and that a hyperglycemia follows the ingestion of dextrose which is similar to that seen with diabetes mellitus. A most significant point was made at that time namely, that when a glycosuric patient is found to have a low fasting blood sugar level the disturbance in the carbohydrate mechanism is most likely to be on the basis of hepatic disease and the condition is not true diabetes. More recently, studies by Newburgh and Conn<sup>17</sup> on the association of diabetes and obesity have produced evidence to show that often a "diabetic" picture occurs on the basis of disturbed glycogen storage in the liver rather than as a result of pancreatic dysfunction.

There have been many discussions of the functions of the liver and of liver function tests.<sup>18</sup> It has been pointed out that the functions of the liver are multiple and that one or more may be disturbed while the others are carried on in normal fashion. The correlation with anatomic damage is not always obvious. The galactose tolerance test has become the standard procedure for measuring carbohydrate function. The dextrose tolerance test has been little used as a liver function test, generally being dismissed with the statement that it is influenced by too many extrahepatic factors to be of great value. Recently a comparison of various liver function tests carried out on the same patients was made by Curtis<sup>19</sup> and his co-workers. They found the dextrose tolerance test far more valuable as a measure of liver function than the galactose tolerance test, the former being positive in 90 per cent of cases of hepatitis and the latter in only 30 per cent.<sup>20</sup> Furthermore,

they defined what they considered a fairly characteristic response associated with liver disease. If the dextrose tolerance curve begins with a normal or low fasting blood sugar level, rises during the first and second hours to levels higher than normal and, finally, falls to hypoglycemic levels during the third, fourth or fifth hour, it is probably indicative of dysfunction of the liver. This type of response was shown by Collier and Troost<sup>16</sup> in their experiments on dogs following the resection of liver tissue at successive operations. These curves were based on observations for only three hours. If the tests had been carried to the five hour period, it is probable that hypoglycemic levels would have been reached. Clinical studies presented in the same article substantiated the experimental observation.

There is no doubt that severe disease of the gallbladder and bile ducts produces anatomic changes in the hepatic parenchyma. This is particularly true if biliary obstruction and infection occur together. Graham's<sup>21</sup> studies of biopsies of the liver demonstrated that inflammatory changes in the liver are a constant accompaniment of gallbladder disease. His work has been challenged but not disproved.<sup>22</sup> It has been supported by studies on experimental cholecystitis<sup>23</sup> and by a review of autopsy material by Mentzer.<sup>24</sup> Certainly there can be little doubt in the minds of those who have operated in many cases of long-standing cholelithiasis and cholecystitis that the gross and microscopic structure of the liver is often definitely altered by the disease.

It is our contention that liver function is also disturbed by disease of the gallbladder and biliary tract and that in certain cases disturbance of carbohydrate metabolism is marked, occasionally even to the extent of causing hypoglycemia. Studies of liver function in cases of gallbladder disease are not abundant. Graham<sup>21</sup> has used a dye test to measure the liver function of patients who are to have operations on the gallbladder and biliary tract and has frequently found evidence of impaired function. There have appeared in the literature a number of reports of diabetes mellitus associated with gallbladder disease which has been cured or improved by surgical correction of the disease of the biliary tract.<sup>25</sup> Rabinowitch<sup>26</sup> has employed the dextrose tolerance test in studying a large number of patients with gallbladder disease, and most of these showed abnormal hyperglycemic curves. It has usually been the assumption that such disturbances of carbohydrate metabolism are due to injury of the pancreas. We believe that this is not necessarily true and submit the opinion that such conditions are not true diabetes but rather disturbances of glycogen storage and release by the affected liver. Studies by Newburgh and his co-workers<sup>17</sup> have been made in several cases of gall-

13 Josephs, Hugh. Spontaneous Hypoglycemia in Childhood. *Am J Dis Child* 38: 346-357 (Oct.) 1929.

14 Nadler, W. H. and Wolfer, J. A. Hepatogenic Hypoglycemia Associated with Primary Liver Cell Carcinoma. *Arch Int Med* 44: 700-711 (Nov.) 1929.

15 Crawford, W. H. Hypoglycemia in a Case of Primary Carcinoma of the Liver. *Am J M Sc* 181: 496-502 (April) 1931.

16 Collier, F. A. and Troost, F. L. Glucose Tolerance and Hepatic Damage. *Ann Surg* 90: 781-793 (Oct.) 1929.

17 Newburgh, L. H. and Conn, J. W. A New Conception of Diabetes Mellitus to be published.

18 Soffer, L. J. Present Day Status of Liver Function Tests. *Medicine* 14: 185-225 (May) 1935. Ravdin, I. S. Some Observations on Normal and Pathologic Liver Function. *Am J Surg* 40: 171-178 (April) 1938.

19 Curtis, A. C. Personal communication to the author.

20 The dextrose tolerance test should be performed after a preparation diet containing 300 Gm of carbohydrate, 80 Gm of protein and enough fat to meet the normal energy requirement has been administered for at least three days. The subject is then given 175 Gm of dextrose per kilogram of body weight after an overnight fast. Specimens of blood should be collected for five hours after the administration of dextrose.

21 Graham, E. A. Hepatitis, a Constant Accompaniment of Cholecystitis. *Surg Gynec & Obst* 26: 521-537 (May) 1918.

22 Colp, Ralph, Doubilet, Henry and Gerber, I. E. The Relation of Cholecystitis to Pathologic Changes in the Liver. *Ann Surg* 102: 202-217 (Aug.) 1935.

23 Tomita, Tosuki. Experimentelle Beiträge zur Leberfunktion bei der Cholecystitis. *Arch f klin Chir* 188: 359-367 1937.

24 Mentzer, S. H. A Clinical and Pathological Study of Cholecystitis and Cholelithiasis. *Surg Gynec & Obst* 42: 782-793 (June) 1926.

25 Graham, E. A. Estimating Risk of Operations on Biliary Tract by Testing Function of Liver. *Radiology* 21: 191-194 (Aug.) 1933.

26 Licht, J. A. and Woods, J. O. The Significance of Glycosuria in Gallbladder and Duct Disease. *Am J M Sc* 167: 110 (Jan.) 1924.

Rathery, F. and Froment, P. Diabète et lithiase biliaire associée. *amelioration du diabète après la cholecystectomie*. *Bull et mem Soc med d hop de Paris* 53: 993-1001 (July 12) 1937.

27 Rabinowitch, I. M. and Bazin, S. T. Application and Interpretation of Blood Sugar Time Curves in the Diagnosis and Treatment of Surgical Infections of the Gallbladder and Biliary Passages. *Ann Surg* 94: 354-362 (Sept.) 1931.

28 Conn, J. W., Newburgh, L. H., Johnston, M. W. and Sheldon, J. M. Study of the Deranged Carbohydrate Metabolism in Chronic Infectious Hepatitis. *Arch Int Med* 62: 765 (Nov.) 1938.

bladder disease by respiration chamber methods and support this contention, showing that the carbohydrate is normally oxidized, as it would not be if the secretion of insulin were disturbed. Recently Curtis and his co-workers have performed liver function studies on patients with gallbladder disease and have shown disturbed function in a high percentage by employing eight different tests. Particularly interesting to us is the fact that for a high percentage of patients with gallstones and chronic inflammatory gallbladder disease the dextrose tolerance test was abnormal. Several of their patients suffered hypoglycemic attacks during the tests.

Discussions of hypoglycemia as a surgical condition have all been concerned with operative procedures on the pancreas. Insulin-producing tumors of the pancreas and hyperfunction of a normal-appearing pancreas have been thought amenable to attack. Considering the complex mechanism involved in carbohydrate metabolism, it seems unwise to assume hyperinsulinism as the cause of hypoglycemia when pancreatic tumors are not present. When tumors of the pancreas are present, they should be removed.

In considering the surgical treatment of hypoglycemia, it should be borne in mind that the liver is an essential organ in the carbohydrate mechanism. Diseases of the biliary tract cause changes in the structure and function of the liver. Despite the reserve powers the organ is known to possess, clinical disturbances of carbohydrate metabolism do occur, with damage compatible with life. In the past it has been considered that infection in the biliary tract involved the pancreas secondarily, thus influencing carbohydrate metabolism, in spite of the fact that examinations of the pancreas have never substantiated the alleged frequency of these changes. The following cases are presented to illustrate hypoglycemic states resulting from damage to the liver secondary to cholecystitis and cholelithiasis.

#### REPORT OF CASES

CASE 1—W. F., a white man aged 47, was admitted to the hospital May 2, 1935, complaining of spells of unconsciousness. He had been well until two years before admission. The attacks occurred at irregular intervals but averaged once a month. They usually came on early in the morning, while the patient was still in bed, and lasted from twelve to twenty-four hours. Although he had no recollection of what occurred at these times, he was not always comatose but showed instead great mental confusion and agitation. Frequently he vomited during attacks. Otherwise there were no gastrointestinal symptoms.

Examination at the time of the first admission revealed that the patient was undernourished but well developed. The heart and lungs were normal and the blood pressure was 130/85. There was a well healed epigastric scar on the right side but no other abdominal abnormality. Neurologic examination gave negative results. The results of lumbar puncture were normal, tests of the spinal fluid and a Kahn test of the blood were negative. Roentgenograms of the skull were normal.

The patient remained in the hospital nineteen days, receiving small doses of phenobarbital and suffering no attacks. He was discharged with the unsatisfactory diagnosis of periodic coma.

He returned to the hospital in January 1936. A letter from his physician stated that he had continued to have the attacks on an average of two to three times a month. His physician suspected an intracranial neoplasm since several times the attacks had been abruptly terminated by intravenous injections of 50 per cent dextrose.

Because of the history of recovery of consciousness following the administration of dextrose, hypoglycemic reactions were suspected and a dextrose tolerance test was performed Jan. 9, 1936, with the following results: fasting blood sugar level 61 mg per hundred cubic centimeters, one hour 226 mg, two

hour 234 mg and three hour 103 mg. A second test, performed January 20, gave identical results save that the fasting blood sugar value was 53 mg per hundred cubic centimeters.

On the morning of January 24 he was unresponsive and drowsy when the nurse attempted to rouse him. Specimens of spinal fluid and blood obtained simultaneously were reported to contain 14 and 18 mg of sugar, respectively, per hundred cubic centimeters. Forty cc of 50 per cent dextrose was administered intravenously, and halfway through the injection the patient's apathy and confusion disappeared and he appeared normal and alert. On two succeeding days similar reactions occurred during one of which the blood sugar level was 17 mg.

These studies appeared to establish the spells of unconsciousness as hypoglycemic reactions, but the dextrose tolerance curve had been of the diabetoid type except for the low fasting blood sugar value. Hepatic insufficiency was suspected, and the patient was subjected to thorough metabolic studies by Drs. Conn and Newburgh, including periods in the respiration chamber. In the respiration chamber he oxidized dextrose normally, and therefore he could not have diabetes mellitus. Fasting blood sugar levels were repeatedly low, but most interesting was a five hour dextrose tolerance test performed on January 27, after the patient had been maintained several days on a 1,000 calorie diet containing 50 Gm of available dextrose. The results were as

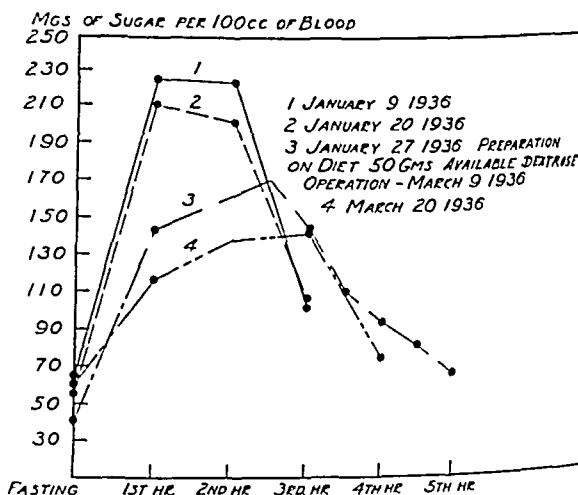


Chart 1—Graphic representation of the dextrose tolerance tests in case 1. The fasting levels are low and the earlier curves show marked initial hyperglycemia.

follows: fasting blood sugar level 40 mg per hundred cubic centimeters, one hour 145 mg, two hour 214 mg, two and one-half hour 168 mg, three hour 142 mg, three and one-half hour 111 mg, four hour 93 mg, four and one-half hour 82 mg and five hour 65 mg. Significant features were the low fasting level and the retardation of the return of the curve to normal.

Studies of the liver function showed evidence of severe damage to the liver. The blood bilirubin content was 2 mg per thousand cubic centimeters (indirect), and there was a brom sulphalein retention of 90 per cent and 70 per cent, respectively, on two occasions. Blood smears revealed macrocytosis. The serum protein levels were low. Cholecystograms showed slight filling of the gallbladder but were indeterminate for the presence of stones.

At length it was decided that operation was indicated because of the possibility of an islet cell tumor of the pancreas, though it was realized that the apparent severe liver disease might be responsible for the hypoglycemic tendency. Laparotomy was performed March 9. The pancreas was first explored through the gastrosplenic omentum and seemed normal in all portions. Further exploration revealed the liver to be moderately enlarged with the granular appearance of early cirrhosis. The gallbladder wall was greatly thickened, and its lumen contained frank pus and several very large calculi. The viscous was removed and a biopsy specimen of the liver taken.

Microscopic examination by Dr. C. V. Weller showed "active chronic purulent cholecystitis" and "biliary cirrhosis." The

specimen from the liver showed active chronic cholangiolitis, fatty infiltration and cloudy swelling

Immediately after operation the patient was given generous amounts of dextrose intravenously. He had no hypoglycemic crises. For several days he had a stormy time, because of hiccupping and a minimal pulmonary infection. A mild infection of the wound cleared up well, and he was allowed up on the twenty-fourth postoperative day. Dextrose tolerance curves made postoperatively are shown in the accompanying charts. After operation the patient was almost entirely relieved of his previous symptoms. Fasting blood sugar values even within the first two weeks were higher than they had been before operation. During the first few weeks after he became ambulatory, he occasionally had a few moments of mild confusion which might have been due to hypoglycemia. One and a half months after operation he had a typical hypoglycemic attack one morning when his breakfast was delayed, and he was promptly restored to normal by dextrose given intravenously. Numerous tests of the liver function and dextrose tolerance were made during the five month period the patient remained in the hospital for observation. At the end of this time the fasting blood sugar level, dye excretion, serum protein content and red cell volume were within normal limits. He returned at monthly intervals until his death April 1, 1937, reported at autopsy as due to coronary artery disease. In January 1937 there was only 10 per cent retention of bromsulphalein and the red blood cells appeared normal. On a low carbohydrate diet he was unable to maintain an adequate blood sugar level, showing signs of hypoglycemia after three days on a diet containing 50 Gm of available dextrose daily. On Feb. 12, 1937, with a normal diet, the fasting blood sugar level was 80 mg per hundred cubic centimeters. The improvement was gradual but definite, and after the first month and a half after operation there were no further attacks of hypoglycemia, except when the patient was on a greatly restricted carbohydrate diet (chart 1).

CASE 2—V R, a white married woman aged 49, came to the hospital Oct. 18, 1935, complaining of weakness in the left leg, roaring in the ears and constant hunger. During the previous five years glycosuria had been detected on several occasions. She had received rather irregular treatment for diabetes in a diabetic clinic, sometimes being on a low caloric reduction diet and at other times receiving small amounts of insulin. She had lost about 60 pounds (27 Kg) in weight over the five year period. Aside from hunger sensations, most intense just before meals, there were no gastrointestinal complaints.

Examination revealed that the patient was well developed, somewhat obese and in good general condition. There were bilateral nerve deafness and unexplained peroneal palsy on the left side. A small thyroid adenoma was present in the isthmus. The chest was clear, and the heart was not remarkable. The blood pressure was 110/84. The abdomen was flat, and there was no tenderness. The liver could not be felt.

The Kahn reaction of the blood was negative, the urine was normal and there was no glycosuria. The basal metabolic rate was plus 14. A dextrose tolerance test performed Oct. 21, 1935, showed a fasting blood sugar level of 72 mg per hundred cubic centimeters, a one hour value of 224 mg, a two hour value of 194 mg and a three hour value of 132 mg. X-ray examinations showed a normal gastrointestinal tract. Cholecystograms revealed a single large semiopaque calculus.

A diagnosis of diabetes mellitus was made on the basis of the dextrose tolerance curve, and the patient was placed on a 1,200 calory diet yielding 140 Gm of available dextrose. She did not show glycosuria, and no insulin was used.

During the next year she was seen at monthly intervals and gradually reduced her weight. Occasionally she had mild pain in the right upper quadrant. She was aglycosuric at all times, and the restrictions on her diet were gradually lifted. Toward the end of the year she began having attacks of "jitters," which usually occurred during midmorning or before meals. During these spells she would become agitated, tremble violently, break into profuse perspiration and have a sense of intense hunger. Ingestion of food always brought immediate relief. Nov. 3, 1936, another dextrose tolerance test was performed, hypoglycemic reactions being suspected. The results were as follows:

fasting blood sugar level 86 mg per hundred cubic centimeters, one hour 180 mg, two hour 109 mg, three hour 58 mg, and four hour 56 mg. With this suspicious curve, the patient was placed on a diet containing 1,600 calories and 50 Gm of available dextrose, and daily fasting blood sugar values were determined. Six values ranged between 42 and 84 mg per hundred cubic centimeters and three of the readings were below 60 mg. During the next three months she was hospitalized twice, and extensive metabolic studies were performed. With a general diet the values for blood sugar all ranged between 70 and 80 mg per hundred cubic centimeters. With the diet containing but 50 Gm of available dextrose, fasting blood sugar values were usually below 50 mg. There was a moderate glycemic response to epinephrine, with a rise from 48 to 130 mg per hundred cubic centimeters after two hours. On a few occasions the patient had typical attacks of "jitters" when on a restricted diet. Other studies of the blood chemistry revealed normal blood protein values on several occasions. The blood bilirubin value ranged between 1.5 and 3 mg per hundred cubic centimeters (indirect).

At length it was decided to operate, the opinion being that the disturbed carbohydrate metabolism was on the basis of hepatic dysfunction. March 3, 1937, cholecystectomy and biopsy of the liver were performed. The liver was definitely enlarged,

MGS OF SUGAR PER 100 CC OF BLOOD

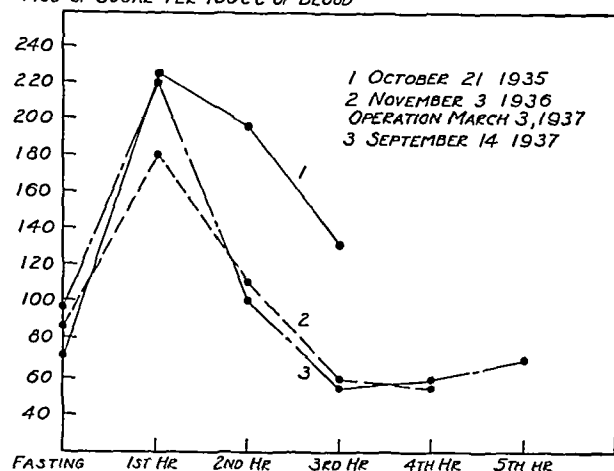


Chart 2—Graphic representation of the dextrose tolerance tests in case 2. The retardation of the return to normal levels was greatly diminished after operation.

the edges were rounded and the surface was finely granular. The gallbladder wall was moderately thickened, and the fundus was bound to the duodenum by adhesions. The lumen of the gallbladder contained one large stone. The specimen for biopsy of the liver was taken from the edge of the right lobe medial to the gallbladder. The pancreas was explored, seemed entirely normal and contained no visible or palpable tumors.

The gallbladder showed slight chronic cholecystitis with some cholesterosis of the mucosal folds. A solitary concretion measured 7 by 3 cm. The liver showed slight chronic interlobular hepatitis with lymphocyte infiltrations in the islands of Glisson. Fat stains showed an irregular distribution of fats, most marked storage being in the lobules which also showed the most marked inflammation.

She left the hospital without dietary restrictions. She has been seen several times since then for check-up examinations. In May 1937 she complained of being nervous and dizzy and very hungry at night. By September she had gained in weight from 140 to 176 pounds (63 to 80 Kg). During the interim she had noted extreme hunger many days at about 11 a.m. There had been no polydipsia or polyuria. After four days of a general diet a dextrose tolerance test was given with the following results: fasting blood sugar level 96 mg per hundred cubic centimeters, one hour 222 mg, two hour 100 mg, three hour 55 mg, four hour 61 mg, and five hour 71 mg. After five days of a diet containing only 50 Gm of available dextrose the fasting blood sugar level was but 30 mg



per hundred cubic centimeters. The patient was discharged again on a general diet. She has moved her home to another state since that time, and efforts to have her return for reexamination have been unavailing.

CASE 3—W B, a white man aged 25, came to the hospital March 23, 1938, complaining of a cutaneous eruption and "spells of nervousness." He had been in good health until the winter of 1932, when he had severe acne of the face and neck and almost simultaneously began to have "spells," during which he would feel dizzy and apprehensive, sweat excessively and have severe tremor of the hands. These spells would last from ten minutes to half an hour, and he would become very hungry. He discovered that if he could eat during the attacks his symptoms would cease, and he regularly obtained relief with food. The attacks occurred on an average of once a week during the five and one-half years and usually came on at night between 9 and 1 o'clock, three hours or more after his evening meal. During the period before admission to the hospital he also had four attacks with loss of consciousness, these taking place in 1932, 1934, 1935 and 1936.

Examination showed that the patient was well developed and well nourished and in apparently good general condition. There was severe acne cysticum of the face, neck and shoulders with

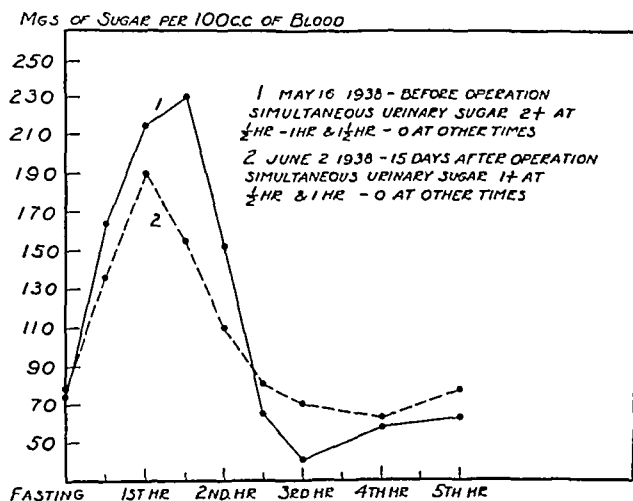


Chart 3—Graphic representation of the dextrose tolerance tests in case 3. After operation the curve very nearly approached the hypothetical normal and the initial hyperglycemia was of short duration.

many old scars. The heart and lungs were normal. The blood pressure was 136/88. The abdomen was flat, symmetrical and muscular, and there were no masses or spasm and no areas of tenderness. The extremities and genitalia were normal, and the neurologic examination gave entirely negative results.

Laboratory studies included examinations of the blood and urine, which proved to be normal. The Kahn reaction of the blood was negative, studies of the liver function gave normal results except for the dextrose tolerance curves. Bromsulphalein tests on April 7 and May 12 showed 12 per cent and 15 per cent retention of dye, respectively. On two occasions the values for serum protein were normal and the blood bilirubin content was 1 mg per thousand cubic centimeters (indirect). Morphologic studies of the blood showed no suggestion of macrocytosis. A galactose tolerance test performed May 14 showed no spill of sugar.

From the patient's history hypoglycemic crises were suspected, and he was admitted for study and observation. A dextrose tolerance test was done April 9, with the following results: fasting blood sugar level 67 mg per hundred cubic centimeters, one hour 250 mg, one and one-half hour 278 mg, two hour 188 mg, two and one-half hour 122 mg, three hour 53 mg and three and one-half hour 38 mg. At the time the three and one-half hour specimen was being drawn the patient lost consciousness and had a generalized tonic and clonic convulsion. He was promptly revived with 10 cc of 50 per cent dextrose given intravenously.

Four days later another dextrose tolerance test was performed. Two hours and thirty-five minutes after the test was started he again became unconscious and had a convulsion. The value for blood sugar five minutes before had been 41 mg per hundred cubic centimeters.

In the meantime the patient received treatment for his acne which showed some improvement. April 18 cholecystograms showed faint visualization of the gallbladder and a single non opaque calculus. After preparation with a diet containing 300 Gm of carbohydrate for three days, another dextrose tolerance test was done on May 15 (chart 3), with the following results: fasting blood sugar level 84 mg per hundred cubic centimeters, one half hour 162 mg, one hour 214 mg, one and one half hour 230 mg, two hour 152 mg, two and one half hour 65 mg, three hour 41 mg, four hour 58 mg and five hour 63 mg.

It was decided that laparotomy and cholecystectomy should be performed, and operation was done May 18. The pancreas was carefully explored through the gastrocolic omentum and appeared normal in all respects. No tumor could be found. The gallbladder wall was thickened, and the gallbladder was removed. The liver did not appear grossly abnormal but a specimen was taken for biopsy.

Examination of the tissue was made by Dr. L. F. Catron. There was a rounded cholesterol calculus 1.5 cm in diameter. The gallbladder wall showed slight active chronic cholecystitis with lymphocyte infiltration beneath the mucosa. The specimen from the liver showed many highly vacuolated cells, probably glycogen vacuoles, and small lymphoid cell infiltrations in the portal tracts.

The patient's postoperative course has been entirely satisfactory to date. He began eating well from the general house diet on the fifth postoperative day. On the tenth postoperative day he was placed on the diet, containing 300 Gm of carbohydrate, used as a preparation for the dextrose tolerance test and on the fifteenth postoperative day, a dextrose tolerance test was performed, with the following results: fasting blood sugar level 75 mg per hundred cubic centimeters, one half hour 136 mg, one hour 186 mg, one and one half hour 153 mg, two hour 107 mg, two and one half hour 78 mg, three hour 70 mg, four hour 62 mg and five hour 74 mg.

#### COMMENT

These cases are examples of severe and moderately severe hypoglycemia. The patients presented chronic cholecystic disease associated with cholelithiasis, the first had severe involvement and the others milder involvement. Biopsy revealed accompanying inflammatory changes in the liver parenchyma in each case. Dextrose tolerance tests were performed in each instance before and after operation. Dextrose tolerance curves made before operation showed variations from normal which indicated damage to the liver as judged by the criteria of Collier and Troost. Studies after operation showed a return toward normal. In none of the cases was there any abnormality of the pancreas which could be determined at operation. In the first two cases, studies with the respiration chamber were carried out before operation, as reported elsewhere by Conn and Newburgh,<sup>28</sup> showing that carbohydrate was oxidized normally and thus disproving the possibility of oversecretion of insulin. All three patients had symptoms caused by hypoglycemia which were modified by removal of the gallbladder.

It is of course too early to assume permanent improvement in the third case, but the patient presented a typical history of hypoglycemic attacks and surgical exploration revealed a normal pancreas.

The modification of the hypoglycemic tendency by operation in these cases was not as dramatic as that seen when pancreatic adenomas are removed. Instead of a sudden return to normal, after cholecystectomy

there was a gradual improvement. In analyzing the curves of the dextrose tolerance tests, one sees that the most definite change after operation was the diminished tendency to prolonged hyperglycemia following the ingestion of dextrose. In other words, the retardation of the return of the curve to normal levels was lessened. In the later stages of the tests the tendency to hypoglycemia persisted.

Regardless of the exact physiologic and biochemical processes, these cases are interesting since they illustrate a cause of hypoglycemia quite definitely not due to oversecretion of insulin. They illustrate another of the possible complications of chronic disease of the gallbladder and bile ducts and demonstrate that carbohydrate metabolism may be seriously disturbed by the accompanying hepatitis and cholangiolitis. The fact that such disturbances may occur is another reason for urging early operation on the diseased gallbladder, especially since the return of carbohydrate metabolism to normal may be slow and perhaps never complete.

Also we believe that these cases are important since they call to mind a cause of spontaneous hypoglycemic states as yet unconsidered. The liver disease was definite but not as destructive as has been present in previously reported cases of hepatic hypoglycemia. We believe that chronic cholecystitis and cholelithiasis with the accompanying changes in the liver must be added to the causes of extrapancreatic hypoglycemia.

#### SUMMARY

Hypoglycemia is a definite clinical state which in its more severe degrees has usually been assigned to hyperinsulinism.

The liver plays an important part in carbohydrate metabolism, and there is indubitable evidence that severe damage to the liver may cause hypoglycemia.

Gallbladder disease is associated with definite structural changes in the liver, and there may be accompanying changes in the liver function especially in the role of carbohydrate metabolism.

Dextrose tolerance curves in three cases of hypoglycemia with characteristic symptoms due to liver damage from gallbladder disease presented definite abnormalities before operation and a return toward normal after operation.

Possible profound and long-enduring disturbances of the carbohydrate metabolism may result from long-standing gallbladder disease, and this is an additional reason for early operation on the abnormal gallbladder.

We feel that the dextrose tolerance curve has a definite value in determining the carbohydrate function of the liver.

#### ABSTRACT OF DISCUSSION

DR EMILE F. HOLMAN, San Francisco. The authors are to be commended for presenting evidence of the altered functioning of the liver in the presence of a diseased gallbladder. Their observations make mandatory more careful preoperative preparation of any candidate for operation on the gallbladder in whom damage to the liver is probably present. An important precaution is the necessity of counteracting the immediate preoperative deprivation of food and water by mouth that is part of the routine preparation for a general anesthetic in any major surgical procedure. Elective abdominal operations are usually performed after a fasting period of from fifteen to eighteen hours. We have in our clinic for some years stressed the necessity of administering 1,000 cc. of 10 per cent dextrose solution intravenously in the two hours before the operation. There is no question, in the minds both of the anesthetist and of the surgeon, that patients so prepared withstand the ordinary

operation much more effectively and, when necessity arises, more prolonged procedures are possible. As to the mechanism whereby the removal of a gallbladder containing one stone and exhibiting normal function by cholecystogram can affect the carbohydrate metabolism of an organ like the liver, which shows such tremendous reserve in its function of regulating carbohydrate metabolism, I am not clear. Perhaps better regulation of food intake after operation accounts for this improvement. I expect further observations by Drs. Collier and Jackson to bring new light on the intricate subject of carbohydrate metabolism.

DR FRANK N. ALLAN, Boston. Since the syndrome of spontaneous hypoglycemia was first recognized it has offered difficulties in regard to both diagnosis and treatment. The diagnosis would seem simple, but there is more to be considered than just blood sugar tests. The situation is complicated by the fact that there is considerable variation in the normal range of the blood sugar level. One can never positively attribute symptoms to hypoglycemia unless one has actually demonstrated that the blood sugar is low at the exact time the symptoms are present and that elevation of the blood sugar results in disappearance of the symptoms. If one has an opportunity to study the case only in the interval between symptoms a sugar tolerance test may give helpful information, but care is needed in the interpretation of the blood sugar curve. The administration of dextrose may provoke, after the initial rise, a terminal fall in blood sugar to 60 or 50 or even less in many normal persons. The diagnosis of hypoglycemia and hyperinsulinism is often wrongly made on this observation alone, because of failure to recognize it as simply an exaggeration of a normal physiologic response. The cases described by the authors undoubtedly presented pathologic hypoglycemia, but the cause of the hypoglycemia in such cases cannot be determined by any simple means. The experience of Drs. Collier and Jackson has led them to believe that a sugar tolerance test resulting in a blood sugar curve with a high peak may indicate hepatic origin, yet this rule cannot be followed invariably. I have seen this type of response in cases in which hypoglycemia was due to hyperinsulinism with islet tumor. This was true early in the course of the first case of islet tumor which I had the opportunity to study and report in collaboration with Wilder, Power and Robertson more than ten years ago. Dietary regulation will overcome mild hypoglycemic symptoms which may be considered physiologic, but the severe symptoms, such as loss of consciousness and convulsions, are often refractory to any conservative method of treatment. It is gratifying to learn from the authors that surgery offers another means of relief. My chief, Dr. Frank Lahey, has often emphasized the menace of damage to the liver resulting from biliary infection associated with gallstones, and almost every surgeon holds the same opinion. Yet far too often we medical men maintain a complacent attitude with regard to gallstones. The demonstration by the authors shows further the importance of early diagnosis and early operation for gallstones, before there has been damage to the liver which may result in serious ill effects, including hypoglycemia.

DR T. L. ALTHAUSEN, San Francisco. Several years ago I studied clinically and experimentally the influence of hepatic damage on certain phases of carbohydrate metabolism, and some of these studies have a direct bearing on the paper of Drs. Collier and Jackson. Rabbits were injected daily for periods up to two years with small doses of one of several hepatic toxins (phosphorus, chloroform, manganese chloride). At intervals the tolerance of these animals to dextrose was tested. In the early stages of hepatic injury the animals were found to exhibit better than normal tolerance to dextrose, which I interpreted as an irritation phenomenon. Later the tolerance to dextrose became progressively impaired. However, several rabbits when tested only a few hours before death again showed a very low blood sugar curve following the test. The same was observed also in animals during convalescence from a single large dose of any hepatic toxin. Essentially the same variations of tolerance to dextrose were observed in patients suffering from diseases of the liver making it extremely difficult to interpret the clinical significance of such tests in any given case. I also found that hepatic insufficiency produced in rabbits a consistent and in patients an occasional, lowering of the fasting

blood sugar. On the other hand, abnormal hypoglycemia after administration of insulin and dextrose in both rabbits and human beings with hepatic damage was a constant enough observation to recommend this procedure as a liver function test for clinical use. I agree with the authors of this paper with regard to the advisability of preoperative liver function tests whenever hepatic insufficiency may be suspected from the nature of the disease or from other clinical indications. At the University of California Hospital, through the cooperation of the Departments of Medicine and Surgery, the operative mortality from cholecystectomy has been reduced from 10 to 2 per cent, largely by the preoperative use of liver function tests. In cases in which considerable hepatic insufficiency was discovered, the operation was either not undertaken or was postponed until after a period of preparation with a high carbohydrate diet and other measures.

DR FREDERICK A COLLIER, Ann Arbor, Mich. I want to thank those who have discussed this paper. They have added a great deal to the subject that Dr Jackson and I could not give. I realize that these cases I have presented are not entirely conclusive but I do think that we have evidence that hepatic injury can be produced by disease of the gallbladder and that hypoglycemia may result. It is our hope that this presentation may stimulate others to make further studies in this field. Dr Allan stated the crux of the matter when he said that he felt that disease of the gallbladder in time may cause harm to the liver. I feel that we have drawn up another indictment against the so-called silent stone. I do not think any stone is ever silent. I think that when stones are present in the gallbladder they should be removed. From the point of view of the surgeon we have presented one more bit of evidence that we should all be more radical in our operative attack on patients who have gallstones.

## Clinical Notes, Suggestions and New Instruments

### AGRANULOCYTIC ANGINA

REPORT OF A CASE DUE TO CAUSALIN

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WASHINGTON, D. C.

The Council on Pharmacy and Chemistry of the American Medical Association suggested the probability that the drug "causalin," recommended for the treatment of arthritis, contains aminopyrine.

We feel that this drug was responsible for the production of agranulocytosis in the case presented here.

#### REPORT OF CASE

J. J. E., a white man aged 65, was admitted to the Georgetown University Hospital Dec. 6, 1937, and died the same day. His chief complaint on admission was "sore throat." Two weeks prior to admission he had a "cold" from which he apparently recovered. One week prior to admission he had a chill with fever. He thought that this condition was a recurrence of his previous "cold." Six days prior to admission he first noticed a sore throat, which was treated locally with mercurochrome. Three days before admission ulcerations were found in the pharynx, which was markedly edematous and congested. Gradually but rapidly he became weaker until the day of his admission, when he was very toxic and semicomatose.

Physical examination revealed a markedly injected hyperemic pharynx with ulcerations on the posterior wall of the pharynx. The tonsils were small. The cervical lymph glands were enlarged bilaterally and were very tender. The heart rate was 120 per minute and irregular. The blood pressure was 65 systolic, 50 diastolic, and the temperature was 104 F. The patient was moribund and died soon after examination.

Examination of the blood showed hemoglobin 60 per cent, red blood cells 3,150,000, white blood cells 500. The differential picture showed polymorphonuclear leukocytes 29 per cent, lymphocytes 70 per cent, myelocytes 1 per cent. Urinalysis showed specific gravity 1.022, albumin 4+, sugar 3+, hyaline casts +, red blood cells +, leukocytes +.

A history obtained from the family revealed that the patient had been taking causalin tablets for his arthritis for the past four months. The definite number of tablets taken could not be determined, but it was believed that he had taken well over 100.

### A METHOD FOR THE DARK FIELD EXAMINATION OF PUS FOR SPIROCHAETA PALLIDA

IRON, IRIFUMA, M.D., PHILADELPHIA

The visible contamination of a specimen of serum with cellular elements and debris renders that specimen almost useless for direct dark field examination for *Spirochaeta pallida*. Various techniques have been devised for the preparation of a suggestive lesion in order to obtain a satisfactory specimen for dark field examination,<sup>1</sup> but no method has been previously developed to convert a pus or blood contaminated specimen into one suitable for adequate dark field study. Carley<sup>2</sup> advocates the dark field examination of urethral discharge when there is any suspicion of syphilis but states that this is not possible in all cases. In fact Dr. John H. Stokes<sup>3</sup> in commenting on the detection of syphilis in a urologic clinic stated "A gonorrheal discharge contains so many pus cells that dark field examination is unsatisfactory as from a heavily blood contaminated specimen. The white blood cell does not undergo lysis as easily as does the red but experimentation may possibly develop methods which will remove the white blood cell factor from the field, permitting an examination of a relatively clear urethral discharge." Stimulated by this suggestion I undertook to develop a method for the removal of the blood cell from the pus contaminated specimen.

The literature while it does not describe a definite method, does give pertinent leads which I have followed in the development of the method. Riehl<sup>4</sup> and Schereschewsky<sup>5</sup> in 1919 were the first to use glass capillary pipets, sealed by fusion in a flame, to preserve specimens of serum. Riehl<sup>4</sup> found recognizable spirochetes as long as fourteen days after collection. Zurhelle<sup>6</sup> and Strempel<sup>7</sup> demonstrated that motile organisms may be found in dead tissue debris seven days after collection. Based on this work, Stokes and Ewing<sup>8</sup> in 1926 described an outfit for physicians to collect serum for dark field examination. Mahoney and Bryant<sup>9</sup> used fine straight glass capillary pipets about 8 cm. in length and of a constant bore. Jauson<sup>10</sup> reported that *Spirochaeta pallida* in washings of the vagina can be thrown down and concentrated for dark field examination by centrifugation for from forty five to sixty minutes at 9,000 revolutions per minute, a high speed. Also it is known that the Wassermann blood serologic test makes use of the fact that the cellular elements of the blood can be rapidly thrown down by centrifugation at low speeds. As a result of these hints from the literature, it occurred to me that it might be feasible to centrifuge capillary tubes filled with pus at a low speed and thus obtain a cleared specimen of serum for dark field examination.

A number of fine straight glass capillary tubes about 12 cm. in length and of a constant bore were prepared. Sections of

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The urological and dermatological staffs of the Hospital of the University of Pennsylvania and Dr. W. G. Turnbull and the staff of the Genito-Urinary Dispensary of the Philadelphia General Hospital gave their heartiest cooperation to the author. This work was carried out under the guidance and advice of Dr. Herman Beerman.

1. Stokes, J. H. *Modern Clinical Syphilology*, ed. 2. Philadelphia: W. B. Saunders Company, 1934, p. 96.

2. Carley, P. S. *Infection with Syphilis Masked by Gonorrhea*. Ven. Dis. Inform. 18, 21 (Feb.) 1937.

3. Stokes, J. H. Unpublished discussion of Friedman and Mazer. 4. Riehl, Zur Frühdiagnose der Syphilis. Wien. klin. Wchnschr. 32: 688, 1919.

5. Schereschewsky mentioned by Riehl. 6. Zurhelle, E. and Strempel, R. Studien über Lebensfähigkeit und Virulenzherhaltung der Spir. pall. in totem Gewebe. Arch. f. Dermat. u. Syph. 153: 219, 1927.

7. Stokes, W. R. and Ewing, Leroy. An Outfit for the Collection of Serum by Physicians for the Dark Field Examination in Suspected Syphilis. J. Lab. & Clin. Med. 11: 372 (Jan.) 1926.

8. Mahoney, J. F. and Bryant, K. K. Delayed Dark Field Examination. Ven. Dis. Inform. 11: 103 (March) 1930.

9. Jauson, H. A. mentioned by Simon, Clement and Bralez, J. A. Case of Primary Adenopathy with Presence of Treponemas Without Chancres. Bull. Soc. franç. de dermat. et syph. 41: 111 (Jan.) 1931.

10. Jauson, H. A. mentioned by Simon, Clement and Bralez, J. A. Case of Primary Adenopathy with Presence of Treponemas Without Chancres. Bull. Soc. franç. de dermat. et syph. 41: 111 (Jan.) 1931.

glass tubing 6 mm in outside diameter and 13 cm in length, sealed at one end, were prepared as receptacles for the fine glass capillaries. Undiluted gonorrheal urethral discharge was collected from dispensary patients of the Urologic Outpatient Department of the Hospital of the University of Pennsylvania. A number of the fine tubes were filled by capillarity with this discharge and one end of each tube was sealed by fusing in a small flame. The tubes were then placed in the receptacles and centrifuged in an international electric centrifuge, size 2, at various speeds and for various lengths of time. The lowest speed and the shortest time necessary to throw down all the cellular elements and leave a clear column of serum in the upper portion of the capillary tube proved to be 1,000 revolutions per minute for ten minutes. This speed was easily obtained with a small portable hand centrifuge, which was later substituted for the electric centrifuge.

A syphilitic rabbit testicle emulsion containing *Spirochaeta pallida* demonstrable by direct dark field examination was mixed with gonorrheal urethral discharge so that the spirochetes could not be demonstrated by direct dark field examination of the mixture. Capillary tubes were then filled with this mixture and centrifuged at 1,000 revolutions per minute for ten minutes. The tubes were filed and broken just above the line of separation of the sediment from the clear supernatant serum, which, after expulsion by pressure from a small rubber bulb, was subjected to direct dark field study. This examination readily revealed motile spirochetes.

This method for the dark field examination of pus for *Spirochaeta pallida* was then tested clinically by applying it to a series of forty patients with acute gonorrheal urethritis, all with typical purulent discharges. These patients were from the urologic outpatient department of the Hospital of the University of Pennsylvania and from the Genito Urinary Dispensary of the Philadelphia General Hospital. The capillary tube was applied directly to the pus appearing at the meatus of the penis and allowed to fill by capillarity. It was then sealed, centrifuged and cut as described, and the cleared serum examined for *Spirochaeta pallida*. Each patient was in addition studied for the presence of a syphilitic infection according to the method of Friedman and Mazer.<sup>10</sup> This method includes history, physical examination, serologic study and serologic follow up for three months.

The results of the clinical application of the method for the dark field examination of pus for *Spirochaeta pallida* are as follows:

In thirty-seven cases the urethral discharges were negative for *Spirochaeta pallida*. The history and physical examination were negative for syphilis. Blood serologic studies were negative at the time of the first visit and at the time of follow-up examinations.

In one case the urethral discharge was negative for *Spirochaeta pallida*. The history and physical examination were negative for syphilis. A blood serologic study was negative at the time of the first visit but positive fifty-two days after the onset of the discharge, sixty-two days after exposure.

In two cases the urethral discharges were positive for *Spirochaeta pallida* only after the specimens had been centrifuged. The spirochetes could not be demonstrated by direct dark field examination of the pus. The history was negative for syphilis. Physical examination in both cases revealed a slightly indurated prepuce and moderate circummeatal excoriation of the glans penis. There was a profuse gonorrheal urethral discharge. A blood serologic study in both cases was positive at the time of the first examination.

This method was also applied in the Clinic of Cutaneous Medicine and Syphilology of the Hospital of the University of Pennsylvania to one patient with a penile lesion suggestive of a chancre. This lesion bled freely when an attempt was made to obtain a specimen of serum for dark field study. The bloody serum was collected in the capillary tube and centrifuged. *Spirochaeta pallida* was found in the first field examined. Dark field study of the uncentrifuged serum was also positive but only after long search.

Finally, this method was applied in the Clinic of Cutaneous Medicine to one patient with an irretractile indurated prepuce from under which a thick creamy discharge of pus could be expressed. Dark field examination of the pus was negative for *Spirochaeta pallida*. Pus examined after centrifugation in the capillary tube revealed many spirochetes.

#### SUMMARY AND CONCLUSIONS

1 A method has been developed for the dark field examination of pus for *Spirochaeta pallida*.

2 A limited clinical application of the method demonstrated *Spirochaeta pallida* in two cases of acute gonorrheal urethral discharge, one case of bloody serum from a penile lesion and one case of thick pus from under an irretractile indurated prepuce—this being the only method for establishing the diagnosis, in this case, of a primary infection with *Spirochaeta pallida*.

It did not demonstrate *Spirochaeta pallida* in thirty-seven cases of acute gonorrheal urethral discharge which were syphilologically negative.

It failed to demonstrate *Spirochaeta pallida* in a patient with acute gonorrheal urethritis in whom blood serologic tests were positive for syphilis sixty-two days after the last sexual contact and fifty-two days after the onset of the discharge.

3 This method makes possible the dark field examination for *Spirochaeta pallida* of small amounts of any body fluid, exudate or discharge susceptible of collection in a capillary tube.

4 The method is a simple procedure requiring a minimum of laboratory equipment and can be performed in as short a time as fifteen minutes.

#### ARTIFICIAL CONCENTRATION OF TEST SERUMS IN BLOOD GROUPING

M C TERRY M D KNOXVILLE IOWA

In a recent issue of THE JOURNAL Hoxworth and Mahoney<sup>1</sup> call attention to the importance of using only test serums of high agglutinin titer in the determination of blood groups and report their success in concentrating inferior serums by the lyophile process to a titer considerably higher than that proposed by Coca<sup>2</sup> for a first grade reagent for this purpose.

Occasionally, as has been Hoxworth and Mahoney's good fortune, serums will be found which equal or exceed the requirements for Coca's grade I, but most of them fall below that standard, and methods for raising the titer of low grade serum are, as Hoxworth and Mahoney say, highly desirable.

The method of concentration by alternate freezing and thawing<sup>3</sup> to which Hoxworth and Mahoney refer, was originally employed by O'Meara,<sup>4</sup> a fact not known to me at the time I made the report, due acknowledgment of O'Meara's priority was made in a subsequent issue of the *Proceedings of the Society of Experimental Biology and Medicine*.

I now present a third method of such simplicity that I am quite prepared to learn that here again some one has anticipated me. The method is that of pervaporation devised by Kober<sup>5</sup> in 1917 but apparently pretty much neglected until it was revived by Farber<sup>6</sup> in 1935. I shall give an example from my work.

A type A' serum which fell short of Coca's grade II was put in a cellophane dialysis tube three-eighths inch in diameter and placed in front of a 16 inch electric fan. The height of the column was 16 cm. On making this or the like experiment for the first time one is astonished at the speed with which evaporation goes on, in the example given the 16 cm column went down to 4 cm in two and one-half hours, and the concen-

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1 Hoxworth Paul and Mahoney Earle Artificial Concentration of Test Serums in Blood Grouping J A M A 111 1554 (Oct 22) 1938

2 Coca A F A Slide Method of Titrating Blood Grouping Sera J Lab & Clin Med 16 405 (Jan) 1931

3 Terry M C High Titer Blood Grouping Serum Proc Soc Exper Biol & Med 33 14 (Oct) 1935

4 O'Meara R A Q J Path & Bact. 37 166 (July) 1933

5 Kober P A Pervaporation Perdistillation and Percrystallization J Am Chem Soc 39 944 (May part 1) 1917

6 Farber Lionel Applications of Pervaporation Science 82 158 (Aug 16) 1935

10 Friedman Leon, and Mazer M L The Detection of Syphilis in a Urological Clinic Am J Syph Gonorr & Ven Dis 22 340 (May) 1938

tration of the agglutinin was such that the product exceeded the requirements for Coca's grade I, a 1:4 dilution causing macroscopic clumping in ten seconds, a 1:8 dilution in twenty seconds.

The lyophile apparatus is rather expensive. The cellophane tubing used in this example costs less than 5 cents.

I know from an experiment with anti-sheep hemolysin that serum can be so far evaporated by Kober's method that when dried in the 37 degree incubator it may be ground up in a mortar to a fairly fine powder which, at least in the case of that hemolysin, keeps its specific property and approximate titer for a long time. It would not seem worth while to go so far with serum for routine blood grouping, but agglutinins for the M and N factors might be made more available in this way.

## Special Clinical Article

### A PROGRAM FOR EARLY AGGRESSIVE TREATMENT OF PULMONARY TUBERCULOSIS

CLINICAL LECTURE AT SAN FRANCISCO SESSION

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DENVER

Pulmonary tuberculosis is a chronic systemic disease with a decided tendency to heal. The chronicity, inherent tendency to heal and curability are due to a beneficent auto-immunization. Were this not true the human race would long since have vanished. This chronicity, when the disease is untreated, inadequately treated or unrecognized, is responsible for its continuous contagion and universal distribution, for a reducible economic waste and disability and for a certain irreducible mortality rate.

A program for early aggressive treatment of pulmonary tuberculosis is properly initiated by the diagnosis of the disease in the earliest possible stage. During the period of inception and the early stage more can be accomplished by less therapy than at any time thereafter.

The inception of tuberculosis is subtle, the onset insidious and the early progress stealthy and so devoid of symptoms that the host is taken unawares.

When the disease first becomes clinically manifest it is usually not in the early stage but is well developed, with focal tissue changes more or less advanced.

The earliest general clinical symptoms due to altered physiology are not positive. They are largely inferential. The earliest local signs dependent on pathologic changes are positive. These are differential.

The preclinical and early clinical stages are often overlooked even by expert examiners. Errors in diagnosis are more frequently made by the less expert and those who are not tuberculosis minded. Physicians must become tuberculosis minded and appreciative of their fallibility. The usual methods of examination for early tuberculosis have definite diagnostic limitations.

However experienced, one cannot place complete reliance on one's skill in auscultation and percussion. Additional corroborative methods of examination must be used, the tuberculin test must be used with children and in all suggestive cases fluoroscopic examination

must be done and roentgenograms of the chest made. To be dependable x-ray examinations must be interpreted by experienced physicians or experts in pathologic changes of the lungs as depicted by x-ray examination.

In borderline cases the x-ray examination cannot determine the grade of activity of a tuberculous lesion. It does portray more accurately than any other diagnostic procedure the presence and extent of lesions.

It is obligatory to check the physical signs with those shown by x-ray examination.<sup>1</sup>

The success of the antituberculosis campaign has been brilliant. Much remains to be accomplished before the disease is vanquished. The incidence of and the deaths due to pulmonary tuberculosis have decreased roughly 60 per cent in the last twenty years. The 40 per cent ratio of deaths to the number of cases has not changed materially notwithstanding the tremendous increase in hospitalization and sanatorium care and the advances made in the active treatment of the disease. The causes of this constant death ratio warrant critical analysis. The ratio is a challenge. An aggressive program of case and feeder finding by which the disease can be diagnosed and treated at its very inception, and isolation or control of those who wittingly or unwittingly, are disseminators of the disease, offer a most potent answer to this challenge.

The antituberculosis program in the past has been of necessity largely one of defense against active phases of the disease. One waited until the victims were well seeded with tubercle bacilli or for their lesions to become definite before beginning active treatment.

To wait for the disease to become clinically manifest is to wait too long. Procrastination compounds difficulties, augments the uncertainty of therapy, prolongs disability, increases expense, spreads infection and multiplies mortality.

Prophylaxis is certain, while cure is uncertain when the disease is fully developed and impossible in a fairly fixed percentage of cases. These facts are established by the convincing investigations and mass studies for case finding and tracing all contacts to the source of infection.<sup>2</sup> Though it is not always possible to trace the infection to its source, these surveys reemphasize the fact that every case of pulmonary tuberculosis originates directly or indirectly from some previous case. The reports further prove that early pulmonary tuberculosis, especially in adolescence and early adult life, the periods during which, in the majority of cases, the disease first becomes active, is commonly symptomless and hence frequently undiagnosed.

One must face facts. The antituberculosis campaign of the future to be fully effective must be not only one of defense but also one of offense. An aggressive campaign of case and feeder finding would attack the disease before the tubercle bacilli became seeded, and active therapy would be begun months or years before irreparable damage to the tissues had time to develop. It is easier to prevent than it is to cure destruction of tissue and complications.

1 Sampson H. L. and Brown Lawrason. Correlation of Clinical and Roentgenological Observations in Pulmonary Tuberculosis. *Radiology* 22: 1 (Jan.) 1934.  
2 Drolet G. J. Present Trend of Case Fatality Rates in Tuberculosis. *Am Rev Tuberc* 37: 125 (Feb.) 1938.  
3 Myers J. A. and Wulff Marjorie. Eleven Years Observations on Tuberculosis Among University Students. *Am Rev Tuberc* 26: 550 (Nov.) 1932. Barnard Margaret W. Amberson J. B. Jr. and Loew M. F. Tuberculosis in Adolescents. *Am Rev Tuberc* 23: 593 (Mar) 1931.

The early recognition and treatment of the infected and control of the infectors is logical, economical and practical.<sup>4</sup> Patients with open tuberculosis must be isolated whenever possible. If sanatorium isolation is impossible, then the utmost should be done by a course of sanatorium treatment and instruction to control or render them innocuous. The contacts must be treated before they in turn have active open tuberculosis.

By such a program the incidence and life history of tuberculosis will become known and its methods of spread understood. Both the profession and the public will become sensitized to the importance of competent periodic health examinations, to the necessity of early diagnosis and to the advantages of early treatment. Thus fortified, many of the present problems in treatment and most of the weak points in the fight against tuberculosis will be overcome.

Tuberculosis is recruited from the ranks of those who are in apparent health. It is no respecter of class, creed or color and knows no geographic, political or social boundaries. A competent, efficient antituberculosis program must be one of stern defense and aggressive offense, coextensive with the distribution of the disease.

#### NECESSITY OF EARLY CASE FINDING

A campaign of early case finding, national in scope, and the isolation or control of bacilli breeders and disease disseminators will accomplish more than any other, if not all other, factors in the treatment and eradication of pulmonary tuberculosis.

This is a large and expensive program beyond the authority and means of private enterprise. One can participate in appointing qualified commissions to study and in organizing competent agencies to carry on this important work. Cooperation of the public with the profession is essential to the success of any health program. An enlightened public sentiment will support and later demand public health projects. Success in the control and elimination of one disease reacts favorably and forcefully on campaigns for the control of other diseases. A national health department is indispensable for the coordination of complex public health activities.

Conservation of public health and control of communicable diseases are the province of the federal government and its various subdivisions. They have the authority to make and enforce health regulations.

A national department of public health should promptly take up and vigorously extend nationwide compulsory mass surveys for case and feeder finding. Small groups of investigators within their limited means and scope have proved the importance and value of such surveys on a voluntary basis.<sup>5</sup> The trail has been blazed, the administrative set-up pioneered and the feasibility of the plan assured.

The treatment of the ill is not the jurisdiction of governmental agencies. This has been, is and should continue to be the prerogative of private physicians. The confusing of federal, state and civic obligations with private and professional affairs begets irresponsibility, inefficiency and distrust. This truth is more certain in the realm of therapy than in any other field of endeavor. Regimentation of doctors is possible though highly undesirable. Regimentation of therapy worthy of respect is impossible.

The requisites for an efficient aggressive program for the control and eradication of pulmonary tuberculosis are:

First in point of time and importance, an authoritative mass survey, national in scope, of case and feeder finding.

Second, continuous maintenance by the medical profession of a true appreciation of the character of the disease. It is expedient to consider tuberculosis more serious than the clinical symptoms indicate.

Third, early treatment. The earlier appropriate treatment is begun, the more consistently enforced by the physician and the more conscientiously followed by the patient, the more rapid and certain will resolution ensue.

#### EXPECTANT TREATMENT

The passive or expectant treatment of pulmonary tuberculosis is founded on the time-tried and proved principles of general rest, fresh air and wholesome food. To this honored triad, modern active treatment has added collapse therapy to secure local rest to the diseased lung. The therapeutic result will be proportionate to the degree, duration and timeliness of general plus local rest. This is true not only in the early stages of the disease but also in advanced stages and in cases in which the disease is resistant and demands some form of surgical aid.

Every patient differs in his local and general reaction to infection. The dose and degree of virulence of the infecting organism and the grade of susceptibility, which fluctuate from time to time, determine the clinical symptoms, the character and intensity of the pathologic changes and the course of the disease. The response to therapy likewise varies. The pulmonary lesions are an accurate index of the trend of battle between the tubercle bacilli and the resistance of the patient. The evolution of the local lesions must be as closely followed as is the general progress made by the patient in order to estimate, round by round, his ability to overcome the disease. The course and severity of the clinical symptoms do not constantly parallel the pathologic changes in the tissues. This lag in constitutional reactions is deceptive.

No one can deny the importance and value of expectant treatment in early stages or that in many cases it fails, without additional aid, to control the progress of the disease.

#### COLLAPSE THERAPY

General rest and expectant treatment should be tried for a reasonable time, a period expressed in terms of weeks. As long as favorable progress is made, one should defer active therapeutic measures. When favorable progress is not made or ceases, active measures to secure the added benefits of local rest by some form of collapse therapy are promptly indicated. Collapse therapy is not a substitute for any of the older forms of treatment, it is an invaluable supplement to these when after a reasonable trial they have failed, or in the light of experience are destined to fail, to reestablish a resistance balance against the disease.

The earlier a focus not controlled by expectant treatment is attacked by the appropriate measure for collapse, the more certain, rapid and favorable will be the effect and the fewer the complications.

One must obtain promptly the minimum collapse of the lung that is conducive to healing all the tubercu-

<sup>4</sup> Korns J H. Tuberculosis in Children. *Am Rev Tuberc* 28: 231 (Aug.) 1933.  
<sup>5</sup> Pope A S. Discovery and Prevention of Tuberculosis in the Community. *J A M A* 97: 846 (Sept. 19) 1931.



lous infiltration and cavitation.<sup>6</sup> A more extensive procedure than is needed to control the lesion should be avoided. Unnecessary destruction of tissue and of functioning lung parenchyma will be prevented.

A variety of mechanical procedures have been devised to control different stages of the disease. They all have definite indications and limitations. There is an optimum time for each procedure, which if not taken advantage of leads to more extensive operations.

Every patient who presents indications for more radical procedures of surgical collapse is a living example of failure, a failure of the physician to diagnose early, to appreciate the gravity of the disease and to institute promptly and continue rigidly appropriate conservative measures, a failure of the patient to cooperate or of the disease to respond to the expectant treatment, or a failure of the physician to resort early to less radical measures for collapse therapy. A favorable opportunity lost renders the general condition of the patient more serious and permits the development of complications or extension of the disease to irremediable stages.

Surgeons have learned the necessity of early operations in the treatment of cancer, the advantage of operating during the rising tide of reserve in thyrotoxic states and the diminished hazard in multiple stage operations in the case of properly prepared patients with prostatic disease. These lessons are equally applicable in the surgical treatment of pulmonary tuberculosis. Timely surgical intervention is truly conservative. Late operations are always of greater magnitude and danger and the results are not so satisfactory as those of early operations.

The purpose of collapse therapy is to secure local rest to the diseased lung, to prevent the development of restraining mechanical factors and to eliminate impediments to contraction of the diseased area of the lung. The objective of compression therapy is actively to compress the cavity or the cavity-bearing area of the lung and control resistant interposed lesions which interfere with contraction and healing. The advantages of timely collapse therapy are proved by the splendid results attained with progressive and otherwise hopeless conditions. Delay in the diagnosis of pulmonary tuberculosis has been and is the chief obstacle to the control of pulmonary disease. Delay in instituting graded collapse therapy compromises and may defeat all efforts to cure.

Successful collapse therapy for pulmonary tuberculosis is not merely a matter of technique. Important as this is, of greater importance is the choice of procedure, the time and the degree of collapse needed. There is no procedure yet devised that is universally applicable to the fluctuating phases of the disease. Each procedure must be graded to control the local lesion. This involves an understanding of the patient, who is always a standard surgical risk, a grasp of the mechanics of the thorax and the physiology of respiration, an estimate of the cardiac reserve and a knowledge of the pathology of all stages of the disease.

A surgeon should approach a case of pulmonary tuberculosis from a medical no less than from a surgical point of view. He should collaborate with the phthisiologist and the radiologist, who must become surgically minded. They must understand all phases

of the disease and the indications and possibilities of combinations of the two plans of treatment.

Competent surgical treatment without continued intelligent general medical care cannot cure. Adequate timely surgical treatment can and does render local conditions favorable for the orderly processes of healing to effect an arrest or cure.

Pulmonary tuberculosis demands medical supervision from its inception until it is clinically cured. Too often this fact is overlooked in the treatment of patients subjected to surgical collapse. The patient and sometimes his physician are deluded by the immediate improvement secured by surgical intervention. They relax in the care which is vital to making that improvement permanent. For a lasting cure it is obligatory that the patient continue for months after operation a graded rest regimen. Adequate prolonged collapse facilitates the permanent obliteration of cavities and the healing of pericavitary lesions by fibrosis. No operation can do more.

Before operative intervention is decided on, a review of the history and a careful complete examination of the patient should be made, a meticulous study of the evolution and the present status of the lesions in the lung, so graphically and chronologically recorded by a series of x-ray films, is imperative. The information obtained is of inestimable value in deciding what, if any, surgical intervention is indicated.

Select that procedure which will be most effective for the given stage. When possible employ revocable measures in ascending grades of severity, giving each procedure a reasonable period to prove its capacity to control the lesion. Note the progress by repeated physical examination and x-ray study. With contralateral lesions, and these are always present in some degree, the responsibility is augmented in proportion to the extent and grade of activity, one must proceed with caution, keeping well within the limits of respiratory and cardiac reserve.

When revocable measures are not indicated or have failed to control the progress of the disease, then irrevocable measures for selective compression are indicated. The least extensive surgical operation that will secure adequate compression is the operation of election. In many cases a sequence of procedures is neither indicated nor advisable. The character, location and extent of the lesion determines an operation of necessity. The general condition of the patient may and often does demand that it be performed in multiple stages. Better regret doing too little than mourn the death of a patient.

#### PROCEDURES

The procedures for collapse therapy are (1) artificial pneumothorax—unilateral, alternating or simultaneous bilateral, (2) intrapleural pneumolysis, (3) interruption of phrenic nerve conduction, temporary or permanent, (4) scalenectomy, (5) extrapleural pneumolysis with or without filling of the extrapleural space, and (6) thoracoplasty, partial upper or partial lower, as single stages or in sequence, with or without extra fascial mobilization of the lung, or complete, in multiple stages. The first four procedures leave the thoracic wall intact and with one exception (permanent phrenic nerve interruption) are revocable, the last two are compressing operations which alter the osseous structures of the thorax and are irrevocable.

<sup>6</sup> Dundee, J. C. End Treatment of Artificial Pneumothorax. New Use of Phrenic Anulsiion. *Am. Rev. Tuberc.* 25: 469 (April) 1932.

*Artificial Pneumothorax*—The introduction of artificial pneumothorax marked a transition from the time-honored passive and expectant treatment to the modern active or aggressive therapy of pulmonary tuberculosis.<sup>7</sup>

Wherever the efficacy of timely pneumothorax is fully appreciated it is recognized as the most valuable adjunct to phthisiotherapy. It has become a standard form of treatment in modern sanatoriums everywhere, curing or arresting the progress of the disease not possible by expectant treatment alone.

Induced pneumothorax is the spearhead of a line of surgical attack to secure added local rest to the diseased area of the lung by procedures graded from early relaxation and temporary collapse to firm irrevocable compression.

It is unfortunate that these gradations are not generally recognized and understood. An appreciation of the gradation principle of collapse therapy is of utmost importance in the modern treatment of pulmonary tuberculosis. The advantages of timely graded collapse therapy are proved by the splendid results obtained in the treatment of resistant progressive and otherwise hopeless cases.

Artificial pneumothorax decreases the volume of the lung by the injection of controlled amounts of air through a needle introduced into a free pleural space. It may be relaxing, collapsing or mildly compressive. The more uniform and continuous, the more effective it will be. Refills are necessary at more or less regular intervals over a long period, demanding prolonged cooperation of the patient, which, for economic, business, social, temperamental or other reasons, is too often interrupted or altogether neglected. This leads to intermittence, early loss or complications. To obviate these the injection of oils was introduced.<sup>8</sup> The safe use of oleothorax demands a greater degree of experience and judgment than does the use of simple pneumothorax.

An early, continuous, uniform and moderately relaxing pneumothorax is a prophylactic pneumothorax. It separates the visceral from the parietal pleura, prevents the formation of adhesions, relaxes and rests the lung, is conducive to contraction of early, soft thin-walled cavities and healing of soft exudative or mixed productive pericavitary zones. Massive repeated hemoptysis may be stopped. In bilateral lesions of a similar type, though different intensity, it may be induced on the two sides simultaneously or alternately. An early pneumothorax is not more dangerous to induce or difficult to control than is a later pneumothorax. It may obviate further measures for collapse.

The practice of inducing high degrees of plus pressure in order to secure attenuation of restraining adhesions, desirable as this may seem is neither wise nor safe and frequently causes complications. Obliteration of the pleural space precludes pneumothorax. Adhesions may prevent the induction and maintenance of a satisfactory pneumothorax.

An incomplete pneumothorax, while it may not collapse cavities, does exercise a salubrious effect on the pericavitary lesions. It renders the pleura less sensitive, and the mediastinum more rigid and gives the heart and contralateral lung time to become adjusted to the altered intrathoracic pressure. The patient is thereby fortified

and will better tolerate the necessary more formidable procedures for collapse. These should not be delayed. Prolonged pneumothorax treatment without diminution in the size of the cavities or continuing improvement of the lesions in the lung is not good therapy. It wastes valuable time, courts complications, imperils the final results and withholds from the patient other measures when these give assurance of success.

*Intrapleural Pneumolysis*—Closed intrapleural pneumolysis<sup>9</sup> is the severance of restraining and tethering pleuritic adhesions through a thoracoscope by means of the electrocautery or coagulation.

Pleuritic adhesions are the greatest impediment to successful artificial pneumothorax, once formed they are usually progressive. If restraining adhesions are narrow, like cords or bands, or fan shaped and are long enough to permit the manipulation of the necessary instruments, they may be severed by intrapleural pneumolysis. Thus may an inefficient or partial pneumothorax be made efficient or complete.

A knowledge of the character and content of the adhesions and of their relation to the lung, pericardium and great vessels, especially at the apex, and to the thoracic wall is important, not only because of the effect they may exercise in keeping the cavity open and the lung expanded but also because of the possible danger of puncturing large vessels and the pericardium, and of tearing or eroding the cavity wall or the diseased lung during or subsequent to coagulation.

The number and disposition of adhesions cannot be adequately determined by x-ray study. The thoracoscope is of positive value in the study of intrapleural adhesions.<sup>10</sup> The restraining effect of adhesions must be established before intrapleural severance is attempted.

At the apex of the thorax, the commonest site of resistant adherent cavities, where intrapleural pneumolysis would be most helpful, it is frequently impossible.

Open intrapleural pneumolysis does not require that the operator have training to acquire proficiency in interpretation of adhesions and dexterity in the use of specialized instruments. Open intrapleural pneumolysis is a more difficult and extensive operation. It has a very limited field for broad, short, isolated, tethering adhesions. A satisfactory closure of the pleura is not easy to accomplish.

*Interruption of Phrenic Nerve Conduction*—This paralyzes the diaphragm.<sup>11</sup> It may be made temporary by crushing the main and accessory nerves, which may be repeated to prolong its effect when, after two or three months, the diaphragmatic function returns. Should a permanent paralysis be desired the main and accessory nerves may be cut or 4 or 5 inches of the stem evulsed. Permanent paralysis is occasionally indicated, especially when the lesion has so seriously compromised the lung that a restoration to function is nil. Alexander<sup>12</sup> has proved that repeated temporary interruption is preferable and usually should precede a permanent phrenic interruption. Paralysis of one-half the diaphragm, even if there is no appreciable

9 Jacobaeus H C The Cauterization of Adhesions in Artificial Pneumothorax Treatment of Pulmonary Tuberculosis *Am Rev Tuberc* 6: 871 (Dec) 1922

10 Singer J J Thoracoscope in Pulmonary Tuberculosis *Am Rev Tuberc* 10: 67 (Sept) 1924

11 Stuetz Kunstliche Zwerchfelllähmung bei schweren chronischen einseitigen Lungenerkrankungen *Deutsche med Wchnschr* 37: 2224 1911

12 Alexander John Temporary Phrenic Nerve Paralysis *J A M A* 102: 1552 (May 12) 1934

7 Alexander John *Surgery of Pulmonary Tuberculosis* Philadelphia Lea & Febiger 1925 p. 26

8 Matson R W Oleothorax *Am Rev Tuberc* 25: 419 (April) 1932

elevation, secures a continuous uniform relaxation of the lung. It is more resting than a pneumothorax. The inconvenience of refills, the variable tension and the waning of a pneumothorax are eliminated. Phrenic nerve operations, while simple, have attending dangers, especially evulsion.

The indications are practically those for pneumothorax. Some authorities give interruption of the phrenic nerve preference, especially when continuing cooperation of the patient is doubtful.

Early temporary paralysis of the phrenic nerve will hasten and assure the benefits of general rest in recent thin-walled cavities with a pericavitary zone of the exudative or mixed type. It is positively indicated when a satisfactory pneumothorax cannot be induced, controlled or continued. It may supplement or intensify a unilateral pneumothorax without increasing the pressure. In the case of bilateral lesions it may be performed concomitantly on the worst side. The greatest benefits are in basal lesions. Midfield and infraclavicular lesions are almost equally controlled. A temporary interruption of the phrenic nerve is of advantage to retard reexpansion of the lung on abandonment of the pneumothorax. It is effective in reducing the size of empyema cavities and in relaxing the lung, favoring closure of bronchial fistulas by contracting fibrosis. Massive repeated hemoptysis is controlled by operation on the phrenic nerve. As a palliative procedure in terminal stages to assuage an exhausting cough it is superior to sedatives.

**Scalenectionomy**<sup>13</sup>—In this operation the scalene muscles are resected close to their insertions in the first and second ribs. The unopposed action of these muscles elevating and horizontally rotating the upper ribs is very great. However, when the ribs and intercostal muscles below the third rib are intact the effect of the scalene contraction disseminated over the entire thorax is greatly reduced.

Scalenectionomy does reduce excursions of the upper ribs and rest the apex of the lung, but to a degree so small that its effect on the lesions in the apex is uncertain and often negligible. It is recommended to control the upper part of the thorax as a supplement or sequence to operations on the phrenic nerve. What a successful operation on the phrenic nerve cannot accomplish alone usually requires more than a supplementary scalenectionomy.

**Extrapleural Pneumolysis**<sup>14</sup>—This is the formation of an extrapleural or fascial space overcircumscribing the area of a cavity by finger or blunt dissection through an incision in the periosteal bed of a resected short segment of an overlying rib. The pocket thus formed is filled with some material to maintain firm selective compression of the cavity-bearing area. The compressing effect is immediate. If sputum is abundant overflow, infection is a possibility. Firm fusion of the endothoracic fascia to the ribs, rupture of the cavity or hemorrhage prevents completion of the operation. No satisfactory filling material has been discovered. Gauze<sup>15</sup> has to be replaced, frequently causing considerable pain. Muscle,<sup>16</sup> if sufficient is available, requires a large fenestra for introduction and fixation.

It atrophies and contracts. Air necessitates refill. Bags inflated with water or compressed air<sup>17</sup> leave a projecting tube which is conducive to infection. Paraffin<sup>18</sup> is irritating and heavy and may cause pressure necrosis, erode and perforate the cavity wall or be extruded through the incision. Theoretically ideal, practically it is uncertain. The presence of any foreign material in a wound is a menace. Its use is indicated for the very ill who cannot stand a limited or multiple-stage thoracoplasty and have unilateral or bilateral disease with small to medium sized, chronic, thick walled cavities in a dense fibrotic area with or without severe hemoptysis.

Extrapleural pneumolysis with the use of gauze filling is most efficient in compressing dense residual fibrotic cavities that have failed to close by all other measures. Extrapleural pneumolysis occasionally is useful before a limited thoracoplasty. It is not easier to perform and is scarcely less shocking than a limited thoracoplasty. Though the compressive effect is selective and immediate, the delayed effect is uncertain.

**Thoracoplasty**<sup>19</sup>—The purpose of thoracoplasty is to secure collapse or active compression of a cavity-bearing area in the lung by means of the subperiosteal resection of definite lengths of a variable number of ribs. It may be partial, limited to a few ribs, either the lower or the upper or in stages including as many ribs as may be necessary to obtain adequate compression. The interval between stages is determined by the condition of the patient, time being allowed for the heart and lung to become adjusted to the altered intrathoracic condition and the diseased area in a measure to clear itself. The collapsing effect depends not so much on the length of the ribs resected as it does on the length of the stumps remaining, especially at the posterior aspect, where the resection must be made at the spine and may include the transverse processes. The number of ribs and the length of the segments to be resected are determined by the character, extent and localization of the disease in the lung, the stability of the mediastinum, the thickness of the pleura and the conformation and rigidity of the chest wall. In order to avoid secondary and difficult revision or corrective operations total or subtotal resection of the first to the third or fourth rib should be performed in an upper stage, going well beyond the underlying diseased area of the lung. Whereas short segments and too few ribs may require additional stage, long segments of too many ribs may cause shock, too sudden and great a degree of compression, weakening of an extensive area of the thoracic wall, massive atelectasis seriously embarrassing respiratory and cardiac function, a dangerous degree of autotuberculinization and rapid local or wide dissemination of the disease.

Some excellent authorities, Casper,<sup>20</sup> Semb<sup>21</sup> and Overholt,<sup>22</sup> at the time of thoracoplasty, especially in the upper stage, advocate and perform extensive mobilization of the lung. Casper leaves the wound partially open and firmly packs the area with gauze saturated

13 Gale J W and Middleton W S. Scalenectionomy in Surgical Treatment of Pulmonary Tuberculosis. Arch Surg 23 38 (July) 1931.  
Aycok T B. Combined Phrenic Exeresis and Scalenectionomy. Am J Surg 22 451 (Dec) 1933.

14 Tuffier Theodore and Loewy G. The Actual Value of Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis. Interstate M J 21 259 (March) 1914.

15 Lange. Tuberkulose Bibliothek. 1924 No. 13.  
16 Archibald E W. Am Rev Tuberc 4 828 (Jan) 1921.

17 Nissen E R. Ueber die neuere Entwicklung der chirurgischen Behandlung der Lungentuberkulose. Berlin Urban & Schwarzenberg 1932.

18 Baer G. Berl klin Wchnschr 50 107 (Jan 20) 1913. Munchen med Wchnschr 40 132 (July 22) 1913.

19 Sauerbruch Ferdinand. Die Chirurgie der Brustorgane. ed. 7. Berlin Julius Springer 1925 vol 1.

20 Bruns E H and Casper Joseph. The Present Status of Chest Surgery in the Treatment of Pulmonary Tuberculosis with Special Reference to Thoracoplasty. Am Rev Tuberc 26 663 (Dec) 1932.

21 Semb Carl. Acta chir Scandinav (supp 37 [art 21]) 76 18 1935. Brit M J 2 650 (Oct 2) 1937.

22 Overholt Richard. Thoracoplasty with Lung Mobilization. Am Rev Tuberc 35 4 (April) 1937.

with mild silver protein to secure firm compression. Redressing is required for a long time, convalescence is prolonged.

Carl Semb of Oslo, Norway was the first to perform extrafascial apicolysis. He secures a concentric collapse and contraction of the entire cavity-bearing area of the upper part of the lung almost to the level of the hilus. In this operation resection of the upper rib segments is not so extensive as in the total or subtotal type of thoracoplasty. The extrafascial ligamentous attachments and adhesions to the lower cervical nerve roots to the large vessels and to the anterior and posterior mediastinum are carefully severed by sharp and gauze dissection. The entire dome of the pleura is fixed and then depressed. The first three intercostal muscle bundles are double ligated and then severed.

Extrafascial pneumolysis may be performed at the first upper stage or be a step in a revision or corrective operation for collapse of resistant cavities. The latter is more difficult but a safer procedure. With the total or subtotal resection of the upper ribs the collapse of apical and subapical cavities is more efficient and residual cavities are less frequent than in the resection of the limited segments of the former thoracoplasties.

Extrafascial pneumolysis is indicated in the case of apical and subapical cavities with dense fibrotic pericavitary zones without exudative foci.

The manipulation incident to mobilization of the lung and the too sudden and massive compression of an actively diseased lung area are fraught with the danger of a local or widespread dissemination of the tuberculous process. The unsupported mobilized area of the lung beneath the limited deribbed upper portion of the thorax cannot be adequately supported. Paradoxical expansion on coughing of this unsupported lung is inimical to the clearing of the secretion from the diseased area. If the region should contain active foci or exudative areas, manipulation, displacement and active, too sudden massive compression are prone to cause complications. The compressing effect is ideal, the greatest attainable. It is safer to do active forceful compression on a residual cavity in a densely fibrotic area with only low grade if any, tuberculous infection by extrapleural gauze tamponade.

The indications for thoracoplasty are those for collapse therapy in general when lesser measures have failed or the temporary collapsed cavities reopen and quiescent areas become reactivated. The degree of fibrosis and contraction deformity is an index of the rigidity of the mediastinum and the local resistance of the lung tissue. A rigid mediastinum gives assurance of cavity compression and security against mediastinal flutter and displacement.

Contraindications to collapse are fresh, recent exudative lesions in the opposite lung, especially near the base, severe asthma, emphysema, active or decompensated heart disease, uncontrolled diabetes and tuberculosis in other organs are, in proportion to their activity, unfavorable complications. Severe anemia, rapid pulse and low blood pressure are warnings of danger, they prejudice but do not preclude surgical collapse.

Delay in diagnosis has been and is the chief obstacle in the control of pulmonary tuberculosis.

Delay in instituting the proper procedure for collapse compromises and may defeat all efforts to cure.

Metropolitan Building

## Special Article

### THE PHARMACOPEIA AND THE PHYSICIAN

#### THE THERAPY OF DIARRHEA IN CHILDREN

A GRAEME MITCHELL, M.D.

CINCINNATI

*This is one of a series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee on Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION—Ed.*

For an understanding of the treatment of diarrheal disturbances some consideration must be given to the underlying causes, the pathology and the symptomatology. The seriousness of diarrhea is attested by the fact that approximately 30 per cent or more of all deaths in the first year of life are attributable to gastro-enteric diseases and that even in the second year these still constitute the largest single cause of death.

#### CAUSE OF DIARRHEA

The symptom diarrhea is a common one and a manifestation of a great variety of diseases, some of which are not primarily gastro-enteric. Thus increased peristalsis and increased frequency of intestinal evacuation may occur in most febrile diseases, especially respiratory infections, in toxic or altered metabolic states such as uremia and acidosis in emotional excitement and exposure to high or low external temperature, and in certain types of allergy.

Diarrhea is helpfully eliminative when indigestible material is ingested or irritating chemical products are taken into the gastro-enteric tract or formed in it by bacterial action. Even an excessive intake of food otherwise digestible may cause an eliminative type of diarrhea.

The diarrheal diseases of childhood and especially of early infancy assume special significance because the younger the organism the more pronounced are the consequences of loss of water and electrolytes. An amount of diarrhea which would cause relatively little disturbance in an adult may be of extreme seriousness in an infant. Age is also a predisposing factor in diarrheal diseases, since these are more frequent in early life. Among predisposing causes the effects of high temperature and perhaps also of humidity are important. Diet is a definite factor and, even when the most improved methods of artificial feeding are employed, the breast-fed infant still retains an advantage in respect to the incidence of diarrheal disturbances.

In infancy and childhood it is the condition known as gastro-enteritis that is of greatest significance in causing diarrhea. This term, although the one most widely employed, is not entirely satisfactory, since inflammatory reaction in the gastro-enteric tract may be minor in character. Other designations, however, are little better or are limited in application. The term "summer diarrhea" details the time of most frequent occurrence and the chief symptom, the term "cholera

infantum" denotes that in certain cases there is a profuse, watery diarrhea which resembles Asiatic cholera, the term "ileocolitis" is applicable when there is actual pathologic change in the gastro-enteric tract, and the term "alimentary intoxication" suggests that there are toxic symptoms which are of intestinal origin.

The cause of gastro-enteritis and its accompanying diarrhea is not always obvious. There is no doubt that many cases are due to infection (infectious diarrhea), the organism responsible being frequently the dysentery bacillus. Streptococci are less commonly operative, sometimes causing epidemics of diarrheal disturbance both in children and in adults. Not so clearly established as direct infectious agents, but occasionally the probable cause of gastro-enteric irritation and inflammation, are staphylococci, *Bacillus pyocyaneus*, the gas bacillus and Morgan's bacillus, and it would appear possible that the colon bacillus may at times take on pathogenic properties. Whether the various organisms last mentioned are primarily causative or only secondary invaders after an initial irritation of the gastro-enteric tract, is open to question. That typhoid and paratyphoid bacilli may cause diarrhea even in young infants should always be borne in mind.

Overemphasized in diarrheal disease is the role of parenteral infection, that is, of infection elsewhere than in the gastro-enteric tract. As already stated, diarrhea is part of the symptomatology of acute febrile diseases, especially of the respiratory tract. However, to attribute all acute, severe diarrheal disturbances in infants to such a source is not correct.<sup>1</sup> While there should always be alertness to determine the presence of parenteral infections and to search for otitis media or mastoid infection, it does not follow, as some clinicians have maintained, that every infant who has diarrhea and evidence of acute middle ear disease should have his mastoid cells surgically drained.

#### THE PATHOLOGY OF DIARRHEA

In the instances caused by the dysentery bacillus and other organisms which actually attack the gastro-enteric mucous membrane, there result inflammatory changes and often ulcerative lesions. Peyer's patches and the solitary lymph follicles are prominent and congested. In other cases, as already pointed out, the changes in the gastro-enteric mucous membrane are so slight as not to be noticeable grossly, and only minor inflammatory or degenerative changes are found microscopically. Toxic changes may be seen at necropsy in the liver, kidney, mesenteric nodes and other tissues.

#### THE ASSOCIATED SYMPTOMS OF DIARRHEA

The clinician cannot always accept the history that diarrhea exists. Parents may have different conceptions of the average or normal number of stools. It is not only the number of intestinal evacuations which is important, the physician must himself determine by inspection and examination the water content and the presence of undigested material, blood, pus and mucus. He must decide also when diarrhea becomes more than merely eliminative and helpful in ridding the gastro-enteric tract of irritating or undigested material and when, therefore, it is necessary to make the attempt to check it.

When diarrhea is excessive and continued there may occur anhydremia or lack of sufficient water in the blood, and also dehydration or desiccation of body tis-

sues. The acid-base balance of the body may be disturbed and an acidosis result from loss of base, sodium and potassium, and also because the impaired circulation and the anoxemia of tissues lead to an accumulation of lactic acid. Furthermore because of the sluggish circulation and failure or diminution of blood flow through the kidneys there may come about faulty elimination of acid phosphates and other acids and their accumulation in the body, thus adding to the acidosis. In gastro-enteric disturbances it may rarely happen that vomiting is sufficiently severe to cause such loss of hydrochloric acid that alkalosis eventuates.

#### TREATMENT OF DIARRHEA

It is on a background such as that outlined that the physician must determine his prophylactic and curative treatment of the symptom diarrhea. Breast feeding should be urged for the first several months of life. A period of excessively high environmental temperature may require a temporary diminution of food intake and also an increase of fluid intake to compensate for increased loss of water through the skin. If indigestible food is being administered, this must be stopped. In any febrile disturbance a lowered food intake and an increased fluid intake are indicated. The underlying cause for any diarrheal disturbance should if possible always be determined and eliminated. If a parenteral infection or a toxic disturbance exists, it should be appropriately treated.

Ridding the intestinal tract of irritating material may be indicated at the beginning of a gastro-enteric upset, and especially when fever is present. Fever cannot be employed later as the criterion since it may be due to dehydration. Colonic flushing with salt or soda solution may help in accomplishing this, but the administration of a cathartic is often proper. Castor oil (*oleum ricini*) is a favorite for this purpose—a drachm (4 cc) for an infant or 2 drachms (8 cc) for an older child. A saline cathartic such as milk of magnesia (*magnesia* *magnesiae*) from 2 to 4 or more drachms (8 to 16 cc.) or citrate of magnesia (*liquor magnesi citratis*) from 2 to 4 or more ounces (60 to 120 cc.), or perhaps magnesium sulfate (*magnesi sulfas*) or some effervescent saline may be given to older children. Calomel (*hydrargyri chloridum mite*) is a drug seldom used or indicated in infants or children suffering from diarrheal diseases. However, purgation is no more to be recommended as a routine measure in the treatment of diarrhea than is digitalis to be given to every patient who has a cardiac murmur. If the patient is seen after diarrhea has already rid the intestinal tract of irritating material, and dehydration is present, purgation only exaggerates the symptoms. At this stage, every effort must be made to stop the loss of fluid from the gastro-enteric tract. Certain drugs may be of value in this respect, particularly bismuth subcarbonate (*bismuthi subcarbonas*), which should be given in doses of from 2 to 3 or more drachms (7 to 10.5 Gm.) a day. Bismuth has an astringent and, by its coating of the intestinal tract, a protective action. A common prescription is one containing about 15 grains (1 Gm.) of bismuth subcarbonate to the drachm (4 cc) of chalk mixture (*mistura cretae*), this suspension being given every hour or two after it has been vigorously shaken. The bismuth subnitrate is seldom ordered, since it is liable to be contaminated with lead, arsenic or antimony.

<sup>1</sup> Mitchell, A. G., McCarthy, M. F., Leichter, J. W. and Seinsheimer, Frank. Otitis Media and Its Relation to Gastro-Enteritis. *J. A. M. A.* 92: 970-974 (March 23) 1929.

<sup>2</sup> Mitchell, A. G. and Jones, L. Dehydration in Nutritional Disorders of Infancy. *Am. J. M. Sc.* 169: 236-247 (Feb.) 1925. Cullen, G. E. Factors Governing Fluid Therapy in the Treatment of Enteritis. *Ohio State M. J.* 32: 509-514 (June) 1936.

and because nitrates may be formed from the nitrate and poisoning thus result. Some physicians prefer milk of bismuth (magma bismuthi) in doses of 1 drachm (4 cc) several times a day, and others prescribe bismuth subgallate or subsalicylate because of their astringent properties, given in the same doses as the subcarbonate. There are also a number of proprietary preparations of bismuth. Kaolin (aluminum silicate) or fuller's earth may be used in place of bismuth. A question might be raised concerning their value,<sup>3</sup> they are being mentioned for the sake of completeness and without recommendation. They may be given in doses of 15 grains (1 Gm) every few hours so that 2 or 3 or more drachms (7 to 10.5 Gm) is taken a day. Activated charcoal (carbo activatus) may be prescribed in place of kaolin, given in the same doses.

In the more subacute stages of diarrhea, astringent preparations containing tannic acid are occasionally administered but apparently have little effect. Tannic acid may be given as tannalbum (albumini tannas) in doses of from 10 to 30 grains (0.65 to 2 Gm) three or four times a day. In more chronic diarrheas there are occasionally employed, but not to be recommended, such drugs as lead acetate, copper sulfate and silver nitrate. These are all poisons and have little if any good effect.

Opium in some form and in doses consistent with the age may be ordered for pain and restlessness. It is usually stated that it decreases peristalsis by its effect in increasing the tone of the intestine, although there is some question concerning its mode of action. A common manner of administering opium is as paregoric (tinctura opii camphorata) in doses of from 15 drops to 1 drachm (1 to 4 cc) several times a day, depending on the patient's age.

It is generally admitted that so-called intestinal antiseptics or disinfectants are without value, although occasionally salol (phenylis salicylas) in doses of from 2 to 5 grains (0.13 to 0.33 Gm) three times a day is still ordered.

Space does not permit a lengthy discussion of the dietary treatment of diarrheal diseases. The principles usually followed are initial starvation, only such solutions as barley water or 5 per cent dextrose solution being given for a period of about twenty-four hours if the patient's condition permits and if he is seen early in the diarrheal disturbance. Later there is the institution of a limited intake of food until the diarrhea improves. Some pediatricians advise starvation from milk for at least several days. Usually, however, a low fat and low carbohydrate and a high protein milk mixture such as skimmed milk or various preparations of protein milk are indicated. Lactic acid milks, particularly those produced by fermentation with lactic acid organisms and still containing them in viable form, are thought to be efficacious by many physicians. The apple diet, recommended by Moro<sup>4</sup> and others, or pectin-agar mixtures evolved by Winters and Tompkins,<sup>5</sup> seem to be helpful in many cases. In older children milk in any form may be prohibited for several days and the diet consist of thick cereal gruels, toast, fruit juices, albumin water and broths.

Most important is the administration of fluid. Water or physiologic solution of sodium chloride (0.85 per

cent sodium chloride solution, liquor sodii chloridi physiologicus) or 5 per cent dextrose solution should be given freely, but in small amounts if vomiting is excited. Diarrhea does not allow fluid to be retained by rectum. Often the need for fluid is so urgent that it must be administered by such parenteral routes as subcutaneous or intravenous injection. This presentation does not permit detailed discussion of fluid therapy, but several remarks are indicated. 1 The fluid given may be physiologic solution of sodium chloride or 5 per cent dextrose (d-glucose) solution, or a mixture of equal parts of the saline and 10 per cent dextrose solution so that the resulting strength of dextrose is 5 per cent. Other acceptable solutions are Ringer's solution, Hartmann's solution<sup>6</sup> (dispensed in ampules) and Darrow's solution.<sup>7</sup> 2 Physiologic solution of sodium chloride and dextrose solution may be given subcutaneously, the other solutions intravenously. 3 The continuous intravenous drip is a satisfactory method of administering fluid, from 15 to 20 drops a minute being allowed to flow into the vein.<sup>8</sup> 4 The total amount of fluid taken by any route (orally, subcutaneously or intravenously) should be known so that no edema will be caused; the normal fluid requirement of approximately  $2\frac{1}{2}$  ounces of fluid per pound daily in the first six months of life being remembered in order that the individual infant's need in the emergency of dehydration can be estimated and more than this given at first when indications exist.

**Acidosis**—Mention must be made of the treatment of acidosis in acute diarrheal disease. While this is a secondary manifestation, brought about by the mechanism already discussed, the combating of it may be life saving. Usually it follows only after marked loss of water, and the first defense against it is, in fact, the administration of sufficient fluid. The presence of acidosis can be determined with certainty only by a determination of the carbon dioxide content of the blood, since clinical symptoms are not always diagnostic, the most characteristic one, hyperpnea, occurring also in alkalosis. It is a mistake to administer sodium bicarbonate in large doses to every sick infant or child, since alkalosis may thus be brought about. In one year in the Children's Hospital of Cincinnati there were admitted four infants, all of whom died, who had severe alkalosis because of excessive administration of alkali. If a physician responsible for the care of an acutely sick infant suffering from gastro-enteritis is not in a position to determine the carbon dioxide content of the blood, the patient should be sent to a hospital where this can be done, the high mortality of gastro-enteritis in infants demanding this. Furthermore, it must be emphasized that acidosis may recur several times and require frequent treatment. It should be noted that Hartmann's solution, an excellent one for the administration of fluid, does not contain sufficient sodium lactate for the treatment of severe acidosis. In fact he recommends for this the more concentrated "one-sixth molar lactate." Cullen<sup>2</sup> has evolved a formula for the administration of sodium bicarbonate in acidosis which is as follows:  $g = b \times \text{wt (Kg)} \times 0.026$ . Sixty-five is considered the normal value of carbon dioxide in

6 Hartmann A F. Chemical Changes Occurring in the Body as the Result of Certain Diseases. Effects of Diarrhea, Vomiting, Dehydration and Oliguria on Acid Base Balance of Plasma of Infants with Mastoiditis. *Am J Dis Child* 35: 557-575 (April) 1928.

7 Cunningham R D M and Darrow D C. Preparation of a Solution of Sodium Bicarbonate and Sodium Chloride for Hypodermoclysis. *Am J Dis Child* 41: 1347-1352 (June) 1931.

8 Lyon R A, Van Dermark J G and Mitchell A G. Clinical Study of Gastro-Enteritis with Special Reference to Continuous Intravenous Method of Treatment. *Ohio State M J* 30: 227-234 (April) 1934.

3 Emery E S. The Use of Adsorbents in Gastrointestinal Diseases. *J A M A* 108: 202-205 (Jan. 16) 1937.

4 Moro E. Zwei Tage Apfeldiät (roh und gerieben) zur Behandlung diarrhoischer Zustände im Kindesalter. *Klin Wchnschr* S 2414-2417 (Dec 24) 1929.

5 Winters Matthew and Tompkins C A. Pectin-Agar Preparation for Treatment of Diarrhea of Infants. *Am J Dis Child* 52: 259-265 (Aug) 1936.



volumes per cent. In this,  $g$  = sodium bicarbonate needed in grams,  $b$  = deficit ( $65$  — determined carbon dioxide content in volume per cent), i. e., 1 Gm. of sodium carbonate per kilogram of weight raises the carbon dioxide content about 40 volumes per cent.

For example a patient weighs 10 Kg. and his blood carbon dioxide content is 15 volumes per cent. It is desired to raise his blood carbon dioxide content to 65.  $b = 50$  ( $65 - 15$ ).  $50 \times 10 \times 0.026 = 13$  (Gm. of sodium bicarbonate to be administered which should be given in 5 per cent solution i. e. 260 cc. of a 5 per cent solution of sodium bicarbonate).

As a matter of fact it is not necessary to attempt to reach the normal limit of 65 volumes per cent of carbon dioxide content. The carbon dioxide content of 50 would bring the child well out of the danger zone. Therefore the calculation could be ( $50 - 15$ ) or  $35 = b$  (or deficit).  $35 \times 10 \times 0.026 = 9$  (Gm. or 180 cc. of a 5 per cent solution of sodium bicarbonate). Seven per cent solution of sodium bicarbonate may be used if the amount of fluid injected needs to be reduced.

In emergencies when analyses of the carbon dioxide content of the blood are not possible coma or impending coma may be used in an indication for alkali therapy, and usually hyperpnea and convulsions likewise although, as stated, hyperpnea (and also convulsions) may occasionally be present in acute alkalosis. Under any conditions the administration of alkalis should be stopped when the urine becomes pink to phenolphthalein indicator (above pH 7). In normal infants from 30 to 45 grains (2 to 3 Gm.) and in older children from 60 to 75 grains (4 to 5 Gm.) of sodium bicarbonate will render the urine alkaline but in acidosis from four to ten times as much may be required. One disadvantage of the administration of sodium bicarbonate by mouth is the fact that it may increase the diarrhea.

In the treatment of acute diarrheal disease in infants repeated small transfusions may be indicated. If continuous intravenous drip is being employed, blood may be administered through the same apparatus.

If convulsions occur calcium gluconate may be given intramuscularly or intravenously in doses of from 5 to 10 cc. of a 10 per cent solution, and perhaps also sedatives of the barbitol group may be administered. Minot<sup>9</sup> has found guanidine-like substances in the blood in gastro-enteritis in infants and children and also suggests the administration of a calcium compound, since in guanidine intoxication the calcium ion concentration of the blood is lowered, a condition which would predispose to convulsions.

**Dysentery Infection**—In dysentery infection there must, in addition to the measures already outlined, be considered the administration of antidysentery serum. It may be stated that, at least in infants and children, this has no demonstrable value. Sodium thiocyanate has been suggested as a possible prophylactic and curative agent in doses of one-third grain (0.022 Gm.) per kilogram of body weight daily.<sup>10</sup> In diarrhea due to amebic infestation several drugs have been recommended, such as carbarsone, about  $3\frac{1}{2}$  to 4 grains (0.25 Gm.) twice a day for ten days,<sup>11</sup> chinofon powder

(mixture of 7-iodo-8-hydroxyquinoline 5 sulfonic acid sodium bicarbonate and sodium iodohydroxyquinoline sulfonate from 15 to 45 grams (1 to 3 Gm.) a day until about 600 grams (40 Gm.) has been given<sup>12</sup> or iodoform (iodochlorohydroxyquinoline), 230 grains (15 Gm.) given orally in two courses of about 12 grains a day (0.75 Gm.) for ten days with a week's rest period between.<sup>13</sup> Emetine hydrochloride also appears to be a specific antamebic drug, the adult dose being from one-third to 1 gram (0.22 to 0.65 Gm.) hypodermically daily (or better not more than 10 mg. per kilogram daily) for a period of eight days.<sup>14</sup> Enemas of 1:5000 solution of quinine may also be given in amebic dysentery.

**Chronic Diarrhea**—In chronic diarrhea there is almost invariably a pathologic background of ileocolitis. A search must always be made to determine any micro-organisms which might be causative. Thus there may be discovered the dysentery bacillus or in some cases, ameba. Bugen<sup>1</sup> believes in the etiologic importance of a specific form of diplostreptococcus. In chronic amebic infestation the measures and drugs already discussed may be tried. Bugen has claimed success in treatment with bacterial antigens prepared from the organism he described, but others have not always seen much benefit from this. In fact many chronic cases of ileocolitis must be classed as idiopathic or nonspecific, since no particular organism appears to be responsible. Vaccines made from organisms such as streptococci or colon bacilli are not of much value. In chronic ileocolitis operations such as appendicostomy or ileosigmoidostomy are sometimes recommended and the fecal stream in the latter operation may be left short circuited for months or years.

The drug treatment of chronic diarrhea cannot be said to be very satisfactory. The astringent remedies such as bismuth or tannic acid already mentioned, may be tried. It is claimed that calcium gluconate or lactate has an effect on healing the intestinal ulceration, and solution of parathyroid (liquid parathyroid) has also been employed.<sup>15</sup>

Examples may be given of the therapy to be employed in the usual case of gastro-enteritis.

**Mild Gastro-Enteritis Without Vomiting, in an Infant Aged 6 Months**—The first day nothing by mouth for twenty-four hours except water, 5 per cent dextrose solution or physiologic solution of sodium chloride, which should be offered in amounts of 3 ounces every three hours, but without forcing. Hypodermoclysis of 200 cc. or more of physiologic solution of sodium chloride or 5 per cent dextrose solution is given twice a day.

The second day, if there is some improvement, half strength skimmed milk, skimmed lactic acid milk or protein milk about 3 ounces every three hours, with 5 per cent dextrose offered between feedings. Hypodermoclysis is given if necessary.

The third day, if improvement continues, full strength skimmed milk is given.

12 Jones P. H. and Turner R. H. Iodoxyquinoline Sulfonic Acid in the Treatment of Amebic Dysentery J. A. M. A. 93 583 586 (Aug. 24) 1929.

13 David N. A. The Treatment of Amebiasis with Iodochlorohydroxyquinoline J. A. M. A. 100 1658 1661 (May 27) 1917.

14 Jerke C. D. Chemotherapy of Amebiasis J. A. M. A. 98 195 199 (Jan. 16) 1932.

15 Barger J. A. Changing Conceptions of Chronic Ulcerative Colitis J. A. M. A. 91 1176 1181 (Oct. 20) 1928.

16 Haskell Benjamin and Cantrow Abraham Further Studies in Calcium and Parathyroid Therapy in Chronic Ulcerative Colitis Am. J. M. Sc. 100 676 683 (Nov.) 1935.

9 Minot A. S. Dodd Katherine and Saunders J. M. Acidosis of Guanidine Intoxication J. Clin. Investigation 13 917 932 (Nov.) 1934.

10 Mitchell E. C. and Goltman D. W. Sodium Thiocyanate in Prophylaxis and Treatment of Bacillary Dysentery with Special Emphasis upon the Shiga Type J. Pediatr. 6 57 70 (Jan.) 1935.

11 Reed A. C. Carbarsone in the Treatment of Amebiasis J. A. M. A. 98 189 194 (Jan. 16) 1932.

After several days the formula is slowly increased to full strength. Sugar may be added to the formula on the fourth or fifth day, orange juice and cod liver oil being added at approximately the same time.

Severe Gastro-Enteritis and Marked Dehydration with Some Vomiting, in an Infant Aged 6 Months. In addition to the treatment outlined for a mild case the following procedures are suggested.

Five per cent dextrose in physiologic solution of sodium chloride given intravenously. Other balanced salt solutions may be used.

Transfusions given after the anhydremia has been partially corrected.

The total fluid in the twenty-four hours to be approximately 3 ounces (100 cc) per pound of body weight.

Fluids by mouth limited to from one-half ounce (15 cc) to 1 ounce (30 cc) of 5 per cent dextrose every three hours.

Determination of the carbon dioxide content of the blood and correction of acid-base balance if necessary.

In severe cases frequent determinations of the carbon dioxide content of the blood. Calcium gluconate from 5 to 10 cc of 10 per cent solution intravenously if there are convulsions.

## Council on Physical Therapy

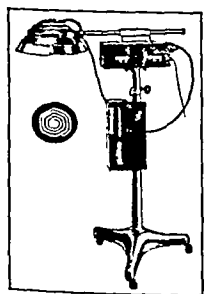
THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT

HOWARD A. CARTER, Secretary

### BRISTOW ULTRAVIOLET LAMP ACCEPTABLE

Manufacturer: Bristow and Company, 2861 West Pico Boulevard, Los Angeles.

This lamp generates ultraviolet radiation of the mercury glow low pressure type for use in physicians' offices and in hospitals or clinics. Both a hexagonal grid and an official applicator combination are available. It is a semiportable unit on a stand with three legs and ball bearing casters. The bakelite parts such as hood, transformer and official cases may be procured in ebony, walnut or old ivory finish, while the stand and trimmings are chrome plated. The unit weighs approximately 42 pounds.



Bristow Ultraviolet  
Lamp

The grid of 8 mm quartz tubing is coiled in a flat spiral (hexagonal pattern) and has an exposed length of 183 cm (6 feet). The grid is attached to an aluminum reflector with specially treated gray finish. This is packed by a double reflector case of dome shape, a bakelite back and an aluminum shell. A handle on the outer shell permits closer applications. The outside diameter of the reflector is 36 cm (14 inches).

Tests were submitted by the firm concerning the spectral distribution and quantity of ultraviolet radiation produced by the lamp. A Hilger Quartz Spectrograph indicated a characteristic cold quartz mercury vapor spectrum. Energy observations taken with a Burt Ultraviolet Photometer calibrated against standards prepared by the Bureau of Standards showed a spectral energy distribution of 89 per cent between 2,000 and 2,600 angstroms, 10 per cent between 2,600 and 3,000 angstroms and 1 per cent between 3,000 and 3,200 angstroms.

Power consumption was 80 watts at the beginning and end of a three hour run.

Since the Council bases its acceptance of lamps on the erythemic test as well as spectral distribution and intensity of radiation, the firm submitted these data. The intensity of ultraviolet radiation for therapeutic purposes produced by the Bristow

lamp at 4 inches was 4,800 microwatts per square centimeter and at 24 inches was 640 microwatts per square centimeter. At the latter distance, a minimum perceptible erythema may be produced by an exposure of about one minute.

The unit was examined by a qualified investigator and found to give satisfactory service. However, because of the high intensity of radiation of wavelengths shorter than 2,800 angstroms (amounting to about 90 per cent of the total) this lamp is not acceptable as a sun lamp for home use but is acceptable as a therapeutic lamp for professional use in the office or in the home if under the supervision of a physician.

In view of the foregoing report, the Council voted to accept the Bristow Ultraviolet Lamp for inclusion in its list of accepted apparatus.

## Council on Pharmacy and Chemistry

### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING PARAGRAPH HAS BEEN ADOPTED BY THE COUNCIL AS AN ADDITION TO THE STATEMENT ON TRICHLOROETHYLENE NOW APPEARING IN NEW AND NONOFFICIAL REMEDIES.

PAUL NICHOLAS LEECH, Secretary

**TRICHLOROETHYLENE** (See New and Nonofficial Remedies, 1938, p. 54).

*Actions and Uses* (For first paragraph see New and Nonofficial Remedies, 1938, p. 54).

Trichloroethylene has recently been proposed for use in the prevention and treatment of attacks of angina pectoris. It is believed that trichloroethylene is worthy of trial for this purpose, provided patients are under continued medical supervision, as in the clinic. Trichloroethylene is a general anesthetic, and its use for this purpose is subject to all the dangers and disadvantages of anesthetics. It should never be prescribed in bulk or taken in large doses. From 1 to 3 cc a day, in divided doses, is ample. The drug should always be taken with the patient in a reclining position, and the material should not be substituted for amyl nitrite in the treatment of the acute anginal attack. Each patient should be warned of the possibility of addiction. Excessive dosage of trichloroethylene may mask a severe attack of coronary pain and lead to its being ignored where it should receive immediate medical attention, together with bed rest. It should be used cautiously in the prevention of attacks because it may mask pain which otherwise would indicate exertion beyond the capacity of the heart.

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary

**SULFANILAMIDE** (See New and Nonofficial Remedies, 1938, p. 450).

**Sulfanilamide-Maltbie**—A brand of sulfanilamide-N N R. Manufactured by the Maltbie Chemical Co., Newark, N. J. No U. S. patent or trademark.  
*Sulfanilamide Tablets* 5 grains.

**STROPHANTHIN** (See New and Nonofficial Remedies, 1938, p. 200).

The following additional dosage form has been accepted.

*Hypodermic Tablets Strophanthin*  $\frac{1}{100}$  grain Upjohn. Physiologically standardized by the Magnus modification of the Hatcher and Brody method to contain approximately 1.5 cat units.  
Prepared by The Upjohn Company, Kalamazoo, Mich. No U. S. patent or trademark.

**PYRAMIDON** (See New and Nonofficial Remedies, 1938, p. 362).

The following additional dosage form has been accepted.  
*Pyramidon Tablets* 2 grains.

**SOLUTION OF POSTERIOR PITUITARY** (See New and Nonofficial Remedies, 1938, p. 350).

**SOLUTION PITUITARY EXTRACT U S P (UPJOHN)**—A brand of solution of posterior pituitary-U S P.

Manufactured by The Upjohn Company, Kalamazoo, Mich.  
*Ampoules Solution Pituitary Extract U S P (Upjohn)*  $\frac{1}{2}$  cc.  
*Ampoules Solution Pituitary Extract U S P (Upjohn)* 1 cc.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JANUARY 14, 1939

## SUBSCRIPTION AND FELLOWSHIP DUES FOR 1939

The colored slip found in this issue of THE JOURNAL the customary reminder to Fellows and subscribers that dues for 1939 are now payable. While many Fellows and subscribers have already sent their remittances for 1939, the reminder this week will be a convenience to those who have not paid. The slip is cut to form a return envelop when folded, and postage is not required. It will be recalled that several months ago the Board of Trustees of the Association found it necessary to change the subscription and Fellowship dues from \$7 to \$8 annually because of the increasing demands made on the Association. Operating costs, labor costs and prices of materials have increased. Whereas the Association previously was not liable for payment of Social Security taxes, the ruling has been reversed and, unless set aside, will call for an expenditure of approximately \$100,000 in the near future. In addition the suit instituted by the Department of Justice of the federal government will involve another item of unpredictable expense if the Association is to defend itself properly. The spirit in which thousands of Fellows and subscribers have already paid the new rate is most gratifying—in fact, numerous letters have been received from physicians expressing willingness to make outright financial contributions to the Association, if requested. Fortunately such contributions are not necessary at present, but in the interest of good business procedure it is hoped that all those whose dues for 1939 are not yet paid will use the colored slip in this issue of THE JOURNAL and remit without undue delay. This will obviate a considerable amount of clerical expense and the sending of personal statements

## INCIDENCE AND FUTURE EXPECTANCY OF MENTAL DISEASE

Not only the present incidence of mental disease is a problem of major proportions but also that occasioned by the future expectancy of this condition. Modern civilization has led to an increasing urbanization of the population. The belief is prevalent that there has been an alarming increase in mental disease in recent years and that this increase is in a measure attributable to the stress and strain of urban environment.

Dorn<sup>1</sup> points out that the problem of measurement of the incidence of mental disease is complex, since there is no sharp line of demarcation between normality and abnormality. Even though there is a definite physical basis for many mental disorders, mental disease is fundamentally a cultural concept which varies with different groups. Many persons who might merely be considered eccentric in a rural district would be unable to cope with the exigencies of an urban environment and might even be committed to a hospital for mental diseases. It is necessary to measure the occurrence of mental disease by the number of persons with recognized mental disease committed to an institution. This type of measurement is of value although it does not, of course, include all cases of mental illness but merely those which have been recognized as needing institutional care, with subsequent hospitalization. One index frequently used for expressing the incidence of mental disease is the number of first admissions per hundred thousand of population. However, this rate is subject to the same criticism as a crude death rate, it is affected by the composition of the population to which it refers. Since mental disease is more frequent among the elderly than among the young, the rate will be high if the proportion of elderly persons in the population is large.

A simple modification of the method of computing a life table leads to a measure of mental disease analogous to the expectation of life of the life table. In this manner a measure is obtained which may be called the expectation of mental disease or, more accurately, the expectation of commitment to a mental hospital. In order to calculate this, the mortality and first admission rates of a given population at a given time are applied to a particular number of infants, 1,000 for instance, and the number of those who would be alive and sane at each age if they were continually subject to the assumed mortality and disease rates is determined. The expectation of mental disease is then simply the ratio of the number who live to become insane to the original thousand infants. True, a mere increase in hospital facilities results to some degree in an increase in the number of first admissions to mental hospitals. This factor was eliminated as far as possible in Dorn's study by using data from Massachusetts, New York and Illinois, where hospital facilities have been fairly adequate for several years and where the combined population was 24,000,000 in 1930.

The contention that the incidence of mental disorders is rapidly increasing does not receive support from data obtained on commitments to mental hospitals in these states. Analysis of commitments in these areas shows that the number of first admissions per hundred thousand of population decreased among women under 70 years of age in each state. This was true also for men in Massachusetts. In New York and Illinois commitment rates increased somewhat after the ages of 45 or 50, but in younger persons a decrease occurred. The average number of patients in state hospitals rose from 248,852 in 1926 to 347,640 in 1935. An increasing proportion of old persons, increasing urbanization and similar environmental factors may explain this increase. A greater number of persons now live to develop mental disorders owing to an increased expectancy of life. An increase in the proportion of the total population which eventually is afflicted with some mental disturbance may result, even though the probability of the development of mental disease remains unchanged for each age. Present population trends point toward such an increase in the number of persons in the age groups in which mental disease is most frequent. As a consequence the number of persons with mental disease may be expected to increase although there may be no increase in the incidence of the disease.

#### ERYTHEMA NODOSUM

A small epidemic of erythema nodosum of exceptional interest, involving fourteen cases, has been reported recently by Brandon and his colleagues<sup>1</sup> from Canada. The school in which the epidemic occurred was attended by 173 boys from 10 to 19 years of age and was situated on a 300 acre farm with widely spaced buildings. There was a staff of thirty-five persons. The boys slept in five cottages, each with a capacity of forty-two. There was, however, ample opportunity for contact between the boys outside their cottages. Careful epidemiologic, clinical and laboratory observations were made. Tuberculin tests were made on 158 of the 173 boys, 139 of them reacted positively to 1 mg. of tuberculin or less. Light of the cases of erythema nodosum occurred in one cottage, four in another, one in each of two others and none in the fifth cottage. All fourteen of the boys were found to be highly sensitive to tuberculin and twelve showed definite or suggestive lesions of tuberculosis. All the positive tuberculous lesions among the cases of erythema nodosum were of the childhood or hilar gland type. Among the boys without erythema nodosum there were sixteen cases of minimal or suspected tuberculosis. No active or open cases were found in the school, in the staff or in the community, and none of the boys had demonstrable tubercle bacilli in the sputum. However, the evidence that the school population had recently been highly sensitized to tuber-

culin was definite and a boy of 17 with open pulmonary tuberculosis had been removed from the school five weeks after the onset of the epidemic. It was concluded that the source of the epidemic was probably this boy and that the disease was probably transferred by direct contact.

The frequent association of erythema nodosum with tuberculosis has led many students of the subject to the conclusion that erythema nodosum is of tuberculous origin, probably on a sensitization basis. Nevertheless there has been much controversy as to whether it can be considered a nonspecific reaction and to accompany such diseases as rheumatic fever on that basis. Wallgren<sup>2</sup> has in fact expressed the view that erythema nodosum should be regarded as a nonspecific allergic cutaneous eruption which appears especially in tuberculosis but occasionally in other infections and even may possibly be provoked by noninfectious agents. He feels that the epidemics of erythema nodosum which have been described and which form one of the supports of its being an expression of an acute specific infectious disease are given a natural explanation by this view. Elsewhere Wallgren<sup>3</sup> argues on what seems to be sound evidence that there is a true rheumatic erythema nodosum. He cites three cases in detail and mentions six points in favor of this syndrome: (1) the pains in the joints, (2) the endocardiac lesion, established by physical examination, (3) the electrocardiographically demonstrated myocardiac lesion, (4) the protracted, highly increased sedimentation rate, (5) the period of fever in connection with the eruption and (6) the absence of any other demonstrable cause of the erythema nodosum, particularly the absence of tuberculous infection (Mantoux, 10 mg., test made twice with negative results, an interval of six weeks having elapsed between the two tests).

Van Heukelom<sup>4</sup> as well agrees that at present erythema nodosum should be considered a nonspecific allergic (or hyperergic) syndrome which in the majority of instances is due to tuberculosis but may occur also in streptococcal infections and probably other disorders.

Although not an extremely common disease, erythema nodosum possesses an interest and significance beyond its usual apparent frequency or seriousness. As a rule it appears as a syndrome of well established clinical course with a characteristic pathologic picture. It is tempting therefore to consider it a specific disease with definite and constant causation, but, as has already been pointed out, its appearance in the absence of tuberculosis has thrown great doubt on the validity of this assumption. There are other lesions or syndromes of similarly controversial nature, such as the Aschoff body in the heart and the condition commonly called a "cold," the specific natures of which are also not yet definitely

2 Wallgren Arvid Erythema Nodosum and Pulmonary Tuberculosis *Lancet* 1 359 (Feb. 12) 1938

3 Wallgren Arvid Rheumatic Erythema Nodosum *Am J Dis Child* 55 897 (May) 1938

4 Van Heukelom A S Significance of Erythema Nodosum *Geneesk tijdschr v Nederlandsch Indie* 78 1595 (July 5) 1938

1 Brandon K F Hardman R P and Birks W H Erythema Nodosum and Tuberculosis *Canad Pub Health J* 29 533 (Nov.) 1938

established. Such questions constitute fascinating enigmas for medical research. The solution of these questions is more than an academic problem, since on accurate etiologic diagnosis alone can adequate specific treatment be instituted.

## Current Comment

### COMMENTATORS SPREAD FALSE NEWS

In newspapers throughout the United States on Sunday, January 8, the column written by Drew Pearson and Robert Allen entitled "Washington Merry-Go-Round" contained the following item:

#### MEDICAL SOCIETY VAINLY TRYING TO COMPROMISE WITH U. S.

Since their indictment last month by a Federal Grand Jury on charges of antitrust law violation, officials of the American Medical Society have made overtures to the Justice Department to compromise the case in out of court agreement.

So far, the negotiations have got nowhere because of the physicians' insistence that the Medical Society be given special privileges under the law.

As far as is known in the headquarters office of the American Medical Association, no official of this Association has made overtures to the Justice Department to compromise the case, neither have the attorneys for the Association, nor has any official been authorized to make overtures or to conduct such negotiations. A telegram was sent to Messrs. Pearson and Allen calling attention to the misstatements of fact. No answer was received. Mr. Allen was then called on the telephone. He said: "We received our information from the Department of Justice from a source we consider unimpeachable."

### CANCER RESEARCH

A distinguished committee<sup>1</sup> appointed by Surgeon General Thomas Parran has listed as the three most important lines of fundamental investigation on the cancer problem (1) study of the transplantable tumors, which has yielded information on the biology of the malignant cell, (2) the conditions governing the experimental induction of malignant tumors and (3) the part played by genetic factors in the development of cancer. The first has yielded information indicating that malignancy is the result of a fundamental change in cell physiology. The general conclusions which should be derived from extensive studies of the identification of malignant tumors have been that so-called carcinogenic agents start a process which appears to lead to malignancy but once the malignancy starts the agents apparently play no further part in the picture. Almost all, if not all, classes of cells may be rendered malignant by one or more agents. The expectation that with this method of inducing tumors it would be possible to trace the transformation of normal cells into malignant cells has not yet been realized. Much has also been already gleaned from studies of hereditary factors in malignancy, especially in experimental animals. There are, the report states, two distinct objectives in further

research: first the causal genesis of tumors, including the inciting causes, and second the formal genesis or the factors responsible for the nature of the cancer cell and its tendency for unlimited multiplication. Somewhere, it is felt, between the inherited or acquired cell tendency and the factor which releases this tendency lies the crux of the cancer problem as far as the inception of the disease is concerned. Further, it is pointed out that investigation of the characteristics of the cancer cell belongs in the field of cell physiology, and the understanding of the process must be dependent on advances in the understanding of the growth and differences of normal cells. This field requires definite nurturing and it is felt that an important function will be served if this line of investigation is stressed.

### "GROWING PAINS" IN CHILDREN

The so-called growing pains in children have been variously interpreted as a normal phenomenon or as a manifestation of rheumatic fever. Recently Hawksley<sup>1</sup> reported an analysis of 115 cases of growing pains based on an examination of 1,000 children seen in London and Birmingham. Sixty-four of these 115 were subjected to follow-up examinations four years after the initial examination. Although no definitely associated diseases were discovered, there was commonly a history of frequent colds and coughs with coincident exacerbation of pains, signs of general but vague ill health, rather frequent minor orthopedic deformities, some fibrositis in certain cases and psychologic maladjustment. In conjunction with the 189 cases followed up by Sheldon and the sixty-four here reported, cardiac rheumatism was revealed to have developed in less than 0.8 per cent. Hawksley concluded that the syndrome of growing pains is not related to rheumatic fever or subacute rheumatism and does not provoke rheumatic carditis. The pains may be associated with a number of conditions which can usually be discovered and treated by ordinary clinical methods. This work finds substantial agreement with a similar study reported by Shapiro<sup>2</sup> at the June meeting of the American Rheumatism Association. Shapiro made a follow-up study at the Lymanhuist heart clinic of 200 children who complained only of leg pains. The pain characteristically comes on at the end of the day and often awakens the patients during the night. Laboratory studies give normal results. None of Shapiro's patients developed rheumatic heart disease. He concluded therefore that this syndrome, which is so common during healthy school childhood and adolescence, is due to normal growth and clearly not to rheumatic fever. The discussion following this paper indicated general accord on the nonrheumatic nature of most so-called growing pains. In the light of these more recent observations, great skepticism should be attached to a diagnosis of rheumatic fever in those children whose only symptoms consist in vague muscular pains and aches in the lower extremities.

<sup>1</sup> Hawksley, J. C. The Incidence and Significance of Growing Pains in Children and Adolescents. *J. Royal Inst. Pub. Health & Hyg.* 1: 798 (Oct.) 1938.

<sup>2</sup> Shapiro, M. J. Nonrheumatic 'Growing Pains' and Subacute Rheumatic Fever. *Proceedings of the American Rheumatism Association* J. A. M. A. 111: 1960 (Nov. 19) 1938.

# ORGANIZATION SECTION

## AMERICAN MEDICAL ASSOCIATION STUDY OF MEDICAL CARE

### Harris County, Texas

The Harris County Medical Society of Texas returned a very complete summary of its study of the need and supply of medical care in its county. Harris County has a population of 425,000 of which the Houston District contains the greatest proportion, about 340,000. The thoroughness with which the county medical society carried out this study is verified by the number of returns they obtained as indicated in table 1.

It is significant to note that the welfare and relief agencies, the health departments, the nurses' organization, the hospitals, the schools and the other organizations which arrange for or provide medical care are practically 100 per cent represented, while the percentage of physicians, dentists and pharmacists who returned reports is considerably less.

Table 2 is a summary of the figures reported by the ten hospitals.

During 1937 the hospitals cared for 22,186 pay or part-pay patients, 11,159 public charges and 10,712 free patients. Seven of the hospitals maintain outpatient departments and treated 101,593 patients in those departments during the year. A total of 1,331 persons needed medical care but were not admitted as bed patients because they were indigents and were referred to the City-County Hospital or because they were not residents of the county and therefore were ineligible for county aid. The tuberculosis hospital reported failure to provide care for some because of lack of beds. Some persons were turned away because they failed to keep their appointments.

In determining a person's ability to pay for hospitalization, the hospital personnel based their decision on the person's income after expenses for necessities—food, rent and clothing—had been deducted.

In the hospital outpatient departments 101,593 patients were treated. These patients made 118,397

visits, free medicine was provided by pharmacists in 2,013 cases, and they compounded 5,207 prescriptions at cost or reduced fees during 1937.

The 266 physicians included in the study reported that they had given free service to 22,725 persons in their offices, in the homes or hospitals and had devoted 27,971 hours to free patients in clinics. The thirty-four dentists provided 994 persons with free care in their offices and gave 960 hours of free service in clinics.

To check the figures returned by the physicians and dentists a check form was sent out on which the physi-

cians, hospitals, individuals and various organizations to determine the economic status of these persons and their need for assistance in obtaining medical care and hospitalization. Persons eligible for relief and emergency cases in need of hospitalization are taken to the City-County Hospital. During the year the welfare and relief agencies reported that they had been unable to provide medical care to seventy persons who needed such care. They stated that the reason for this was that in most cases the persons were not residents of the county and therefore were ineligible to receive county aid.

The nurses' organization, with twenty-two full-time public health and visiting nurses, reported visiting 2,354 persons in 1937 who were not receiving medical care. Of this number seventy-eight were unable to obtain medical services. The reasons for this inability were the distance to any source of medical care and lack of funds to pay for medical services, in some cases the persons were transients who had no funds to pay for such services. The nurses stated that they had provided care to all persons who had requested their services.

The health department had no requests for medical services that could not be provided, and they knew of no person in need of medical care who was not receiving such care.

The elementary and secondary schools, which provide physical examinations, reported that 14,992 of the pupils needed some medical care but that only twenty of these were not provided with the needed care, and that was due to their parents' negligence or procrastination.

The physicians and dentists listed eight instances in which medical or dental care was not given to persons

TABLE 2—Information Obtained from Hospitals

For	Private Rooms	Semi private Rooms	Wards	Total No. of Beds
General medicine and surgery	471	222	68	761
Maternity	3	103	13	121
Children	16	23	32	71
Nervous and mental				
Tuberculosis			172	172
All others	26	6		32
Total	548	354	283	1,187
Bed occupancy	\$4 22%	\$4 90%	\$4 27%	
Rate per day				
High	\$10 00	\$4 50	\$3 50	
Low	4 00	3 50	3 00	

TABLE 1—Basis of Study

Distribution of forms	Number Sent	Number Returned and Used in Study
Physicians	400	266
Dentists	101	34
Hospitals	12	10
Nurses organization	1	1
Health departments	2	2
Welfare and relief agencies	21	20
Schools	3	3
Colleges	3	3
Other organizations	205	201
Pharmacists	500	50



needing or requiring such services Their reasons were summarized as follows

- 1 Personal differences between patient and doctor
- 2 No bed available
- 3 No funds
- 4 No reason given

For the whole area, 2,196 persons were unable to obtain either medical, dental or hospital care The one reason for failure to provide this care given by the organizations reporting the majority of these cases was that the persons were transients and ineligible for county aid

With regard to preventive medicine, 110 physicians perform preventive services in private practice, four in the health departments and thirty-six for other agencies All children who entered school for the first time in 1937 were successfully vaccinated against smallpox For each 1,000 children born alive 200 were immunized against diphtheria One per cent of the births were not attended by a physician or midwife Of the total

TABLE 3—Services Performed for Seven Consecutive Days

Days	No of Persons Who Received Services	No of Persons Served Without Any Charge	No of Persons Referred to Other Sources of Free Services	No of Free Surgical Operations
		Physicians		
1	1 730	278	41	36
2	1 711	467	37	27
3	1 806	217	24	28
4	1 808	203	28	21
5	1 663	220	40	3
6	1 838	211	36	47
7	1 341	162	28	10
Totals	11 092	1 807	24	192
		Dentists		
1	172	36	1	4
2	185	22	1	5
3	167	14		6
4	187	24		1
5	181	18		2
6	180	13	1	
7	141	19		2
Totals	1 201	126	3	20

number of obstetric patients, 26.8 per cent waited until after the third month of pregnancy before consulting their physicians

#### ARRANGEMENTS FOR LOW INCOME AND INDIGENT PATIENTS

What plans, understanding or arrangements exist by which the county medical society and other organizations undertake to provide or arrange for medical services for those who need and are unable to pay for such services?

##### Nurses' Organization—None

**Health Departments**—There is a liaison committee of the Harris County Medical Society Through this committee and the board of health the plans are working out agreeably between the county medical association and the city health department

**Welfare and Relief Agencies**—1 There is no formal arrangement I would like to have one I would like to discuss the subject of fees so that we would be operating our clinic in complete agreement with the feeling of the medical society about fees and other matters Many of our cases are not medical ones Many of the children are not medical cases Many of them are examined only by our psychologist In many cases a social worker does most of the work

2 Adequate care is given by the local hospitals and private physicians and dentists

3 All patients who are not violently insane and who are cooperative that need general hospital care are sent to Jefferson Davis Hospital

4 We have the fullest cooperation of the doctors and social workers connected with our charity hospitals

5 A representative of the medical society is appointed to serve on our agency board

6 We have been very much pleased with the cooperation given us by the hospitals, clinics and doctors in private practice

7 We refer patients needing hospitalization to either Hermann or Jefferson Davis Hospital

8 No definite policy has been established but satisfactory cooperation exists between the hospitals and this agency

9 The clinics giving medical attention outside the scope of our free antituberculosis clinic have for years given prompt attention to cases sent them by us The Houston Tuberculosis Hospital patients are all passed on by the Houston Anti-Tuberculosis League, which acts as a "clearing house" for admission of patients to this institution

10 Florence Crittenton Home receives excellent cooperation from Jefferson Davis Hospital, Hermann Hospital, the city health laboratories, who make laboratory tests for this agency, Texas Dental College, Junior League Clinic, Mexican Clinic, TB Clinic, Maternal Health Center and the Public Health Nursing Association We pay Methodist Hospital a nominal fee for the delivery of the patients in our institution

11 Examination of school children is taken care of by the regular school medical staff The Harris County Medical Society also has a centralizing liaison committee which arranges and provides for examination of preschool children who cannot afford a private doctor

**Colleges and Universities**—1 Physicians and dentists assist in health examinations and health advice

2 Medical and dental members of the college staff provide medical and dental services on a low income basis for students who require services on this basis

**Pharmacists**—1 The local medical society contributes its services to the two charity hospitals—which takes care of the needy in this locality

2 The physicians who are members of the Harris County Medical Society contribute their service to patients who are unable to pay—also service on the staff of the City County Hospital

3 Have always been able to find a doctor more than glad to take care of a worthy case

4 It is taken for granted that a physician will make a call (and not one has ever refused) when an emergency exists and the patient has no money and no income When the emergency is relieved, the patient is either continued to be treated free of charge by the physician or is sent to the City-County Hospital

**Secretary**—The Medical and Dental Service Bureau, owned and operated by the members of the Harris County Medical Society, undertakes to finance medical, dental and hospital service for any one who does not wish to apply to a clinic or charity hospital

#### COMMENTS

The number of comments which accompanied this study is so great that it is not possible to publish them all A summarization representative of each group is given

**Physicians**—The number of free clinics, governmental hospitals and philanthropic organizations which provide medical care offer every one an opportunity to obtain medical care This abundance of free services available tended to create malingering by people who could well afford to pay for medical services The amount of free services performed by the physicians has already been given

**Dentists**—The majority of the people could obtain and pay for all necessary dental services if they made a sincere effort to make arrangements for obtaining the services The indigent are provided for in the free clinics and by the relief agencies The people in the low income groups can secure good dental services at rates within their ability to pay just as easily as they obtain any other services or goods they really desire There is need for more restorative dentistry among the low income group

**Hospitals**—In no case has there been any refusal to hospitalize patients regardless of their financial status

*Health and Relief Agencies*—There is need for additional funds to provide medical care for persons with infectious diseases, especially venereal diseases, and for persons with chronic illnesses who need institutionalized care. Some arrangement is needed to enable relief agencies to provide medical care for transients and nonresidents who are now ineligible for county aid.

*Health Departments*—An increase in the county budget to provide more medical care for the indigent and persons in the low income group would solve the problem.

*Schools*—School children have adequate medical care. There is a need for a free dental clinic supported by public or private funds.

*Other Organizations*—In the Houston district 218 business establishments assist and encourage their employees to become members of group hospitalization plans that are offered by

insurance companies. Other business organizations have employees' mutual benefit associations that pay sickness and death benefits to members or members' dependents.

*Pharmacists*—There is adequate medical service available for the people in all income groups at fees they are able to pay. The indigent are provided for through the relief agencies or at free clinics. There is a great need for a filter system that will prevent the people who can afford to pay from obtaining medical care at the free clinics.

Too many people go without medical care because the physicians will not help them to obtain free care.

*Nurses*—There is need for a medical social service filter system to determine eligibility of persons in the low income group for free care or for medical services at rates commensurate with their ability to pay.

## THE PHYSICIAN'S INCOME TAX—1939

*Prepared by the Bureau of Legal Medicine and Legislation*

This discussion relates only to the requirements of the federal income tax law. Information with respect to the requirements of state income tax laws should be obtained from responsible state sources.

The Revenue Act of 1938 amended in numerous respects the prior income tax law, but none of the changes made relate to physicians as a class distinct from the main body of federal income tax payers.

Every one who is required to make a federal income tax return must do so on or before March 15, unless an extension of time for filing his return has been granted. For cause shown the collector of internal revenue for the district in which the taxpayer files his return may grant such an extension, on application filed with him by the taxpayer. This application must state fully the causes for the delay. Failure to make a return may subject the taxpayer to a penalty of 25 per cent of the amount of the tax due.

The normal rate of tax on residents of the United States and on all citizens of the United States regardless of their places of residence is 4 per cent on net income in excess of the exemptions and credits.

### WHO MUST FILE RETURNS

1 If gross income was less than \$5,000 during 1938, a return must be filed (a) by every unmarried person, and by every married person not living with her husband or his wife, whose net income was \$1,000 or more, and (b) by every married person living with her husband or his wife whose net income was \$2,500 or more. If the aggregate net income of husband and wife, living together, was \$2,500 or more, each may make a return or the two may unite in a joint return.

2 Returns must be filed by every person whose gross income in 1938 was \$5,000 or more, regardless of the amount of his net income and of his marital status. If the aggregate gross income of husband and wife, living together, was \$5,000 or more they must file either a joint return or separate returns, regardless of the amounts of their joint or individual net incomes.

If the status of a taxpayer, so far as it affects the personal exemption or credit for dependents, changed during the year, the personal exemption and credit must be apportioned, under rules and regulations prescribed by the Commissioner of Internal Revenue with the approval of the Secretary of the Treasury, in accordance with the number of months before and after such change. For the purpose of such apportionment a fractional part of a month should be disregarded unless

it amounts to more than half a month, in which case it is to be considered as a month.

As a matter of courtesy only, blanks for returns are sent to taxpayers by the collectors of internal revenue, without request. Failure to receive a blank does not excuse any one from making a return, the taxpayer should obtain the necessary blank from the local collector of internal revenue.

The following discussion covers only matters relating specifically to physicians. Full information concerning questions of general interest may be obtained from the official return blank and from the collectors of internal revenue.

### GROSS AND NET INCOMES WHAT THEY ARE

*Gross Income*—A physician's gross income is the total amount of money received by him during the year for professional services, regardless of the time when the services were rendered for which the money was paid, plus such money as he has received as profits from investments and speculation and as compensation and profits from other sources.

*Net Income*—Certain professional expenses and the expenses of carrying on any enterprise in which the physician may be engaged for gain may be subtracted as "deductions" from the gross income, to determine the net income on which the tax is to be paid. An "exemption" is allowed, the amount depending on the taxpayer's marital status during the tax year as stated before. These matters are fully covered in the instructions on the tax return blanks.

*Earned Income*—In computing the normal tax, but not the surtax, there may be subtracted from net income from all sources an amount equal to 10 per cent of the earned net income, except that the amount so subtracted shall in no case exceed 10 per cent of the net income from all sources. Earned income means professional fees, salaries and wages received as compensation for personal services, as distinguished from receipts from other sources.

The first \$3,000 of a physician's net income from all sources may be regarded under the law as earned net income, whether it was or was not in fact earned within the meaning set forth in the preceding paragraph. Net income in excess of \$3,000 may not be claimed as earned unless it in fact comes within that category. No physician may claim as earned net income any income in excess of \$14,000.

## DEDUCTIONS FOR PROFESSIONAL EXPENSES

A physician is entitled to deduct all current expenses necessary in carrying on his practice. The taxpayer should make no claim for the deduction of expenses unless he is prepared to prove the expenditure by competent evidence. So far as practicable, accurate itemized records should be kept of expenses and substantiating evidence should be carefully preserved. The following statement shows what such deductible expenses are and how they are to be computed.

**Office Rent**—Office rent is deductible. If a physician rents an office for professional purposes alone, the entire rent may be deducted. If he rents a building or apartment for use as a residence as well as for office purposes, he may deduct a part of the rental fairly proportionate to the amount of space used for professional purposes. If the physician occasionally sees a patient in his dwelling house or apartment, he may not however, deduct any part of the rent of such house or apartment as professional expense, to entitle him to such a deduction he must have an office there with regular office hours. If a physician owns the building in which his office is located, he cannot charge himself with "rent" and deduct the amount so charged.

**Office Maintenance**—Expenditures for office maintenance, as for heating, lighting, telephone service and the services of attendants, are deductible.

**Supplies**—Payments for supplies for professional use are deductible. Supplies may be fairly described as articles consumed in the using, for instance, dressings, clinical thermometers, drugs and chemicals. Professional journals may be classified as supplies, and the subscription price deducted. Amounts currently expended for books, furniture and professional instruments and equipment, "the useful life of which is short," generally less than one year, may be deducted, but if such articles have a more or less permanent value then purchase price is a capital expenditure and is not deductible.

**Equipment**—Equipment comprises property of a more or less permanent nature. It may ultimately wear out, deteriorate or become obsolete, but it is not in the ordinary sense of the word "consumed in the using."

The cost of equipment, such as is described above, for professional use, cannot be deducted as expense in the year acquired. Examples of this class of property are automobiles, office furniture, medical, surgical and laboratory equipment of more or less permanent nature, and instruments and appliances constituting a part of the physician's professional outfit, to be used over a considerable period of time, generally over one year. Books of more or less permanent nature are regarded as equipment and the purchase price is therefore not deductible.

Although the cost of such equipment is not deductible in the year acquired, nevertheless it may be recovered through depreciation deductions taken year by year over its useful life, as described below.

No hard and fast rule can be laid down as to what part of the cost of equipment is deductible each year as depreciation. The amount depends to some extent on the nature of the property and on the extent and character of its use. The length of its useful life should be the primary consideration. The most that can be done is to suggest certain average or normal rates of depreciation for each of several classes of

articles and to leave to the taxpayer the modification of the suggested rates as the circumstances of his particular case may dictate. As fair, normal or average rates of depreciation, the following have been suggested: automobiles, 25 per cent a year, ordinary medical libraries, x-ray equipment, physical therapy equipment, electrical sterilizers, surgical instruments and diagnostic apparatus, 10 per cent a year, office furniture, 5 per cent a year.

The principle governing the determination of all rates of depreciation is that the total amount claimed by the taxpayer as depreciation during the life of the article, plus the salvage value of the article at the end of its useful life, shall not be greater than its purchase price or, if purchased before March 1913, either its fair market value as of that date or its original cost, whichever may be greater. The physician must in good faith use his best judgment and claim only such allowance for depreciation as the facts justify. The estimate of useful life, on which the rate of depreciation is based, should be carefully considered in his individual case.

In a Treasury Decision, approved Feb. 28, 1934, No. 4422, it is held, among other things, that

1 The cost to be recovered shall be charged off over the useful life of the property.

2 The reasonableness of any claim for depreciation shall be determined on the conditions known to exist at the end of the period for which the return was made.

3 Where the cost or other basis of the property has been recovered through depreciation or other allowances, no further deduction for depreciation shall be allowed.

4 The burden of proof will rest on the taxpayer to sustain the deduction claimed.

5 The deduction for depreciation in respect to any depreciable property for any taxable year shall be limited to such ratable amount as may reasonably be considered necessary to recover during the remaining life of the property the unrecovered cost or other basis.

Particular attention is called to the last of the foregoing provisions. If, in prior years, rates have been claimed which, if continued, will fully depreciate the cost, less salvage, before the end of its useful life, based on conditions now known, a reestimate of the remaining useful life should now be made and the portion of the cost that had not been depreciated at the beginning of the year 1938 (for a return for the year 1938) should be spread over this reestimated life.

**Medical Dues**—Dues paid to societies of a strictly professional character are deductible. Dues paid to social organizations, even though their membership is limited to physicians, are personal expenses and not deductible.

**Postgraduate Study**—The Commissioner of Internal Revenue holds that the expense of postgraduate study is not deductible.

**Traveling Expenses**—Traveling expenses, including amounts paid for transportation, meals and lodging, necessarily incurred in professional visits to patients and in attending medical meetings for a professional purpose, are deductible.

**Automobiles**—Payment for an automobile is a payment for permanent equipment and is not deductible. The cost of operation and repair, and loss through depreciation, are deductible. The cost of operation and repair includes the cost of gasoline, oil, tires, insurance,

repairs, garage rental (when the garage is not owned by the physician), chauffeurs' wages, and the like.

Deductible loss through depreciation of an automobile is the actual diminution in value resulting from obsolescence and use and from accidental injury against which the physician is not insured. If depreciation is computed on the basis of the average loss during a series of years, the series must extend over the entire estimated life of the car, not merely over the period in which the car is in the possession of the present taxpayer.

If an automobile is used for professional and also for personal purposes—as when used by the physician partly for recreation, or so used by his family—only so much of the expense as arises out of the use for professional purposes may be deducted. A physician doing an exclusive office practice and using his car merely to go to and from his office cannot deduct depreciation or operating expenses, he is regarded as using his car for his personal convenience and not as a means of gaining a livelihood.

What has been said in respect to automobiles applies with equal force to horses and vehicles and the equipment incident to their use.

#### MISCELLANEOUS

*Contributions to Charitable Organizations*—For detailed information with respect to the deductibility of charitable contributions generally, physicians should consult the official return blank or obtain information from the collectors of internal revenue or from other reliable sources. A physician may not, however, deduct as a charitable contribution the value of services rendered an organization operated for charitable purposes.

*Social Security Taxes*—The excise taxes imposed on employers by section 804, title VIII, and section 901, title IX, of the Social Security Act, commonly referred to as old age and unemployment benefit taxes, are deductible annually by employers in computing net income for federal income tax purposes. If the taxpayer's return is made on a cash basis, as are the returns of practically all physicians, the taxes are deductible for the year in which they are actually paid. If the return is made on an accrual basis, the taxes are deductible for the year in which they accrue, irrespective of when they are actually paid. Employees, including physicians whose employment brings them

within that category, may not deduct the tax imposed on them by section 801, title VIII, of the Social Security Act, generally referred to as the old age benefits tax. If, however, the employer assumes payment of the employee's tax and does not withhold the amount of the tax from the employee's wages, the amount of the tax so assumed may be deducted by the employer, not as a tax paid, but as an ordinary business expense.

*Laboratory Expenses*—The deductibility of the expenses of establishing and maintaining laboratories is determined by the same principles that determine the deductibility of corresponding professional expenses. Laboratory rental and the expenses of laboratory equipment and supplies and of laboratory assistants are deductible when under corresponding circumstances they would be deductible if they related to a physician's office.

*Losses by Fire or Other Causes*—Loss of and damage to a physician's equipment by fire, theft or other cause, not compensated by insurance or otherwise recoverable, may be computed as a business expense and is deductible, provided evidence of such loss or damage can be produced. Such loss or damage is deductible, however, only to the extent to which it has not been made good by repair and the cost of repair claimed as a deduction.

*Insurance Premiums*—Premiums paid for insurance against professional losses are deductible. This includes insurance against damages for alleged malpractice, against liability for injuries by a physician's automobile while in use for professional purposes, and against loss from theft of professional equipment and damage to or loss of professional equipment by fire or otherwise. Under professional equipment is to be included any automobile belonging to the physician and used for strictly professional purposes.

*Expense in Defending Malpractice Suits*—Expense incurred in the defense of a suit for malpractice is deductible as a business expense.

*Sale of Spectacles*—Oculists who furnish spectacles, etc., may charge as income money received from such sales and deduct as an expense the cost of the article sold. Entries on the physician's account books should in such cases show charges for services separate and apart from charges for spectacles, etc.

## TAX RETURNS DUE UNDER THE SOCIAL SECURITY ACT

Physicians, medical associations and hospitals subject as employers to the taxes imposed by the Social Security Act, are again reminded that periodic tax returns must be made to the collector of internal revenue of the revenue district in which they are located. A tax return with respect to federal old age benefit taxes is required every month and an informational return every quarter. The monthly return for December 1938, required of every employer of one or more employees subject to the act, must be filed not later than January 31 on form SS-1. When this return is made the employer must pay to the collector the tax due from himself and all taxes imposed on his employees for the collection of which he is by law made responsible. The quarterly information return, for the quarter ended Dec 31, 1938, must be filed on or before January 31 on forms SS-2 and SS-3.

Tax returns with respect to federal unemployment compensation taxes are required annually of all non-exempt employers of eight or more persons subject to the act. The return for the calendar year 1938 must be filed on or before January 31 on form 940. With this return the employer may transmit to the collector the entire tax due or he may pay at that time one fourth of the tax and the remainder quarterly in equal installments as in the case of income taxes.

Copies of required forms and information concerning the returns may be obtained from the office of the collector of internal revenue. A failure to file a tax return subjects the delinquent employer to a penalty of from 5 per cent to 25 per cent of the tax due, depending on the period of delinquency, and, in case of a wilful refusal to file the return and pay the taxes, to criminal prosecution. Returns should be filed promptly.

## OFFICIAL NOTES

## RADIO BROADCASTS

The fourth series of programs broadcast in dramatic form portraying fictitious but typical incidents of significance in relation to health by the American Medical Association and the National Broadcasting Company, entitled "Your Health," began Wednesday October 19 and will run consecutively for thirty-six weeks. The program is broadcast each Wednesday over the blue network of the National Broadcasting Company at 2 p. m. eastern standard time (1 p. m. central standard time, 12 noon mountain time, 11 a. m. Pacific time).<sup>1</sup>

These programs are broadcast on what is known in radio as a sustaining basis, that is, the time is furnished gratis by the radio network and local stations and no revenue is derived from the programs. Therefore, local stations may or may not take the program, at their discretion, except those stations which are owned and operated by the National Broadcasting Company.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

January 18	Scarlet Fever	Measles and Whooping Cough
January 25	Smallpox and Diphtheria	
February 1	Preventing Epidemics	

<sup>1</sup> Owing to program conflicts there will be no Chicago broadcast of the network program. Instead a recording of the program will be broadcast over station WENR at 8 p. m. each Wednesday. This recording will be an identical rebroadcast of the network program broadcast earlier the same day.

## THE ST LOUIS SESSION

## Chairman of Local Committee on Arrangements

Dr Robert E. Schlueter, St. Louis, will serve as chairman of the Local Committee on Arrangements for the St. Louis session, which will be held May 15-19.

## Applications for Hotel Reservations

The Subcommittee on Hotels of the Local Committee on Arrangements has furnished a list of St. Louis hotels and rates for rooms which may be found on advertising page 43 of this issue of THE JOURNAL together with an application form that may be used to secure reservations through the Subcommittee on Hotels. The form that is printed in the advertising pages may be clipped and, when properly filled in, should be sent at once to Dr. Neil S. Moore, Chairman of the Subcommittee on Hotels of the Local Committee on Arrangements, 910 Syndicate Trust Building, St. Louis, Mo.

If those who expect to attend the annual session of the American Medical Association will send in their applications at the earliest possible time, there should be no difficulty encountered in securing satisfactory accommodations. Applicants for reservations are especially requested to include a second and a third choice in order that good accommodations may be assured if the desired reservation cannot be had at the hotel of preference. It will greatly expedite matters if requests for reservations are addressed directly to Dr. Moore.

## MEDICAL ECONOMIC ABSTRACTS

WISCONSIN EXPERIMENT IN  
COOPERATIVE MEDICINE

The Douglas County Medical Society, in cooperation with the State Medical Society of Wisconsin and the Cooperative Health Association at Superior, has concluded an agreement to provide members of the association with complete medical and surgical care on a prepayment basis for a period of trial and study.

In the preface to the agreement that was signed the following statements were made:

In September 1938 the State Medical Society of Wisconsin adopted the report of its Special Committee to study the distribution of health service and sickness care in Wisconsin. That report recommended that there be instituted under the direction of a special committee and the local county medical society and with the assistance of lay groups actively interested in proposals dealing with new methods of the delivery of sickness care experimental voluntary plans providing sickness care on a prepayment and voluntary basis. To assure that any such plan create no health hazard to those seeking services under it and to make certain that any subscriber should obtain those services contracted to be given even though the fee basis should prove inadequate and the compensation not that which the Cooperative expects the State Medical Society adopted as a requirement that the local medical society stand guarantor that the services be given and their quality be high. In other words the actual reserve would be the physicians of the community. The State Medical Society of Wisconsin and the Douglas County Medical Society have agreed that the Cooperative Health Association of Superior offers a proper situation for such experiment and thus the two medical societies and the Cooperative state these principles in the form of articles of agreement to be followed in developing such a voluntary plan in Superior Wisconsin.

The agreement provides that those who become members of the Cooperative Health Association shall have free choice of physician among the members of the Douglas County Medical Society, that a joint conference committee be established to meet regularly to discuss problems that may arise that not more than 20 per cent of the membership dues shall be subject to administration charges, that 80 per cent of the gross income should be earmarked for physicians' services, and that no more than 300 units would be encompassed in the trial. Units may represent individual membership or family memberships. The total number of people participating in the trial, it is estimated, will reach a total of 1,200 individuals. The amount of monthly dues has not as yet been established by the Cooperative Health Association. However, \$3 a month for complete medical and

surgical care for an entire family has been tentatively considered. For a couple or for a single person the dues would be less. The plan does not include hospitalization costs, as the members of the association plan to avail themselves of the statewide group hospitalization plan now being effected by the society in cooperation with the hospital associations. The society emphasizes that the premiums established were accepted by it "without expression of judgment" as to sufficiency. The plan does not limit the participants to any stipulated income group.

COOPERATIVE PLANNING IN  
PENNSYLVANIA

The committee of the Medical Society of the State of Pennsylvania has studied the work of the Emergency Child Health Committee to make recommendations to the state society as to future policies. The committee has worked in the closest cooperation with Samuel McClintock Hammill, chairman of the Emergency Child Health Committee.

When this work began, says Dr. Ben L. Hull in the *Pennsylvania Medical Journal* 42:237 (Dec.) 1938, in practically no county was there a well developed, coordinated effort on the part of the medical profession and other health agencies. As the result of a misunderstanding of one another's functions, in the majority of the counties there was definite antagonism between the profession on the one hand and the privately and publicly supported agencies on the other. In addition, the various privately and publicly supported agencies in the counties were competing among themselves rather than cooperating, which resulted in duplication of effort and inefficient service. These differences have been smoothed out largely, and the leadership of the medical profession and its willingness to cooperate with other agencies has been definitely established and deeply appreciated.

The most striking feature of the work has been, however, that it has opened up a new field of service in that the effort has been directed toward the protection of health rather than the cure of disease. This does not mean that the sick have been neglected because the various county committees have provided curative services where they were needed, whenever unsuspected handicapping defects have been recognized, provision has been made for their correction.

By Sept 15, 1938, a total of 148,143 children had been examined and 422,147 defects had been discovered. Of this number, 45.4 per cent have been corrected.

The physicians are encouraged to join the boards of welfare groups and assist in shaping their programs along the lines of medical leadership and interest them in directing their efforts to the financing of the corrective measures in the indigent and of assisting in getting in contact with families in the borderline and well-to-do groups and securing appointments with their family physicians at regular intervals.

The plan visualizes a strong central governing committee in the state society known as the Child Health Committee, with a similar committee in each county society. We have found that this type of medical leadership was always welcome.

In the actual working of the program among this class of people the parent-teacher associations, the tuberculosis societies and the child welfare leagues could all be well utilized in getting the children to the office of the family physician, in conveying back to the parents the necessary recommendations for correction that the physician has made, and in seeing that those corrections are carried out.

### POLITICAL HEALTH INSURANCE IN NEW ZEALAND

An editorial in the *New Zealand Medical Journal* (37:239 [Oct] 1938) tells how health insurance came to New Zealand. The first approach was the appointment of an investigation committee to hear evidence. This committee consisted entirely of members of one political party in the lower house of parliament. Its chairman was a member of the medical profession whose highest qualification was a political one and who dominated the committee. The report was kept secret, especially from all representatives of the medical profession.

The medical profession appointed a special committee of men of high standing and experience to draw up a plan for national health insurance suited to the conditions of practice in New Zealand. This committee's plan was then approved by the British Medical Association and presented to the government for its consideration and study. The plan was given scant if any real consideration by the government of New Zealand. Many months after its presentation to the government the responsible ministers concerned had not even read it. There were some discussions between representatives of the medical profession and the Ministers of Finance and Health but at no time was any information presented to the medical representatives concerning the government's proposal, except that the Minister of Finance was in favor of a universal scheme. The profession stressed the necessity for a service to the people unable to make full provision for themselves and pointed out that an incomplete medical service was grossly inefficient. The minister of finance constantly reiterated his determination not to allow in any circumstances any difference in medical treatment or in the personal attention given by the medical attendant. The profession sought to build up medical treatment to the highest level for all but the politicians were determined to bring down medical treatment to a strictly uniform level notwithstanding that this must develop uniformity of a low standard.

During all the discussions the committee showed a marked antipathy to the medical profession, and it became clear that the government did not desire to hear any evidence not in favor of its own proposals.

It may be stated, therefore, that the government has placed on the statute book the most far-reaching legislation of its kind ever drafted by a government anywhere in the world with the most incomplete preparation. The legislation has been evolved on the recommendation of an investigation committee of almost incredible inefficiency for the task allotted to it. The representations of the medical profession have not been seriously considered in the matter of major policy. The act determines the complete socialization of the profession and institutes a system of medical service which has aptly been described as 'demoralizing to those that give it and destructive to those that receive it—a service providing for the poorest type of treatment known to the medical profession, and this type is to be universal throughout the community.'

There can be no doubt as to the profession's duty to the country in this matter. For the benefit of the health of the people of New Zealand in the future, and for the preservation of all that is best in the profession of medicine, it is its duty to oppose to the uttermost this ill conceived measure so strongly tainted by party politics.

### COST OF PNEUMONIA TREATMENT

A study of the records of 625 pneumonia cases in New York City is reported by Joseph Hirsh in *Public Health Reports* (53:2153 [Dec 9] 1938). The cases were studied in terms of those factors in diagnosis and treatment to which monetary value can be assigned. The schedule used included (1) days hospitalized, (2) duration of illness, onset, admission, discharge, (3) serum (in units), (4) oxygen (in liters, later translated in terms of tanks), (5) x-ray plates, (6) laboratory services, pneumonia and pathology, (7) surgery, (8) drugs, (9) miscellaneous therapy, (10) consultations. These items were then priced on a conservative basis lower than those actually charged by the hospitals whose records were used.

The average cost per patient was \$167.60. Because there were several unusually expensive cases, the median of \$134.16 is taken as more significant. If the total cost is divided according to the type of services rendered, it is found that hospital care constituted 40 per cent of the total ward cost, 53 per cent of the semiprivate and 50 per cent of the private. Physicians' services comprised 22 per cent of the total ward cost, 26 per cent of the semiprivate, 35 per cent of the private and 62 per cent of the home. Serum therapy comprised 24 per cent of the total ward cost, 11 per cent of the semiprivate, 5 per cent of the private and 10 per cent of the home. The cost of other services constituted 15 per cent of the total for ward cases, 10 per cent for semiprivate, 10 per cent for private and 28 per cent for home.

The two major items of cost are hospitalization and physicians' services, of which the latter is much less than the cost of hospitalization. For ward cases serum therapy constituted a larger proportion of total costs than physicians' services.

### THE COST OF DENTAL CARE UNDER HEALTH INSURANCE

The Chicago Dental Society commissioned Peter T. Swanish, commissioner of placement and unemployment compensation of the Illinois Department of Labor, to undertake an analysis of the material accumulated by the Industrial Diagnostic Service, which had been conducted by the Chicago Dental Society as a measure of public health education. The study embraces 4,211 persons for whom dental work was done. The required information for use in the computations in this study was available for 1,308 females and 2,412 males.

The average length of time since the females included in the sample last visited a dentist was eighteen months, as compared with 32.9 months in the case of males. Women visit a dentist about 183 times as often as men. Over 65 per cent of the females included in the 1,308 cases visited a dentist within one year or less, 81.7 per cent within an interval of two years or less, 88.5 per cent within an interval of three years or less, 92.0 per cent within an interval of four years or less and 94.7 per cent within an interval of five years or less.

Actual dental need was defined as treatment considered actually necessary to safeguard the health of the person at the time of examination. To provide for the actual dental needs of the 4,211 individuals included in this sample would require in round sums an outlay out of the funds of a health insurance plan of \$48 for females, \$55 for males and \$53 for males and females combined.

Complete roentgenograms of the mouths of 4,211 persons were examined and reduced to dollar terms by qualified technicians and dentists, a dollar figure arrived at in this manner should approximate the actual dental needs of that large number of working men and women in whose behalf such plans are adopted or urged. A health insurance plan should undertake to meet the actual dental needs of persons covered by the scheme,

1 Swanish, Peter T. The Cost of Dental Care under Health Insurance. Chicago Dental Society, 1938.



would be obliged to expend on an average the sums indicated. In face of the tremendous fiscal obstacles in the way of a plan organized to provide for the actual dental needs of men and women, it is highly probable that a health insurance plan would be forced of necessity to limit itself to providing preventive treatment only. If we accept the arithmetical mean figure as the measure of dental need, and there is no good reason why it should not be accepted, then it is clear that no health insurance plan yet devised or placed in operation even pretends to provide for the actual dental needs of those embraced under such schemes. It is also quite clear that all such plans are organized to provide dental treatment of a preventive character and nothing more.

In 1931 the average per capita expenditure in Germany for cash and maternity benefits, hospital care, medical and dental treatment, medicines and drugs, funeral benefits, administrative and other costs was \$18.69. Of this total 5.08 per cent, or approximately 95 cents per capita was spent for dental care. Under the sickness insurance system in Denmark, a voluntary

scheme, the per capita outlay from recognized "sickness funds" in 1930 was \$7.51. Out of the \$7.51, 3.18 per cent, or roughly 24 cents, was spent for dentistry.

From the magnitude of these outlays it seems reasonable to infer that health insurance as one of several integral parts of a broader scheme to provide social security is also a device intended to insure political security and, together with all the other component measures included in social security plans, seems to rest on the assumption that a small dose of economic security will assure an adequate measure of political stability, and that while accomplishing the latter it will act to stalemate desire on the part of industrial workers at large for change of a more revolutionary nature.

As a practical proposition involving a fiscal burden of enormous proportions, a health insurance plan could not go beyond preventive care. The simple arithmetic of the matter suggests that even with a health insurance plan in operation there would still remain a vast amount of dental treatment for the private practitioner to supply.

## MEDICAL LEGISLATION

### Massachusetts

**Bills Introduced**—H. 287 proposes as a condition precedent to the issuance of a license to marry that each applicant present a statement signed by a licensed physician that he or she has submitted to a Wassermann or Kahn or similar blood test and that in the opinion of the physician, he or she "is not infected with syphilis or in a stage of that disease that may become communicable." The statement of the physician is to be accom-

panied by a record of the standard laboratory blood tests made. H. 288 proposes to prohibit the sale of any medicine "which in and of itself contains enough poison or other deadly drug so that if taken in whole or in part is sufficient to cause the death of the person taking it" unless the container shall be so labeled as to state the nature of the poison or the deadly drug, what quantity thereof would constitute a lethal dose, and the antidote therefor.

## WOMAN'S AUXILIARY

### Arkansas

The auxiliary to the Sebastian County Medical Society met in Fort Smith October 10 and voted to place *Hygiene* in the Girls' club, the Carnegie library, the Rosahe Tilles Children's home, the Y M C A and twelve rural schools.

The auxiliary to the Washington County Medical Society held a dinner meeting at Fayetteville, November 1. Following the dinner and program, members worked on supplies for the City Hospital.

### Louisiana

The principal project of the auxiliary to the Caddo Parish Medical Society is sponsoring the education of children in the Pines Preventorium for the tuberculous. Other projects are *Hygiene*, Doctors' Day, Southern medical history, periodic health examination and a fund to aid indigent physicians.

### Minnesota

The auxiliary to the Minnesota State Medical Association held an executive board meeting at Minneapolis September 26. The speakers were Mrs. Charles C. Tomlinson, president of the auxiliary to the American Medical Association, and Dr. J. M. Hayes, president of the Minnesota Medical Association.

### Mississippi

The auxiliary to the Mississippi State Medical Society has decided to raise a fund of \$5,000 to finance the purchase of certain needs of the state preventorium for the care of children. The goal is to complete the fund before the annual meeting in Gulfport in 1939.

### Missouri

Dr. Robert E. Schluter, St. Louis, spoke at a meeting of the auxiliary to the St. Louis County Medical Society October 11 on "Recent Developments in Medical Science." The presidents of the women's clubs of the city were guests.

The auxiliary to the Buchanan County Medical Society has reported that 103 subscriptions to *Hygiene* were placed in schools in the county. The auxiliary contributed \$15 to the essay fund of the state auxiliary.

### New York

The auxiliary to the Medical Society of the County of Kings held its first annual health institute at the county medical society building, 1313 Bedford Avenue, Brooklyn, October 11. Among the speakers were Dr. John B. Dalbora, president, Medical Society of the County of Kings; Dr. Matthew Walzer, "Are You Allergic?"; Dr. Walter Truslow, "What Price Feet?"; Dr. George H. Roberts Jr., "Heartaches" and a demonstration of the value of electrocardiograms; Dr. LeGrand Kerr, "Why Immunize the Child?"; Dr. Charles A. Gordon, "Maternal Welfare", motion picture, "The Birth of a Baby".

Mr. F. Davis, superintendent of Nassau Hospital, spoke on "Hospitalization and the Medical Plan" in the Nassau Hospital Auditorium October 18 before the auxiliary to the Nassau County Medical Society.

### Oklahoma

The auxiliary to the Pottawatomie County Medical Society met in Shawnee September 28. An address on auxiliary work was given by the president, Mrs. Clinton Gallaher.

The auxiliary to the Oklahoma County Medical Society held a registration tea in Oklahoma City September 30 with 150 members in attendance. The first monthly sewing and business meeting was held at the Y W C A October 26 with ninety-five members present. The auxiliary furnishes clothing for the State Hospital for Crippled Children.

### Texas

The auxiliary to the Northwest Texas District Medical Society met in Breckenridge September 13. Dr. T. C. Terrell, Fort Worth, counselor for the thirteenth district, spoke on socialized medicine.

The auxiliary to the Bell County Medical Society held a meeting at the home of Dr. and Mrs. G. V. Brindley, Temple, October 14. Mrs. F. F. Kirby outlined the aims of the auxiliary, emphasizing health education, student loan funds and the promotion of friendships among the families of doctors. One hundred and forty members of the county auxiliary were present.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### ALABAMA

**Society News**—Dr Tinsley R Harrison, Nashville, Tenn, addressed the Madison County Medical Society, Huntsville, recently on "Use and Abuse of Drugs in the Management of Cardiac Disease." Dr Joseph E Hirsh, Birmingham, discussed "Medical Treatment of Peptic Ulcer with Special Reference to Histidine" before the society recently. At a meeting of the Tuscaloosa County Medical Society November 14 Dr James M Mason, Birmingham, spoke on empyema and Dr James William MacQueen, Birmingham, standardization of hospitals.

**Changes in Health Officers**—Dr Jack A Crittenden, Elba has been appointed health officer of Coffee County, succeeding Dr William A Dodson Jr, who resigned on account of ill health. Dr Martie F Parker, Greenville, has been named health officer of Butler County to succeed Dr Charles J Fisher, who is taking graduate work at the Johns Hopkins School of Hygiene and Public Health, Baltimore. Dr Hugh G Clark, Lafayette, has been appointed health officer of Chambers County. He succeeds Dr Abraham I Perley, who was awarded a year's graduate study at Harvard University.

### CALIFORNIA

**Medical Care for Needy Transients**—The Agricultural Workers' Health and Medical Association, a recently established government agency to provide medical care for needy transients has been moved from Tulare to 1110 East Main Street, Visalia. The association dispenses federal funds, certifying to private physicians and private hospitals sick or injured transients who have not been in the state long enough to qualify for county aid.

**Society News**—The San Francisco County Medical Society was addressed January 10 by Drs Mayo H Soley, San Mateo, on "Differential Diagnosis Between Hyperthyroidism and Heart Disease" and Howard A Brown and Jesse L Carr, "Cerebral Anoxemia Resulting from Nitrous Oxide Anesthesia." Dr George R Herrmann, Galveston, Texas, addressed the Los Angeles Clinical and Pathological Society November 16 on "The Clinical Nature of Heart Failure."

### CONNECTICUT

**Changes in Health Officers**—Dr Samuel S Farago, Westerly, R I, has been appointed health officer of Pawcatuck succeeding the late Dr William A Hillard. Dr Helen Baldwin has been appointed health officer of Canterbury. Dr Charles Flynn is now acting health officer of Hamden. Dr George H Joslin was formerly health officer of Hamden. Dr William Sherman Randall is health officer of Shelton, filling the unexpired term of the late Dr John Eugene Black. Dr Donald J McCrann West Hartford, has been appointed health officer of Bloomfield replacing Dr Maurice B Thompson, who has moved to New York to engage in full time medical insurance work, according to the *New England Journal of Medicine*. Dr Archibald M Gaulocher, Wingdale, N Y, has been appointed health officer of Kent and Dr Frank D Ursone, Norfolk, of Colebrook. Dr Edward J Brophy, Norwich, is completing the unexpired term of the late Dr Harrison Gray.

### DISTRICT OF COLUMBIA

**Society News**—The Georgetown Clinical Society and the George Washington University Medical Society presented a symposium on practical considerations of common problems in obstetrics and gynecology before the Medical Society of the District of Columbia December 14. *THE JOURNAL*, January 7, erroneously reported that the Georgetown University Medical Society cooperated in the program. Dr Charles Joseph Horgan discussed "The Surgical Consideration of the Redundancies of the Colon" in his presidential address before the Washington Medical and Surgical Society, Washington, recently. Dr Horgan retired as president at this meeting.

### FLORIDA

**Personal**—Dr Lucien Y Dyrenforth, Jacksonville, was recently made chairman of the committee on the biologic sciences of the Florida Academy of Sciences. Dr Edward Jelks, Jacksonville, was elected chairman of the technical advisory committee to the Florida Crippled Children's Commission at a meeting in Jacksonville December 1.

**Hospital News**—The Lake County Medical Center was formally dedicated in Eustis November 6. The new hospital is under the supervision of the Lake County Medical Society and was made possible by a gift of the late Frank D Waterman, who donated \$145,000 worth of bonds on the Foundation Inn Building to the Lake County Medical Center, consisting of ten stockholders, all members of the county medical society. Speakers at the dedicatory ceremonies included Dr William Henry Spiers, Orlando, president of the state medical association, Senators C O Andrews and Claude Pepper, and Mayor Gaylord of Eustis.

**District Meeting**—The second annual meeting of the South Central Medical Society was addressed in Eustis recently, among others, by the following:

Dr Lester L Whiddon Fort Pierce Practical Odds and Ends  
Dr William O Fowler, Orlando Artificial Pneumothorax Its Technique Value and Usage  
Dr Thomas C Kenaston Cocoa Coronary Thrombosis in General Practice  
Dr Thomas M Rivers Kissimmee Relation of the Sympathetic Nervous System to Health and Longevity

Dr William P Nicolson Jr, Atlanta, addressed the evening meeting on "Cancer of the Breast, Its Diagnosis and Management." The Lake County Medical Society acted as host.

### GEORGIA

**Society News**—At a meeting of the Fulton County Medical Society, Atlanta, November 17 the speakers included Drs Lonnie W Grove and Kenneth R Bell on "Surgical Diseases of the Spleen," and Calvin B Stewart, "Cancer of the Lip." The society was addressed November 3 by Dr David Henry Poer on "Recent Developments in the Treatment of Thyroid Conditions", Dr Arthur Park McGinty and W Elizabeth Gambrell, Ph D, presented a paper entitled "Chronic Brucellosis."

**District Meeting**—At a meeting of the Eighth District Medical Society in Douglas recently the speakers included Drs Franklin G Eldridge, Valdosta, "Malaria Control", Benjamin H Minchew and Braswell E Collins, Waycross, "Further Study of the Social Aspect of Strabismus", Grady N Coker, Canton, president of the state medical association, "Our Problems", Thomas H Johnston, Douglas, "The Technique of Local Anesthesia", Charles H Watt, Thomasville, "A Modified Well Leg Traction Splint and Distractor Combined," and William F Reavis and L W Pierce, Waycross, "Prostatic Obstruction."

### ILLINOIS

**New County Society**—A tricity medical society, embracing Pope, Johnson and Massac counties has been organized with Dr Lewis S Barger, Golconda, as president. Dr Virgil O Decker, Metropolis, was chosen vice president and Dr Joseph A Fisher, Metropolis, secretary.

### Chicago

**Society News**—Dr Morris Fishbein, Editor of *THE JOURNAL*, will address the Rotary Club of Chicago at the Hotel Sherman January 31 on "The Social Aspects of Medical Care." Paul H Douglas, Ph D, professor of economics, University of Chicago, addressed the club January 3 on "The Need for Better Medical Service."

**Personal**—William Baker Day, Ph M, dean of the University of Illinois College of Pharmacy since 1920, died December 10 in Oak Park, aged 67. Professor Day was professor of histologic botany from 1898 to 1913 and was acting dean and professor of botany and materia medica from 1913 to 1919. He was president of the American Pharmaceutical Association in 1912 and secretary from 1914 to 1925. For several years he was secretary of the board of trustees of the U S Pharmacopeial Convention.

**Medical Counselor Appointed**—The Chicago *Tribune* has appointed Dr Frederick W Fitz, a member of the staff of Passavant Hospital, as medical counselor for its employees. Dr Fitz graduated at Northwestern University Medical School in 1934. The counselor's services will be controlled by the Dearborn Mutual Benefit Association, an employees' organization the cost to be met by the *Tribune* company. The counselor's services will be entirely advisory. He will not treat or prescribe.

for or become the personal physician of any employee or member of any employee's family. According to the *Tribune*, the counselor's duties will be

- 1 To confer with employees who wish to consult him about their personal medical problems or those of their families
- 2 To advise when requested as to competent physicians in all parts of the city and suburbs and to maintain a list of such physicians men known to possess not only skill but a high sense of honor and integrity whose fees will be in accordance with the employees' capacity to pay
- 3 To assist in arranging for surgical procedures hospital accommodations and so on
- 4 To act when the employee or his family desires as an agent between them and the physician they select. The counselor's medical knowledge would assure a fair answer to such questions as the necessity for a proposed operation
- 5 To cooperate in assuring employees fair charges on the part of physicians surgeons hospitals and nurses
- 6 When an employee so requests to check any diagnosis brought him by the employee either by conference with the physician making it or by reference to the symptoms leading to the diagnosis
- 7 To advise on group health problems of employees and inspect work conditions in departments of the *Tribune*

## INDIANA

**County Societies Expand Activities**—The Lake County Medical Society now sponsors a survey of venereal diseases in the county and a plan with a reputable insurance organization offering hospital and voluntary sickness insurance, according to the state medical journal. The employment of a full time executive secretary in Hammond has also been approved. The Vanderburgh County Medical Society also recently voted to reorganize. Expanded activities will include the employment of a full time executive secretary and a new plan for medical care, it is reported.

## IOWA

**Society News**—At a meeting of the Des Moines Academy of Medicine and the Polk County Medical Society, Des Moines, October 25, the speakers were Drs. Guy C. McFarland Jr., Ames, and Donald H. Kaump on 'Low Back Pain and Epiaero-iliac Lipoma' and 'Leukemoid Reactions' respectively. Dr. John P. Peters, New Haven, Conn., addressed the Linn County Medical Society in Cedar Rapids December 15 on 'Nephritis' and 'Medical Economics'.

**Laboratory Courses for Study of the Pneumococcus**—The state department of health conducted a laboratory course for study of the pneumococcus and of diagnostic procedure for type determination of pneumonia in the Medical Laboratories Building, Iowa City, December 6-9 and 14-16. The course was given by Dr. Milford E. Barnes, director of the state hygienic laboratory, assisted by Dr. Irving H. Borts, bacteriologist in charge, and other staff members. According to the state medical journal, the course affords an opportunity for hospital and laboratory workers, technicians and physicians in all parts of the state to become more familiar with the Neufeld method. Limited funds were available through the U. S. Public Health Service to finance part of the expenses of laboratory technicians who registered for the course. A third course may be given this month.

## MASSACHUSETTS

**Graduate Extension Courses**—The Massachusetts Medical Society, the state department of health, the U. S. Public Health Service and the U. S. Children's Bureau are sponsoring a series of medical graduate extension courses throughout the state. The current series will be offered in New Bedford, Lawrence, Salem, Northampton, Quincy, Brockton, Milford and Fitchburg. Courses in the remainder of the state will be conducted during the winter and spring months. Subjects will include anemia, Bright's disease and hypertension, heart diseases, gonorrhea, syphilis, obstetrics and pediatrics.

**Dr. Wilhelm Superintendent of Peter Bent Brigham Hospital**—Dr. Norbert A. Wilhelm, superintendent of Butterworth Hospital, Grand Rapids, Mich., has been appointed superintendent of Peter Bent Brigham Hospital, Boston, succeeding Dr. Joseph B. Howland. A graduate of St. Louis University School of Medicine, class of 1925, Dr. Wilhelm served as second assistant superintendent of Peter Bent Brigham Hospital from July 20, 1930, to March 5, 1934, when he was named first assistant, this position he held until April 1, 1937, when he went to Grand Rapids. Dr. Howland graduated at Harvard University Medical School, Boston, in 1896 and has been superintendent of Peter Bent Brigham Hospital since May 1, 1919. The change was effective January 1.

**Society News**—Dr. William Dameshek discussed 'The Relations of Hematology to Dermatology' before the New England Dermatological Society in Boston December 14. The Massachusetts Society of Examining Physicians was

addressed December 14 by Robley D. Evans, Ph.D., Cambridge, on 'Some Health Hazards in the Use of Radioactive Substances,' and Dr. William J. Brickley, Boston, 'A Comparison of the Practice of Medicine and the Practice of Law.'—Dr. Channing Frothingham, Boston, addressed the William Harvey Society of Tufts College Medical School, Boston, November 18 on 'The Economic Side of Medicine.'—Dr. Charles H. Shamlian discussed 'Asphyxia: Its Prevention and Treatment' before the Eastern Hampden Medical Association recently in Springfield.

## MICHIGAN

**Study of Hospital Needs in Detroit**—A study of the Detroit hospital situation recently completed by Dr. Jacob J. Golub, director of the Hospital for Joint Diseases, New York City, indicates a need for more hospital beds. Dr. Golub's study was part of a survey conducted by the Council of Jewish Federations and Welfare Funds, Inc., at the request of the Jewish Welfare Federation to determine special aspects relating to the question of establishing a hospital under Jewish auspices in Detroit. Dr. Golub said that it is generally regarded as desirable for large cities to have five general beds for each thousand of population, at 80 per cent occupancy. Eight of the largest cities in the United States exceed that number. But Detroit, although occupying fourth place in the country on the basis of population, drops to tenth place from the standpoint of its ratio of hospital beds, taking its population at its 1930 census of 1,568,662. Because Detroit has grown rapidly and has a predominantly youthful population its relative shortage of hospital beds has not yet become noticeable. Between 1910 and 1920, a period of high industrial growth in the motor industry, Detroit's population rose 113 per cent. At the end of the decade between 1920 and 1930 the census rose to 1,568,662, an increase of 57 per cent. Because of this great influx, Detroit has a younger population than any other city in the country, 75.8 per cent being 40 or younger. The sickness rate per thousand people tends to increase with age. It is reported that on the average in any one day, among children 15 years of age, one in twenty-four is sick, among persons between the ages of 15 and 24 years one in forty is sick, among persons between the ages of 25 and 64, one in twenty-four is sick, and among persons 65 years and older, one in eight is sick. Dr. Golub's study points to the factor of increasing bed utilization in Detroit's forty-two hospitals with a capacity of 7,092 beds. The eleven general hospitals, with more than a hundred beds each, at present admit 77 per cent of the community's patients and are occupied 85 per cent of capacity. During several months of the year they have no vacant beds at all. When a hospital is on the average occupied from 80 to 85 per cent of its capacity it is, from the standpoint of community service, fully occupied. The difference between 80 and 85 or 100 per cent represents beds held for advance reservations for patients, beds vacated in the afternoon and not occupied by patients (on the waiting list and sent for) until the next morning, and beds held for emergency service. Since 1930, presumably because of the economic depression Detroit's rate of growth has lost its momentum and shows only a 5 per cent increase in 1936 over the 1930 census. This trend would indicate that Detroit's population is growing older, the bed utilization is rising and the shortage of facilities will soon become evident. Dr. Golub said there seems to be no good reason why the Jews should not participate in meeting the requirements of the sick in Detroit with reference to hospital care. He suggests the ultimate establishment of a 200 bed institution operating on the highest standards. 'The cost of erecting and equipping a 200 bed hospital would be close to \$1,000,000. A study of the problems in financing Dr. Golub's proposed hospital project has been prepared by Harry L. Lurie, executive director of the Council of Jewish Federations and Welfare Funds.'

## NEBRASKA

**Society News**—Dr. Stuart W. Harrington, Rochester, Minn., addressed the Omaha-Douglas County Medical Society, Omaha, December 13 on 'Surgical Treatment of Diaphragmatic Hernia' and Dr. John C. Sharpe on 'Treatment of Hemorrhagic Blood Diseases.' Dr. Frank W. Hartman, Detroit, addressed the society November 8 on anoxia and Dr. Frank M. Conlin 'Differential Diagnosis of Intrathoracic Tumors.'—Drs. Charles A. Owens and Harley E. Anderson, Omaha, addressed the Adams County Medical Society, Ingleside, November 3 on 'The Use of Sulfanilamide in Urology' and 'The Use of Cystography in Placenta Praevia.'

respectively—Drs Richard F. Richie and Roy H. Whitham, Lincoln, addressed the Lancaster County Medical Society November 1 on "Hysteria" and "Modern Gastric Surgery" respectively.

## NEW YORK

**Birth Certificates to Show Mothers' Blood Tests**—A law requiring that birth or stillbirth certificates indicate whether a blood test was made during pregnancy or at delivery became effective in New York January 1. This measure is a companion law to one also enacted in March 1938 providing for serologic blood tests of expectant mothers. The new birth certificate will give the date on which the blood test was made during pregnancy or if no test was made, the reason. The result of the test will not be given on the certificate.

**Fifty-One Years a County Secretary**—Dr Samuel W. Close, Gouverneur, was honored at a dinner December 4 by members of the St. Lawrence County Medical Society in recognition of his services as secretary for fifty-one years. Dr Frank F. Williams, Canton, was toastmaster and Dr Grant C. Madill, Ogdensburg, presented to Dr Close for the society a gold-headed cane bearing in appropriate inscription Dr Close graduated from New York University Medical College, New York, in 1885 and settled in Gouverneur in 1886. At a recent meeting of the society he was made secretary emeritus for life.

## New York City

**Harvey Lecture**—Edwin J. Cohn, Ph.D., professor of biological chemistry, Harvard University Medical School, Boston, will deliver the fourth Harvey Lecture of the current series at the New York Academy of Medicine January 19. His subject will be "Proteins as Chemical Substances and Biological Compounds."

**Dr Wilcox Appointed Director of Academy**—Dr Herbert B. Wilcox, professor of diseases of children at the College of Physicians and Surgeons of Columbia University, has been appointed director of the New York Academy of Medicine to succeed Dr John A. Hartwell, who has resigned. The change will take place April 1. At the annual meeting January 5 Dr Malcolm Goodridge was installed as president for a term of two years. The retiring president, Dr James Alexander Miller, in his address revealed that the academy had recently been asked to show why it should be exempt from federal income tax. After detailed examination the exemption was allowed. The academy has been exempt from all taxation since it was founded in 1847. The Medical Information Bureau, established in 1928, has now been raised to the status of a regular standing committee of the academy.

**Physicians' Club at the World's Fair**—Announcement is made of the formation of the Professional Club for physicians and public health workers at the New York World's Fair. Incorporators of the club were Drs James R. Reuling Jr., who was elected president, Edward R. Cunniffe and Matthias Nicoll Jr., White Plains, N. Y., vice presidents. Mrs W. R. Walsh, secretary, and Dr Benjamin Wallace Hamilton, treasurer. Club rooms will be provided on the main floor of the Medical and Public Health Building of the fair. Membership is open to accredited members of the American Medical Association and the American Public Health Association. Accredited representatives of organizations whose financial support has made possible the educational exhibits in the Medical and Public Health Building will also be members and it is expected that membership will be extended to other groups.

**Art Work by Hospital Patients**—An exhibition of paintings and drawings by patients in the psychiatric division of Bellevue Hospital was held at the Harlem Community Art Center in November under the auspices of the hospital and the WPA Federal Art Project. Teachers furnished by the federal art project have worked since the spring of 1935 with the patients under the supervision of the psychiatric staff, making notes on the behavior and remarks of patients during the periods devoted to art work. From the data thus obtained the physicians believe they have gained certain conclusions of value in the diagnosis, analysis and treatment of the patients. The exhibition consisted of 106 entries, grouped by case types covering both adults and children. Art classes have also been found beneficial to handicapped children at the Convalescent Home for Hebrew Children, Rockaway Beach, L. I. The work not only serves educational and recreational ends but has helped crippled children to recover the use of their fingers in many cases. It has also improved morale in the orthopedic ward, the home reported.

**Personal**—Dr Solomon Stan Bauch was elected president of the New York Physicians' Art Club at the annual dinner November 26, Dr Alfred Braun vice president and Dr J. R. Gudger secretary—Dr Rudolf Schindler, Chicago, gave the annual Herbert Swift Carter Lecture at Columbia University College of Physicians and Surgeons November 29 on "The Clinical Significance of Gastroscopy." Dr Schindler also lectured December 2 at Cornell University Medical College on "Gastroscopy with Special Reference to Its Value in the Fight Against Gastric Carcinoma" and November 30 before the New York Gastro-Enterological Association on "The Clinical Value of Gastroscopy." He addressed the New York Academy of Medicine on "Chronic Gastritis" January 5.—The medical board of St. Mary's Hospital, Brooklyn, sponsored a dinner in honor of Dr John Richard Kevin December 10 at the Hotel St. George, marking his fiftieth anniversary as a member of the staff.—Dr Joshua M. Van Cott, emeritus professor of pathology and clinical medicine, Long Island College of Medicine, was recently elected a member of the board of trustees. A graduate of the Long Island College Hospital in 1885, Dr Van Cott is president of the board of trustees of the Hoagland Laboratory.

## NORTH CAROLINA

**New City Health Building**—A building formerly used for a school in Winston-Salem has been remodeled as headquarters for the city's health services, it is reported. The city health department, the city-county venereal disease clinic, offices of the outpatient department of the city hospital and the medical work of the city department of welfare will be accommodated in the building. An addition was made for the city health department laboratory.

## OHIO

**Dedication of Hospital Unit**—Dedication of a new outpatient dispensary and contagious disease wing attached to the Starling-Loving University Hospital, Ohio State University College of Medicine, Columbus, was a feature of the annual clinics and homecoming November 19. The clinic will use four floors, and two floors will make up the unit for contagious diseases. One room is reserved for the respirator recently purchased with funds from the President's Birthday Ball.

**Conference of Health Commissioners**—The nineteenth annual conference of Ohio health commissioners with the state department of health was held in Columbus November 17-18. The guest speakers included Drs John Sundwall, Ann Arbor, Mich., on "Qualifications of Public Health Personnel", Allen W. Freeman, Baltimore, "Present Tendencies in Rural Health Organization," and Miss Pearl McIver, U. S. Public Health Service, Washington, D. C., "Making Public Health Nursing More Effective."

**Society News**—Dr Roy D. Arn, Dayton, addressed the Montgomery County Medical Society, Dayton, December 2 on "Appendicitis with Special Reference to the Treatment of Complicated Cases." Four thousand persons visited a "Hall of Health" sponsored by the society and the Y. M. C. A. department of physical education during the week of November 7.—Dr Guy H. Williams Jr., Cleveland, was elected president of the Association of Physicians of Ohio State Institutions at the recent annual meeting in Columbus, Dr Ewing H. Crawfis, Lima, vice president, and Milton P. Smith, Toledo, secretary.—Dr Frederick H. Falls, Chicago, addressed the Academy of Medicine of Cleveland December 16 on "Management of the Common Complications of Pregnancy."—Dr Robert D. Mussey, Rochester, Minn., addressed the Academy of Medicine of Cincinnati December 13 on "Progress and Conservatism in Obstetric Practice."

**Prescription Not Admissible in Evidence**—A physician's prescription cannot be received in evidence under the laws of Ohio except under the same circumstances as those that make the testimony of the prescribing physician admissible, according to Judge James S. Martin of the court of common pleas, Lucas County. A prescription the judge ruled, is within the contemplation of section 11494, Ohio general code, which prohibits a physician from testifying concerning communications made to him by his patient or his advice to his patient, in a professional relation, unless the patient expressly or impliedly consents to such testimony. The occasion of Judge Martin's ruling was a will contest (*Zwicker et al v. Leonard*, No. 153334) in which it was contended that the testator was not competent when he executed his will because of the continued use of narcotic medication. To

prove this contention, contestants sought to require the drug house which seemingly had filled the prescriptions of the attending physician to produce those prescriptions. This Judge Martin refused to require "The court," the judge stated in a journal entry, finds that such prescriptions are privileged under the law and not available as evidence in this action"

### PENNSYLVANIA

**Society News**—Dr Thomas H A Stites, Nazareth, among others, addressed the Westmoreland County Medical Society December 20 on 'Postgraduate Education'—Dr David H Ruben, Washington, addressed the Washington County Medical Society, Washington, December 14 on 'Urology in General Practice'—Dr Chauncey L Palmer, Pittsburgh, chairman of the committee on public relations of the Medical Society of the State of Pennsylvania, addressed the annual public health meeting of the Fayette County Medical Society, January 12 on 'Socialized Medicine'

### Philadelphia

**Jeanes Hospital Ten Years Old**—Jeanes Hospital celebrated its tenth anniversary at a meeting December 12 at the Friends' Meeting House. The speakers on the program were Drs Morris Fishbein, Chicago, Editor of THE JOURNAL on 'Importance of the Early Recognition of Cancer' and Wilmer Krusen, 'The Responsibility of the Public Regarding Cancer'. Mr Charles F Jenkins treasurer of the hospital recounted its history. Mr J Wilmer Lundy, president, introduced the program.

**Society News**—The annual Gross Lecture of the Pathological Society of Philadelphia was delivered by Dr Milton C Winternitz, New Haven December 8, on 'Further Studies on the Pathogenesis of Vascular Disease'. Plans for the third annual Pediatric-Pharmacy Week to be sponsored by physicians and pharmacists of Philadelphia during the week of May 1 were laid at a meeting November 7 at the Philadelphia College of Pharmacy and Science. Dr William N Bradley is chairman for physicians and Ambrose Hunsberger Ph M, for the pharmacists.

**Cancer Research Project**—The Women's Medical College of Pennsylvania has opened a cancer research project under which 1000 women will receive physical examinations twice a year for five years in an attempt to detect cancer or prevent its development. Clinics for the examinations will be held the second Thursday of each month under the supervision of Dr Catharine Macfarlane with the assistance of Drs Margaret C Sturgis and Julia Ruth S Fetteiman. No charge is made for the examination and all cases requiring treatment are referred to family physicians.

**Hospital News**—A new unit of St Christopher's Hospital for Children was dedicated November 30. Funds for the building were provided by a bequest of \$100,000 in 1931 by the late Joseph Bromley and one of \$150,000 by the late William B Scott, for many years president of the hospital. The Methodist Episcopal Hospital recently dedicated a new \$50,000 x-ray department of which Dr Milton F Percival is in charge. Coming lectures in the series presented by Mount Sinai Hospital will be

Dr Frank E Lentz, Rheumatism January 18

Dr Harry J Epstein, Syphilis—the Masquerader of Diseases February 15

Dr Charles S Wachs, Old and New Ideas of Childbirth, March 15

Dr Morris Weinstein spoke December 21 on 'Donts in Ear, Nose and Throat Conditions'

### Pittsburgh

**The Emmerling Lecture**—Dr Ralph Pemberton, Philadelphia, delivered the Drs Charles and Karl Emmerling Memorial Lecture at the Pittsburgh Academy of Medicine December 13 on 'The Syndrome of Arthritis'.

**Society News**—The child health division of the General Health Council of Pittsburgh sponsored a meeting in the interest of children with cardiac disturbances December 6. Dr Ann G Kuttner, resident physician at Irvington House for Cardiac Children, Irvington, N Y, was the guest speaker on 'The Care of Children with Rheumatic Heart Disease'. Dr John M Lichty discussed the local problem of this group. Among speakers at a meeting of the Pittsburgh Surgical Society December 16 were Drs Walter Scott Nettrour on 'Surgical Imports of Bile Acid Determinations for Liver Function' and Harold W Rusbridge and Grover C Weil, 'A Study of Surgical Management of Lipoma'. Dr John S Lewis Jr, Youngstown, Ohio, among others addressed the Pittsburgh Urological Association December 12 on 'Urine Drainage—Its Clinical Applications'.

### RHODE ISLAND

**Society News**—A panel discussion on "Cooperation in the Cancer Problem" was presented at a meeting of the Providence Medical Association November 7. Dr Herman C Pitts was chairman and the discussers were Drs Benjamin Earl Clarke, on the role of the pathologist, Peter P Chase, the surgeon, George W Waterman, the gynecologist, and Isaac Gerber, the radiologist. Dr Sylvester McGinn, Boston, addressed the Pawtucket Medical Association November 17 on 'Modern Treatment of Congestive Heart Failure'. Dr Irving J Walker, Boston, will speak January 19 on 'Clinical Aspects of Water Balance'.

### TEXAS

**Post-Graduate Assembly of Southwest Texas**—The annual International Post Graduate Medical Assembly of Southwest Texas will be held in San Antonio January 24-26. Sixteen instructors are listed in the program.

**Public Health Association Meeting**—The annual meeting of the Texas Public Health Association was held in San Antonio in November under the presidency of Dr Benjamin M Primer, Austin. Among the speakers were Drs Arthur T McCormack, Louisville, Ky, Clifford E Waller of the U S Public Health Service, Washington, D C, and Ernest W Bertner, Houston president of the Texas State Medical Association. Dr Walter Kleberg, health officer of Galveston, was elected president.

**Public Medical Meeting**—The Central Texas Medical Society sponsored a banquet meeting in Waco November 7 to which public officials and representatives of many civic groups were invited and physicians were asked to bring non-medical friends. The speakers were Drs Rosco G Leland, Chicago, director of the Bureau of Medical Economics, American Medical Association, Edward H Cary, Dallas, chairman of the Association's Committee on Legislative Activities, Samuel E Thompson, Kerrville, a former president of the Texas State Medical Association and Holman Taylor, secretary of the state association. Drs Leland Thompson and Taylor addressed a similar meeting in Houston in September under the auspices of the Harris County Medical Society.

### WASHINGTON

**Hospital News**—A thirty-two bed hospital for the treatment of Buerger's disease has been opened at Soap Lake according to *Northwest Medicine*. It was reported that the hospital has applications from 900 prospective patients.

**Society News**—Dr Brien T King, Seattle addressed the King County Medical Society, Seattle December 19 on 'A New and Function-Restoring Operation for the Relief of Bilateral Recurrent Nerve Paralysis' and Dr Ralph H Loe on 'Tumors of the Sacrococcygeal Region'. Drs Percy F Guy and Glenn S Usher of the state department of health, Seattle addressed the Cowlitz County Medical Society Longview, November 16 on causes and prevention of maternal deaths and on venereal disease control. Drs Joseph Irving Tuell, Seattle, and Melvin F Fuller, Aberdeen addressed the Grays Harbor County Medical Society, Aberdeen, November 16, on subdeltoid bursitis and treatment of pneumonia with sulfanilamide. Dr Louis P Gambee, Portland Ore, addressed the Walla Walla Valley Medical Society, Walla Walla, December 8 on intestinal obstruction due to recurrent volvulus of the sigmoid. A symposium on lobar pneumonia was presented before the Spokane County Medical Society, Spokane, December 8, by Drs George H Anderson, James D Edgar, Milo T Harris and Donald A Palmer.

### WISCONSIN

**Society News**—Dr Elmer L Sevringhaus, Madison, addressed the Dane County Medical Society, Madison November 10 on 'Pituitary Therapy in General Practice'. Dr Eben J Carey, Milwaukee, addressed a meeting of the Columbia-Marquette-Adams County Medical Society and its auxiliary with dentists, lawyers and pharmacists of the three counties in Portage November 9, his subject was 'Relation Between Medicine and the Public'. At a meeting of the Eau Claire-Dunn-Pepin County Medical Society November 28 Dr Robert P Montgomery, Milwaukee, spoke on 'Low Back Pain and Sciatica' and Mr C W Kroening of the Employers' Mutual Insurance Company Wausau on 'Wisconsin Hospitals and Medical Payment Plan' and 'Open Panel Agreement with Wisconsin Workmen's Compensation Carriers'. At a meeting of the Green Lake-Waushara Counties Medical Society

Berlin, November 21, the speakers were Drs William J Bleckwenn, Madison on "Diagnosis and Treatment of Head Injuries," John T F Gallagher, "Subacromial Bursitis," and George H Ewell, "Urological Problems of General Interest" —Dr Philip H Kreuscher, Chicago, addressed the Rock County Medical Society, Janesville November 22 on 'Injuries and Diseases Involving the Lower Part of the Spine and Sacro-Iliac Joints'

### GENERAL

**Special Society Elections**—Dr Arthur T McCormick, Louisville, Ky, was named president elect of the Southern Medical Association at the annual meeting in Oklahoma City in November and Dr Walter E Vest, Huntington, W Va was installed as president Drs Henry H Turner, Oklahoma City, and William Hibbitts, Texas, were elected vice presidents The 1939 meeting will be held in Memphis, Tenn Dr Vest appointed Drs Robert M Anderson, Shawnee, Okla, William H Anderson, Booneville, Miss, and Lucien A LeDoux, New Orleans, to the council of the association to succeed respectively Drs Willis K West, Oklahoma City, Harvey F Garrison Jackson, Miss, and Arthur A Herold, Shreveport, La

**Casselberry Prize to Be Awarded**—The American Laryngological Association announces that the sum of \$500 has accumulated from the Casselberry Fund and will be awarded in part or as a whole as a prize, a decoration or for the expense of original investigation or research in the art and science of laryngology and rhinology Theses or reports of work done must be in the hands of the secretary Dr James A Babbitt, 1912 Spruce Street, Philadelphia, before February 1 Any further information may be obtained from Dr Babbitt

**Bequests and Donations**—The following bequests and donations have recently been announced

Rivercrest Preventorium, Mont Clare, Pa, of the Kensington Dispensary for the Treatment of Tuberculosis \$15,000 by the will of the late Amos Bird, Jr, retired ship captain

St Vincent's Hospital \$20,000 New York Foundling Hospital and St Ann's Maternity Hospital, all of New York \$5,000 each by the will of Mrs Eleanor Iselin Kane

New York Medical College, Flower and Fifth Avenue hospitals, New York \$20,000 to endow a bed for needy American artist musicians by the American Criterion Society

The Doernbecher Hospital and Shriners' Hospital for Crippled Children, Portland, Ore, each one third of a \$25,000 estate left by Fred A Allen

Montefiore, Hebrew Beth Israel hospitals and the Hospital for Joint Diseases, New York \$11,645 each by the will of the late Betsy Dinkelman

Englewood Hospital, Englewood, N J \$10,000 by the will of the late Frederick Lyon

**Medical Director Appointed**—Dr John Warren Bell, Lincoln, director of maternal and child health in the state department of health of Nebraska, has been appointed medical director of the National Society for the Prevention of Blindness With this addition to the staff the society plans more extensive cooperation with the medical profession and local, state and national health officers and associations Dr Bell graduated from the University of Minnesota Medical School, Minneapolis, in 1916 Before going to Nebraska he was director of the division of maternal and child health in Cattaraugus County in New York

**Warning of Swindler**—California physicians have recently complained that a man using the name Andrew Dolte has been posing as a representative of the F A Davis Company, medical publishers of Philadelphia, the company reports The man has taken orders for medical books, collected for them and failed to deliver the books In many instances he has induced physicians to give him books from their libraries and has not delivered other books in exchange as promised This impostor is about 45 years old, 5 feet 11 inches tall, clean shaven and has a receding chin It is believed that he will attempt to continue operations in the Western and Southern states Any information should be referred to local Better Business Bureaus or to the bureau in San Francisco

**Orthoptic Council Organized**—A group of ophthalmologists representing the American Ophthalmological Society, the Section on Ophthalmology of the American Medical Association and the American Academy of Ophthalmology and Otolaryngology met in Washington October 11 and organized the American Orthoptic Council Dr Le Grand H Hardy, New York, was elected president of the new council Dr Derrick T Vail, Jr, Cincinnati, vice president and Dr Edwin B Dunphy, Boston, secretary The group adopted resolutions suggesting that the national societies through the American Orthoptic Council should take over training of technicians for this work and should establish a central training station for

them It was planned that examinations would be held at least once a year, with certificates of proficiency for successful candidates A syllabus for student orthoptic technicians is being prepared

### CANADA

**Typhoid in British Columbia**—Twenty-six known cases and four suspected cases of typhoid occurred in Merritt, B C, in October Investigation of the outbreak indicated that the disease was probably transmitted through raw milk

**Personal**—Sir Frederick G Bunting, Toronto, delivered the W E Dixon Memorial Lecture of the Royal Society of Medicine, London, at a meeting of the section of therapeutics and pharmacology recently His subject was 'The Immunologic Aspect of the Tumor Problem' —Dr Alexander R Munroe, Edmonton, Alta, has resigned as professor of surgery at the University of Alberta Dr William Fulton Gillespie, associate professor of surgery, succeeded him

**Cancer Control Society**—After several months of organizational work, the Canadian Society for the Control of Cancer has been chartered and provincial branches are being formed Dr Cecil C Ross, formerly instructor in surgery at the University of Western Ontario, London, has been appointed executive secretary and headquarters have been established at 43 St George Street, Toronto, in an office donated by the University of Toronto Pending the first meeting of the grand council, to which each province is to elect one medical and one lay member, the national board of directors is composed of Drs John S McEachern, Calgary, Alta, president, George S Young, William E Gallie and Thomas C Routley, all of Toronto, Mr E S Macfarlane, Mr F K Morrow and Mr H Napier Moore, all of Toronto The new society is sponsored by the Canadian Medical Association and has the endorsement of the trustees of the King George V Silver Jubilee Cancer Fund for Canada Within the dominion medical association a department of cancer control is being organized to act for the medical profession in advancing the aims of the cancer society These aims are enlistment of the Canadian public, ensuring that the facts known at present are intelligently applied, and educating all men and women to realize that in many cases cancer can be cured if treatments are started in time

### FOREIGN

**Personal**—Dr Julius de Daranyi, director of the Hygiene Institute of the Royal Hungarian Peter Pazmany University of Budapest, has been made president of the Hungarian Committee on Postgraduate Medical Education

**Society News**—Dr Warren H Lewis, of the department of embryology at the Carnegie Institution of Washington and Johns Hopkins University School of Medicine, Baltimore, was elected president of the International Congress for Experimental Cytology at the 1938 meeting in Zurich The next congress will be in Stockholm in August 1940 —The sixth Australasian Medical Congress will meet in Perth, Western Australia, in August 1940 The main theme of the congress will be 'Rheumatic and Allied Disorders'

**Tuberculosis Prize Awarded**—The Leon Bernard Memorial Prize, recently established to honor the late Dr Bernard who for fourteen years was secretary general of the international Union Against Tuberculosis was awarded to Dr Karl Fischel, at one time on the staff of the Will Rogers Memorial Hospital, Saranac Lake, N Y, Dr E Arnold of France and Dr John B McDougall of Great Britain, according to the Bulletin of the National Tuberculosis Association The award was announced at a meeting of the executive committee and the council of the union in Paris

**Congresses on Ophthalmology**—The International Association for the Prevention of Blindness will meet in London April 19 preceding the annual congress of the Ophthalmological Society of the United Kingdom Use of the Crede method for the prevention of ophthalmia neonatorum will be the subject for discussion at the international meeting Speakers will include Dr Conrad Berens, New York, Dr Arthur H H Sinclair, Edinburgh, Prof F Terrien, Paris, Prof V Szily, Munich, Prof Luigi Maggiora, Genoa, Prof Vasquez Barriere, Montevideo, Dr Rowland P Wilson, Cairo, Egypt, and Dr John D M Cardell, London This association may be addressed at 66 Boulevard Saint-Michel, Paris VI Also on April 19 the International Organization Against Trachoma will hold a meeting to discuss the incidence and types of trachoma in various parts of the world The speakers will be Drs Harry S Gradle, Chicago, Dr Francis J Lavery, Dublin and Mr Arnold Sorsby, London The address of this organization is 33 Welbeck Street, London W 1



## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Dec 17, 1938

#### The Cancer Bill

In moving the second reading of the cancer bill in the House of Commons, the minister of health, Mr Elliot, said that it was urgently necessary to bring facilities for the treatment of cancer within the range of every person. The success of radium and x-rays depended on treatment at an early stage. Ample facilities for early diagnosis and adequate treatment were necessary but at present were lacking. Cancer was increasing and had become second on the list of fatal diseases in this country. There were 74,000 deaths from it in Great Britain in 1937. Of all deaths during the working period of life (between the ages of 15 and 65), 17 per cent were due to cancer. About 10,000 deaths occurred under the age of 50. Cancer was not, as was sometimes thought, an old person's disease. Its annual death rate per million of the population of Great Britain was 835 for 1901 and 1,624 for 1937. Thus the death rate had nearly doubled in a generation, in striking contrast to that of other diseases, for which there had been a steady fall. There had been much discussion as to whether the figures represented a real increase of cancer. The general opinion was that much of the increase was explicable in other ways, such as increased longevity and more accurate diagnosis. For cancer of the more accessible organs, lip, jaw and skin, the mortality was declining at almost every age. This was probably due in part to treatment.

From inquiries conducted by the ministry it had been estimated that in this country there were in 1937 more than 100,000 persons suffering from cancer. Of these about 10 per cent had the disease in organs for which treatment had not hitherto been practicable. Fifty per cent of the cancers were susceptible to treatment by surgical intervention alone, but only if diagnosed early. This group included cancers of the stomach and intestine, which accounted for the largest number of deaths. There remained 40,000 persons who suffered from easily accessible cancers. For these surgical intervention, often combined with radiation, or radiation alone, was effective, especially in the early stage. Even when the disease was too advanced for cure, alleviation could be obtained from radiation. Even in some apparently hopeless cases cure, judged by five years' freedom from symptoms, was obtained.

For internal cancers the problem was not so much treatment as diagnosis. Many patients applied for treatment too late. Fearing that they were suffering from cancer, which they regarded as incurable, they delayed seeking advice. The bill was designed to combat the bogey of incurability. It would secure that no one, wherever domiciled, who was suffering or was suspected by his physician to be suffering from cancer would be out of the reach of the best advice and treatment. Every one would be able to obtain admission to an appropriate hospital whether for further examination or for treatment. The proposals would be financed by local authorities in conjunction with the government, which was prepared to make a grant of \$2,500,000. It was estimated that 1,000 new hospital beds and between 300 and 350 consultation centers would be required. The bill prohibited advertisements of "cancer cures," which have already been banished voluntarily by reputable journals. After some criticism of details the second reading of the bill was carried by a majority.

#### Spinal Epidural Suppuration

Spinal epidural suppuration is a rare condition which is often unrecognized, and the scanty literature for the most part consists of reports of single cases. It appears, however, not

to be so rare as the records show. The Birmingham surgeon Mr F. A. R. Stammers has been able to record in the *British Journal of Surgery* seven cases which he has observed since 1932. The usual mode of infection is extension from contiguous structures. The condition was secondary in three of his cases to staphylococcal osteomyelitis of laminae, in one to tuberculous disease of a lamina, in one to a suppurating tubulodermoid passing through a spina bifida and in one to a suppurating sacrococcygeal sinus. In the seventh case it was hematogenous. Dandy (*Archives of Surgery* 13:477 [Oct] 1926) said that in some cases it results from spread along adjacent lymphatics and mentions two cases in which it followed a carbuncle in the dorsal region. In two of Stammers' cases it was localized and produced signs indistinguishable from those of neoplasm within the spinal canal, pain, sensory and motor changes, and conditions in the cerebrospinal fluid. There was diffuse suppuration in the other five cases, with certain features in common. Pain in the back was the first symptom. The spine became stiff, and this proved to be a matter of absolute limitation of flexion while hyperextension was still free and painless, a point of distinction from tuberculosis of the spine. In all cases this stiffness slowly or rapidly involved more and more of the spine, in some cases neck rigidity and even head retraction developed. Another common feature was pyrexia. Stammers holds that the combination in a young patient of pain in the back, limitation of flexion tending to involve higher and higher levels with free hyperextension, and pyrexia means ascending spinal meningitis secondary to infection within the spinal canal but outside the dura. Osteomyelitis is the commonest cause, but its diagnosis in the spine is particularly difficult. Lumbar puncture carries grave risks, though useful information might be obtained by inserting the needle only into the epidural space. One patient presented slight edema over the dorsolumbar part of the spine. If the patient is very ill with a high temperature and great pain, and if in addition there is a tender spinal zone or slight edema, the cause is osteomyelitis of a vertebra. Immediate operation is then necessary not only to relieve toxemia but because paraplegia may occur at any moment and develop so rapidly (within twenty-four hours) and clear up so slowly, or not at all, in spite of drainage of the abscess that its genesis must be vascular.

#### The Evacuation of Children in Time of War

In a previous letter to THE JOURNAL it was stated that during the recent international crisis the government was prepared to evacuate 500,000 children from London in one day, because of the danger of air attacks. An evacuation division has been set up at the ministry of health, and, as children are so much concerned, officers of the board of education will serve. In addition, an advisory committee representing local education authorities and teachers is to be set up. Plans are to be worked out for the evacuation of children, school by school, accompanied by their teachers, so that their education can continue. Arrangements will also be made for the evacuation of children under school age accompanied by their mothers if they elect to go. The billing will be arranged to insure as far as possible that children will be received into homes where their presence will be welcome.

#### Drug Addiction in Great Britain

The government report to the League of Nations on traffic in opium and other dangerous drugs for 1937 states that addiction to narcotic drugs is not prevalent in Great Britain. The known addicts number 620, 300 men and 320 women. It is noteworthy that of these 132 are physicians, five are pharmacists, two are veterinary surgeons and one is a dentist. Thus contact with drugs appears to be an important factor in addiction. In 72 per cent of the cases the drug taken is morphine,

in 17 per cent heroin and in 85 per cent cocaine. There is no evidence of organized illicit traffic in this country. The thirty-nine prosecutions under the dangerous drug acts were in all cases for breaches of the acts or regulations and not for trafficking. The government department dealing with drugs cooperated successfully with Canada, Egypt, the United States, the Netherlands and France in checking the traffic abroad. The possession and use of opium prepared for smoking are totally prohibited in Great Britain, and when the drug in this form is seized it is confiscated and destroyed.

### The British Congress of Obstetrics and Gynecology

The eleventh British Congress of Obstetrics and Gynecology will be held at Edinburgh April 4-6. The chief subject for discussion will be pain in labor and methods of alleviation. It will be introduced by Prof. Chassar Moir of Oxford and Dr. John Sturrock of Edinburgh. The official guests of the congress will be Professor Wagner of Berlin and Dr. S. R. Meaker of Boston. Other subjects to be dealt with are genital hypoplasia, dysmenorrhea, tubal infection, hyperemesis gravidarum, results of pregnancy toxemia, trichomonas infection, male sterility, habitual abortion and myometrial activity. A visit will be paid to the department of animal genetics under the direction of Prof. F. A. E. Crew. Those who desire to exhibit should communicate with the local secretary of the congress, Dr. Chalmers Fahim, 7 Chester Street, Edinburgh 3.

### BERLIN

(From Our Regular Correspondent)

Dec 5, 1938

### Cancer and the Vitamin Economy

Prof. Erich Schneider of the University Surgical Clinic, Freiburg-in-Breisgau, has in the last five years investigated cancer and the vitamin economy. A survey of the five year survival of cancer patients shows how small is the proportion for whom radical operation is the most feasible therapeutic procedure. The total number of cancer patients in the last ten years was 1,425. Of these, 676 patients submitted to operative treatment, namely, 483 underwent radical operations

#### *Survival of Cancer Patients Who Underwent Radical Operation*

Diagnosis of Carcinoma According to Site	Number of Patients	Percentage Alive Five Years After Operation
Breast	171	24.2
Skin	95	39.2
Stomach	61	7
Rectum	46	11.8
Lower lip	38	26.4
Parotid	14	54.5
Lung	12	11.1
Penis	9	33.3
Bladder	10	0
Upper jaw	8	0
Gallbladder	4	0
Testis	2	0

and 193 underwent palliative operations. Of the last-mentioned group, only three patients with cancer of the stomach were alive five years after operation regardless of whether roentgen irradiation was done. The table contains data on the five year survival of patients who underwent radical operation.

Earlier investigators, particularly Gordonoff and Ludwig at Berne, demonstrated a general inhibition in the growth of fibroblasts and cancer cells in patients presenting avitaminoses, and this was most remarkable if the deficiency was in vitamins A and B<sub>1</sub>. An excess of these vitamins led on the contrary to a notable increase in growth of the mentioned cells, whereas vitamins C, B and E exerted no measurable effect. From this one may infer that curtailment of the vitamin supply

of the patient's dietary is a therapeutic indication. However, clinical examinations of cachectic cancer patients elicit evidence of the genesis and development of a strongly marked hypovitaminosis combined with classic manifestations. With the advance of cancer the vitamin A values of the body serums are observed to decline, the finding may even be completely negative. This disturbance is accompanied in about 20 per cent of the cases by so called pathologic excretion of vitamin A in the urine. A deficiency of this sort is not based on the size of the cancerous tumor and is likewise independent of metastasis and of the cholesterol values. Much more frequently one can prove that it originates solely through the concomitant infection in the decomposing tumor, with its toxic effect on the liver and hepatic reticulo endothelial system. Correspondingly, after therapeutic exhibition of vitamin A there is of course no observable deleterious reaction in the sense of an increased development of the tumor. With respect to vitamin C it was found that after the usual tolerance tests abnormally high deficits were demonstrable. Impairment of the blood-kidney barrier for permeability of vitamin C may be excluded. The kindred assumption of a pathologically increased oxidative capacity of the carcinomatous plasma as a cause of the diminished secretion was not established. Rather the oxidation capacity was reduced by about 30 per cent. Furthermore, it was demonstrated with Jensen's sarcoma of rats that a possible increase in the liver glycogen value by exhibition of vitamin C was manifested in the tumor animals. However, no clearly life-prolonging effect of vitamin C therapy was observed. This utilization of vitamin C in the process of glycogen synthesis explains the high vitamin requirement and the lack of excretion in the urine as well as the absence of scorbutic manifestations. The phenomena may be interpreted as defense mechanisms of the organism.

### Schools for the Hard of Hearing

The National Health Bureau has published a report by Dr. Dornedden on schools for the hard of hearing in Germany. Although schools for the blind and for the severely deaf have been nationally regulated since 1911, uniformity of regulation does not exist with regard to education of children who are hard of hearing. Only a few cities have created special schools and classes for pupils with defective hearing in order to relieve the regular classes of this additional teaching burden. About 1,600 pupils with defective hearing (765 boys and 658 girls) attend the special schools. The limits within which the children can follow instruction in the classroom have been set at 0.5 meter for the whispering voice and from 3 to 4 meters for the ordinary conversational tone. Incontestable determination of the proportion of children whose hearing is defective but who cannot be actually classified as deaf has not been made, but the number may be estimated at 5 per thousand of all school children, namely about 40,000 within the German Reich. The mentioned 1,600 accommodations take care of scarcely 4 per cent of the need, exclusive of Austria.

The common elementary school is in no position to recognize and utilize the educative capability of these children, who can immediately be placed on the road to ampler development if they are offered a better type of instruction. Such instruction will compensate for present poor performances, which are due to limited educational facilities. Institutions for deaf-mutes are unsuitable for children who are merely hard of hearing. It is therefore recommended that such children be placed in schools designed especially for them. In such schools each class ought not to contain more than fifteen pupils. Each school would thus have a pupil population of about sixty, and this means one school to each 12,000 children. The training of teachers is similar to the training of teachers of deaf-mutes. Fairly gifted pupils can thus receive a general education suffi-

cient for pursuit of a practical occupation, and especially talented pupils will be able to receive more advanced instruction. Training in handicrafts and draftsmanship is especially to be promoted.

### Poliomyelitis in 1938

Dr Gantenberg reports to the Berlin Medical Society eighty cases of poliomyelitis observed during the last year. The 1938 epidemic was characterized by severe involvement of the meninges, not merely as meningism but rather as true spinal meningitis, with much more pronounced painfulness of the musculature and the nerve trunks. At the outset many catarrhal manifestations in the upper respiratory passages were observed, frequently together with muscular pain of the rheumatic type and ischialgia. The cerebrospinal fluid always gave positive Nonne-Apelt and Pandy reactions and showed a great increase in cells, particularly lymphocytes. In some cases the sugar content was increased, but in a few it was lowered. On the basis of pathologic-anatomic observations, this year's prevalent form of poliomyelitis could be designated true meningo-encephalomyelitis.

### A Museum of Pharmacy

The newly founded Museum of Pharmacy has been opened at Munich. It was called into being by a gift made in March 1937. Already its exhibits, which are to be extensively added to, offer an impressive record of the cultural history of the apothecary's profession. In southern Germany in particular, with its ripe old culture, furnishings of old time apothecary shops are frequently found which possess an artistic value. The museum's collection of drugs represents an initial attempt at a historical exhibit of the kind. The entire collection from the private museum of the historian of pharmacy Dr Ferchl of Mittenwald, Upper Bavaria, was obtained directly from the possession of German apothecary shops.

### Prof Otfried Forster Retires

Having reached the age of 65, Prof Otfried Forster has retired from the chair of neurology and psychiatry at Breslau University. Through his basic research in anatomy and physiology as well as in the pathology of the nervous system, Forster has gained for himself an illustrious name. Neurosurgery likewise is much in his debt. The intradural resection of the dorsal nerve roots, for abolishment of spastic paralysis and tabetic crises, is known as Forster's operation; it was done by him as early as 1909. In 1935 Forster was awarded a British prize, the Jackson gold medal.

### AUSTRALIA

(From Our Regular Correspondent)

Dec 7, 1938

### Health Insurance Difficulties

There is reason to doubt that the National Health and Pensions Insurance Act placed on the statute books several months ago in the face of strong opposition and after one of the longest parliamentary debates in Australian history, will ever be implemented. No agreement has yet been reached between the federal government and members of the British Medical Association in Australia. This difficulty has been responsible for the official postponement of operations originally planned to commence Jan 1, 1939. The royal commission set up to investigate the question of fees payable to practitioners working under the scheme has not yet reached a decision but is expected to report before the end of the year. This commission, however, is dealing only with financial aspects of the case, and, whatever its conclusions may be, it is doubtful that cooperation between the government and the profession will ensue, for medical opinion is that more than finance is involved

in the provision of a satisfactory national medical service. It is felt that medical service should at least be complete, including the insured man's wife and family and providing all forms of medical treatment. The estimated cost per person of a complete medical service has been drawn up for Australia and compared with similar figures for British Columbia and New Zealand. It has been estimated that in Australia each breadwinner has an average of one dependent. If each breadwinner pays about twice the cost per person, a complete "cover" is given to every member of the community and the single breadwinner helps to carry the load of the married man with a family.

Indicative of the general feeling toward the government scheme is a resolution carried in Melbourne by the federal council of the British Medical Association. Under this motion, members of the association are asked to pledge themselves not to accept service under the act unless 70 per cent of the members agree to do so. It is pointed out that signatories are not refusing to accept service but are agreeing to abide by a decision of the majority. The New South Wales branch of the British Medical Association is confident that 90 per cent of its members will sign the resolution, and one Melbourne doctor has distributed 3,500 eight page anti-insurance pamphlets to members of the British Medical Association all over

### Cost per Person (Approximate) of Complete Medical Service

	British Columbia		New Zealand		Australia	
	Shil- lings	Pence	Shil- lings	Pence	Shil- lings	Pence
General practitioner service	13	7	15	0	16	0
Maternity service		10				
Special service	4	0	2	0	3	0
Dental service	2	0	7	6	5	0
Home nursing service	2	0	2	0	2	0
Hospital service	14	0	18	0	15	0
Drugs and surgical and optical service	6	5	4	6	6	0
Laboratory service	3	2	2½		4	0
Reserve fund	4	0	3	9¼	4	0
	2 10	0	2 15	0	2 15	0

Australia. A disadvantage of the present scheme is that it is intimately bound up with pension payments and cash benefits. It is felt that the profession can cooperate fully only in a plan for health insurance which is entirely separated from these other measures. Suggested alternatives to the government scheme are schemes either controlled by the British Medical Association or in conjunction with friendly societies.

During the past several months the British Medical Association in Australia has collected, at great expense of time and money, a great deal of information regarding medical practice in Australia and possible effects of national insurance. Masses of data are now available which were unobtainable before the drafting of the bill, at the time when members had to negotiate with the government's experts. They were then unable to substantiate their claims and had to accept as correct figures and statements presented to them by the government. Now, however, the association is provided with sufficient information to enable it to discuss health insurance on an equal footing with the government.

Apart from the opposition of the medical profession, the government is meeting severe criticism from other quarters. First, from a strong federal labor opposition, second, from a section of employers who regard with misgiving the extra cost that they will have to carry as contributors to the scheme on behalf of their employees, third, from a body of rural opinion which voices the grievances of small farmers who will be required to pay contributions for persons they employ but

who will not themselves, as self employing persons, be eligible to become insured, and, finally from the existing friendly societies

### Royal Australasian College of Physicians

The inauguration of the Royal Australasian College of Physicians, which took place December 13 and succeeding days, was an important event in the medical history of Australia and New Zealand. It is fitting that the ceremony was held in the great hall of the University of Sydney thereby demonstrating the happy union in spirit of this new body with the older academic institutions. The new college like its companion body the Royal Australasian College of Surgeons will serve to set and maintain a high standard in its special form of practice, although it is not a licensing body. Its constitution has been modeled on that of the Royal College of Physicians of London to the extent that it admits two grades of medical practitioners—members and fellows, with the powers of government vested chiefly in the fellows. The object which influenced the founders to recognize the grades of member and fellow was to encourage medical graduates to become members without regard to the form of practice they follow, thus allowing them the privileges of union with the college whether they are engaged in academic work, in public administrative medicine or in general practice including the ordinary run of surgical and obstetric work. From the fellows, however, will be demanded a higher standard of achievement and a greater restriction of work, as they will be engaged in consulting practice as physicians and in medical teaching or will be following the auxiliary branches of scientific medicine. It is already a policy of the college to encourage physiologists, pathologists, dermatologists and radiologists to enter its ranks, and among its foundation fellows are representatives of these branches of the profession.

Eventually, fellows will all pass through the preliminary door of membership and will be promoted to the rank of fellow on attainment of professional eminence. Membership is gained by examination only, but it is provided in the regulations that candidates possessing a recognized higher medical qualification will be excused from a written test, a privilege that may also be extended during the next five years to practitioners of not less than fifteen years' experience. This recognition, on the one hand, of the value of qualifications such as the higher degrees conferred by universities and, on the other, of the practical wisdom attained by general practitioners in caring for the health of the public meets with general appeal, and the profession in Australia looks forward with optimism to the working of this leaven in the medical community.

### The Hospital Problem

The determination of the Nurses Wages Board in Victoria to introduce a fifty hour week is a welcome step toward reform, but the decision has presented a new problem to public hospitals. It has been disclosed that the nursing staffs of the public hospitals will have to be increased by about 30 per cent in order that the new ruling may be observed and concern is expressed at the fact that already there is a shortage of nurses, with little prospect of meeting the unexpected demand. Furthermore, the increase in salaries together with the need for additional buildings in which to accommodate the extra staff may place some of the hospitals in an embarrassing financial position.

The problem of the shortage of nurses is a real one in Australia. It has been suggested that it may be overcome by a reduction of the training course from three to two years, the provision of better living conditions for nurses in hospitals and the employment of more fully trained nurses instead of trainees in paying portions of hospitals. Trainees are doing so much of the work in hospitals that positions for trained nurses are interfered with. To meet the situation not only

must nurses be brought into the profession, they must be kept there. But it will take more than a mere shortening of hours to make nursing attractive. More far-reaching and expensive remedies are necessary. Realization of this fact and of the consequent rise in the cost of adequate medical care is but one more argument in favor of greater activity in the field of preventive and constructive medicine.

### Plans to Overcome Malnutrition

At a meeting of the National Health and Medical Research Council, arrangements were made to implement the recommendations of the Commonwealth Advisory Council on Nutrition to improve the diet of the people in this country. They include the appointment of a committee to study the correction of faulty diet and to investigate and rectify special nutritional disorders. The official representative of each state will recommend to his government the immediate formation of a state committee to undertake the improvement of the nutritional status of the people as an immediate social obligation.

## Marriages

ELTON S. OSBORNE JR., Nichols, Fla., to Miss Marie Wilson Willis of Monticello, Fla., in Jacksonville, July 30, 1938.

ZACK DOWDY OWENS Elizabeth City, N. C. to Miss Martha Anderson of Houston, Minn., at Baltimore, Oct. 16, 1938.

CLAUDE C. BLACKWELL, Birmingham, Ala. to Miss Mary Latham Rowland in Washington, N. C., Nov. 5, 1938.

TRUGOTT J. G. BLOEDEL Thief River Falls, Minn., to Miss Marion Bernice Long of Minneapolis, Nov. 9, 1938.

FREDRICK A. WIES New Haven, Conn., to Miss Vivian Wilbour Nelson of Manchester, N. H., Oct. 4, 1938.

EDGAR WILLIAM WARREN II, New Haven, Conn., to Miss Helen A. Mead of New York, Nov. 19, 1938.

HARRY JUSTICE WARTHEN JR., to Miss Martha Winston Alsop, both of Richmond, Va., Sept. 1, 1938.

LE ROY HAMILTON WARDNER to Miss Carolyn W. Potter, both of Saranac Lake N. Y., Aug. 27, 1938.

CHARLES LLOYD LAWSON Acmar, Ala., to Dr. NETTIE MARIE BLACK of Columbia, S. C., Nov. 30, 1938.

HENRY THOMAS BALLANTINE JR., Boston, to Miss Elizabeth E. Minter of Brookline, Mass., recently.

WILLIAM STURGES PARKER Merion Station, Pa., to Miss Anita Woodruff Jones, Sept. 10, 1938.

ROY A. HOFFMAN, Minneapolis to Miss Lolita B. Wilkinson of Cloquet, Minn., Oct. 16, 1938.

ENNION SKELTON WILLIAMS to Miss Ann Hill Brown, both of Richmond, Va., Dec. 2, 1938.

JOHN KILGO WEBB to Miss Marjorie Barr O'Steen, both of Greenville, S. C., Oct. 8, 1938.

GUSTAVE FREEMAN, Chicago, to Miss Elizabeth G. Hulse of Monroe, N. Y., Dec. 29, 1938.

LONDON TIMBERLAKE to Miss Mary Perry, both of Birmingham, Ala., Oct. 5, 1938.

G. HOWARD GOWEN to Miss Ruth Cogdal, both of Champaign, Ill., in October 1938.

EDWARD B. WEINMAN, Ann Arbor, Mich., to Miss Evel Allender in October 1938.

HAROLD M. GOLDEN to Mrs. Myrtle Riley, both of Los Angeles, Oct. 29, 1938.

ALBERT F. LEE Durham, N. C., to Miss Frances Halliday of Seattle, Nov. 2, 1938.

H. KERVIT BRASK, Nashville, Tenn., to Miss Roberta Barbara White recently.

JOHN E. SIEDLINSKI to Miss Charlotte A. Savickis, both of Chicago, August 28.

PATRICK U. DE VITO to Miss Teresa Riggio, both of Brooklyn, Dec. 4, 1938.

SAMUEL NORWOOD to Miss Miriam Cary, both of Chicago, Sept. 17, 1938.

## Deaths

**Dr. Hugh Talbot Patrick** ☉ eminent neurologist, died in Chicago, January 5, of carcinoma of the stomach. Dr. Patrick was born in New Philadelphia, Ohio, May 11, 1860. After his preliminary education in the University of Worcester (1878-1880), he received the degree of doctor of medicine from Bellevue Hospital Medical College of New York University in 1884. He studied nervous and mental disease abroad from 1891 to 1894 and then returned to Chicago to take up the practice of neurology. In 1896 he married Fanny E. Gary, daughter of Judge Joseph E. Gary. In 1896 also he became professor of nervous and mental disease in the Chicago Polyclinic. He became assistant professor of nervous disease in Northwestern University in 1894, later clinical professor, and subsequently emeritus professor of nervous disease. He had been from time to time attending or consulting neurologist to the Wesley, Passavant, Polyclinic, Henriotin Memorial and St. Anthony's Hospital, as well as to the Illinois Charitable Eye and Ear Infirmary and the Illinois Eastern Hospital for the Insane. His eminence as a practitioner in his special field was recognized by election to the presidency of the American Neurological Association and the Chicago Neurological Society. He was also corresponding member of the Société neurologique de Paris. During the World War he served as consultant neurologist and saw service in several of the larger camps in the United States.

To the American Medical Association Dr. Patrick contributed of his efforts as a delegate from Illinois in 1912 to the House of Delegates, and again in 1919-1920 as a delegate from the Section on Nervous and Mental Diseases. He served in the same year as chairman of the Reference Committee on Sections and Section Work. He also served as secretary of the Section on Neurology and Medical Jurisprudence from 1897 to 1899, and as chairman of the section 1899-1900.

Dr. Patrick gave especially of his services in the foundation of the *Archives of Neurology and Psychiatry*, making it without doubt the leading publication in its field in the world. He was active in organizing support for such a periodical and became its first editor. In November 1936 a special issue of the *Archives of Neurology and Psychiatry* was dedicated to him. It contained, in addition to notes of appreciation by Drs. Peter Bassoe, Bernard Sachs and Prof. Georges Guillain of Paris, contributions on neurologic topics by these writers and by many others who were from time to time associated with Dr. Patrick in his work. As editor of the *Archives of Neurology and Psychiatry* he was instrumental in making it reflect constantly the progress of American medicine in the fields of neurology and psychiatry.

His own contributions to the advancement of his specialty included articles on arteriosclerosis of the nervous system, chronic progressive hemiplegia, the motor neuron in practical diagnosis, the proper care and treatment of the patient with epilepsy, syphilis of the nervous system, and the factor of fear in nervous diseases. As he grew older he developed special interest in biographies and the historical aspects of neurology.

The death of Dr. Hugh T. Patrick is mourned by innumerable physicians and laymen who admired his facile mind, his wit and his faithful friendship.

**T. Wingate Todd**, Cleveland, Victoria University of Manchester Medical School, England, 1907 and F.R.C.S., England, 1911, member of the Ohio State Medical Association and the American Association of Anatomists, demonstrator in anatomy at the Manchester University, 1907-1910, and in 1910 lecturer

on anatomy and clinical anatomy, Henry Willson Payne professor of anatomy at the Western Reserve University School of Medicine and director of the Hamann Museum of Anthropology, chairman of the Brush Foundation, director of research, Developmental Health Inquiry of Associated Foundations, served with the Royal Canadian Army Medical Corps, corresponding member of the Société d'anthropologie de Paris, Académie royale de médecine de Belgique, author of "Clinical Anatomy of the Gastrointestinal Tract," "An Introduction to Mammalian Dentition," "Behavior Patterns of the Alimentary Tract" and "Atlas of Skeletal Maturation", aged 53, died, Dec. 28, 1938, of coronary arteriosclerosis and thrombosis.

**Herbert U. Williams**, Buffalo, University of Buffalo School of Medicine, 1889, University of Pennsylvania Department of Medicine, Philadelphia, 1891, since 1934 professor of pathology and bacteriology emeritus at the University of Buffalo School of Medicine and dent, 1912-1915, past president of the Buffalo Academy of Medicine, member and past president of the American Association of Pathologists and Bacteriologists, member of the Association of American Physicians, honorary member of the Société de médecine d'Haiti, in 1913 member of the state board of medical examiners, formerly pathologist to the Buffalo General, Erie County and Buffalo City hospitals, author of "Manual of Bacteriology," 1898 and monographs on origin of syphilis, paleopathology and mummies, aged 72, died Dec. 8, 1938, of pulmonary edema.

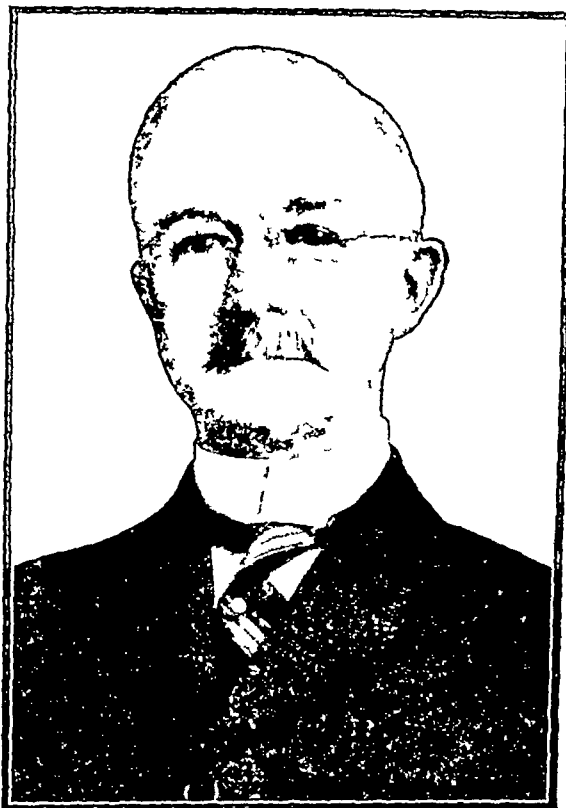
**Frederick William Johnson** ☉ Newton, Mass., Harvard University Medical School, Boston 1881, fellow of the American College of Surgeons, at one time professor of clinical gynecology, Tufts College Medical School, Boston, served in various capacities and at various times on the staffs of the Massachusetts Women's Hospital, Carver Hospital, St. Mary's Infant Asylum and St. Elizabeth's Hospital, Boston, Jordan Hospital, Plymouth, Sturdy Memorial Hospital, Attleboro, and the Elliot Hospital, Manchester, N. H., aged 85, died, Dec. 3, 1938, of aortic stenosis.

**Frederick L. Van Sickle** ☉ Harrisburg, Pa., Jefferson Medical College of Philadelphia, 1886, member of the House of Delegates of the American Medical Association in 1916-1917 and in 1923, past president and formerly executive secretary of the Medical Society of the State of Pennsylvania, past president of the American Academy of Medicine, formerly medical director of the Mid-Valley Hospital, Peckville, at one time editor of the *Atlantic Medical Journal*, now the *Pennsylvania Medical Journal*, aged 76, died, Oct. 9, 1938, of arteriosclerosis and myocarditis.

**John Raymond Hume**, New Orleans, State College of Physicians and Surgeons, Indianapolis, 1907, member of the Louisiana State Medical Society, professor of otolaryngology, Tulane University of Louisiana School of Medicine, member of the American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otolological Society, for many years on the staff of the Eye, Ear, Nose and Throat Hospital, aged 55, died, Oct. 29, 1938, of coronary occlusion and hypertension.

**George Clowes Van Wart**, Fredericton, N. B., Canada, University of Pennsylvania Department of Medicine, Philadelphia, 1890, past president of the Medical Council of Canada and the Council of Physicians and Surgeons of New Brunswick, fellow of the American College of Surgeons, senior surgeon to the Victoria Public Hospital, aged 70, died, Oct. 1, 1938.

**William Rush Hockenberry**, Shippery Rock, Pa., Cleveland College of Physicians and Surgeons, Medical Department Ohio Wesleyan University, 1897, member of the Medical Society of the State of Pennsylvania, president of the board of trustees of the Shippery Rock State Teachers College, aged 71, died, Oct. 4, 1938, of chronic nephritis and arteriosclerosis.



HUGH TALBOT PATRICK, M.D., 1860-1939

**Moses Kleiner** • Denver, Yale University School of Medicine, New Haven, 1888, formerly associate professor of therapeutics, University of Colorado School of Medicine, on the staffs of the Mercy, St Anthony's and Beth Israel hospitals, aged 70, died, Dec 1 1938, in the New England Baptist Hospital Boston, of carcinoma of the pancreas

**Willis Bryant Moulton**, Portland, Maine, Medical School of Maine, Portland, 1883, member of the Maine Medical Association, formerly professor of ophthalmology and otology at the Bowdoin Medical School, for many years on the staff of the Maine General Hospital, aged 76, died Oct 8 1938, of arteriosclerosis and heart disease

**Siegfried Strauss**, Glenside, Pa, Hessische Ludwigs-Universität Medizinische Fakultät, Giesen, Hesse, Germany, 1911, member of the Medical Society of the State of Pennsylvania, served during the World War on the staff of the Abington (Pa) Hospital, aged 52, died, Oct 3, 1938, of coronary occlusion

**Alexander Stephens Garrett**, Weatherford, Texas, Atlanta (Ga) Medical College, 1890, formerly secretary of the Parker County Medical Society and past president of the Palo-Pinto County Medical Society, at one time city and county health officer, served as trustee of the public schools, aged 77, died, Oct 27 1938

**Malcolm Leal**, Colchester, Conn, New York Homeopathic Medical College, New York, 1879, at one time professor of theory and practice, New York Medical College and Hospital for Women, formerly consulting surgeon to the New York Ophthalmic Hospital, New York, aged 82, died, Oct 24, 1938, of acute myocarditis

**Edward Everard Adams**, Murphy, N C, Jefferson Medical College of Philadelphia, 1923, member of the Medical Society of the State of North Carolina secretary of the Cherokee County Medical Society, aged 39, died Nov 10, 1938, in St Mary's Hospital Knoxville, Tenn of pneumonia

**Walter Leon Knight** • Wewoka Okla, St Louis University School of Medicine St Louis, 1906, formerly secretary of the Seminole County Medical Society, for many years member of the board of education, medical director of a hospital bearing his name, aged 57, died Oct 18, 1938 of pneumonia

**Salvatore J Parlato** • Buffalo University of Buffalo School of Medicine 1920 served during the World War, aged 42, on the staffs of the Columbus Hospital Millard Fillmore Hospital and the Sisters Hospital, where he died, Oct 15, 1938, of injuries received in an automobile accident

**Noah Alexander Johnston**, Adamsville, Ala, University of Nashville (Tenn) Medical Department, 1907, member of the Medical Association of the State of Alabama, aged 62, died, Oct 13, 1938 in a hospital at Birmingham, of a self-inflicted bullet wound

**Frank Bowman Krimmel** • Erie, Pa, Hahnemann Medical College and Hospital of Philadelphia 1908 fellow of the American College of Surgeons on the staffs of the Hamot Hospital and St Vincent's Hospital, aged 53, died, Oct 3, 1938 of coronary thrombosis

**William L Kendall** • Enid Okla, Dallas (Texas) Medical College 1904, past president of the Garfield County Medical Society, at one time superintendent of the Northern Oklahoma Hospital, aged 61, died, Oct 12, 1938, of hemiplegia and hypertension

**Andrew J Hamilton**, Rison Ark, Arkansas Industrial University Medical Department Little Rock 1893, member of the Arkansas Medical Society, formerly city and county health officer, aged 74, died Oct 31 1938 of intestinal hemorrhage and hypertension

**Samuel Thompson Lindsay** • Rochester N Y, Harvard University Medical School Boston 1923, member of the American Society of Clinical Pathologists, on the staff of St Mary's Hospital, aged 54, died Oct 10, 1938 of acute gangrenous appendicitis

**Shepherd A Mullin**, West Chester Pa, Hahnemann Medical College of Philadelphia 1879, member of the Medical Society of the State of Pennsylvania, aged 81, on the staff of the Homeopathic Hospital where he died, Oct 16, 1938, of influenza

**Legan Henry Hobgood**, New Bedford Mass, University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1921, member of the Massachusetts Medical Society, aged 45, died, Oct 27, 1938, of biliary cirrhosis

**William A Kearney**, Prospect, Va, University of Maryland School of Medicine Baltimore 1883, member of the Medical Society of Virginia, aged 83, died, Oct 17, 1938 in a hospital at Richmond of urinary calculi and bronchopneumonia

**Rush Oliver Lees**, Utica, N Y, Harvard University Medical School, Boston, 1897, member of the Medical Society of the State of New York, on the staff of St Luke's Hospital, aged 63, died, Oct 3, 1938, of coronary thrombosis

**George S Smith** • Liberal, Kan, Kansas City (Mo) Medical College, 1891, past president of the Meade County Medical Society, on the staff of the Epworth Hospital, aged 83, died, Oct 24, 1938, of chronic myocarditis and nephritis

**Frank Aylmer Woods**, Holyoke, Mass, Hahnemann Medical College and Hospital of Philadelphia, 1893, formerly member of the board of health, aged 67, died, Oct 17, 1938, in a hospital at Wellesley, Mass, of cirrhosis of the liver

**James Thomas C Affleck**, Sacramento Calif, Cooper Medical College, San Francisco, 1889, aged 74, died Oct 2, 1938, in the Sutter Hospital of lobar pneumonia and fractures of the leg and hip received in an automobile accident

**John William Chappell**, Washington, D C, Columbian University Medical Department, Washington, D C, 1881, member of the Medical Society of the District of Columbia, aged 82, died, Nov 2, 1938, of chronic myocarditis

**Clarence Parnell Holden**, Melrose, Mass, New York Homeopathic Medical College, New York, 1880, for many years chairman of the board of health, aged 85, died, Oct 8, 1938 of cerebral thrombosis and arteriosclerosis

**Holland Harvey Green** • Hillsboro, Va, George Washington University School of Medicine, Washington, D C, 1931, president of the Loudoun County Medical Society, aged 38, died, Oct 18, 1938, of coronary thrombosis

**Clark William Greene**, Binghamton N Y, Bellevue Hospital Medical College, New York, 1873, member and past president of the Medical Society of the State of New York, aged 89, died, Oct 1, 1938, of myocarditis

**Theodore Charles Guenther** • Brooklyn, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1896, for many years on the staff of the Norwegian Hospital, aged 63, died, Oct 29, 1938, of embolism

**Frank Watlington Lester**, Pasadena, Calif, College of Physicians and Surgeons Medical Department of Columbia College New York 1878, aged 83, died, Oct 21, 1938 of cystitis and arteriosclerotic heart disease

**Albert S Kaufman** • New Kensington, Pa, Baltimore Medical College, 1893, formerly member of the school board on the staff of the Citizens General Hospital, aged 69, died, Oct 8, 1938 of arteriosclerosis

**Ferdinand P Henn**, Glendale, N Y, Long Island College Hospital Brooklyn, 1908, aged 55, died Oct 1, 1938, in St John's Hospital, Long Island City, of nephroma of the right kidney and bronchopneumonia

**Guy Edward Armstrong**, Pound Wis, Northwestern University Medical School, Chicago, 1909, served during the World War, aged 66, died Oct 14, 1938, in Marinette, of toxic myocarditis following diphtheria

**Jacob Weaver Royer**, Terre Hill, Pa, Jefferson Medical College of Philadelphia 1892, served during the World War, aged 71, died in October 1938 of benign hyperplasia of the prostate

**Samuel M Miller**, Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1877, aged 84, died, Oct 6, 1938 of carcinoma of the face and arteriosclerotic heart disease

**Robert Hill**, Ipswich, S D, College of Physicians and Surgeons, Keokuk, Iowa, 1894, member of the South Dakota State Medical Association, aged 73, died, Oct 23, 1938, of uremia

**Susan Edgar Abbott Wooldridge**, Pittsburgh, Boston University School of Medicine, 1902, member of the board of education, aged 59, died Oct 10 1938 of rheumatic heart disease

**Elmer Willard Coe** • Youngstown, Ohio, Ohio Medical University Columbus 1896, on the staff of St Elizabeth's Hospital, aged 68, died, Nov 16, 1938, of cerebral hemorrhage

**Thomas C Allen**, Bernie, Mo, Barnes Medical College, St Louis, 1901, member of the Missouri State Medical Association, aged 65, died, Nov 18 1938, of cardiac hypertrophy

**Elmer Ellsworth Jackson**, Washington, D C, Howard University College of Medicine Washington, 1889, aged 77, died Oct 9, 1938, at Chillum, Md, of intestinal obstruction

**John H O Quinn**, Patterson Ga, University of Georgia Medical Department, Augusta 1898, aged 69, died Oct 30, 1938, of hemiplegia, myocarditis and hypostatic pneumonia



**Lewis Harmon Young**, San Francisco, College of Physicians and Surgeons, San Francisco, 1903, aged 69, died, Oct 13, 1938, of injuries received in an automobile accident

**Richard Craig Price** \* Denver, University of Colorado School of Medicine, Denver, 1919, aged 44, died Oct 29, 1938, of sclerosis of the coronary arteries and myocarditis

**Max Sturnick**, Boston, Harvard University Medical School, Boston, 1904, member of the Massachusetts Medical Society, aged 61, died Oct 24, 1938, of coronary occlusion

**Gomer John**, Promise City, Iowa, Keokuk Medical College, College of Physicians and Surgeons 1900, aged 70, died, Oct 28, 1938, of septicemia and lobar pneumonia

**Minnie Iland**, Crane, Ore., University of Southern California College of Medicine, Los Angeles 1907, aged 64, died, Oct 14, 1938, in Seattle of cerebral hemorrhage

**Edwin A. Boone**, Loyal, Okla., Keokuk (Iowa) Medical College, 1897, aged 78, died, Oct 22, 1938 in St Mary's End Springs Hospital, End, of coronary thrombosis

**Frederick W. Ireland**, Norwalk, Conn. Jefferson Medical College of Philadelphia, 1903, aged 63 died Oct 29, 1938, in Pembroke Ont., Canada, of cerebral hemorrhage

**Francis Charles Ligouri**, New Rochelle N. Y. University of Vermont College of Medicine, Burlington, 1899, aged 64 died Oct 15 1938 of coronary thrombosis

**Wesley Asbury Giffin**, Deckerville Mich. Detroit College of Medicine, 1891, served during the World War, aged 71 died, Oct 31, 1938 of coronary thrombosis

**John Franklin Hunt**, Dickson, Tenn. University of Nashville (Tenn.) Medical Department, 1900 aged 65, was found dead Oct 18 1938 presumably of heart disease

**William B. McDaniel**, End Okla. Barnes Medical College St. Louis, 1901 aged 69 died Oct 30 1938, of cerebral hemorrhage hypertension and diabetes mellitus

**Albert S. Yenni** \* New Orleans Medical Department of Tulane University of Louisiana, New Orleans 1897, aged 63, died Oct 1 1938 of carcinoma of the larynx

**Thomas M. Edwards**, Frostproof Fla. University of the South Medical Department, Seawater Tenn. 1900 aged 64, died, Nov 3 1938 of cerebral hemorrhage

**Bailey Campbell**, Dayton, Ohio Medical College of Ohio Cincinnati 1896, aged 72 died in October 1938 of myocarditis diabetes mellitus and chronic prostatitis

**Inez Hyatt**, Conneaut Ohio Ohio State University College of Homeopathic Medicine Columbus, 1915 aged 67, died suddenly Oct 15, 1938, of heart block

**Frank Augustine Gardner**, Salem Mass. Boston University School of Medicine 1883, aged 77, died Oct 18, 1938, of coronary sclerosis and thrombosis

**Daniel Lewis Youngs**, Clarksville Iowa Drake University Medical Department Des Moines, 1895 aged 73, died, Oct 31 1938, of arteriosclerosis

**William John Joseph Manning**, Norristown Pa. Jefferson Medical College of Philadelphia 1895 aged 70, died, Oct 4, 1938, of chronic endocarditis

**Edward L. Jones**, Raymond Neb. Lincoln Medical College of Colnet University 1905, aged 74 died Oct 12, 1938, of heart disease and hypertension

**Malcolm Osgood Austin**, San Francisco Cooper Medical College, San Francisco, 1895 aged 75 died Oct 23 1938 of carcinoma of the prostate

**William F. Hotchkin**, Blue Island, Ill. Chicago Homoeopathic Medical College 1896 aged 76 died in October 1938 of chronic nephritis

**Reginald Francis Scott**, Toronto Ont. Canada, University of Toronto Faculty of Medicine 1926 aged 40, died, Oct 14, 1938

**Louis Otto Saur**, Fosters, Ohio (licensed in Ohio in 1898), formerly health officer of Norwood aged 62 died, Oct 31, 1938

**Harry Bay** \* Cole Camp Mo. Barnes Medical College St. Louis, 1904, aged 59 was killed by a train Oct 28 1938

**William Archibald Kerr**, Elora Ont. Canada, Trinity Medical College, Toronto, 1899, aged 66 died Oct 16 1938

**George Theodore Urquhart**, New York, University of Toronto Faculty of Medicine, 1920, aged 47, died Oct 1 1938

**Stephen Henry Murphy**, Kentron Ont. Canada Trinity Medical College, Toronto, 1894, aged 74, died Oct 28, 1938

**Edna Zinn Juchhoff** \* Chicago, Chicago Medical School, 1927, aged 57, died Oct 7, 1938, of myocarditis

## Correspondence

### PNEUMONIA IN PRIVATE PRACTICE

*To the Editor*—I read with much interest the article by Drs Russell L. Cecil and E. A. Lawrence, "Pneumonia in Private Practice," in THE JOURNAL November 19. However, I am not able to corroborate the conclusions of the authors.

I have been engaged in the general practice of medicine in rural West Virginia since 1912. In that time I have treated approximately 100 cases of lobar pneumonia, with one death. I have treated approximately 150 cases of other types of pneumonia, with five deaths. These are not selected cases but run of the mine cases of general practice in rural West Virginia for the period indicated and include all the cases I have been privileged to treat. I have not sent any pneumonia patients to any hospital. One was taken to a hospital contrary to my advice and died there.

About one half of these cases occurred in the five years that began with 1918. So far as I know, the experience of the other rural physicians whom I have known best has not been materially different from my own. I do not know that pneumonia in rural West Virginia is any more mild than pneumonia in the shadow of the big city clinics, but somehow the country doctors have been able to maintain a better batting average.

One difference in case management which I have noticed is that in rural practice in this section the treatment is more personal with more attention to detail, and less standardized than in the large clinics.

I have had serum in my icebox for the past several months but have never used it. I have never used an oxygen tent.

E. R. COOPER, M.D., Glenville, W. Va.

[NOTE.—This letter was referred to Dr. Cecil whose reply follows.—Ed.]

*To the Editor*—Unfortunately there are no studies in medical literature which throw any definite light on the subject of pneumonia in private practice, particularly pneumonia in rural private practice. I have heard a good many country doctors claim that their death rate in pneumonia was very low but when one begins to question them more carefully it is almost impossible to get any accurate figures as to types, character of pneumonia or age of patient.

As a matter of fact, there is much ground for the belief that pneumonia in the country is considerably milder than it is in the large cities, with a correspondingly lower death rate. No doubt this is due largely to the fact that the severe types (types I, II and III) are rarely encountered in the country districts. However, I would be willing to go still further and admit that a hundred type I cases in the country would show a lower fatality rate than a hundred type I cases in the city. However, right here in New York City, Park Avenue practitioners boast just as Dr. Cooper does that they do not lose many of their pneumonia patients.

It is assumed that the virulent forms of pneumonia are spread by contacts with carriers. Such contacts are lacking in the country and for that reason the virulent forms of pneumonia are not so common among country people as they are among city people.

The doctors in the Southern states claim that pneumonia is milder in the South than it is in the North. But this is not borne out by statistics prepared by the life insurance companies or by the U. S. Bureau of the Census. West Virginia has a higher death rate than New York State, 93 per hundred thousand versus 85 per hundred thousand.

There seems to be rather general agreement that the fatality rate for pneumonia in the home is less than that for cases treated in hospitals. For example, in the final report of the

Massachusetts Pneumonia Study by Heffron and Robinson (Final Report of the Massachusetts Pneumonia Study and Service, 1931-1935, *Commonwealth* 24 24 [Jan-Feb-March] 1937) their cases are summarized as follows

	Cases	Deaths	Fatality Rate Per Cent
Home cases	138	70	20.7
Hospital cases	167	85	23.2

These figures check pretty well with the figures of Dr Rogers, director of the New York State Bureau for Pneumonia Control (Rogers, E S, and Gooch, M E Type I Pneumococcus Pneumonia Observations from Study of Two Thousand Cases Treated with Specific Serum, *New York State J Med* 38 1369 [Nov] 1938) His figures were quoted in our article and were as follows

	Cases	Deaths	Fatality Rate Per Cent
Home cases	551	74	13.4
Hospital cases	1 475	273	18.5

The figures of Rogers are more significant than those of Heffron, as they were all type I cases and were all treated with serum

These statistics are no reflection on hospital therapy They simply mean that the doctor keeps his mildly affected patients at home and sends his sick ones to the hospital

A careful bacteriologic study of rural pneumonia would be an important contribution to medical literature, but a large number of cases would have to be studied and the typing done by a first-class bacteriologist I suspect that there is a good deal of inaccurate typing done in rural and small-town hospitals

I cannot agree with Dr Cooper that the character of the nursing or medical care is a factor in the difference between the fatality rate in country and city practice Certainly no pneumonia patients in the world could have better or more personal care than they receive at the Hospital of the Rockefeller Institute, yet the death rate in a large series of type III cases at that hospital is 40 per cent!

RUSSELL L CECIL, M D, New York

### VALUE OF RETICULOGEN

To the Editor—Recently there has come to my attention the following statement, which appeared on page 15 in a small book entitled "The Anemias" published by Eli Lilly Company in 1938 "Reticulogen contains 20 units of anti pernicious anemia principle per cc"

I have also recently seen such a statement in the literature contained in a package of Reticulogen I know of several instances of such a statement being made to physicians by men representing Eli Lilly Company In at least one of these instances the physician was led to believe that this represents U S P units

I have seen no reference to Reticulogen in publications of the potency of anti-pernicious anemia substances made by the U S P Anti-Anemia Advisory Board There has been a statement made by this subcommittee that no parenteral liver substance would be given a rating of more than 15 units per cubic centimeter of material, and furthermore that mixtures with other substances would not be accepted for inclusion in the Pharmacopoeia (The Standardization of Liver Preparations, editorial, *THE JOURNAL*, July 16, 1938 p 254)

As I am not aware of the use of units in describing liver extracts other than those proposed by the U S P Anti-Anemia Advisory Board and because the company does not refer to any other unit it seems to me that this is a deliberate mis-

representation designed to sell this material to those physicians not familiar with the facts stated I believe that if such is the case the U S P Committee and the Council on Pharmacy and Chemistry should make these facts and the standing of this particular preparation entirely clear to all readers of *THE JOURNAL* On the other hand if this material has been tested and such potency has been approved by the Anti-Anemia Advisory Board it would be a great service both to the physician and to the patient with pernicious anemia to have this evidence made available

WILLIAM P MURPHY, M D, Boston

### "REPORT ON THE USE OF ROENTGEN RAYS FOR CONTRACEPTION"

To the Editor—The report by the Councils' Committee on Contraceptives appearing on page 1767 of *THE JOURNAL* November 5 errs in taking up a matter which does not fall in its jurisdiction That portion of the work of Harris and of Mayer, Harris and Wimpfheimer on the use of the roentgen rays to induce therapeutic abortion is not a method of contraception In a later portion of the report the committee condemns the method because "it is decidedly dangerous and its use should be deprecated"

The mandate of this committee is described in an editorial comment on page 1170 of the same issue of *THE JOURNAL* In this it is stated that the House of Delegates 'delegated to the Council on Pharmacy and Chemistry and to the Council on Physical Therapy the problem of investigating materials, devices and methods recommended or employed for the prevention of conception with a view to determining their physiologic chemical and biologic properties and effects' The committee is charged simply with studies affecting problems of therapeutic contraception and problems of sterility as well

Contraception, according to the definition in Webster's Dictionary, is "prevention of conception or impregnation" The function of the committee as I must conclude from the authorization by the House of Delegates does not include the study of measures for the interruption of pregnancy when established

The authors whom they refer to have not, as I must point out, advocated radiotherapy for the induction of sterility In fact, they emphasize that patients, after the conclusion of the treatment, are given instruction in methods of contraception The authors likewise state that, in spite of this contraceptive advice and the procurement of adequate devices, 35 per cent of the patients treated by radiotherapy conceived subsequently

The committee has interlarded between the opening and the concluding paragraphs twenty-two lines pertaining to inquiries concerning the use of the roentgen rays for the purpose of inducing criminal abortion and illegal sterilization The paragraph which presents an abstract of the two papers referred to, namely that of William Harris (*Am J Roentgenol* 27 415 [March] 1932) and that of M D Mayer, William Harris and Seymour Wimpfheimer (*Am J Obst & Gynec* 32 945 [Dec] 1936), gives an unbiased resume of these papers Then, however, follows a paragraph discussing the illegal use of roentgen rays to interrupt pregnancy and produce sterility in women In the concluding paragraph this discussion is continued and, without further paragraphing the method employed by the authors quoted is condemned as "in spite of the results reported by the workers mentioned in the use of roentgen rays for therapeutic abortion it is the opinion of radiologists and other members of the medical profession that this method is decidedly dangerous and its use should be deprecated" Even the most careful reader might draw the inference, whether this is warranted or not, that the motives of the workers mentioned are suspected

The 200 patients reported on by Mayer, Harris and Wimpfheimer were treated in the gynecologic service of the Mount Sinai Hospital between 1927 and 1936 under my personal super-

vision The method was first resorted to after the tragic death on the operating table of a patient with severe cardionephritis during the emptying of the uterus had emphasized the danger of the interruption of pregnancy in poor surgical risks.

The therapeutic abortions were induced only after the head of the gynecologic department, the head of the radiotherapeutic department and the head of the department referring the patient had agreed on the necessity of the measure. The underlying cause warranting the induction was required to be permanent and absolute. The most frequent underlying condition was chronic cardiovascular disease (seventy-four cases). Next came pulmonary tuberculosis (twenty-seven cases). For further details of the other scattered cases, I refer to the articles themselves.

As to the results obtained abortion resulted spontaneously in 90 per cent. The method failed in 4 per cent. The morbidity was 3 per cent (fever in 1 per cent, sharp bleeding in 2 per cent). The mortality was 0. This record of 200 consecutive interruptions of pregnancy in patients suffering from serious general diseases requires no apology.

If the Council on Physical Therapy should see fit to judge and condemn the method in question it has a warrant to do so, but such a report should be given independent of any possible application of the method for illegal practices. This report should be based on the opinion of competent roentgenologists, who should judge the merits of the use of roentgen rays for the induction of therapeutic abortion in the special instances in which it was employed.

ROBERT T. FRANK, M.D., New York

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### REDUCING DIET WITH STEAK AND POTATOES

To the Editor—Recently a patient told me of a physician who was reducing patients' weights by putting them on a so-called steak and potato diet. They were to eat a pound of steak twice a day and an Idaho potato with each steak and a glass of milk every other day. They were to take their vitamins either orally or subcutaneously. I can see how this diet would not be hard to take if one likes steaks but my conception of the proper way to reduce would be a balanced diet with a reduction of caloric intake. Frankly it sounds to me nothing short of pure hogwash. What do you think of such a diet? M.D. Michigan

ANSWER—Reduction diets are essentially starvation diets. Obviously the greater the starvation the more rapid the loss of weight. How to starve without serious physiologic disturbance is the scientific question. A good reducing diet should provide every essential generously except calories. The protein content of the diet suggested far exceeds metabolic needs. On the other hand the diet is dangerously low in vitamins A, B<sub>1</sub> and C, provides insufficient bulk for the average normal person and would barely meet the minimum requirement of the adult for calcium. Vitamin deficiencies can, of course, be made up by the use of concentrated vitamin preparations. There is no apparent reason for administering these subcutaneously, however, since all available vitamin preparations are effective orally in the amounts needed as dietary supplements. The total caloric content of a steak and potato diet cannot be easily estimated because it will be greatly influenced by the amount of fat in the meat. It is to be assumed that the instructions cover cooked potatoes and cooked steak with all visible fat removed. On this assumption the diet may be estimated to contain roughly 75 Gm of carbohydrate, 250 Gm of protein and 40 Gm of fat, which is equivalent to 1,660 calories. That such a diet might lead to consumption of body fat for energy requirements is, of course, undeniable. That it is an effective, safe and sane method of weight reduction remains to be demonstrated. Steffanson found it impossible to eat lean meat exclusively over long periods. It was only with a good supply of fat that he could maintain

good digestion. However, increasing the fat rapidly increases the calories. According to the Rose Laboratory Manual for Dietetics (fourth edition, New York, Macmillan Company, 1937) two pounds of the edible portion of porterhouse steak of average fat content may be expected to supply approximately 200 Gm of protein, 185 Gm of fat and 2,460 calories, while the edible portion of beef sirloin steak will supply approximately 170 Gm of protein, 168 Gm of fat and 2,200 calories. The Council on Foods has outlined the principles which should govern the selection of foods for the reducing diet in its report on "Foods for Weight Reduction" (THE JOURNAL, Aug. 8, 1936, p. 431). This report should be consulted. Helpful tables of food composition and further suggestions for the selection of a low caloric diet may be found in the section of diet in the new (1938) edition of the A. M. A. Internist's Manual.

### SIBSON'S FASCIA AND SEBILEAU'S BANDS

To the Editor—What is the distinction between Sibson's fascia at the apex and the endothoracic fascia? The anatomies describe Sibson's fascia but none does not describe the endothoracic fascia. Can you give me the anatomy of Sebileau's bands? They are extensions of the endothoracic fascia. M.D. California

ANSWER—Sibson's fascia (Francis Sibson, London physician, died in 1876, published "Medical Anatomy" in sections from 1855 to 1869) is a continuation above the first rib of the endothoracic fascia. The latter is loose and indefinite between the parietal pleura and the ribs more clearly recognizable on the diaphragm, and best developed over the cupula pleurae. It is described in Morris's Anatomy (Jackson). Above the first rib where the apex of the lung and cupula pleurae are crossed by the subclavian arteries and veins and the lower cords of the brachial plexus, the fascia outside (above) the pleura is better developed. This is Sibson's fascia. It extends in general from the transverse process of the seventh cervical vertebra to the dome of the pleura and to the upper margin of the first rib.

It contains three definite thickenings (Sebileau's bands—Sebileau, Pierre, L'appareil suspenseur de la plevre, *Bull. Soc. anat. de Paris* 1891, p. 410). These three bands are: 1. Superficial, fibrous (or more often muscular), extending from the anterior tubercle of the sixth and seventh transverse processes to the dome of the pleura and to the first rib lateral to the subclavian artery. It lies between the subclavian artery and the eighth cervical nerve. 2. Deep, fibrous, extending from the first rib 2.5 cm from its vertebral end forward dividing in a < shape around the first thoracic nerve to be inserted into the upper surface of the pleural dome. 3. Medial, fibrous vertebralpleural from the front of the body of the seventh cervical and first thoracic vertebrae to be inserted into the superomedial part of the pleural dome. 1 corresponds to a muscle well developed in the higher apes and described by Testut (*Bull. Soc. d'anatomie de Paris* 1883). The scalenus minimus when present (about 30 per cent) joins 1 and 2. Zuckerkandl described this fascia in 1877 (*Ztschr. f. Anat. und Entwickl.*). See also Applied Anatomy of the Lungs and Pleural Membranes, by J. S. Dickey, 1911, p. 361, and Testut, *Traité d'anatomie humaine*, 1901, volume IV, where Sebileau's bands are pictured (p. 473, fig. 408).

### EFFECTS OF ORCHITIS FROM MUMPS

To the Editor—A man aged 20 had a bilateral orchitis from mumps and had a stormy time with fever for more than three weeks. The two sides were affected in succession. A relative is afraid that the boy may develop eunuchoid symptoms. Is there any basis for such fear? M.D. California

ANSWER—Testicular atrophy is an important and fairly common sequel of orchitis from mumps. Atrophy is not noticed at first because it progresses slowly and there are no active symptoms. The atrophy begins, perhaps, in about two months after involvement and may continue for as long as one year. The atrophy varies in degree, the organ may be decreased in size from one fourth to one half or it may be reduced to the size of a large bean, becoming hard and insensible to pressure. After the orchitis has subsided, a variable amount of testicular damage remains. The seminiferous tubules are chiefly affected, resulting in a loss of sperm formation. If both testes are involved, the patient becomes sterile. The secondary sex organs and male characteristics, however, remain normal, the patient does not suffer from loss of libido and can perform the sex act satisfactorily. Rarely, however, a condition develops which is characterized by hypogonadism and gynecomastia. This is unusual, since even after surgical castration in a male who has already attained sexual maturity there may be no loss of the masculine characteristics.

## FEVER TUBERCULOSIS OR NEURASTHENIA

*To the Editor*—A woman aged 23 married and divorced three years complains of nervousness poor appetite burning on urination burning in the rectum edema of the ankles loss of weight and tiredness especially in the afternoon. She has been occupied as a clerk for the last three years. She has a past history of scarlet fever erysipelas Bartholin gland infection pleurisy and neuritis. She apparently recovered from all these. The tonsils and adenoids were removed eighteen years ago. She has menstrual periods every six weeks with dysmenorrhea the periods lasting three or four days. Examination revealed a blood pressure of 90 systolic 70 diastolic weight 92 pounds (42 kg) hemoglobin 80 the temperature is elevated in the afternoon to 99.6 F but in the morning and late in the evening is normal. The heart lungs and abdomen are normal. The cervix appeared slightly inflamed. The uterus was in the normal position slightly enlarged. The urine is normal and the Kahn test is negative. Cervical smear showed a moderate number of pus cells. X-ray examination of chest and lungs as interpreted by a roentgenologist is as follows: There is a long perpendicular heart. Mild linear thready shadows are noted on both sides of chest with a few soft subtending shadows extending into both apexes and outward toward the lung periphery. No definite lesions of specific infection are apparent. There is a thickening of the hilus glands on the left side of the chest. However in these mild incipient and borderline cases it is well to treat them as incipient tuberculosis. The sputum test revealed no tubercle bacilli. I have kept the patient from work put her to rest in bed with a nourishing and nutritious diet and have given her elixir of iron quinine and strychnine and calcium and calcidein tablets. On such treatment she has improved considerably gaining 10 pounds (4.5 kg) in one month she has overcome her nervousness edema of the ankles has disappeared and the blood pressure has gone up to 116 systolic 80 diastolic but there is one symptom that completely puzzles me. She has a normal temperature at all times except when she uses the telephone and when she has visitors or when she carries on a lengthy conversation then her temperature rises to from 99.2 to 99.8 F also causing her to perspire excessively. When she has discontinued using the telephone or has dismissed visitors the temperature recedes to normal in about half an hour. I would appreciate your assistance in explaining why this patient requires the elevated temperature. Could it be due to an emotional disturbance or is it due to a low grade tuberculous infection?

ANGELO L. VINCENTI, M.D. Chicago

**ANSWER**—Most of the details in this case are suggestive of neurasthenia. A diagnosis of tuberculosis should not be made on the indecisive roentgenographic evidence described, and the word tuberculosis should not be mentioned to the patient. It is unusual for the roentgenographer to suggest therapy. Nevertheless since tuberculosis has been considered it would be wise to apply a skin test with purified protein derivative to determine the sedimentation time, and to examine the chest every three months or more until the disease is ruled out with certainty. The complaint of burning on urination should be investigated further to ascertain the presence or absence of cystitis or other infection.

The history of elevation of temperature to fever levels after emotional excitement is a characteristic of a certain form of neurasthenia and simply seems to indicate an unstable nervous control. The existence of hypotension, menstrual irregularity, subnormal weight and excessive perspiration all seem to be part of the syndrome described in *THE JOURNAL* Oct 3 1936, page 1089, by H. A. Reimann in an article entitled "The Problem of Long Continued, Low Grade Fever." Detailed methods for diagnosis, management and reference to other work are given in that article.

## DERMATITIS FROM PHENOL FORMALDEHYDE RESINS

*To the Editor*—At a local factory where I am doing some industrial work we are using a water soluble phenol and formaldehyde solution (this is essentially liquid bakelite). At the present time we have two men who are sensitive to this preparation and I would appreciate any information you might have. Is there a modern textbook on the subject of the toxicity of the various chemicals used in modern industry?

H. A. CAMPBELL, M.D. Newark, Ohio

**ANSWER**—Dermatitis is common among workers handling phenol formaldehyde resins and is usually due to hypersensitivity to formaldehyde. In a study made by the United States Public Health Service (Skin Hazards in American Industry, Part II, Public Health Bulletin 229, September 1936, pp. 1-12) it was found that 80 per cent of such workers were sensitive to formaldehyde and the remainder to phenol, cresol or hexamethylenetetramine, which is an ingredient in certain resins prepared for molding.

In order to determine to which of these substances the patient is sensitive, patch tests can be performed with (1) a 4 per cent solution of formaldehyde, (2) a 2 per cent aqueous solution of phenol and (3) dry powdered hexamethylenetetramine. The patches may remain on the normal skin for twenty-four hours without causing a reaction. A sensitive individual will react to the patch of a substance to which he is sensitive.

To protect the workers against the irritants in phenol formaldehyde resins, manufacturing processes should be totally enclosed

If this is not possible, hoods with suction exhausts should be placed over open processes so that dust and fumes are drawn away from the worker and out of the room. The workrooms should be ventilated by intake and exhaust fans to remove dust and fumes. The floors, walls, ceilings and machines should be washed down or vacuum cleaned at frequent intervals to keep them free from dust and irritating chemicals. Clean work clothes consisting of long sleeves, long-legged underclothes and long-sleeved coveralls fastened at the neck and wrists, and rubber gloves extending under the sleeves of the coveralls, should be provided. New workers who are hypersensitive to the resins but who have only mild eruptions should be given protective ointments in addition to the protective clothing and allowed to work for a period of three or four weeks in the hope that they will develop an immunity or become "hardened." If this does not occur, they should be removed from the job. If the patient's livelihood depends on his continuing at the job, an attempt should be made to desensitize him to the chemical to which he is sensitive. This should be done by beginning with minute doses administered subcutaneously and gradually increased. The results of each injection should be carefully watched so as to avoid severe constitutional reactions.

A book on the subject of toxicity of the various chemicals used in modern industry has been written by Alice Hamilton (*Industrial Toxicology*, New York: Harper & Brothers, 1934). Public Health Bulletin 215 and 229, "Skin Hazards in American Industry, Parts I and II," describe industrial processes and their skin hazards in nineteen industries. These bulletins may be obtained by writing to the Surgeon General, United States Public Health Service, Washington, D. C.

## CALCIFICATION OF ARTERIES

*To the Editor*—I am seeking information regarding the time of onset of calcification of the arteries. Which arteries calcify first as demonstrated at autopsy or by x-ray examination and at what age does this calcification appear? Is it the same in the two sexes? What is the order of calcification of the various arteries? Is there any set chronological order for calcification of the various arteries? The reason for these questions is this. In a few patients complaining of coldness color changes and even nocturnal and rest pain in the lower extremities I have found no vascular disturbance to account for these symptoms. However in each case a lateral x-ray view of the lumbosacral region has revealed calcification of the aorta. This has led me to believe that there is also calcification of the arteries supplying the lower portion of the spinal cord with a resulting ischemia explaining the symptoms. In these cases there was no other demonstrable evidence of calcification and the ages varied from 47 to 66 years the age group in which calcification is a normal observation.

ROY J. POPKIN, M.D. Los Angeles

**ANSWER**—Calcification of the media is most frequent and most severe in arteries of the lower extremities. Monckeberg in 1903 in the pathologic study of fifty-five cases of medial calcification found the femoral artery involved in fifty-one, the tibial in thirty-six, the radial in twenty-one and the femoral alone in fifteen. In 1924 Lange in a pathologic study of 3,000 cases in which the age varied from 30 to 80 years found medial calcification in the lower two thirds of the femoral in 97 per cent, posterior tibial in 87 per cent, anterior tibial in 83 per cent, upper third of the femoral in 57 per cent, radial in 18 per cent, ulnar in 14 per cent, popliteal in 9 per cent and brachial in 2 per cent.

There is no doubt that calcification is much less common in the arteries of the upper extremity than in those of the lower. Several writers comment on the infrequency of medial calcification of the arteries of the brain except in the internal carotids, in which it is commonly seen roentgenographically. Faber found that calcification of the splenic, renal and hepatic arteries usually stops at the hilus. The large and medium-sized arteries in the substance of the kidneys are rarely calcified.

Lundsgaard and Rud in the roentgenologic study of peripheral arteries in 345 persons from 20 to 40 years of age demonstrated calcification in 52 per cent of men and 9 per cent of women. Joslin found calcification in 50 per cent of 345 patients with diabetes. Morrison and Bogan in 1929 presented a careful roentgenologic study of calcification of the vessels of the legs of 234 patients who had diabetes. They showed a steady increase in the incidence of calcification from the third to the eighth decade of life. Lansbury and Brown found x-ray evidence of calcification of the arteries of the legs in 65 per cent of men and 28 per cent of women older than 50 years.

Medial calcification begins in childhood and increases in intensity with age. It is usually not prominent macroscopically until after middle life. There is nothing available in the literature to indicate any chronological order for calcification of various arteries nor any information which indicates which arteries calcify first. It is probable, however, that those of the lower extremities are first involved with medial calcification.

Certainly routine roentgenograms of the pelvis indicate that calcification of the lower aorta and iliac arteries is common. The correspondent would probably have difficulty in getting authorities on vascular diseases to agree with his conclusion that roentgenologic evidence of calcification of the aorta indicates calcification of the lower portion of the spinal cord with resulting ischemia, for calcification itself does not indicate that there has been any significant interference with the chief function of the arteries, namely the transportation of blood.

Lansbury and Brown have summarized the situation as follows: "The clinical value of calcification of the arteries of the leg has been a debatable question. The finding, on roentgenographic examination, of definite degree of calcification, frequently leads to erroneous conclusions. It is clear, from this study and from other studies, that calcification is a normal process in older subjects and is more frequent among males than among females. Its presence by itself, therefore, in the absence of occlusive thrombosis, is not clinically significant. There has been a tendency to think that diverse, indefinite symptoms referable to the legs have a vascular basis, if calcification is present in spite of the presence of open arteries. Occlusion of the arteries is the essential process that produces arterial insufficiency, symptoms of claudication, ulcers and gangrene. The presence of calcification does not give any significant information as to the presence or absence of an occlusive process. Degenerative pathologic changes in the coats of the arteries do not, as far as is known, cause symptoms."

The correspondent is referred to Lansbury, John, and Brown, George. Clinical Significance of Calcification of the Arteries of the Lower Extremities (*Proc Staff Meet, Mayo Clin* 9 48 [Jan 24] 1934) and to Cowdry, E V. Arteriosclerosis (New York, Macmillan Company, 1933).

#### VOICE CHANGES IN BOY

To the Editor—I have seen a boy aged 14 years normal at birth weighing 7½ pounds (3 400 Gm). When 6 years old he had measles, mumps and whooping cough. At the age of 7 he had a severe case of influenza with empyema which cleared up on aspiration and washing with antiseptic solution. His tonsils were removed the following summer and he spent the following winter in Florida and has not been ill since. He started having the usual changes of puberty about eighteen months ago. These are all normal except for the voice which still breaks. At times he seems unable to make a sound. He is normal in weight and height, the weight being evenly distributed. The sex organs are normal and the pubic hair is normal in distribution and amount. He has never been shy but is becoming so on account of his voice. The acne vulgaris which he has shows no change. No treatments were given for one year. Lately I have given him 1 000 rat units of antuitrin S weekly for eighteen weeks with no apparent change. Should I continue this treatment? If so, how long and with what dosage? Is there a better treatment?

M D, Ohio

ANSWER—Most boys have the voice changes described in the query and recover spontaneously after a brief period. The boy should be advised not to use his voice excessively or stram his vocal cords at home or at school or on the playground. He should be assured that the changes are normal and that no permanent ill effects will result.

The antuitrin-S will probably have little or no effect, nor would any other glandular product, in the amelioration of this pubescent process. An occasional dose of bromide given internally would calm his nervous irritability and might aid in stabilizing his voice production.

#### INDICATIONS FOR ADENOIDECTOMY

To the Editor—1 Does the knowledge that adenoids are diseased warrant routine removal at the time of tonsillectomy? 2 Is it known definitely that the adenoid can be a focus of infection? 3 What are the possibilities as an obstruction to respiration?

M D Indiana

ANSWER—1 Adenoidectomy is always performed at the time of the tonsillectomy. The majority of the laryngologists remove the tonsils first, after which the adenoid masses are removed. This is the routine in almost all cases. No surgical operation should be undertaken when an acute upper respiratory infection is present or when an acute inflammation or infection is found to exist in any viscous organ, or in the presence of fever.

2 The adenoid may have just as serious focal possibilities as the tonsils, teeth or sinuses. Bacterial multiplication readily takes place in the deep crypts, in which, after removal, pus is often noted. From this source infection may travel down the nasopharynx to the oropharynx and laryngopharynx and to the tracheobronchial tree. Cultures taken from the crypts of removed adenoid masses show growth in all instances.

3 In many infants, and less frequently in older children, the adenoid masses obstruct respiration. Not infrequently infants

are unable to nurse adequately, with resultant nutritional disturbances. A careful history and examination by the attending physician will reveal, in most instances, the cause of this condition, and when the adenoid masses are proved to obstruct respiration or feeding their removal is clearly indicated, regardless of the age. It is good practice, therefore, to remove the adenoid masses only when respiratory obstruction exists, to promote free air passage in the early years of infancy, later the faucial tonsils can be removed, lymphoid elements in the epipharynx again being cleaned out at the same time.

#### TOTAL PROTEIN OF SPINAL FLUID

To the Editor—In Queries and Minor Notes in THE JOURNAL Oct 1, 1938, page 1318 Dr Robert M Harbin Jr asked for the best technique in estimating the total protein of spinal fluid. I was surprised that the method advised by Dr Kingsbury and Dr Clark was not mentioned. It is my impression that it is the choice of many of the large laboratories and hospitals in the country. I believe it is used in a routine manner at the Mayo Clinic. I am mailing a photostatic copy of one of the pages described in Todd and Sanford's textbook. I believe that this matter ought to be discussed further in THE JOURNAL.

CHESTER W LONG MD, Milwaukee

ANSWER—The method described by Denis and Ayer (*Arch Int Med* 26 436 [Oct] 1920) for the estimation of protein in spinal fluid and suggested in THE JOURNAL (Oct 1, 1938, p 1318) as a simple but satisfactory method for this estimation was based on the paper by Folin and Denis on "The Quantitative Determination of Albumin in Urine" (*J Biol Chem* 18 273, 1914), as was the paper by Kingsbury, Clark, Williams and Post on "The Rapid Determination of Albumin in Urine" (*J Lab & Clin Med* 11 981 [July] 1926), to which the writer refers. The latter method as adapted by Todd and Sanford (*Clinical Diagnosis by Laboratory Methods*, Philadelphia, W B Saunders Company, p 544) for spinal fluid protein probably offers the advantage of rapidity in large laboratories where many determinations are done in a routine manner but the accuracy can scarcely be as great as with the Denis and Ayer technique, since a test tube comparator is employed instead of a colorimeter. Furthermore, a special outfit comprising a specially lighted test tube rack containing standards would be required for the determination, whereas the Denis and Ayer method requires only regular laboratory equipment. More recently Ayer, Dailey and Fremont-Smith (*Arch Neurol & Psychiat* 26 1038 [Nov] 1931) have slightly modified the Denis and Ayer method.

#### HABITUAL DEATH OF FETUS

To the Editor—I have attended three women apparently in perfect health with negative blood Wassermann reactions and perfect kidney function. Each of them has had two consecutive stillborn infants just before term or during normal easy delivery. These were their only pregnancies. The babies were perfectly formed. In two cases death of the fetus had antedated labor by twenty-four hours or more so some maceration of the skin had occurred. One of these women was the second wife of a healthy appearing man whose first wife died subsequent to a toxemia from her dead fetus. What is the most likely cause of these events? Veterinarians tell me that entirely aside from brucellosis frequently weak or stillborn offspring occur from the same sire. This community is definitely in the garter belt and minor degrees of myxedema may be present. Two of these women were given corpus luteum and compressed wheat germ tablets throughout their second pregnancies without the desired effects.

EDWIN P RUSSELL MD Rome N Y

ANSWER—Habitual death of the fetus after viability and before term is not so rare. In spite of all modern additions to our knowledge, not much progress has been made in solving this problem. One should eliminate first of all syphilis, diabetes, chronic nephritis, lead, alcohol, coffee, tobacco and other poisonings, and blood diseases in both husband and wife. Then one should investigate carefully the state of the cervix and uterus, particularly for residuums of previous infection and for deformity.

In the scientific approach to the knowledge of these cases, one must investigate all the medical conditions present in both husband and wife and then also study the local conditions in the wife. The husband too with a chronic prostatitis or a chronic pyelitis may be the source of infection in the uterus or adnexa and cause recurrent abortions.

Among animals it is well known that some males cannot convey sufficient life spirit to the ovum to carry it through to term. For example, a cow will abort or produce nonviable calves with one bull and healthy calves from another.

The subject is too vast for detailed consideration here and the inquirer is referred to the seventh edition of De Lee's Principles and Practice of Obstetrics (Philadelphia, W B Saunders Company), in which most of the knowledge extant today has been summarized.

## ABSORPTION FROM VAGINAL MUCOSA AND UTERUS

*To the Editor*—1 Is there any absorption from the vaginal mucosa? If there is how much absorption takes place? 2 Assuming that there is absorption from the vaginal mucosa would a foul smelling thick lochia after a normal delivery cause any rise in the temperature curve? 3 Assuming a positive answer to question 2 what rationale is there in the use of douches such as sodium bicarbonate?

F E GROSSMAN M D Connelsville, Pa

**ANSWER**—1 There is no absorption from the intact vaginal mucosa. There can be absorption from a damaged vaginal mucosa. It is not probable that absorption in such a manner occurs often enough to be of practical importance.

2 Absorption from the uterus of toxins elaborated by organisms commonly of low virulence is by far the most common cause of temperature rises during the puerperium.

3 Douches are of no value save as a cleansing agent, and the potentialities of danger from them far outweigh any good that they might do.

## PITUITARY EXTRACT AND LABOR

*To the Editor*—Is there any harm in giving from 0.5 to 1 cc of solution of posterior pituitary after the birth of a baby and before the placenta is delivered?

M D Ohio

**ANSWER**—It is usually inadvisable to administer an oxytocic drug prior to the delivery of the placenta unless one is prepared to meet an occasional complication that is likely to arise. If solution of posterior pituitary is given before the completion of the third stage, it may interfere with the normal mechanism of placental separation. The partially or even the completely separated placenta may become incarcerated above a contraction zone which may develop between the lower segment and the corpus. This contraction ring may remain for several hours, defeating attempts at the expulsion of the placenta by Crede's procedure. In the event that there is no excessive bleeding, one can wait until this contraction zone relaxes sufficiently to allow the passage of the placenta. In the event that excessive bleeding does occur, it may be necessary to give the patient anesthesia to a surgical degree before it is possible to invade the uterus manually and remove the placenta. Although this complication is not frequent, its occurrence may be an additional hazard to the patient.

If solution of posterior pituitary is given just as the baby is being delivered, it will facilitate the separation of the placenta in most instances, thereby shortening the third stage of labor and perhaps decreasing the amount of hemorrhage. In many hospitals the administration of an oxytocic drug in this manner is almost a routine practice but it should not be resorted to in the home.

CAUTERIZATION OF CERVIX WITH RETRO  
DISPLACEMENT

*To the Editor*—Is cauterization of an eroded cervix contraindicated when there is a first or second degree retroflexion of the uterus?

M D Illinois

**ANSWER**—Cauterization of the eroded or ulcerated exposed vaginal portion of the cervix is not hazardous in patients with a retrodisplacement. Endocervical cauterization should be avoided because the necrotic debris tends to drain in a retrograde direction into the uterus and through the tubes.

## RENAL THRESHOLD FOR SUGAR AND AGE

*To the Editor*—In the average uncomplicated case of diabetes mellitus is there any notable change in the renal threshold for sugar as the patient grows older?

M D Ohio

**ANSWER**—No notable change in the renal threshold for sugar occurs in the uncomplicated case of diabetes mellitus as the patient grows older. Studies of the renal threshold in diabetic patients have yielded conflicting reports. Apparently it is true that the renal threshold is somewhat higher in diabetic patients than in normal patients, but it varies with individuals. It is well known, however, that the renal threshold may be materially raised in any diabetic patient who is undergoing severe infection or in whom arteriosclerotic changes are occurring.

## AMNIOTIC FLUID FOR ADHESIONS

*To the Editor*—What is the present status of opinion on the value of amniotic fluid for the prevention of postoperative abdominal adhesions?

M D New York

**ANSWER**—From both the experimental and the clinical standpoint, amniotic fluid appears to have definite value as a stimulant of the peritoneal defense mechanism and as a deterrent to the formation of abdominal adhesions. It also seems to have some value as a protection against postoperative peritonitis. Amniotic fluid has not been generally accepted, but it would seem that in case of widespread adhesions its use is indicated.

## Medical Examinations and Licensure

## COMING EXAMINATIONS

## STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in *The Journal* January 7 page 78.

## NATIONAL BOARD OF MEDICAL EXAMINERS

**NATIONAL BOARD OF MEDICAL EXAMINERS** Parts I and II. Medical centers having five or more candidates desiring to take the examination Feb 13 15 May 12 (Part II only—limited to a few centers) June 19 21 and Sept 11 13. Ex Sec Mr Everett S Elwood 225 S 15th Street Philadelphia.

## SPECIAL BOARDS

**AMERICAN BOARD OF ANESTHESIOLOGY** An Affiliate of the American Board of Surgery. Written examination Part I will be held in various cities of the United States and Canada April 8. Oral examinations for all candidates St Louis May 13 14. Applications must be filed not later than sixty days prior to the date of the examinations. Sec Dr Paul M Wood 745 Fifth Ave New York.

**AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY** St Louis May. If there are sufficient applications before Feb 15 to warrant holding an examination Philadelphia, November. Sec Dr C Guy Lane 416 Marlboro St Boston.

**AMERICAN BOARD OF INTERNAL MEDICINE** Written examinations will be held in various parts of the United States Feb 20. Sec Dr William S Middleton 1301 University Ave Madison Wis.

**AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY** General oral clinical and pathological examinations for all candidates Part II examinations (Groups A and B) will be held in St Louis May 15 16. Application for admission to Group A examinations must be on file in the Secretary's office by March 15. Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh (6).

**AMERICAN BOARD OF OPHTHALMOLOGY** Written Various cities throughout the country March 15 and Aug 5. Oral St Louis May 15 and Chicago Oct 6. Sec Dr John Green 6830 Waterman Ave St Louis.

**AMERICAN BOARD OF OTOLARYNGOLOGY** St Louis May 12 13 and Chicago Oct 6 7. Sec Dr W P Wherry 1500 Medical Arts Bldg Omaha.

**AMERICAN BOARD OF PATHOLOGY** Richmond Va April 8 9. Sec Dr F W Hartman Henry Ford Hospital Detroit.

**AMERICAN BOARD OF PEDIATRICS** St Louis May 16. Appointments must be made before Jan 16 Cincinnati Nov 14 15. Appointments must be made before July 14. Sec Dr C A Aldrich 723 Elm St Winnetka Ill.

**AMERICAN BOARD OF RADIOLOGY** St Louis May 11 14. Sec Dr Byrl R Kirklin 102 110 Second Ave SW Rochester Minn.

## New York June Examination

Mr Herbert J Hamilton, chief, Bureau of Professional Examinations, reports the written examination held by the New York State Board of Medical Examiners in Albany, Buffalo, New York and Syracuse, June 27-30, 1938. The examination covered nine subjects. An average of 75 per cent was required to pass. Eight hundred candidates were examined, 604 of whom passed and 196 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
George Washington University School of Medicine (1936 3) (1937) (1938 6)	(1935)	(1935)	11
Georgetown University School of Medicine (1937)	(1938 7)	(1938 7)	8
Howard University College of Medicine (1935)	(1938 4)	(1938 4)	5
Emory University School of Medicine	(1938 3)	(1938 3)	3
Loyola University School of Medicine	(1938 2)	(1938 2)	2
Northwestern University Medical School	(1924)	(1924)	1
Rush Medical College	(1937 2)	(1938 3)	3
School of Med of the Division of Biological Sciences	(1936)	(1936)	1
University of Kansas School of Medicine	(1932)	(1932)	1
University of Louisville School of Medicine (1935)	(1937)	(1937)	2
Tulane University of Louisiana School of Medicine	(1938)	(1938)	1
Boston University School of Medicine	(1934)	(1938)	2
Harvard University Medical School (1932) (1935 2)	(1936)	(1936)	6
Tufts College Medical School	(1937)	(1937)	1
Univ of Michigan Medical School (1935) (1937 2)	(1938 2)	(1938 2)	5
St Louis University School of Medicine	(1938 2)	(1938 2)	2
Washington University School of Medicine	(1938)	(1938)	1
Creighton University School of Medicine	(1938 5)	(1938 5)	5
University of Nebraska College of Medicine	(1933)	(1933)	1
Albany Medical College	(1937)	(1938 16)	17
Columbia University College of Physicians and Surgeons (1933) (1937 4)	(1938 55)	(1938 55)	60
Cornell Univ Medical College (1930) (1937 3)	(1938 40)	(1938 40)	44
Long Island College of Medicine (1936) (1937)	(1938 56)	(1938 56)	58
New York Medical College and Flower Hospital (1937 2)	(1938 6)	(1938 6)	8
New York Univ College of Med (1935) (1937 3)	(1938 77)	(1938 77)	81
Syracuse University College of Medicine	(1938 27)	(1938 27)	27
Univ of Buffalo School of Medicine (1936) (1937)	(1938 38)	(1938 38)	40
University of Rochester School of Medicine	(1938 19)	(1938 19)	19
University of Oklahoma School of Medicine	(1937)	(1937)	1
University of Oregon Medical School	(1936)	(1936)	1
Hahnemann Med College and Hospital of Philadelphia	(1938)	(1938)	1
Jefferson Medical College of Philadelphia (1935)	(1937)	(1937)	1
Temple University School of Medicine	(1936)	(1938)	2
University of Pennsylvania School of Medicine (1933), (1936 3) (1937) (1938 2)	(1933),	(1933),	9
Woman's Medical College of Pennsylvania	(1937)	(1938)	7
Marquette Univ School of Medicine (1935)	(1937)	(1938 3)	5
University of Alberta Faculty of Medicine	(1936)	(1936)	1
Dalhousie University Faculty of Medicine	(1937)	(1938 6)	7



Queen's University Faculty of Medicine (1934)	(1938 5)
University of Toronto Faculty of Medicine (1936)	(1937 2)
Univ of Western Ontario Med Sch (1932)	(1935) (1938 3)
McGill University Faculty of Medicine (1930)	(1934) (1935) (1936 2) (1938 3)
Medizinische Fakultät der Universität Wien (1901)	(1920) (1922 2) (1937 9) (1938)
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England (1936)	(1938)
University of Bristol Faculty of Medicine (1937)	(1937)
Université de Lyon Faculté de Médecine et de Pharmacie (1936)	(1936)
Université de Paris Faculté de Médecine (1935)	(1937 2) (1938)
Albert Ludwigs Universität Medizinische Fakultät Freiburg (1920)	(1922) (1936)
Albertus Universität Medizinische Fakultät Königsberg (1919)	(1931) (1937)
Eberhard Karls Universität Medizinische Fakultät Tübingen (1921)	(1921)
Friedrich Alexanders Universität Medizinische Fakultät, Erlangen (1914)	(1914)
Friedrich Wilhelms Universität Medizinische Fakultät Berlin (1921)	(1922 2) (1923) (1924) (1925) (1935 3) (1936 3) (1937 3) (1938 2)
Georg August Universität Medizinische Fakultät Göttingen (1923)	(1923)
Hamburgische Universität Medizinische Fakultät (1936)	(1936)
Johann Wolfgang Goethe Universität Medizinische Fakultät Frankfurt am Main (1920)	(1920)
Julius Maximilians Universität Medizinische Fakultät Würzburg (1919)	(1921) (1924) (1936)
Ludwig Maximilians Universität Medizinische Fakultät München (1920 2)	(1923) (1936) (1937)
Rheinische Friedrich Wilhelms Universität Medizinische Fakultät Bonn (1927)	(1938 2)
Schlesische Friedrich Wilhelms Universität Medizinische Fakultät Breslau (1909)	(1931)
Universität Heidelberg Medizinische Fakultät (1903)	(1914)
Universität Köln Medizinische Fakultät (1925)	(1925)
Universität Rostock Medizinische Fakultät (1935)	(1935)
Magyar Királyi Pazmany Petrus Tudományegyetem Orvosi Fakultása Budapest (1936)	(1936)
Regia Università degli Studi di Modena Facoltà di Medicina e Chirurgia (1933)	(1933)
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia (1934 2)	(1935)
Regia Università di Pisa Facoltà di Medicina e Chirurgia (1936)	(1937 2) (1938)
American University of Beirut School of Medicine (1934)	(1934)
Licentiate of the Royal College of Physicians of the Royal College of Surgeons Edinburgh and of the Royal Faculty of Physicians and Surgeons Glasgow (1935)	(1937 7) (1938 10)
University of St Andrews Conjoint Medical School (1937)	(1937)
Universität Basel Medizinische Fakultät (1934)	(1935 2) (1937 4)
Universität Bern Medizinische Fakultät (1934)	(1935 4) (1936) (1937 3) (1938)
Universität Zürich Medizinische Fakultät (1936 2)	(1937 7)
Université de Genève Faculté de Médecine (1937)	(1937)
Université de Lausanne Faculté de Médecine (1936)	(1937)

School	FAILED	Year Grad	Number Failed
George Washington University School of Medicine (1938)		(1938)	1
Georgetown University School of Medicine (1934)		(1937 2) (1938 2)	5
Loyola University School of Medicine (1937 3)		(1938 2)	5
Rush Medical College (1937)		(1937)	1
University of Louisville School of Medicine (1938)		(1938)	1
University of Maryland School of Medicine and College of Physicians and Surgeons (1936)		(1936)	1
Tufts College Medical School (1922)		(1937)	2
St Louis University School of Medicine (1935 2)		(1935 2)	2
Creighton University School of Medicine (1937)		(1938)	2
Columbia Univ College of Phys and Surgeons (1905)		(1938)	2
Cornell University Medical College (1935)		(1935)	1
Long Island College of Medicine (1935 2)		(1938 3)	6
New York Homeopathic Medical College and Flower Hospital (1935)		(1935)	1
New York University University and Bellevue Hospital Medical College (1934)		(1934)	1
New York University College of Medicine (1938 2)		(1938 2)	2
Syracuse University College of Medicine (1938 3)		(1938 3)	3
University of Buffalo School of Medicine (1936)		(1938 3)	4
University of Rochester School of Medicine (1938)		(1938)	1
Hahnemann Medical College and Hospital of Philadelphia (1932)		(1937 3) (1938)	5
Temple University School of Medicine (1938)		(1938)	1
University of Pennsylvania School of Medicine (1937)		(1937)	2
Woman's Medical College of Pennsylvania (1924)		(1938)	1
Queen's University Faculty of Medicine (1937)		(1937)	1
University of Western Ontario Medical School (1938)		(1938)	1
McGill University Faculty of Medicine (1932)		(1932)	1
Karl Franzens Universität Medizinische Fakultät Graz (1933)		(1933)	1
Leopold Franzens Universität Medizinische Fakultät Innsbruck (1937)		(1937)	1
Medizinische Fakultät der Universität Wien (1936 3)		(1936 3)	10
Deutsche Universität Medizinische Fakultät Prag (1935)		(1935)	2
Universität Karlova Fakulta Lékarska Praha (1935)		(1935)	1
Université de Nancy Faculté de Médecine (1936)		(1936)	1
Université de Paris Faculté de Médecine (1935)		(1936)	4
Albert Ludwigs Universität Medizinische Fakultät Freiburg (1936)		(1936)	1
Albertus Universität Medizinische Fakultät Königsberg (1922)		(1922)	4
Eberhard Karls Universität Medizinische Fakultät Tübingen (1915)		(1915)	1
Friedrich Alexanders Universität Medizinische Fakultät Erlangen (1934)		(1934)	1

Friedrich Wilhelms Universität Medizinische Fakultät Berlin (1913)	(1922 2) (1923) (1924 4) (1931) (1932) (1933 2) (1934 2) (1935) (1936 5) (1937)	21
Georg August Universität Medizinische Fakultät Göttingen (1921)	(1936)	2
Hessische Ludwigs Universität Medizinische Fakultät Giessen (1909)	(1909)	1
Johann Wolfgang Goethe Universität Medizinische Fakultät Frankfurt am Main (1923)	(1926)	2
Julius Maximilians Universität Medizinische Fakultät Würzburg (1920)	(1922) (1928)	3
Ludwig Maximilians Universität Medizinische Fakultät München (1898)	(1913) (1921) (1923 2) (1936) (1938 2)	8
Medizinische Akademie Düsseldorf (1934)	(1934)	1
Philippus Universität Medizinische Fakultät Marburg (1923)	(1923)	1
Rheinische Friedrich Wilhelms Universität Medizinische Fakultät Bonn (1937 2)	(1938 4)	6
Schlesische Friedrich Wilhelms Universität Medizinische Fakultät Breslau (1911)	(1919) (1920) (1923) (1934)	5
Universität Heidelberg Medizinische Fakultät (1911)	(1922 2) (1934) (1937)	5
Universität Köln Medizinische Fakultät (1925)	(1925)	1
Universität Leipzig Medizinische Fakultät (1903)	(1911)	3
Magyar Királyi Ferencz Jozsef Tudományegyetem Orvostudományi Kara Szeged (1933)	(1937)	2
Magyar Királyi Pazmany Petrus Tudományegyetem Orvosi Fakultása Budapest (1933)	(1933)	1
Licentiate of the Royal College of Physicians and of the Royal College of Surgeons Ireland (1938)	(1938)	1
National University of Ireland (1937)	(1937)	1
University of Dublin School of Physic Trinity College (1937)	(1937)	1
Regia Università degli Studi di Bologna Facoltà di Medicina e Chirurgia (1935)	(1936 2) (1937 3)	6
Regia Università degli Studi di Milano Facoltà di Medicina e Chirurgia (1937)	(1937)	1
Regia Università degli Studi di Modena Facoltà di Medicina e Chirurgia (1934)	(1934)	1
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia (1934)	(1935 2) (1936 3)	6
Regia Università degli Studi di Siena Facoltà di Medicina e Chirurgia (1936)	(1936)	1
Regia Università di Napoli Facoltà di Medicina e Chirurgia (1932)	(1933) (1936 2)	4
Unwersytet Jozefa Pilsudskiego Warszawa (1930)	(1930)	1
Licentiate of the Royal College of Physicians of the Royal College of Surgeons Edinburgh and of the Royal Faculty of Physicians and Surgeons Glasgow (1935)	(1936) (1937) (1938 3)	6
University of St Andrews Conjoint Medical School (1937)	(1937)	1
Universität Basel Medizinische Fakultät (1935 2)	(1936 2)	4
Universität Bern Medizinische Fakultät (1934)	(1935 3) (1936) (1937 5) (1938)	11
Univ de Geneve Faculté de Médecine (1933 2)	(1936) (1937)	4
Université de Lausanne Faculté de Médecine (1935)	(1936)	4
Kiev Medical Institute (1913)	(1913)	1

## Book Notices

**The Pathology of Diabetes Mellitus** By Shields Warren M D Pathologist to the New England Deaconess Hospital Boston With a Foreword by Elliott P Joslin M D Second edition Cloth Price \$4.75 Pp 246 with 89 Illustrations Philadelphia Lea & Febiger 1938

This edition, appearing eight years after the first, is based on a larger experience in the subject than any one person has ever before accumulated. The total number of diabetic necropsies is 484. Nine were on children under 11 years of age, twenty-nine were on older children and adolescents, and eight were in cases of hemochromatosis. In addition, because, as Dr Joslin says in the foreword, the present case of diabetes is half surgical, Dr Warren has had the opportunity to study nearly as many biopsies as necropsies. "I am thankful," Dr Joslin adds, "for the training which Dr Warren received as editor of the volume of Preventive Medicine issued by the Harvard Medical School, because automatically a note of prevention of diabetes and its complications permeates the text." The motto on the wall of Dr Warren's "modern operating room" betokens this—*Mortui vivos docent*.

The years that have passed since the first edition of this book have brought new problems to the attention of pathologists. Are infants of diabetic mothers abnormally large with hyperplastic islands of Langerhans? What is the nature of the hepatomegaly in diabetic children? Why does arteriosclerosis in the diabetic patient tend to affect selectively the intrinsic arteries of the heart and the arteries of the leg? What part, in clinical diabetes, is played by the pituitary body? These and many other pressing questions receive consideration. Experimental diabetes, produced in dogs by Young in 1936 by injecting extracts of the anterior lobe of the pituitary body, has been confirmed by Best. Sections of the pancreas of such animals, given to Dr Warren by Dr Best, showed marked hydropic degeneration of the island cells. However, examination of the pituitary body by serial section in eighteen cases of diabetes,

and random sections of the pituitary body in twenty-six more cases, revealed no constant significant abnormality. Vacuolization of the basophilic cells of the anterior lobe, comparable to that described by Kraus, also was seen in control cases. The acidophils were normal in number except in one instance, adenomatous groups of cells, such as Kraus has stained, were not found.

The increase in size and weight of the liver in diabetes may be due to a variety of conditions and is not always associated with increased accumulation of fat. The content of fluid is important, study of some of the larger livers suggests hydrops of the cells rather than an excess of fat or glycogen. The abdominal pain not infrequently associated with hepatic enlargement in diabetes may result from stretching of the capsule, as suggested by Marble. This would imply rapid change of size, perhaps too rapid for deposition of fat, but quite compatible with fluctuation of intracellular fluid. However, in the nondiabetic cases of a series of diabetic and nondiabetic livers the total fatty acid was found to range from 22 to 43 per cent of the wet weight of fresh liver, whereas in the diabetic cases the range was from 41 to 108 per cent.

This book is a compact mass of such material of interest. The illustrations are excellent and the writing is concise and clear. It is highly to be recommended for all students of diabetes and pathology.

**A Report on the Provision and Distribution of Infective Material for the Practice of Malaria Therapy in England and Wales.** By Lieut. Colonel J. A. Sinton V.C. O.B.E. M.D. Ministry of Health Reports on Public Health and Medical Subjects No. 84. Paper. Price 6d. Pp. 22 with 2 illustrations. London: His Majesty's Stationery Office, 1938.

The author states that there may be serious objections to the method of inducing malarial attacks by direct blood inoculation from patient to patient, especially if the donor is suffering from dementia paralytica. Under these conditions the risk of transmitting a syphilitic virus, possibly one with neurotropic characters, to a noninfected patient should never be taken. For this reason, as well as for the reason that malarial strains transmitted from patient to patient sometime become less virulent and are frequently lost, the British Ministry of Health has established an official malaria laboratory at Horton. The monograph describes the way in which mosquitoes are raised, the method of inoculating them from infected patients, the conservation of infected mosquitoes, and the feeding of the infected animals until they are shipped to the various parts of England.

The table dealing with the results of the treatment of dementia paralytica by induced malaria is especially interesting. Statistics are given from the year 1927 to the year 1936 inclusive. About 700 patients were inoculated each year. These patients had all been institutionalized. Approximately 15 per cent were discharged from the various mental institutions as cured and a further 8 per cent were discharged as improved, making a total of approximately 23 per cent who had been benefited by the treatment. The death rate varies between a high of from 10 to 14 per cent in the case of some workers to a low of from 3 to 4 per cent in the case of others. The author states that this apparent contradiction of the rates of mortality is due to the timely administration of appropriate treatment and by careful nursing to keep the temperature within bounds and hold the infection in check and damp down its severity. This seems rather contradictory, since it is now believed by many investigators that the height of the fever is one of the important factors if not the most important factor in treating dementia paralytica.

The therapeutic possibility of *Plasmodium vivax*, *P. falciparum*, *P. malariae*, *P. ovale* and *P. knowlesi* have been investigated and the author states that *P. vivax* is the most useful plasmodium for routine distribution and the inoculation of the nonimmune type of individual, who forms the vast majority of the patients to be treated in the British Isles. It is further stated that the inoculation with *P. falciparum* may be dangerous and may quickly lead to fatal results. Infections with other species of *Plasmodium* have, however, been found useful in special circumstances. They are suitable for certain patients who have resisted infection with *P. vivax* or have developed but a mild infection after inoculation with this parasite, and also for patients who have previously had malaria and who have developed as a result some degree of tolerance to infection with *P. vivax*. *P. malariae* has proved especially useful under such

conditions. Several different strains of *P. vivax* derived from countries as far apart as India, Rumania and Madagascar have been tried at Horton in the practice of malaria therapy. The one selected as the most satisfactory from all points of view is the so-called Madagascar strain at present in use. The method of collecting infected blood and the preparation of blood for distribution is described. All in all, the monograph is a concrete presentation of the subject matter and is useful to the laboratory worker and physician who wishes to obtain specific knowledge in this field.

**Meningiomas: Their Classification, Regional Behaviour, Life History and Surgical End Results.** By Harvey Cushing M.D. Moseley Professor of Surgery, Harvard University, Cambridge, Massachusetts. With the collaboration of Louise Eisenhardt M.D. Assistant Professor of Pathology, Yale University School of Medicine, New Haven, Connecticut. Cloth. Price \$15. Pp. 785 with 686 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, 1938.

This beautiful monograph is a masterly description of the experience of the senior author with the tumors of the meninges. After an account of their pathology and an enumeration of the cases, various types are discussed in particular situations in the cranial and spinal cavities with illustrative histories. The latter are often interesting and dramatic. It is difficult to imagine a more thrilling story than that of the two cases in chapter XXVI. The experiences recounted will long be an inspiration to every surgeon who attempts to remove these tumors. The book is beautifully printed in a clear new type which makes it easy to read. It concludes with a record of the operative mortality, which has been reduced to 8.9 per cent. This astonishing result is the crowning achievement of the life of a great surgeon, who has done more than any other to establish neurosurgery on a sound basis. If the art falls into disrepute because of present practices it will be from neglect of the main lesson which he attempted to teach.

**Pseudo Tuberculosis in Man. Part I. Besnier-Boeck's Disease. Visceral Localisation of the Sarcoids of Boeck.** By Prof. I. Snapper and Dr. A. W. M. Pompen. Part II. Regional Iletitis. By Prof. I. Snapper. Lectures Given in November 1937 at the University of London. Cloth. Price 7.50 florins. Pp. 90 with illustrations. Haarlem: de Erven F. Bohn, N. V., 1938.

This carefully prepared booklet is edited exceptionally well and includes twelve high grade halftone plates. Each plate contains from four to six individual black and white illustrations of roentgenograms, photographs, photomicrographs or drawings. This English edition is well written and will remain a classic for some time. Twenty-seven pages of appendices present thirteen detailed reports of Besnier-Boeck's disease and six case reports of ileitis regionalis. The first part of the volume is confined to a consideration of a new chapter in internal medicine, i.e. the story of the visceral localization of the so-called lupus pernio (Bernier, 1889) and the multiple sarcoids of the skin (Boeck, 1899). These disorders, which were considered by most clinicians as cutaneous tuberculids, are not confined to the skin alone and have become of great interest to general medicine, augmented by increased doubt concerning the supposed tuberculous etiology of this group of diseases. Boeck originally chose the name "sarcoids of the skin" because he first thought them related to the ill defined pseudoleukemias, but in 1900 he concluded that they were purely inflammatory lesions and changed the name to "benign miliary lupoid" with a certain similarity to lupus vulgaris. However, the title "benign sarcoids" persisted. Although opinion prevailed that this represented solely a disease of the skin, Boeck was of another belief. In 1905 he opined that the sarcoids were caused by a benign or uncommon form of the tubercle bacillus. In 1914 Schaumann demonstrated that the sarcoids of Boeck and lupus pernio were histologically the same disease and elaborated the conclusions of Boeck as to the constitutional character of the sarcoid lesion and its tuberculous etiology. The authors' attention to this remarkable syndrome began in 1935 when a patient whose illness during life presented great diagnostic difficulties showed the presence of Besnier-Boeck's disease at necropsy. This led to a review of cases seen previously, and finally observations were made in thirteen cases which demonstrated that this diagnosis must always be considered in cases of enlargement of hilar glands without obvious tuberculous etiology. Eight cases showed pulmonary localization, skeletal changes were present in five, eye

symptoms in five, spleen in seven, skin in seven and liver in four. Examination of the blood showed no typical abnormalities. The Pirquet test was negative nine times and positive twice. The prognosis on the whole is favorable. In none of the authors' cases did symptoms of active tuberculosis develop. The authors believe that the histologic structure of the nodules lacks the characteristics for a diagnosis of tuberculosis. In opposition to Schaumann, patients with Besnier-Boeck's disease do not often die of tuberculosis. This classic seems destined to stand as a lasting monograph on a disease which will frequently tax clinical diagnostic ingenuity, and it is well worth reading for its practical historical value concerning a disease which must be studied in man alone for the present. As long as the etiology remains obscure it seems historically justifiable to describe this syndrome as "Besnier-Boeck's disease." No specific therapy is known.

In the second part of the monograph, another pseudo-tuberculous disorder is noted which has been recognized during the last few years and has no tuberculous etiology, the so called isolated hypertrophic ileocecal tuberculosis. The six cases described typify the diagnostic difficulties that regional ileitis may present. A long period of unexplained intestinal symptoms leads to swelling in the lower right quadrant of the abdomen, and incomplete stenosis of the ileum develops. Nothing but methodical examination will establish the existence of regional ileitis. Many cases have a completely atypical symptom complex. Resection of the diseased ileum and adjacent part of the cecum may be necessary. The monograph includes twenty-nine references to Besnier-Boeck's disease and ten to ileitis regionalis.

**Diseases of the Nose Throat and Ear. Medical and Surgical.** By William Lincoln Ballenger MD FACS and Howard Charles Ballenger MD FACS. Assistant Professor of Otolaryngology Northwestern University School of Medicine Chicago. Seventh edition. Cloth. Price \$11. Pp 1030 with 576 illustrations and 30 plates. Philadelphia Lea & Febiger 1938.

The appearance of a textbook in a seventh edition is presumptive evidence of its popularity. The work of the two Ballengers (the older of the two unfortunately dead for some years) has for a long time held a prominent place among standard works on otolaryngology. Although the present edition has about a hundred less pages than the previous one it is even more complete. By careful revision, obsolete and repetitious material has been eliminated. There has been some rearrangement in the presentation of subjects as compared with the sixth edition. In the present volume part one covers the nose and accessory sinuses instead of the ear. It includes chapters on clinical anatomy and physiology of the nose and accessory sinuses, surgical correction of facial deformities, epistaxis, rhinoscleroma, allergy, nasal neuroses, the etiology, pathology, symptoms and diagnosis of sinus infections and the surgical treatment of sinus infections. Part two is devoted to the pharynx and fauces and includes such subjects as surgical anatomy, diseases of the tonsils, tonsillectomy, deep neck infections and functional neuroses of the pharynx. Part three discusses the diseases of the larynx, including the anatomy, malformations, diverticula, diphtheria, laryngeal paralyses and neuroses, as benign and malignant neoplasms of the larynx, tracheotomy and defects of speech. Part four deals with the ear in an extensive manner. Among the chapters are those on clinical anatomy and physiology, the functional tests of hearing, aural malformations and neoplasms, acute and chronic otitis media, petrositis, facial paralysis, brain abscess, otosclerosis, physiology, functional testing and surgery of the labyrinth. Part five presents bronchoscopy, direct laryngoscopy, esophagoscopy and gastroscopy. There has been fine cooperation in the preparation of this book on the part of Gabriel Tucker and Chevalier L. Jackson in the revision of the chapters on peroral endoscopy, the work of Dr Jackson in rewriting the chapter on gastroscopy, the thorough revision by Alfred Lewy of his section on physiology and functional testing of the labyrinth, and the description by J. M. West of his intranasal operation for dacryostenosis. The text is embellished with numerous illustrations. There are many bibliographic references and a complete authors' and general index. The various subjects are clearly and logically presented, the headings are strikingly designated in large type, and the vast amount of data stated concisely but without omission of any

essential facts. Indeed, this volume covers the whole field of otolaryngology more completely, especially from the practical point of view, than some other more extensive publications. In a word this work is easy to read, authoritative, comprehensive and highly informative. It will serve to great advantage students, practitioners and teachers who concern themselves with diseases of the ear, nose, throat, bronchial tree and esophagus.

**Ergebnisse der biophysikalischen Forschung in Einzeldarstellungen.** Herausgegeben von Professor Dr. B. Rajewsky, Direktor des Kaiser Wilhelm Instituts für Biophysik in Frankfurt am Main. Band I. Ultrakurzwellen in ihren medizinisch biologischen Anwendungen. Von H. Dünzer, H. E. Hollmann, B. Rajewsky, H. Schaefer und E. Schliephake. Paper. Price 19 marks. Pp 308 with 188 illustrations. Leipzig, Georg Thieme 1938.

This volume on ultrashort waves in their medical-biologic applications is the latest contribution to that field by German physical therapy. This work is the first volume of a symposium called "The Observations of Biophysical Research" being assembled by Professor Rajewsky.

In no sense a handbook for everyday use by the physician, it is essentially a rigorously theoretical textbook for advanced study. The subject matter is in large measure intelligible only to a properly qualified physicist. This becomes evident from a cursory examination of chapter headings.

**Introduction.** Actual problems of biophysical research in the field of short and ultrashort waves.

**Chapter 1.** The physical and technical fundamentals of ultrashort wave therapy.

**Chapter 2.** Biophysical foundation of ultrashort wave action in living tissue.

**Chapter 3.** Theory of the reactions of biologic bodies in the high frequency fields.

**Chapter 4.** The problem of treating biologic bodies in an ultrashort wave radiation field.

**Chapter 5.** The present position of clinical experience in ultrashort wave therapy.

The various chapters are prepared individually by the authors in the indicated sequence, each author being considered an expert in his subject. The most interesting and most valuable portions of the book are the highly theoretical sections. These contain a wealth of experimentally obtained data, tabulations and graphs on the electrical properties of different tissues and a profusion of mathematical formulas and proofs not obtainable elsewhere in medical literature.

Much of the subject matter is recent. Magnetron and Barkhausen-Kurz circuits are discussed, centimeter and decimeter waves are investigated from every angle, polar substances and the theory of dipoles are fully explained, and a complete chapter is devoted to the radiation field as distinguished from the capacity and induction field.

In contradistinction to the thoroughness with which the higher branches are investigated, the elementary aspects of the subject are skimmed through or overlooked. The fundamental electrical considerations are inadequately treated, dosage is superficially discussed and dismissed, and the clinical studies are entirely unsatisfactory, being merely reshaped and condensed from Dr. Schliephake's book, which is familiar to many American readers.

Taking the good with the bad, however, this work is entitled to a place on the reference shelf of every well equipped biophysical library and laboratory.

**A Study of Epidemic Influenza With Special Reference to the 1936-7 Epidemic.** By C. H. Stuart Harris, C. H. Andrews and Wilson Smith with D. K. M. Chalmers, E. G. H. Cowen and D. L. Hughes. Medical Research Council Special Report Series No. 228. Paper. Price 80 cents. 2s. 6d. Pp 151 with illustrations. New York: British Library of Information. London: His Majesty's Stationery Office. 1938.

The authors have made careful studies of four small outbreaks of respiratory infections in which no virus was isolated and one widespread epidemic of influenza in which several strains of influenza virus were obtained. They correlated clinical symptoms in the various outbreaks but were unable to show a characteristic group of symptoms that would distinguish "epidemic influenza" from febrile catarrh. The latter third of the report discusses laboratory studies with the influenza virus. The section on isolation of the virus can be followed by those who wish to make experimental studies with the influenza virus. The

section on antibodies in human serum is of academic interest. Efforts to immunize human volunteers with vaccine made from a highly virulent strain of virus were attempted. The authors concluded that "proof of the efficacy or uselessness of vaccination must await further trials in future epidemics."

**Practical Microbiology and Public Health for Students of Medicine Public Health and General Bacteriology** By William Bernard Sharp M.D. Ph.D. Professor of Bacteriology and Preventive Medicine in the Medical Department of the University of Texas Galveston. Cloth Price \$4.50. Pp. 492 with 125 illustrations. St. Louis: C.V. Mosby Company, 1938.

This book is essentially a laboratory manual in bacteriology, immunology and public health. With directions for procedure it also includes a number of examples of charts of various kinds for recording the growth and other characteristics of bacteria. While not a manual worth reading by itself (nor is it intended to be), its real value can be demonstrated only when used as a guide in actual laboratory work.

**Base para interpretación de la radiografía de tórax del adulto. La imagen en el sujeto sano (proyección dorso ventral)** Por I. J. Pardo. Paper. Pp. 115 with 67 illustrations. Caracas: Lit. y tip. del Comercio, 1937.

Realizing that the interpreter of pulmonary roentgenograms must not place undue emphasis on appearances which are of almost universal occurrence, the author of this little book has initiated a series of studies to throw more light on the interpretation of the roentgenogram of the adult chest. In Venezuela the author has evidently taken a lead in seeking to perfect our knowledge of this subject. This little volume deals with the postero anterior projection of the healthy subject. It is assumed and hoped that further, equally meritorious, studies may follow in due time. The study was begun in Spain but the revolutionary events caused the author to continue his work in Caracas. Nearly all of the clinical material came from the dispensary of the Autonomous University of Barcelona. The discussion includes general questions relating to radiography, the extra-thoracic soft parts, the skeleton, the diaphragm, the accompanying shadows and other soft tissue intrathoracic elements, the mediastinal shadow, the lung, the pleura and the calcifications which represent the primary tuberculous lesions. The book justifies praiseworthy criticism.

**Handbook of Histological and Cytological Technique** By R. R. Bensley and S. H. Bensley. Department of Anatomy, The University of Chicago. Cloth. Price \$2. Pp. 167. Chicago: Illinois University of Chicago Press, 1938.

This little manual of histologic technic differs from most others available by the fact that it emphasizes some of the excellent methods and points of view of R. R. Bensley. It differs further from most others in not being overburdened with the rarely used and to a great extent unnecessary methods. Most of the methods which are detailed are clearly stated although some are unnecessarily complicated. The beginner will be lost in the extreme detail and lack of precise directions in the section dealing with sectioning and mounting. This is especially true of that part dealing with the microtome knife. The short discussion on glands is especially informative from the point of view of histochemistry. One of the best sections in the manual is the excellent presentation of the principles of staining. It contains a brief history of the use of stains and an instructive outline of the accumulated data on the underlying reactions which occur in various staining processes. Indeed, the chief value of the manual lies in the emphasis placed on these principles underlying staining technics.

**Health Hygiene and Hokey** By W. W. Bauer, M.D. Cloth. Price \$2.50. Pp. 322. Indianapolis & New York: Bobbs-Merrill Company, 1938.

This is more than another book for public consumption on debunking of health fads. In addition to this aspect it contains many common sense suggestions for normal living. The author writes entertainingly and simply in a strictly accurate manner. Several of the alliterative chapter headings illustrate the readability, such as "Soft Soap and Skin Games," "Dispelling Dietary Dilemmas," "Brains, Biceps and Bunk." As a guide for sensible living it can be safely recommended to patients especially those most inclined to follow the miscellaneous advice of friends and relatives.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Medical Practice Acts Unlicensed Cancer Specialist Enjoined**—The defendant, W. W. Cooper of Altoona, Kan., was, in a suit instituted by the state of Kansas, on the relation of the attorney general, enjoined from practicing medicine without a license. He appealed to the Supreme Court of Kansas.

According to the evidence, the defendant was 86 years of age and for many years sold what the court referred to as "Baker's medicines, household remedies." Eventually he prepared a cancer "remedy" of his own, in the form of a paste, which was applied to the affected part of the body. An investigator, apparently employed by the State Board of Registration and Examination, consulted the defendant concerning a mole under his arm, during September of 1936 and May of 1937. During the first consultation, the defendant advised the investigator that the mole was a cancer but that it could be cured for a fee of fifty dollars. The investigator paid three dollars at the time and the defendant put some paste on adhesive tape and applied it to the mole, telling the investigator to return in about two weeks. Immediately on leaving the defendant's residence, the investigator removed the paste. He returned again in May 1937 and a similar treatment was given. On leaving, the investigator again promptly removed the paste and it was delivered to a chemist for analysis. At the trial, the chemist testified that his analysis showed that the paste contained "about 50 per cent chloride of zinc, starch, and some vegetable tissue, indicating it was a mucilaginous drug called 'althaea'."

The defendant contended that he was not engaged in the practice of medicine or surgery. But, the court said, the answer to that contention is found in the medical practice act, which declares that any person shall be regarded as practicing medicine and surgery who shall prescribe or recommend for a fee, any drug or medicine for the cure or relief of any infirmity or disease of another person. It cannot be doubted, the court continued, that the practice in which the defendant engaged, without a license, was clearly prohibited. Furthermore, the evidence of the defendant was not that his compound constituted a domestic remedy, the administering of which was exempted from the medical practice act. His evidence was quite to the contrary. It was to the effect that the remedy could be applied by any one without danger who had access thereto. He contended, however, that it was a combination of drugs known only to himself. For this knowledge, claimed to be possessed solely by himself, and for the treatment of the patient, he charged a fee. The defendant further contended that the prohibition of the practice as conducted by him violated his inalienable rights, but he cited no authorities in support of this contention. The law does not prohibit the practice of medicine and surgery, the court observed. It simply prescribes certain requirements with which the defendant and others must comply in order to qualify for practice. Such legislation constitutes a valid exercise of police power.

Ordinarily, the court said, the commission of crime may not be enjoined. The legislature of Kansas, however, has by statute authorized the use of the injunctive process to enforce the provisions of the medical practice act. Such a statute is not invalid as authorizing an injunction against an act made criminal or as denying the right to a jury trial in criminal prosecutions. Punishment for violation of such injunction would be for contempt of the order of injunction and not punishment for violation of a criminal statute. These principles, the court said, have been clearly recognized in cases of injunction under medical practice acts and similar legislation.

The question at issue the court said, was not how much benefit or harm resulted from the defendant's treatments but whether he was authorized to do what he did and what he intended to continue to do, without a license. The defendant's own admissions, concluded the court, disclosed that his practice was not within the law. The judgment for the state was therefore affirmed.—*State ex rel Beck, Atty. Gen. v. Cooper (Kansas) 78 P. (2d) 884*

**Compensation of Physicians Liability of Motorist on Oral Promise to Pay for Medical Services Rendered Accident Victim**—The defendant's wife, while driving her husband's automobile, ran over a little girl and fractured her spine. The defendant personally made arrangements for the plaintiff, a bone specialist, to attend the girl, promising orally to pay the medical and hospital bills. After the child had recovered, the defendant refused to pay for the services rendered and the plaintiff sued. He recovered a judgment against the defendant, who thereupon appealed to the Supreme Court of Oklahoma.

The defendant contended that the promise he made to the plaintiff to pay the medical bills was not a valid, direct promise, based on a valuable consideration, but was an oral promise to answer for the debt of another, which was not binding on him. But, said the court, the evidence reasonably sustained the finding by the trial court that the promise was made directly to the plaintiff, with no conditions or contingencies attached to it whatever. The plaintiff so testified, and the reasonable probabilities, in view of all the circumstances, corroborated and gave credence to his testimony. In the opinion of the court, it was clear that the plaintiff's promise to perform the services, followed by the performance, was a sufficient consideration for the promise to pay. The fact that the child did not belong to the defendant was immaterial nor was the question whether the defendant was under any legal or moral obligation to the child or to its parents to furnish medical attention conclusive of the case. The important fact was that, regardless of the foregoing, the plaintiff did perform professional services in reliance on the defendant's promise to pay therefor.

The defendant's promise was not that he would pay if the father of the child did not pay. The promise was an original undertaking, it was not a promise to answer for the debt, default or miscarriage of another so as to bring it within the statute of frauds. The rendering of professional services, the court said, so far as the present question is concerned, is governed by the same rules as apply to the furnishing of goods. When a person orally promises to pay for goods furnished to another, if the oral contract creates original liability on the part of the promisor and credit is extended solely to him, it need not be in writing to be valid. If it is the intention of the promisor to pay only in case of default of that other party, such contract is within the statute of frauds and must be in writing to be valid. The court thought that the present case was similar to *Ward v. Archer*, 173 Okla. 465, 52 P. (2d) 758, in the third court syllabus of which it was said:

A person who promises to pay physician's and surgeon's fees and hospital expenses for one injured by a son of the promisor is bound thereby and when this state of facts is found by the court trying the case without a jury no other primary liability or promise appearing the promise is not within the statute of frauds.

The defendant finally contended that the trial court erred when it sustained an objection to his question put to the plaintiff on cross-examination, inquiring of the plaintiff whether, if the father of the child had offered to pay the bill, the plaintiff would have refused it on the ground that it was an obligation of the defendant's. The defendant stated that the purpose of the question was to ascertain whether the plaintiff regarded defendant's promise as original. No doubt, the court said, the plaintiff, acting as the ordinary prudent person who is willing enough to receive payment of that which is owed him, would have accepted it regardless of whom he considered liable. The court could not see that it made any material difference whether the question was permitted or excluded.

The judgment for the plaintiff was therefore affirmed—*Proctor v. Sisler* (Olla) 78 P. (2d) 802.

**Chiropody Employment by Corporation of Licensed Chiropodist Lawful**—The defendant corporation operates a shoe store in Manhattan, in which it sells accessories such as arch and ankle supports, pads and plasters. In fitting shoes its salesmen use a mechanical device known as a pedograph, which indicates the outer physical characteristics of the customer's foot and aids in determining the proper width, length and size of the shoe or of the arch support if one is required. The defendant employs a licensed chiropodist and a registered nurse,

who gives vibratory foot massage treatments under the supervision of the chiropodist. A salesman took a pedograph imprint of the feet of an investigator, posing as a customer. In response to questions, he described what he said were abnormal conditions in her feet and then recommended a course of treatment by the chiropodist employed by the defendant. Later the investigator and a companion received from the chiropodist and the nurse the treatments suggested by the salesman. The defendant was thereafter prosecuted for unlawfully practicing chiropody and was convicted. The appellate division of the supreme court affirmed the judgment, and the defendant appealed to the Court of Appeals of New York.

At common law, said the Court of Appeals, any person could lawfully treat deformities and functional disturbances of the feet. In 1905, however, the legislature enacted a law forbidding any person not theretofore legally authorized to practice chiropody in the state of New York to engage in such practice without a license. Neither that law nor any amendment to it restricts specifically the employment by corporations of licensed chiropodists. It was contended on behalf of the prosecution, however, that in providing that "no person" shall practice chiropody without a license the law barred the employment of a licensed chiropodist by a corporation, because a corporation is a "person" and cannot be licensed. But, said the court, the law does not mention corporations and on its face has no applicability to corporations. Its obvious purpose is to protect the public health by prohibiting any one from treating or diagnosing foot ailments unless qualified and by requiring such qualification to be shown by the possession of a license. In the field of pharmacy, the court pointed out, attempts to confine ownership of drugstores to licensed pharmacists, or to corporations whose stock is owned solely by licensed pharmacists, have been declared unconstitutional, on the ground that such a requirement has no relation to public health. The court did not think it material in determining the present question that corporations have been denied the right to practice law, medicine and dentistry. Between physician and patient, dentist and patient, and lawyer and client there is a confidential and trust relationship which does not exist between the chiropodist and those whom he treats.

The use of the pedograph as a mechanical aid in determining the proper size of the shoe required does not constitute, the court said, the practice of chiropody. With respect to the statements made by the salesman in answer to inquiries of the customer, it would be an unreasonable and harsh construction of the law, the court thought, to hold that it was intended to prohibit shoe salesmen from pointing out to customers the manifest abnormalities of their feet when questions are put to them by the customers. The salesman at no time held himself out as being a chiropodist or as being able to practice chiropody. On the contrary, he referred the customer to the licensed chiropodist. The nurse who gave massage and vibratory treatments under the direction of the licensed chiropodist was not practicing chiropody any more than a nurse who assists a physician is practicing medicine.

The judgment of conviction was therefore reversed—*People v. Dr. Scholl's Foot Comfort Shops, Inc.* (N. Y.), 13 N. E. (2d) 750.

## Society Proceedings

### COMING MEETINGS

- American Academy of Orthopedic Surgeons Memphis Tenn Jan 15 19
- Dr Carl E. Bridgley 1313 East Ann St. Ann Arbor Mich Secretary
- American Orthopsychiatric Association New York Feb 23 25 Dr
- Norvelle C. La Mar 149 East 73d St. New York Secretary
- American Society of Anesthetists New York Feb 10 Dr Paul M
- Wood 131 Riverside Drive New York Secretary
- Annual Congress on Medical Education and Licensure Chicago Feb 13 14
- Dr W. D. Cutter 535 North Dearborn St. Chicago Secretary
- Middle Section American Laryngological Rhinological and Otolological
- Society Sioux City Iowa Jan 19 20 T. R. Gittins Davidson Bldg
- Sioux City Iowa Chairman
- Society of Surgeons of New Jersey Newark Jan 28 Dr Walter B
- Mount 21 Plymouth St. Montclair Secretary
- Western Section American Laryngological Rhinological and Otolological
- Society Spokane Wash Jan 29 Dr Frederic G. Sprowl Medical
- Arts Bldg Spokane Wash Chairman

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### American Journal of Surgery, New York

42 481 856 (Dec.) 1938 Partial Index

- Examination of a Patient for Medicolegal Purposes F L Flack Tulsa Okla.—p 505
- \*Prevention and Correction of Facial Disfigurement V P Blair J B Brown and L T Byars St Louis—p 536
- Abdominal Catastrophes Resulting from External Violence A M Shipley and J C Hamrick Baltimore—p 542
- Diagnosis and Treatment of Acute and Chronic Back Pain Due to Trauma C R G Forrester Chicago—p 582
- Plan for Conservatism in Fusing Operations on Spine and Pelvis G W N Eggers Galveston Texas—p 595
- Compound Fractures of the Elbow Joint in Adults W R Cubbins J J Callahan and C S Scuderi Chicago—p 627
- \*Injuries to the Hand T W Harmer Boston—p 638
- Fracture of the Os Calcis P B Magnuson and F Stinchfield Chicago—p 685
- Injection versus Surgery in the Cure of Hernia Critical Summary F W Slobe Chicago—p 704
- Repair of Severed Tendons L Mayer New York—p 714
- New Concept of Tenosynovitis and Pathology of Physiologic Effort N J Howard San Francisco—p 723
- Treatment of Industrial Burns Report of 350 Cases H Pojner Houston Texas—p 744
- Visual Acuity Its Relation to the Form Sense and Application of This Relationship to Medicolegal Problems A C Snell Rochester N Y—p 756
- Effect of Trauma as Precipitating Factor in Certain Neurologic Diseases F Kennedy New York—p 769
- Functional Disorders of Nervous System as Sequelae to Trauma A M Ornstein Philadelphia—p 772
- A Ray in Treatment of Infection A Soiland Los Angeles notes on literature by H F Mershon—p 798
- Aggravation of Chronic Pulmonary Tuberculosis by Trauma of the Chest J B Amberson Jr New York—p 804
- Disability Evaluation E D McBride Oklahoma City—p 840

**Prevention and Correction of Facial Disfigurement**—Blair and his associates state that all fractures about the face should be reduced and the fragments held in their normal position before solidification commences. For those of the lower jaw and the tooth bearing area of the upper jaw the reduction should be as early as possible. Compound fractures of the lower jaw should be drained by external incision. With most injuries of the soft tissue it is better practice to let the wound heal spontaneously than to indulge in early debridement or to run the risk of suture scars. Tattooed wounds, whether from road oil or from gunpowder, should have the foreign matter removed early, the former by vigorous washing with a stiff brush after anesthetizing the surface, the latter by cutting out each individual grain with a needle pointed knife. In seeking gross foreign bodies in an open wound, the finger will sometimes detect what the roentgenogram and the eye miss.

**Injuries to the Hand**—Harmer believes that prompt attention to minor cuts of the hand may avert serious consequences and that what is done when the patient is first seen frequently determines the course and outcome. Errors of omission or commission at the first treatment of a relatively simple injury to the hand may lead to consequences so serious that the functional result, even after a long period of illness with one or more operations, may be pitiful. The author emphasizes the importance of (1) systematic preoperative examination based on anatomy and physiology, (2) appropriate instruments, (3) adequate exposure and gentle, deliberate technic to minimize operative trauma, (4) early active motion directed toward the restoration of function in cases of sutured or grafted tendons accompanied by guarded limitation of antagonistic muscles, and

(5) the importance of early active motion in cases of neuro-rhaphy accompanied by the employment of devices which permit the use of unaffected muscles but coincidentally prevent strain on the nerve suture and on the affected muscles during the reestablishment of their innervation.

### Annals of Surgery, Philadelphia

108 961 1130 (Dec.) 1938

- Treatment of Brain Abscess P C Bucy Chicago—p 961
- Carcinomatous Metastases to the Brain W J German New Haven Conn.—p 980
- Epidural Spinal Infections I Cohen New York—p 992
- \*Toxic Myelopathy (Spinothane) Some Contraindications to Spinothane Anesthesia H Kelman and G A Abbott Strlepton N Y—p 1001
- Effect of Breathing 95 per Cent Oxygen on Intraluminal Pressure Occasioned by Gaseous Distention of the Obstructed Small Intestine L Rosenfeld and J Fine Boston—p 1012
- Important Steps in Aseptic Intestinal Anastomosis F K Collins Los Angeles—p 1022
- Transient Acute Pancreatitis S H Gray J G Probst and C J Heifetz St Louis—p 1029
- Surgery and Diabetes H J John Cleveland—p 1052
- Strangulated Littre's Femoral Hernia with Spontaneous Fecal Fistula Case Report with Review of Literature B M Weinstein Nashville Tenn.—p 1076
- The Perineal Testis C E Rea Minneapolis—p 1083
- \*Effects of Ligations on Nerves of Extremities F M Allen New York—p 1088
- Acute Hematogenous Bursitis M B Cooperman Philadelphia—p 1094
- Chronicized Beef Tendon for Internal Fixation of Fractures F P Strickler Louisville Ky.—p 1102

**Toxic Myelopathy**—Kelman and Abbott suggest that, if spinal anesthesia were not given patients with severe myocardial damage, hypertension, marked hypotension and psychoneuroses as well as congenital anomalies, the number of complications following its use would be diminished. The spinal anesthetics commonly employed have been shown to be both myelolytic and hemolytic. When injected into dogs they produce an aseptic meningeal reaction with an exudation of plasma cells and a proliferation of arachnoidal cells, which later results in a thickening of the meninges, disintegration of axons and degeneration of the peripheral portion of the cord. Somewhat similar changes have been demonstrated in the spinal cords and nerve roots of patients dying after spinal anesthesia (procaine hydrochloride). As an anesthetic, spinal anesthesia has about the same immediate mortality and death rate from postoperative pneumonia as has ether but is superior to it in that it produces greater muscular relaxation and does not have the ill effects which follow ether. Almost any part of the central nervous system may be affected, with the involvement remaining permanent or causing a fatality, but if the foregoing contraindications are recognized the complications and mortality incident to spinal anesthesia should become negligible. Four cases of toxic myelopathy following spinal anesthesia are reported.

**Ligations on Nerves of Extremities**—Allen has shown in other studies that ligations of the limbs result in an instructive form of shock and also that the resistance to local asphyxia is greater than is commonly supposed, since the limbs of animals can survive complete lack of circulation for at least fifteen hours and the same is presumably true for man. Granted that a proper form of tourniquet is applied without excessive tension, the danger of gangrene under ordinary surgical conditions is largely imaginary. However, certain other sequelae are of surgical interest, particularly the occasional paralyses or contractures. Only two possible causes for such lesions exist: pressure in the zone of ligation and asphyxia. Experimental observations show that permanent paralyses arise only from direct pressure of the tourniquet and suggest that wide pressure is more injurious than a narrow band. The duration of the nerve paralyses increases in proportion to the time of ligation. The tension of the tourniquet and the temperature during ligation are important factors in the after-effects. Motor and sensory nerves differ in their sensitiveness to asphyxia in that the former suffer paralysis much more readily and also regenerate more slowly. Peripheral ganglion cells are much more resistant than the fibers of cerebral or spinal nerves.



## Archives of Ophthalmology, Chicago

20 907 1146 (Dec) 1938

- Aniseikonia W B Lancaster, Boston—p 907  
 Physiologic and Clinical Ophthalmologic Problems in Relation to Individual Variability A Bruckner, Basel Switzerland—p 913  
 Simple Dacryocystostomy L Guy New York—p 954  
 Angiomatosis Retinae Report of Case with Pathologic Study of the Enucleated Eye R McDonald and S W Lippincott, Philadelphia—p 958  
 Lesion of the Optic Tract Probably the Result of Infected Sphenoid Sinuses A N Lemoine Kansas City Mo—p 966  
 Events of Vascularization and Devascularization Seen in Corneas P F Swindle Milwaukee—p 974  
 Orbital Hyperostosis Its Occurrence in Two Cases of Meningioma of the Skull A Knapp New York—p 996  
 Intra Ocular Nematode Worms Report of Case and Review of Literature L T Jones, L W Jordan and N P Sullivan Portland Ore—p 1006  
 Scleromalacia Perforans Report of Case in Which the Eye Was Examined Microscopically F H Verhoeff and M J King Boston—p 1013  
 \*Use of Sorbitol in Glaucoma J Bellows I Puntney and J Cowen Chicago—p 1036  
 Etiology of Retinal Separation Considered from the Standpoint of Surgical Correction E B Spaeth, Philadelphia—p 1046

**Sorbitol in Glaucoma**—In the twelve cases of glaucoma in which Bellows and his co-workers administered a chemically complex alcohol (sorbitol) of approximately the same molecular size as dextrose the intra-ocular tension was lowered. The greatest drop was obtained in patients with high intra-ocular tension who did not respond to the administration of miotics alone. Although a gradual decrease in tension was noted as early as two hours after the injection, in most cases the maximal effect was reached from twelve to twenty-four hours after injection. Then the tension gradually rose and reached a level approaching the original value, but in no instance did the tension rise appreciably above that point. In several instances in which operative procedures were not undertaken the intra-ocular tension observed for a number of days remained at a fairly normal level. In some cases repeated injections of sorbitol achieved a pronounced effect when a single injection had produced little change. The authors conclude that 100 cc of a 50 per cent solution administered intravenously and repeated in twenty-four hours, if necessary, will nearly always reduce intra-ocular tension when it is greatly increased and is not controlled by the use of miotics alone. It thus relieves the attending pain and prepares the eye for operation.

## Archives of Pathology, Chicago

26 1093 1298 (Dec) 1938

- \*Iodine Balance in Exophthalmic Goiter I D Puppel and G M Curtis Columbus, Ohio—p 1093  
 Experimental Carbon Tetrachloride Poisoning, in the Cat II Influence of Ligation of Single Bile Ducts H L Stewart Boston and A Cantarow Philadelphia—p 1121  
 Aneurysm of a Coronary Artery K D Manohar Bombay, India—p 1131  
 Postmortem Blood Chemical Determinations Comparison of Chemical Analyses of Blood Obtained Post Mortem with Degrees of Renal Damage Found at Autopsy R C Hamilton, Pittsburgh—p 1135  
 Effect of Vitamin D<sub>2</sub> (Calciferol) on the Dog N Goormaghtigh and H Handovsky Ghent Belgium—p 1144  
 Hydrolysis of Esters in Interfacial Medium Experimental Study G M Hass Boston—p 1183  
 Intercellular Transformations of Unsaturated Fatty Acids and Esters Experimental Study G M Hass Boston—p 1196  
 Effects of Anterior Pituitary Implants and Extracts on Epiphyseal Joints of Immature Female Guinea Pigs M Silberberg and Ruth Silberberg St. Louis—p 1208

**Iodine Balance in Exophthalmic Goiter**—Puppel and Curtis state that three normal persons maintained on a low intake of iodine remained in continuous negative iodine balance. The blood iodine averaged 43 micrograms per hundred cubic centimeters. However, three patients with exophthalmic goiter maintained on a low intake of iodine similar to that of the normal persons showed a great increase in the excretion of iodine, particularly through the feces. This resulted in an increase in negative iodine balance of from two to three times the normal. The blood iodine was increased, averaging 9 micrograms per hundred cubic centimeters. The factors studied, which may influence the increased negative iodine balance of patients with exophthalmic goiter on a low intake of iodine, were the effect of general hospital management, roentgen therapy and thyroidectomy.

## Archives of Physical Therapy, Chicago

19 657 720 (Nov) 1938

- Experiences with a New Type of Mercury Glow Lamp R Kovacs New York—p 661  
 Intra Esophageal Diathermy in Dysphagia and Cardiospasm Martha Brunner New York—p 670  
 Hyperpyrexia in Treatment of Ocular Syphilis A N Lemoine Kansas City Mo—p 675  
 Physical Therapy in Rural Practice H J Harris, Westport N Y—p 684  
 Technical Problems of Short Wave Diathermy Evaluation of Wave Length Dosage, Technique N E Titus New York—p 690  
 Power Measurements of Diathermy Apparatus H A Carter, Chicago—p 699

## Arkansas Medical Society Journal, Fort Smith

35 123 140 (Dec) 1938

- Controlling the Size of the Family F J Taussig St. Louis—p 123  
 Irregular Menses A W Strauss Little Rock—p 126

## Canadian Public Health Journal, Toronto

29 527 574 (Nov) 1938

- Practical Achievements in Vital Statistics R H Coats Ottawa Ont—p 527  
 Erythema Nodosum and Tuberculosis K F Brandon Vancouver B C R P Hardman Toronto and W H Birks Bowmanville, Ont—p 533  
 Undulant Fever in Edmonton Alta G M Little Edmonton Alta—p 542  
 Scarlet Fever Immunization G M Fraser Peterborough Ont.—p 545  
 Contribution of Child Psychiatry to Mental Hygiene J D M Griffin Toronto—p 550  
 \*Localized Outbreak of Poliomyelitis A Somerville High River Alta—p 554

**Localized Outbreak of Poliomyelitis**—Somerville cites the histories of five cases of poliomyelitis occurring in a rural area. The first patient was a school teacher, showing, with other signs and symptoms, fairly definite loss of voice, with complete recovery. The four other patients were children attending the school, two of them showed definite paralysis, with complete recovery in one and partial recovery in the other. The spread appears to have been from the teacher to the pupils. The incubation periods varied from eight to fourteen days. One child, who did not show any paralysis but was definitely sick, appears to have been the source of infection for two other children twenty-one days after the onset of his symptoms. The exposure of these two patients apparently resulted from playing with the recovered child for an hour or two. In one of these two cases the incubation period was twelve days, with paralysis occurring in spite of serum being given twelve hours previously. In the other case the incubation period was eight days. This latter case did not show paralysis and was not notified as poliomyelitis.

## Illinois Medical Journal, Chicago

74 477 564 (Dec) 1938

- Cancer of the Larynx with Description of a New Instrument for Intra laryngeal Irradiation F E Simpson Chicago—p 492  
 Traumatic Rupture of the Male Urethra H Culver Chicago—p 500  
 The Premature Infant—Early General and Feeding Care J H Hess Chicago—p 506  
 Cyanosis in the Newborn A H Parmelee Oak Park—p 516  
 \*Silicotuberculosis H C Sweany Chicago—p 520  
 Value of Fluoroscopy and Roentgenography in the Study of Certain Diseases of the Neck C D Sneller Peoria—p 526  
 Early Pathologic Lesions of the Cervix and Endometrium B H Orndoff Chicago—p 531  
 Further Studies in Treatment of Ulcerative Colitis with Aluminum Hydroxide and Kaolin J B Eyerly and H C Breuhaus Chicago—p 534  
 Value of One Injection of Alum Precipitated Toxoid in Controlling Diphtheria C H Benning Royal Oak Mich—p 538  
 Diarrhea as an Institutional Problem L H Block Chicago and B L Greene, Elgin—p 542  
 Treatment of Intracranial Gliomas H C Voris Chicago—p 549  
 Postnatal Complaints in 1000 Consecutive Cases W A Simunich Chicago—p 556

**Silicotuberculosis**—Sweany describes the joint action of silicosis and tuberculosis. He does not consider silicotuberculosis as a disease entity but a "blend" in which every shade between the two conditions may be found as well as other associated peculiarities. He discusses only the principal types of the whole disease complex, from which he concludes that the whole field of silicotuberculosis seems to be related to three factors—silicosis, tuberculosis and inert dust. The sil-

cosis and tuberculosis enhance each other, the coal dust tends to check both but is prone to cause the development of huge masses and finally cavities. If the inert dusts predominate the fourth hazard appears, viz acute infection. The hazard of acute infection, however, is not in the same category as the silicotuberculosis or even the silicosis.

### Indiana State Medical Assn Journal, Indianapolis

31 663 728 (Dec.) 1938

- Diagnosis and Treatment of Smallpox G F Kempf, Indianapolis — p 663  
Smallpox Control K C Eberly Fort Wayne — p 667  
Trigeminal Neuralgia and Pains in the Face W E Dandy Baltimore — p 669  
Obstetrics for the General Practitioner E D Plass Iowa City — p 673  
The Imperfectly Descended Testicle H O Mertz Indianapolis — p 678  
Diagnosis and Treatment of Some of the Common Poisons W D McNally, Chicago — p 683  
Dizygotic Twins Case Report W C Murphy and W W Eichelberger, Evansville — p 691

### Journal of Infectious Diseases, Chicago

63 225 350 (Nov. Dec.) 1938

- Study of Hemolytic Streptococci with Reference to Correlation Between Their Group Specific Substances and Biochemical Characteristics M Catherine Hechler and M A Farrell State College, Pa — p 225  
Bacteriologic Study of Liver Abscesses in Cattle I E Newsom Fort Collins Colo — p 232  
New Intermediate Bacteriae from Intestinal Tract of the Rhesus Monkey W S Preston and P F Clark Madison Wis — p 234  
Bacillary Dysentery in the Rhesus Monkey W S Preston and P F Clark Madison Wis — p 238  
\*Antientdotoxic Action of Certain Organic Sulfur Compounds with Review of Theories of Mechanism of Action of Sulfonamide Compounds P Gross F B Cooper and M Lewis Pittsburgh — p 245  
Studies on Variation of Blood Cells of Cattle in Health and During Brucella Infections F N Bell and M R Irwin, Madison, Wis — p 251  
Interrrelationships of Blood Cells of Cattle in Health and During Brucella Infections M R Irwin and F N Bell Madison Wis — p 263  
The Moscow 2 Strain of Equine Encephalomyelitic Virus as Compared with Other Strains of Equine Encephalitic Viruses Beatrice F Howitt, San Francisco — p 269  
Inheritance of Agglutinogens A B M and N Frances E Holford Madison Wis — p 287  
\*Prophylactic Use of Serums and Vaccines in Acute Bacillary Dysentery J Felsen and A G Osofsky New York — p 298  
\*Bacteriology of Normal Skin New Quantitative Test Applied to a Study of Bacterial Flora and Disinfectant Action of Mechanical Cleansing P B Price Baltimore — p 301  
Neutralization of Virus of St Louis Encephalitis by Serum from Children Margaret G Smith and Elizabeth Moore St Louis — p 319  
Comparison of Infection of Mice by Mycelial and Yeast Forms of *Blastomyces dermatitidis* R D Baker Durham N C — p 324  
Isolation of *Bacillus Dysenteriae* (Dudgeon Urquhart) in an Outbreak of Diarrhea Elizabeth L Hazen New York — p 330  
Occurrence of Avian Tubercle Bacilli in Dressed Poultry W H Feldman Rochester, Minn — p 332  
Trichinosis in Cleveland Postmortem Examination of Diaphragm and Skeletal Muscle from 100 Consecutive Autopsies C H Evans Jr, Cleveland — p 337  
Viability of Pneumococci in Dried Sputum E G Stillman New York — p 340  
Failure of Bacteria Other Than Staphylococci to Produce Enterotoxin Substance. F R Hunter and G M Dack, Chicago — p 346

**"Antientdotoxic" Action of Sulfur Compounds**—Gross and his collaborators investigated the possible antientdotoxic action of sulfanilamide and of 4,4'-di-(acetylamino)-diphenylsulfone against meningococcus and hemolytic streptococcus endotoxins. In the experiments with meningococcus endotoxin two series of mice were employed, each consisting of ten controls, ten treated with sulfanilamide and ten treated with two minimal lethal doses of meningococcus endotoxin. All controls died in less than forty-five hours. While there was a slight increase in survival time of the sulfanilamide treated mice (average of about ten hours), all animals died in less than sixty-nine hours. In the sulfone treated group there was no increased survival time, but one mouse survived indefinitely. With one minimal lethal dose, eight out of ten controls died in twenty-seven hours, one in less than sixty-eight hours and one survived indefinitely. In the sulfanilamide treated group all ten mice died in less than forty-eight hours, while all ten sulfone treated animals died in less than twenty-six hours. The results therefore indicated no antientdotoxic action on the part of either drug against formaldehyde-killed meningococci. In the experiments with hemolytic streptococcus endotoxin a series of fourteen mice, eight of which had received 25 mg

of sulfanilamide orally one hour earlier, were given one minimal lethal dose (0.7 cc) of C 203 suspension of hemolytic streptococcus endotoxin intraperitoneally. The treated mice were subsequently given the same dose of sulfanilamide once daily. A second series of forty-five mice were given sublethal doses of the C 203 suspension, 0.1 cc on the first day, 0.2 cc on the third day and 0.5 cc on the ninth day. Fifteen of these animals were untreated, fifteen were treated orally once daily with 25 mg of sulfanilamide and the other fifteen were similarly treated with 25 mg of 4,4'-di-(acetylamino)-diphenylsulfone. In the first series all eight treated mice died within ninety-six hours. Of the six control mice four died within fifty-three hours, one on the fourth and the last on the eighth day. Cultures of the peritoneal exudates were sterile. In the second series, involving the use of multiple sublethal doses, there were three deaths in the untreated control group within fifteen days, while the sulfanilamide-treated group had five and the sulfone treated group six deaths. Sulfanilamide therefore showed no antientdotoxic action against single lethal or multiple sublethal doses of hemolytic streptococcus endotoxin. Similarly, 4,4'-di-(acetylamino)-diphenylsulfone exhibited no antientdotoxic action against multiple sublethal doses of killed hemolytic streptococci.

**Prophylactic Serums and Vaccines in Dysentery**—In an attempt to formulate a rational scientific basis for the use of prophylactic serum and vaccine Felsen and Osofsky determined the effect of the simultaneous injection of *Bacillus dysenteriae* and serum, the injection of serum at varying periods after inoculation with *Bacillus dysenteriae* and the injection of anti-dysentery serum at varying intervals before inoculation with *Bacillus dysenteriae*. Immune rabbit serums protected mice against ten lethal doses of a moderately virulent strain of *Bacillus dysenteriae*. This protection was evinced when the protective serums were injected previously to or together with the inoculation of the organism. When the serum injection followed the fatal dose of bacteria, no protection could be observed. Active immunization produced by the use of vaccine also offered a considerable degree of protection.

**Bacteriology of Normal Skin**—Price describes a method for studying the bacteriology of the normal skin and shows the effect of mechanical cleansing on the flora of the skin. The underlying principle of the test is simple. If hands are washed in a basin of sterile water, a large number of bacteria will be removed. By plating and culturing measured specimens of the water, counting the colonies and multiplying them by the total volume of the water the exact number of bacteria removed can be calculated. Therefore, if a long series of basins is used and the hands and arms are scrubbed in each one in turn for the same length of time in a uniform manner, the washing in each basin will be found to contain progressively decreasing numbers of bacteria. Cumulative totals of organisms in these basins, therefore, when plotted against time, form a curve. This is a regular logarithmic curve which can be projected mathematically to zero. Bacteriologically, the most important variable factor in mechanical cleansing is the vigor used in scrubbing—or, more accurately, the amount of friction produced at the surface. Rinsing without friction has practically no effect on the resident flora. Washing by rubbing the hands together is far less effective than scrubbing with a brush. A soft brush is less efficient than a stiff one. Vigorous scrubbing of the hands removes germs much more rapidly than languid scrubbing. In the preoperative scrub-up the aim should be to remove the dirt, fats and transient bacteria. To accomplish this the nails should be trimmed short and scraped carefully to remove all visible dirt and then the hands should be scrubbed conscientiously for seven minutes (on the average), with warm (city) tap water abundant soap, a brush of medium stiffness with well packed bristles of equal length. The scrub-up will remove about half of the resident flora. Further reduction of that flora is best accomplished by means of chemical disinfectants. When gloves are changed between operations, there is no need to scrub the hands unless they have become contaminated when only two or three minutes is required. Beneath the gloves the resident flora will have increased, however, so use of a germicide

between operations becomes necessary. After reduction (e. g. by disinfection) reestablishment of the resident flora appears to proceed at a rate represented in general by a sigmoid curve. Hands and arms thoroughly degermed may require a week or more for complete reestablishment of the usual flora. Beneath clothing the generation time is slightly shorter. Under sterile rubber gloves it is much shorter, the existing flora increasing rapidly until it may exceed by far the ordinary flora. Transients lie free on the surface or are loosely attached along with the dirt by fats, hence they are removed or killed with comparative ease. Resident bacteria are more firmly attached and are far more resistant to attack by either detergents or germicides. The transient flora may contain any number of pathogenic bacteria, the resident flora relatively few as a rule. Certain contaminating organisms seem able to change status and become permanent residents of the skin. Consequently, prolonged or frequent exposure of the skin to contaminations may result in a resident flora containing many pathogenic germs. Such skin is not easily disinfected. Hands may thus become chronic carriers of virulent organisms.

### Journal of Nervous and Mental Disease, New York

88 733 880 (Dec.) 1938

- Factors Limiting Recovery After Central Nervous Lesions. K. S. Lashley. Cambridge Mass.—p. 733.  
Hydrocephalus. O. Marburg. New York.—p. 756.  
Disturbances of Micturition Associated with Disseminated Sclerosis. O. R. Langworthy. Baltimore.—p. 769.  
\*Unequal Nares as a New Diagnostic Aid. J. H. Leiner. New York.—p. 771.  
Pathology of Huntington's Chorea. T. T. Stone and E. I. Falstein. Chicago.—p. 773.

**Unequal Nares as Diagnostic Aid.**—Leiner states that the presence of unequal nares has proved of value either as a single or as a confirmatory sign in the diagnosis of supranuclear, nuclear or peripheral nerve lesions involving the facial nerve. Its greatest value is found when diagnostic signs are of urgent necessity, i. e. when the patient is unconscious and in hemiplegia. The absence of this sign has its significance in malingerers. Study of the pathologic nares shows a falling in of the delicate ala on the side involved, often revealing a total collapse of this structure comparable to the dilated contour of the normal side. This complete collapse is viewed in nuclear and peripheral nerve involvement. In supranuclear lesions, inspection of both sides will show at a glance the side involved, which is not only narrower, but the pear shaped contour has disappeared and the position of the ala has shifted, while the normal ala retains all its characteristics. In fractures of the base of the skull in which the middle fossa is involved, particularly when the fracture extends through the mastoid and aqueduct, an inspection of the nares in unconscious patients showed a total collapse of the nares on the side involved. In the refrigerating type of Bell's palsy, cases are seen in which the entire nose is pulled over to one side.

### New England Journal of Medicine, Boston

219 865 898 (Dec. 1) 1938

- Maternal Mortality Study in Massachusetts for 1937. R. J. Heffernan. Brookline Mass.—p. 865.  
Caesarean Section in Massachusetts in 1937. R. L. DeNormandie. Boston.—p. 871.  
The Small Obstetric Hospitals in Massachusetts. Preliminary Report. J. C. Merriam. Framingham Mass. and R. H. Goodwin. New Bedford Mass.—p. 879.  
Diagnosis and Conservative Treatment of Acute Pancreatitis. R. Lium. Boston.—p. 881.  
\*Pulmonary Tuberculosis in Old People. M. H. Joress. Boston.—p. 885.

**Pulmonary Tuberculosis in Old People.**—Joress studied the signs and symptoms of sixty unselected elderly patients with pulmonary tuberculosis. Thirty patients presented caseation besides fibrosis, twenty-four of whom had cavities. The latter group presents a definite variance from the generally accepted concept that tuberculosis of senescence is of the chronic fibroid variety, with the implication that the lesions are benign. Likewise, contrary to general opinion, in more than one third of the patients the disease was manifested by an acute onset. The seriousness of tuberculosis can further be attested by the occurrence of hemorrhage in ten patients. Night sweats occurred in ten and fever in twelve. No apical rales were elicited in twenty-four, while twelve showed signs

of cavity and twenty-six patients showed cavernous disease on roentgenographic examination. The sputum was positive in twenty-three among the fifty-two patients in whom it was examined. Of the fifty-two properly followed patients, about one half improved and one half did not. Of the twenty-nine patients who "improved," eighteen belonged to the latent apical and chronic fibroid types and only eleven were fibrocavitary. In the group designated as "worse" there were one latent apical, two chronic fibroid and three fibrocavitary cases at the beginning of the observation period.

### Ohio State Medical Journal, Columbus

34 1309 1416 (Dec.) 1938

- \*Some Surgical Principles in the Care of Infections of the Hand. S. L. Koch. Chicago.—p. 1325.  
Osteomyelitis. Diagnosis and Treatment. G. I. Bauman. Cleveland.—p. 1329.  
Chronic Gastritis. Selected Case Experiences with Gastroscopic Observations. Part II. I. Schiff and S. Goodman. Cincinnati.—p. 1333.  
The Time Element in the Reduction of Fractures. B. J. Hein. Toledo.—p. 1339.  
Dehydration Treatment of Pregnancy and Its Related Toxemias. G. L. Erbaugh. Dayton.—p. 1347.  
Infantile Eczema. E. H. Baxter. Columbus.—p. 1350.  
Cerebral Debut of Certain Cases of Cardiac Disease. J. L. Fetterman and W. F. Ashe. Cleveland.—p. 1354.  
The Life History of Allergy. S. R. Zoss. Youngstown and M. B. Cohen. Cleveland.—p. 1359.  
The Mechanism Which Controls Hydrogen Ion Concentration of the Body Fluids. Suggestions in Practical Therapy. A. W. Oelgoetz. P. A. Oelgoetz and J. Wittekind. Columbus.—p. 1362.

**Infections of the Hand.**—Koch warns that the successful treatment of infections of the hand does not consist simply in the administration of some new drug three times a day or the daily injection of a new and widely advertised pharmaceutical product. If these infections are to be treated successfully one must still adhere to well recognized surgical principles, many of them as old as surgery itself, and many of them disregarded from time to time in the unsuccessful effort to find a short cut to successful treatment. Whether an infection involves the hand or some other part of the body, the questions presenting themselves are whether (1) the infection is an acute spreading process or is localized, (2) what tissues and structures are involved, (3) how an infection involving these tissues can be drained efficiently and with a minimal risk of injury, (4) what should be done after drainage has been secured and (5) what type of infection is present and what organisms are responsible. The author states that the surgeon who keeps constantly in mind the possibility of unusual infections and does not delay in securing both anaerobic and aerobic cultures and in making serologic tests when an infection presents unusual symptoms or is unduly persistent does both himself and his patient a service.

### Public Health Reports, Washington, D. C.

53 2025 2074 (Nov. 18) 1938

- The U. S. Marine Hospital (National Leprosarium). Carville. La. Review of the More Important Activities for the Fiscal Year Ended June 30, 1938. H. C. Hasseltine.—p. 2025.  
Protozoa in Plankton as Indicators of Pollution in a Flowing Stream. J. B. Ickey.—p. 2037.  
Comparison of Modified Eijkman Medium and Standard Lactose Broth in the Examination of Oysters, Clams and Shellfish Growing Waters. Velma Payne.—p. 2058.

53 2075 2120 (Nov. 25) 1938

- \*Susceptibility of Animals to Endemic Typhus Virus. Second Report. G. D. Brigham.—p. 2078.  
Manipulation and Counting of River Plankton and Changes in Some Organisms Due to Formalin Preservation. J. B. Ickey.—p. 2080.  
Unusual Case of Cyanide Poisoning During Fumigation. C. L. Williams.—p. 2094.

**Endemic Typhus in Animals.**—Brigham points out that the animals native to the United States which have been previously reported to be susceptible to endemic typhus fever are the woodchuck, meadow mouse, whitefooted mouse, opossum, old field mouse, cotton mouse, golden mouse, wood rat, cotton rat, rice rat and flying squirrels. Raccoons were found insusceptible. He states that further studies now add to this list two species of squirrels, two species of wild rabbits, a species of chipmunk and the skunk. Two gray foxes were not susceptible. No strains of typhus recovered from these animals exhibited any differences, when compared in guinea pigs, from the original Wilmington strain of endemic typhus.

# Rhode Island Medical Journal, Providence

21 159 176 (Nov) 1938

Modern Surgery of the Esophagus C E Bird Providence—p 159  
Toxic Manifestations of Sulfanilamide E J West Providence—p 166

21 177 188 (Dec) 1938

The Pathology and Treatment of Antepartum Hemorrhage A H Morse New Haven Conn—p 177  
Peaks and Pioneers in the History of the Thyroid N H Copenhagen Bristol Tenn—p 180

# South Carolina Medical Assn Journal, Greenville

34 303 332 (Dec) 1938

The Management of Head Injuries J McLeod Florence—p 303  
Fatal Case of Agnucloctosis Following Sulfanilamide Therapy P H Culbreath Ellenton—p 307  
Post Transfusion Reactions E B Saye Spartanburg—p 309

# Southern Medical Journal, Birmingham, Ala

31 1219 1320 (Dec) 1938 Partial Index

Impairment of Function of Adaptability as Measured by Simple Conditioned Reflex Test in Certain Psychogenic Contrasted with Organic Diseases W H Gantt Baltimore—p 1219  
Treatment of Hypertension Laboratory and Clinical Findings in 205 Cases M Doles Norfolk Va—p 1225  
Recent Observations on Treatment of 600 Pellagrins with Special Emphasis on Use of Nicotinic Acid in Prophylaxis T D Spies Jean M Grant Cincinnati R E Stone, Chapel Hill N C and J B McLester Birmingham Ala—p 1231  
Revision of Immunopathologic Concept of Tuberculosis A Blumberg Oteen N C—p 1237  
Mechanical Treatment of Venomous Bites and Wounds F M Allen, New York—p 1248  
Heart Symptoms Caused by Spontaneous Pneumothorax in Persons Otherwise Normal E F Horine Louisville Ky—p 1253  
Value of Tumor Chims C L Martin Dallas Texas—p 1255  
Continuous Catheter Drainage of Subarachnoid Space in Pneumococcal Meningitis Report of Two Recoveries R F Slaughter and V P Sydenstricker Augusta Ga—p 1269  
Obesity and Its Management J A Ward Birmingham Ala—p 1280  
Progress in Allergy H S Bernton Washington D C—p 1286  
Control of Syphilis in Tuberculosis J R Phillips Houston Texas and L F Knoepf Beaumont Texas—p 1295  
Ray and Ultraviolet Light in Treatment of Dermatophytosis O G Hazel and C Brundage Oklahoma City—p 1297  
Present Status of Medical Education in Cuba Plans for the Future C E Finlay Havana Cuba—p 1298

**Nicotinic Acid as Prophylactic in Pellagra**—In an effort to determine whether pellagrins would remain free from diagnostic evidence of pellagra if treatment with nicotinic acid was directed individually, Spies and his colleagues followed up 694 pellagrins examined in 1936. The present status of all patients was determined and plans for their study in prevention or treatment groups were made. After the initial examination most of the patients returned to the clinic at least once a week for examination, some more often. Each patient was treated individually and was given a week's supply of nicotinic acid in 100 mg tablets. The dosage was adjusted individually. The patients continued their usually grossly inadequate, unbalanced diets. The prevention group was made up of 199 persons in whom pellagra had occurred at least once every year for the last two to fifteen years. Of these, 173 received nicotinic acid. As the season advanced it usually became necessary to increase the initial dosage. Infections, unusually strenuous exercise or an extremely inadequate diet tended to necessitate an increased dosage of nicotinic acid. There was in every case an almost immediate increase in sense of well being and vigor likewise indigestion, nausea and diarrhea were relieved. Constipation, when it persisted after general improvement, usually responded favorably to an increased dosage of nicotinic acid. Nervousness, irritability, headache, insomnia and mental confusion responded quickly to adequate dosage. It was almost universally volunteered by the patients that their skin became lighter and that the vague burning sensations in various parts of the body disappeared soon after treatment was initiated. Although their general condition improved, in a number of these patients polyneuritis developed, but clinically active pellagra did not develop in any. The polyneuritis persisted until adequate vitamin B<sub>1</sub> therapy was given. Patients of this group who were without the drug from one to two weeks experienced, within a week, a recurrence of their symptoms of subclinical pellagra. Without exception they resumed treatment with benefit similar to that previously experienced. The twenty-six persons who served as a control group had a recur-

rence of the disease. In twenty of thirty-four patients in a second control group in whom a history of yearly relapse in the past was indefinite, diagnostic evidence of the disease developed. Of 321 patients with clinically active pellagra treated, 291 were not hospitalized. In many of the ambulatory patients the disease was so severe that hospitalization would formerly have been required. In each of the ambulatory pellagrins treated there was a prompt and beneficial response following adequate nicotinic acid therapy. Of the hospitalized patients three died of other diseases at a time when the pellagra had been cured or was improving. No patient died of uncomplicated pellagra. For patients with acute pellagra in relapse, nicotinic acid is perhaps best given in 50 mg doses ten times a day by mouth, even if the patient is vomiting. Nicotinic acid is not a substitute for all the essential nutritional substances usually missing from the pellagrins' diet. A liberal and well balanced diet must be urged. Within twenty-four hours after nicotinic acid therapy was begun the brilliant fiery redness and swelling of the tongue had disappeared, the greatly increased salivation had become normal and there was less discomfort of the oral mucosa. The associated Vincent's infection healed quickly. Similar changes took place whenever the mucous membranes were involved. Disturbed gastrointestinal function became normal soon after nicotinic acid therapy was begun. Acute mental symptoms, varying from slight confusion to delirium and mania, responded dramatically, in most cases overnight. In contrast nicotinic acid has been of no benefit in cases of psychoses and psychoneuroses unrelated to pellagra. The fiery red dermal lesions of all patients blanched following administration of the drug, but nicotinic acid seemed to have less effect when the continuity of the skin was broken and the lesions were moist, ulcerated, dry or pigmented. Nicotinic acid relieves only a deficiency of nicotinic acid or closely related substances. Its greatest value comes when it is added to a full, well balanced diet.

**Mechanical Treatment of Venomous Bites**—Allen discusses the possibilities and limitations of different procedures used for practical treatment of snake bite. 1 Many snake bites are nonfatal, especially when the quantity of injected venom is small, and recovery occurs in such cases without treatment or often in spite of wrong treatment. 2 Antivenin is recognized as the best and surest protection when the specific type of serum is promptly available. Doubts still exist as to whether it is sufficient and infallible in the most severe cases. Other treatment should probably be used. 3 The Jackson suction method is evidently valuable, but the necessary apparatus and the services of a physician for some ten hours must be available. 4 Timid excision is practically useless. Dangerous cases may be helped by reasonably early excision of a mass of tissue such as is commonly removed in a carbuncle operation. This plan may also be promising for smaller bites, such as those of the black widow spider. In a sufficiently desperate emergency excision can be performed by an unskilled person. 5 For the most overwhelming venom doses, such as may be typified by the bite of a king cobra, it is possible that excision and even antivenin may be insufficient. Experimental evidence indicates that amputation can prevent all dangerous symptoms, and in a case of sufficient danger the limb should obviously be sacrificed early in order to save life. 6 A tourniquet should be applied to stop circulation only for controlling hemorrhage during or after excision or amputation, for gaining time preliminary to amputation and in connection with local refrigeration. 7 Local refrigeration can abolish pain, stop toxic absorption and preserve the local tissues. These benefits are not lasting, and the only demonstrated value of the method seems to be as preliminary to amputation or for anesthesia. Local refrigeration offers a means of gaining time until antivenin can be obtained in the case of venoms which are not so powerfully proteolytic as the Crotalus group. Simple training in first aid methods of those most likely to be bitten can reduce the mortality in non-serum treated cases practically as near to the vanishing point as in serum treated cases, though the suffering and disability will be greater. The laborers and others who are mostly exposed to snake bites will generally carry out first aid with a hardihood which will atone for any lack of skill.

## Surgery, Gynecology and Obstetrics, Chicago

67 705 838 (Dec.) 1938

- Study of Bone Regeneration G Levander Koping Sweden—p 705
- Mode of Inception and Lateral Spread of Certain Squamous Cell Carcinomas Histopathologic and Experimental Study A Brunschwig and D Tschetter Chicago—p 715
- Neuritis of the Brachial Plexus Mechanical in Origin Scalenus Syndrome H C Naffziger and W T Grant, San Francisco—p 722
- \* Further Studies in Infertility and Sterility Analysis of 200 Couples I F Stein Chicago—p 731
- Surgical Anatomy of Carotid Sinus Nerve and Intercarotid Ganglion N B Tchibukmacher Kharkov U S S R—p 740
- Resistance of Peripheral Tissues to Asphyxia at Various Temperatures F M Allen New York—p 746
- \* Pathologic Basis for Swelling of the Arm Following Radical Amputation of the Breast J R Veal Washington D C—p 752
- Total Reconstruction of the Auricle E C Padgett Kansas City Mo—p 761
- Avoidance of Injury to the Common Bile Duct R H Jackson Madison, Wis—p 769
- Sialography Its Technique and Application in the Roentgen Study of Neoplasms of the Parotid Gland J V Blady and A F Hoeker New York—p 777
- Failures Following Gastro-Enterostomy for Gastroduodenal Ulcer L Ginzburg and S Mage New York—p 788
- \* Refrigerated Cartilage Isografts G B O'Connor and G W Pierce, San Francisco—p 796
- Surgical Considerations in Removal of Stones from the Kidney J T Priestley, Rochester Minn—p 798
- Cutting the Costal Arch for Upper Abdominal Exposure H M Clute and H L Albright, Boston—p 804
- Modified Subtemporal Decompression for Use in Infants and Children F D Ingraham Boston—p 811
- Mechanical Problem of Unmodified Blood Transfusion W E Morse Rapid City S D—p 813
- Perforation in Gastric Carcinoma Study and Report of 133 Cases R W McNealy and R F Hedlin Chicago—p 818

**Infertility and Sterility**—Stein bases his remarks on an analysis of 200 childless couples examined in private practice. Infertility was encountered in 103 matings as against ninety-seven sterile matings. In a former series there were fifty-seven infertile and 243 sterile couples. In both groups, primary infertility or sterility occurred about three times as frequently as did secondary. Uterine hypoplasia, tubal obstruction, previous abortion and chronic endocervicitis continue to play a significant part. The male partner is shown to be directly responsible in slightly more than one third of the cases of sterility and substandard sperm specimens were not infrequently revealed among the infertilities. Tubal patency tests were done in 111 cases. Tubal obstruction was encountered in twenty, of which fifteen were complete and five partial. Surgical measures were carried out in seventy-three cases. Pregnancies occurred in fifty-one of the infertile and in fifteen of the sterile matings. From this it is apparent that a considerable proportion of the matings were only relatively infertile. If given time, a certain proportion of apparently infertile women eventually succeed in becoming pregnant without investigation or treatment, as occurred in nine patients in this series. On the other hand, pregnancy is often delayed for an indefinite time among couples apparently healthy, even though no contraceptive is used and an investigation is urgently requested by them. In others, pregnancy follows immediately after the Huhner and patency tests are performed and before any other treatment becomes indicated. This fact strengthens the author's belief that the patency test with gas or with opaque mediums has therapeutic as well as diagnostic value. Glandular therapy played but a small part, its chief virtue resting in thyroid extract. Estrogenic preparations were used in the treatment of hypoplasia, and pregnancy sometimes occurred despite little change in the size of the uterus. The hormone now available from the serum of pregnant mares has been shown to stimulate ovulation in the human being and it is highly probable that this agent will prove of practical value in certain types of sterility. Favorable results should be expected from such therapy in minor grades of hypoplasia associated with immature or inactive ovaries and in cases of anovulatory bleeding. When the ovaries have become polycystic, however, no result can be expected from endocrine therapy. Surgery is then indicated.

**Swelling of Arm After Breast Amputation**—Since his recent article on the venographic observations in twenty cases of swelling of the arm following radical removal of the breast, Veal has seen twenty-six additional cases, a total of forty-six cases of swelling following operation. Twenty-two patients who did not experience swelling of the arm after operation have

been studied in order to determine the possible extent of venous obstruction that may exist before edema occurs. Venographic studies supplemented with venous pressure determinations have proved valuable as a means of differentiating between the several forms of swelling (venous, lymphatic and lymphatic and venous) of the arm following radical amputation of the breast. Simple lymphatic edema is the least frequent cause of swelling of the arm after such an amputation. This form of edema may result from recurrent lymphangitis cellulitis or cutaneous metastases. The deep veins of the arm are not primarily involved and remain patent. Edema resulting from obstruction of the axillary and subclavian veins is by far the most common cause of swelling of the arm following operation. The most frequent cause of the venous obstruction is a recurrence of the malignant growth along the course of these veins. In some cases the venous occlusion results from benign scar formation. In others the axillary vein is occluded by the sharp angulation of its course when the arm is dependent because of the fixation of the floor of the axilla. The venous obstruction produces a local increase in the venous pressure and fluid escapes into the tissues. Lymphatic stasis is a secondary result of the venous obstruction and if prolonged will lead to permanent blockage of the lymphatic flow. Infection is prone to develop and may lead to further obstruction and cause a greater degree of swelling. The skin may then become thickened and present the typical picture of lymphatic edema.

**Refrigerated Cartilage Isografts**—For the last five years in the reconstruction of contour defects of the face and its appendages O'Connor and Pierce have used "refrigerated cartilage isograft." The cartilage, mainly rib, is obtained under sterile or unsterile conditions and stripped of its perichondrium. It is thoroughly washed with ordinary tap water to remove any blood which may have collected on the cartilage. This material is then placed for at least one week before use in a covered sterile glass container and covered with a solution of one part aqueous merthiolate (1:1,000) to four parts of sterile physiologic solution of sodium chloride. The solution should completely cover all of the cartilage by at least 1 inch. The container is placed in the refrigerator and left there; it is taken out only when the solution has to be changed, cultured or the refrigerated cartilage used for grafting purposes. When new material is prepared the solution is drained off and changed twice a week for two weeks and then only once a week thereafter. Refrigerated cartilage isografts that have been preserved for more than six months are just as efficient as fresh cartilage. This long waiting period, although not advisable, does not materially affect the cartilage as a graft. Of the 375 transplants that the authors performed, local infection developed in six cases. This occurred mostly in grafts that were used to reconstruct the nasal bridge or tip in which external sterilization is difficult. These infections responded to local treatment with all the grafts remaining in situ except any portion of a graft that became exposed. The exposed portion of the graft was gradually digested or was surgically excised to speed up wound closure. The latter treatment was the usual procedure, as it materially shortened the postoperative care. If a refrigerated cartilage isograft becomes infected, the whole cartilage graft may be removed immediately. The infection generally subsides rapidly and the wound heals in a short time. If, in infection, good dependent drainage is established, the graft can be left in situ and it will survive, but healing will be delayed. Refrigerated cartilage isografts are the material of choice for certain types of contour reconstruction, as they are easy to obtain, will keep in vitro indefinitely, will not absorb, will resist infection, are pliable, are easily sterilized and will lend themselves favorably to sculpturing.

## Wisconsin Medical Journal, Madison

37 1053 1160 (Dec.) 1938

- Surgery of the Common Bile Duct C B Puestow Chicago—p 1067
- Prevention and Treatment of Puerperal Sepsis J M Freeman Wausau—p 1072
- Disruption of Abdominal Wounds. Brief Review of Literature and Report of Three Cases W J Carson Milwaukee—p 1076
- Dissecting Aneurysm of the Aorta Its Clinical Recognition Report of Two Cases A J Patek Milwaukee—p 1080
- Individualization of Psychiatric Hospital Treatment W C Menninger Topeka Kan—p 1086

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Indian Medical Gazette, Calcutta

73 585 648 (Oct.) 1938

- Latent Syphilis in the Tropics S D S Greval P C Sen Gupta and B C Das—p 585  
Note on Racial Variations in Leprosy with Particular Reference to Indian and Burmese Races J Lowe—p 591  
Oxycephaly M M Cruickshank—p 595  
Convulsion Therapy in Schizophrenia M Taylor—p 596  
Suspected Botulism Report on Two Cases C D Torpy—p 600  
Cholera Epidemic in Swat State Northwest Frontier 1937 C J Hassett—p 602  
Prawns as a Possible Vector of *Vibrio Cholerae* K P Kundu—p 605  
Antimosquito Measures in Cantonments with Special Reference to Dry Day Instituted in 1927 F F Strother Smith—p 606  
Cinchona Febrifuge in Treatment of Malaria R N Gore—p 608  
Preliminary Report on Experiment in Coolie Line Sanitation K P Hare—p 609  
Apparatus for Continuous Oiling of Streams E G Michelson—p 612  
Bacteriologic Examination and Hydrogen Ion Concentration of Urine of Series of 122 Cholera Patients D N Chatterjee and K S Malik—p 612

**Cinchona Febrifuge in Malaria**—Gore has commenced the use of cinchona febrifuge tablets in place of quinine and has found it to be a success not only in ridding the patients of fever but in preventing relapses and definitely reducing enlarged spleens. The drug also has a laxative effect. Among rural populations suffering from malaria the author's experience suggests that cinchona febrifuge powder should be the drug of choice. Honey is a good vehicle for making pills or paste and since honey is available in villages, 4 grain (0.26 Gm.) pills can be made with it for adults, and for children a proportionate quantity can be made into a paste with honey. As cinchona febrifuge is efficacious and cheap it will ensure the greatest benefit, as continuous treatment is more likely. Since 1916 the author gave as a routine a 3 grain (0.2 Gm.) dose of quinine hydrochloride at the commencement of the rigor, with the idea that fresh parasites in the plasma before entering erythrocytes would be killed in greater numbers, as quinine is absorbed rapidly. This single preliminary additional dose of quinine gave better results than cinchona febrifuge without it.

## Journal of Pathology and Bacteriology, Edinburgh

47 361 656 (Nov.) 1938 Partial Index

- Staphylococcus  $\beta$  Hemolysin M L Smith and S A Price—p 361  
Staphylococcus  $\gamma$  Hemolysin M L Smith and S A Price—p 379  
Effect of Injections of Serum on Hemolytic Complement with Particular Reference to Bordet's Anti Immune Body Effect S Thomson—p 395  
Persistence of Virus of Herpes in Rabbits Immunized with Living Virus J R Perdrau—p 447  
Reticulosis and Reticulosarcoma Histologic Classification A H T Robb Smith—p 457  
Observations on Nature of Gordon's Encephalitogenic Agent D G f Edward—p 481  
Blood Supply of Abnormal Tissues in Lungs R D Wright—p 489  
Changes in Lymph Glands of Tumor Bearing Mice. L Dorothy Parsons—p 501  
Description of Effect of Hypophysectomy on Growing Rat with Resulting Histologic Changes in Adrenal and Thyroid Glands and Testicles A C Crooke and J R Gilmour—p 525  
Biologic Characters of Spontaneous Tumors of Mouse with Special Reference to Rate of Growth A Haddow—p 553  
Influence of Carcinogenic Compounds and Related Substances on Rate of Growth of Spontaneous Tumors of the Mouse. A Haddow—p 567  
Influence of Carcinogenic Substances on Sarcomas Induced by the Same and Other Compounds A Haddow—p 581  
Morbid Anatomy of Epituberculosis R H Fish and W Page!—p 593  
Red Cell Fragility in Various Blood Conditions D A K Cassells—p 603  
Detoxifying Action of Human Bile on Diphtheria Toxin M Doreen Smith J Daly and P J Moloney—p 625

**Blood Supply of Abnormal Tissues in the Lungs**—Wright injected lungs from human cadavers in order to show the distribution of the pulmonary and bronchial arteries and their branches in pathologic lesions. He found that proliferative tuberculous lesions and actively growing chorionic carcinomas are avascular. The fibrous scars of tuberculous and silicotic lesions have vessels injected from the bronchial artery. The vessels which develop in fibrosarcomas growing in the lungs are all injected from the bronchial arteries. The vessels of the stroma of carcinomas growing in the lung are

injected from the bronchial arteries. The author's conclusion is that if in the adult lung a tissue develops which is usually supplied from the systemic arterial circulation, the vessels which grow with it are injected from the bronchial artery. This development of new vessels from the systemic arteries may be closely linked with the excitation of collagenous tissue to further development, irrespective of the nature of the causative agent of the collagenous proliferation.

**Red Cell Fragility**—Cassells investigated the erythrocyte fragility in various blood disorders in order to determine the character of the red cell fragility curve in different types of anemia and how far any observed change in the curve could be accounted for by the degree of anemia present or by other recognized changes in red cell characteristics. He found that the majority of anemias show a "shift to the left" of the curve of erythrocyte hemolysis in hypotonic saline solution. The curve tends to move to the right as the anemia improves. The shift to the left is dependent to some extent on the degree of anemia but not entirely, since correction for the anemia does not necessarily cause a return of the curve to normal limits. Some anemias, particularly those associated with pregnancy, fall within normal limits or their curve of fragility lies at the extreme right of the normal. (1) these cases show microcytosis and usually a higher color index, though the latter is not the determining factor, since cases of pernicious anemia have a curve to the left of normal and (2) the cells are not necessarily thicker than normal. In the absence of anemia the curve, following splenectomy, is shifted to the left. The only other abnormality in such cases is a tendency to macrocytosis.

## Lancet, London

2 1151 1212 (Nov. 19) 1938

- Surgical Treatment of Pain J Taylor—p 1151  
\*Meningo-Encephalitis Due to *Cryptococcus Meningitidis* (Torula Histolytica) Report of Case J G Greenfield J P Martin and M T Moore—p 1154  
\*Treatment of Lobar Pneumonia with Sulfapyridine. S C Dyke and G C K Reid—p 1157  
Chemotherapy of Gonorrhea with Sulfapyridine V E Lloyd D Erskine and A G Johnson—p 1160  
Treatment of Acute Gonorrhea with Sulfapyridine Analysis of Sixty Five Cases E E Prebble—p 1163  
Carcinoma of the Lung Two Cases Treated by Surgical Removal P R Allison and W S Stanbury—p 1165  
Endaural Approach to the Mastoid W Howarth and G H Bateman—p 1168  
Intrinsic Carcinoma of the Duodenum Report of Successful Removal R M Handfield Jones—p 1168  
\*Penthoal with Nitrous Oxide and Oxygen G Organe and R J B Broad—p 1170  
Double Vertebral Compression Fracture from Convulsion Therapy H Stalker—p 1172

**Meningo-Encephalitis Due to *Cryptococcus Meningitidis***—Greenfield and his associates cite a fatal case of meningo-encephalitis due to *Cryptococcus meningitidis* (Torula histolytica). The organism possibly gained entry through the broken skin. The diagnosis in this case and in other recorded cases was not made until after death. The symptoms of this disease closely resemble those of tuberculous meningitis and cerebral tumor and abscess. In doubtful cases of chronic meningitis the cerebrospinal fluid should be examined with the oil immersion objective and injected intracisternally into laboratory animals. Of the many names applied to this organism the name *Cryptococcus meningitidis* suggested by Dodge is recommended as the most suitable.

**Treatment of Lobar Pneumonia with Sulfapyridine**—Dyke and Reid used sulfapyridine in the treatment of eight cases of pneumonia of the lobar type. The pneumococcus was typed in every case by mouse inoculation. Treatment was commenced from twelve hours to four days from the onset of the pneumonia. An immediate fall of temperature, pulse rate and improvement in the clinical condition followed the administration of the drug in every case. In all cases in which the drug was administered in full and efficient dosage (sufficient dosage for the adult appears to be 2 Gm followed by 1 Gm every four hours for five doses and then 1 Gm every six hours) the subsequent course was uneventful and recovery rapid. Serum and all other forms of treatment other than symptomatic were withheld. The drug should be given for at least five days.



**Pentothal with Nitrous Oxide and Oxygen**—Organe and Broad used pentothal combined with nitrous oxide and oxygen anesthesia in 236 cases. Operations performed include tonsillectomy and orthopedic, gynecologic, perineal and rectal operations. Vomiting was greatly reduced and the condition of the patients was better than after any other form of general anesthesia. The only immediate advantages to the surgeon are the rapid induction of anesthesia and the quiet breathing for abdominal operations. The method is popular with patients because of the pleasant induction and recovery compared with other forms of anesthesia. Nursing is easier because there is little vomiting or restlessness and no breathing difficulty. This combination of anesthesia should be attempted only by anesthesiologists who are already familiar with the use of pentothal. The technical complications are that during anesthesia the needle may become blocked or slip out of the vein. In these circumstances it is necessary to make a fresh venipuncture. A few patients complained of sore arms after operation and in two cases there was thrombosis of the vein. On three occasions a needle was broken in the arm.

### Medical Journal of Australia, Sydney

2 717 760 (Oct. 29) 1938

Some Aspects of Pathology of Bone Tumors of Interest to Radiologists R. A. Willis—p. 717

Diagnosis of Fevers in South Queensland E. H. Derrick—p. 723

Artificial Cranial Deformation in New Britain L. Ford—p. 729

First Fifty Two Names in the Medical Register of South Australia J. B. Cleland—p. 732

2 761 804 (Nov. 5) 1938

Observations on Anatomy of Ischioanal Fossa W. J. Close—p. 761

\*Hematocrit Determinations in Normal and Abnormal Blood J. A. McLern—p. 770

The Problem of Strained Back in Working Men D. Barry—p. 774

Some Clinical Observations on Coronary Artery Disease R. Whistler—p. 778

2 805 844 (Nov. 12) 1938

Experiences in Preventive Medicine A. J. Turner—p. 805

The Arrangement of the Deep Cervical Fascia F. S. Meyers and R. H. Macpherson—p. 813

Importance of the General in the Study of the Particular with Special Reference to Radiology E. W. Frecker—p. 817

Economic Aspect of Industrial Surgery J. C. B. Allen—p. 825

**Hematocrit Determinations in Blood**—McLern found that mean corpuscular volume ranged in his sixteen patients suffering from hyperchromic macrocytic anemia from 114 to 170 cubic microns, the average value being 138 cubic microns, the mean corpuscular hemoglobin ranged from 38 to 58 micro-micrograms, the average value being 47 micro-micrograms, the mean corpuscular hemoglobin concentration ranged from 29 to 45 per cent, the average value being 35 per cent. The high mean corpuscular volume and mean corpuscular hemoglobin, which are well above the normal values, are the characteristic features of this type of anemia. The mean corpuscular volume in fifteen cases of hypochromic anemia ranged from 62 to 81 cubic microns, the mean value being 73 cubic microns, the mean corpuscular hemoglobin ranged from 13 to 21 micro-micrograms, the mean value being 17 micro-micrograms, the mean corpuscular hemoglobin concentration ranged from 17 to 27 per cent, the mean value being 22 per cent. The low values for mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration are the characteristic features of the group. The mean corpuscular volume in two of three cases of acholuric jaundice fell within normal limits. In acholuric jaundice the mean diameter of the red cells is less than normal. The observation that the corpuscular volume is usually within normal limits is explained by an abnormal globular shape of the erythrocytes. This is termed spherocytosis and is regarded by Haden and others as the fundamental variation from normal in the disease. The mean corpuscular volume in three cases of polycythemia was within normal limits. The mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration were slightly below normal in two of the cases. In fifty-five normal Melbourne residents, values for mean corpuscular volume, mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration were substantially the same as the values obtained in America and England. The method is recommended as a ready means of differentiating between hyperchromic macrocytic and hypochromic microcytic anemias.

### Annales de Médecine, Paris

44 313 392 (Nov.) 1938

\*Hypertensive Syndrome in Acute Nephritis of Childhood R. Debre

J. Marie and P. Seringe—p. 313

Study of Aleukemic Myelosis R. Waitz and J. Warter—p. 344

Investigations on Sclerosis of Pulmonary Artery and Its Branches

S. Ciechanowski—p. 365

**Hypertensive Syndrome in Acute Nephritis of Childhood**—Debre and his associates point out that, although the existence of arterial hypertension in the course of acute nephritis of childhood is known, it is habitually ignored. They call attention to the frequency of hypertension in acute nephritis of childhood and emphasize that the physician who suspects, recognizes or treats acute nephritis in a child must watch for it every day. They emphasize the importance of the complications that may be caused by the arterial hypertension of acute nephritis. They give special attention to the cardiac and nervous disturbances. The authors studied twenty-three children ranging in age from 12 to 14 years. They believe that infections of the upper respiratory tract are most often responsible for the nephritis. The onset with lumbar pains and sudden increase in temperature, so frequent in adults, is not common in children. Occasionally the first sign is a hematuria (three of the twenty-three cases) and often it is a malleolar or palpebral edema (ten cases), appearing insidiously in the course of general disorders such as pallor, asthma and anorexia with or without vomiting. They discuss the cardiac rhythm, the hepatic and pulmonary forms of asystole and acute pulmonary edema. Cardiac disorders frequently appear when the arterial tension is high and their evolution parallels that of the hypertension. The nervous disorders resulting from the arterial hypertension in children with acute nephritis are especially eclampsia and amaurosis. Factors indicating a favorable prognosis are early onset of treatment, short duration of the causal infection and slight increase in arterial tension. Severe changes in the urine and blood indicate an unfavorable prognosis. For treatment they regard a dry diet as the best and recommend a regimen with a high carbohydrate content and a low fluid intake.

### Archives de Médecine des Enfants, Paris

41 665 784 (Nov.) 1938

Staphylococcus Toxoid and Therapy of Disorders Due to Staphylococci G. Ramon—p. 665

\*Osteomyelitis During Period of Growth and Their Treatments

M. Fevre—p. 695

Treatment of Staphylococcal Infections J. Cathala and P. Auzepy—p. 711

Recurrences of Staphylococcal Infectious Relapses of Osteomyelitis P. Lombard—p. 726

Multiple and Relapsing Cutaneous Abscesses in Nursing Child by Maternal Hemovaccination Rapid Success of Staphylococcus Toxoid A. Beraud—p. 736

**Osteomyelitis During Growth**—Fevre criticizes the use of the term osteomyelitis of adolescence, which he says is usually applied improperly and then gives his attention to the classical osteomyelitis of childhood. Discussing the advisability and the choice of the time for an intervention, he says that it is not necessary to intervene during the primary septicemic forms of osteomyelitis, for all interventions during this stage are locally ineffective and they may be dangerous. It is necessary to wait with the intervention so that a well localized suppurating focus exists. The local signs are more reliable than the general signs in ascertaining the existence of pus. In the frankly acute cases of osteomyelitis, the time of intervention must be neither too early nor too late. For a long time he employed reduction by simple continuous extension in osteomyelitic luxations of the hip. Naturally it was often necessary to open the abscess, but contrary to the general opinion he never thought it necessary to do more. The author stresses further that in some cases of sudden aggravation an intervention is urgent when signs of a duly localized focus exist. In this connection he recalls cases in which a retarded intervention made a secondary operation necessary. On the determination of the nature of the intervention the author adheres to the principle of trying to adapt the operation to the existing lesions. That is why frequently his interventions are restricted to the opening of the abscess and that the pri-

mary operation terminates only exceptionally in a trepanation or a resection. If the general condition is not improved by the opening of the abscess or if its alteration seems to be secondary to osseous lesions of the focus, he resorts to trepanation or resection. Local immobilization, usually by means of a plaster cast, and a general treatment which is adapted to the circumstances and to the clinical aspects of the osteomyelitis precede and complete the surgical treatment.

### Presse Medicale, Paris

46 1705 1728 (Nov. 19) 1938

- Treatment of Pleuritis and of Purulent Pleural Fistulas L. Imbert —p 1705  
Puncture of Liver in Diseases of Blood P. Emile Weil P. Isch Wall and Suzanne Perles —p 1707  
Suppuration of Air Cyst Formation of Lung P. Pruvost A. Meyer Roy and Depierre —p 1710  
\*Treatment of Pneumonia by p-Aminophenylsulfamide A. Cam R. Cattar and H. Sikoria —p 1714  
Application of Methods of Stratigraphic Roentgenography (Tomography) in Examination of Skeleton Buffe Grillon and Aubert —p 1717  
Cervical Rib and Kienbock's Disease of Semilunar Bone P. Mallet Guy and H. Cavaillier —p 1721  
Ulcerous Cutaneous Forms of Hodgkin's Disease H. Durand P. Cot tenot and H. Mamou —p 1723  
Infiltration of Stellate Ganglion and of Superior Thoracic Chain by Supero External Method G. Arnulf —p 1726

**Treatment of Pneumonia by p-Aminophenylsulfamide**  
—Cam and his associates say that it is generally admitted that the organic compounds of sulfur and especially p-aminophenylsulfamide are experimentally active against pneumococcal infections. It has been demonstrated that this chemotherapy is capable of protecting mice that are inoculated with virulent strains of pneumococci and that it has a correspondent bactericidal action in vitro. However, little is known about the clinical application. To be sure, Heintzelman and his collaborators reported in 1937 about favorable results with p-aminophenylsulfamide in pneumonia patients with type 3 pneumococcus (*Am J M Sc* 193 759 [June] 1937, abstr. THE JOURNAL, July 31, 1937, p. 389) and suggested that sulfanilamide therapy deserved wide application in the treatment of human pneumonias. Cam and his associates employed it in the treatment of a number of patients with pneumonia, some of whom were alcoholic addicts and some of whom were quite old. They describe the clinical histories of eight cases and say that they eliminated from this report several cases of influenza in the course of which auscultation revealed pulmonary rales and rapid recovery occurred under the influence of chemotherapy. Discussing the dosage of p-aminophenylsulfamide, they say that they administered 3 or 4 Gm daily, depending on the nature of the case. They always administered this considerable amount until the temperature returned to normal, then they reduced it to 2 Gm and then to 1 Gm for several days following the defervescence. They do not believe that it was pure coincidence that the pneumonic foci disappeared during the medication with sulfanilamide. The grave and even hopeless condition of some of the cases makes that appear unlikely. Moreover, the defervescence and the improvement of the general and functional conditions followed so rapidly after the onset of the treatment that a relationship of cause and effect cannot be denied. Regarding the dangers of sulfanilamide therapy, the authors say that they are negligible because the treatment does not have to be continued for long. In their cases, which were for the most part grave, they noted only a more or less intense cyanosis, which always disappeared after the cessation of the medication, they did not observe renal impairment. They do not draw definite conclusions from their observations but think that the near future will tell whether the treatment of pneumonia will make the same progress as that of erysipelas.

### Revue Belge des Sciences Médicales, Louvain

10 457 532 (Oct.) 1938

- \*Nontropical Sprue Study of Four Cases Observed in Belgium L. Brull A. Lambrechts and G. Brac —p 457

**Nontropical Sprue**—The object of this extensive report by Brull and his associates is to describe their investigations in four cases of chronic diarrhea, which are characterized by steatorrhea, a large deficit in the intestinal absorption of calcium and phosphorus and a demineralization, which is evident

in generalized osteoporosis, hypocalcemia and severe tetany. Associated in variable degrees with these cardinal symptoms are denutrition, meteorism, anemia, disturbances in cutaneous pigmentation, hydremia and edemas. These cases recall disorders described under the term nontropical sprue, celiac disease of adults or idiopathic steatorrhea. The principal symptom is the steatorrhea. The nonabsorption of the lipids leads to the appearance in the feces of considerable amounts of unassimilated calcic soaps, a phenomenon which is probably the basis of the decalcification and of all the ensuing symptoms. On close analysis the syndrome appears to be a condition of complex avitaminosis. The encouraging results obtained by the authors with vitamin B<sub>2</sub> (riboflavin) support the hypothesis according to which this steatorrhea depends on a B<sub>2</sub> avitaminosis. The decalcification connected with the steatorrhea must be of the same origin. The melanoderma disappears after treatment with lemon juice or by a regimen that is rich in hydrosoluble vitamins. The anemia is corrected by the antianemic factor of the liver. The disorder in the phosphorus metabolism, which consists in the predominance of the fecal excretion over the urinary elimination, is promptly counteracted by vitamin D. The deficiency of vitamin A in the plasma is restored to normal by the administration of this vitamin. These deficiencies are not primary. These patients have a more or less generalized deficiency in the digestive secretions such as pepsin, hydrochloric acid, bile salts and lipase, which indicate a functional impairment of the digestive tract. It seems that it is this impairment which reduces the absorption not only of the lipids but also of the vitamins. Thus the complex hypovitaminosis is secondary to a disorder of the digestive tract. In studies on the mineral metabolism the authors demonstrated that vitamin D favors the intestinal absorption of phosphorus and that the metabolism of the lipids and of calcium are interdependent. They further showed the respective merits of various methods of therapeutic recalcification, notably the uselessness of recalcification by the parenteral route. With regard to the treatment they stress the following points: 1. No alimentary restrictions must be imposed, except those on lipids. 2. The only factor which is likely to influence the absorption of lipids directly is vitamin B<sub>2</sub>, still its action demands more confirmation. 3. Multiple vitamin therapy is useful together with a generous diet. 4. Prolonged recalcification by mouth is helpful in counteracting the tetany and the osteoporosis. 5. Antianemic treatment is efficient. In short, the entire symptomatology can be counteracted, without however definitely counteracting the fundamental disorder, the tendency to steatorrhea.

### Schweizerische medizinische Wochenschrift, Basel

68 1201 1220 (Oct. 29) 1938 Partial Index

- Results of Intravital Examination of Bone Marrow A. Vischer —p 1201  
\*Observations on Specific Agent of Tularemia B. Galli-Valerio —p 1206  
Lingual Acrobatus E. Oppikofer —p 1207  
Trauma and Paralysis W. Moos —p 1208  
Conditions of Excitation in Acute Porphyria Two Cases Irene Ferrat Marton —p 1209

**Specific Agent of Tularemia**—Following remarks about the geographic distribution of tularemia in Europe, Galli-Valerio describes his studies on the causal agent of this disease. He says that it has been cultured on coagulated egg medium, on dextrose agar with blood and cystine and on other mediums. The medium of choice is dextrose agar with blood and cystine, on which it grows in abundant grayish colonies which have a smooth and slightly glossy surface and a wavy margin. The organism is strictly aerobic and it grows at a temperature of 36 or 37 degrees. It is absolutely gram negative but it is stained readily by diluted fuchsin of Ziehl, by the blue of Papanicolaou, by thymol, by Giemsa 1:20 and by eosin. It appears in all cultures under two completely intermingled forms: a micrococcus and a very short bacterium. The first of these two forms, the micrococcus, predominates. After describing his experiences in animal cultures the author gives his attention to the classification of the causal organism of tularemia. He says that different observers have placed it near the bacilli of hemorrhagic septicemia or the pest and pseudotuberculosis of rodents. This comparison seems entirely

erroneous to him and he classifies the organism as a coccobacterium, a type which he suggested in 1924 for the micro-organism of undulant fever and for the organism which causes abortion in bovine animals and which appears under the form of small, gram-negative cocci mixed with short rods. From the morphologic point of view these three micro organisms are quite analogous and, more interesting still, the serum of the patients affected with tularemia agglutinates not only the tularensis coccobacterium but often the melitensis coccobacterium and the abortus coccobacterium. American investigators observed that, of 100 tularemic serums, thirty-seven agglutinated also the melitensis coccobacterium and the abortus coccobacterium. Moreover, in three of eight patients with undulant fever the serum agglutinated the tularensis coccobacterium. However, the tularemic serums did not agglutinate the organisms of typhoid, paratyphoid, dysentery and so on. Thus the serologic reactions confirm completely the observations on the morphologic analogy of the three organisms. The term coccobacterium which the author applies to these organisms indicates their character in that the same culture contains coccus and bacterial forms. It is interesting to note that the three coccobacterial organisms (melitensis, abortus and tularensis) are transmitted to man by animals, namely by goats, cattle and rodents, respectively.

### Arch Ital d Mal d App Diger, Bologna

7 393 498 (Sept) 1938 Partial Index

- Nonoperative Reduction of Intestinal Intussusception During Roentgen Examination of Intestine B Bononini—p 393  
Main Organic and Inorganic Constituents of Gastric Secretion Their Relations in Normal and Pathologic Conditions I Mazzoleni and G Fenwick—p 418  
\*Hypochromic Anemia After Gastric Resection in Gastroduodenal Ulcer F Ojetti—p 454  
Clinical and Experimental Studies on Pathogenesis of Gastric and Duodenal Ulcer E Periti—p 473

**Hypochromic Anemia After Gastric Resection—Ojetti** observed the behavior of the blood and the gastric secretion and the stomach in a group of eighty one patients who had had a surgical intervention for gastroduodenal ulcer. The observations were made from one to eighteen years after the operation. All patients who had had ample resection of the Polya-Finsterer type (fifty-one) had anachlorhydria. The amount of hydrochloric acid in the gastric secretion was moderately diminished in the majority of the cases in which a moderate resection (six cases) or a conservative operation (twenty-four cases) had taken place. Nine patients in the group of those who had had an ample resection and seven in the group of those who had had a conservative operation showed either recurrence of the ulcer, which was verified by the roentgen examination of the stomach, or bloody stools. Therefore they were excluded from the group of the observations. Of the group of forty-two who had had an ample resection eight patients showed essential hypochromic anemia with figures of hemoglobin lower than 80 and erythrocytometry lower than 4,000,000. Two patients in the group of six who had had moderate resection showed moderate anemia. Anemia was not seen in the group of seventeen cases in which a conservative operation had been performed.

### Archiv fur Kinderheilkunde, Stuttgart

115 129 192 (Nov 18) 1938

- Treatment of Iron Deficiency Anemias in Children by Means of Ferrous Iron E Lorenz—p 129  
Rare Disorders in Nurlings and Small Children Caused by Salmonella Enteritidis (Gartner's Bacillus) Charlotte Rohn—p 137  
Peculiar Form of Meningitis in Nursing Produced by Bacterium Lactis Aerogenes G Hensel—p 145  
\*Periosteal Bone Changes During Early Nursing Age (Part II) O von Chiari—p 149  
Etiology of Scarlet Fever Heart III Heart Block in Scarlet Fever P von Kiss and R Martyn—p 168  
Juvenile Tabes Dorsalis Case Maria Várady—p 176

**Periosteal Bone Changes in Nurlings—Von Chiari** says that Erdheim's contention that the small amount of ore deposited at the sites of greatest mechanical wear is correct. The long tubular bones are exposed to the greatest strain at the periphery and here the calcification is most pronounced. It was pointed out by Davidson and Merit that the progressive osteoporosis of the long tubular bones in rickets is due to

the fact that the calcium salts are drawn away from the trabeculae and are deposited near the periosteum. These authors observed shadows along the periosteum of the tubular bones in the beginning of florid rickets, although other visible signs of rickets were absent. This sign of the displacement of calcium salts makes possible the early roentgenologic diagnosis of rickets, cases have been observed in which the appearance of the aforementioned roentgenologic signs preceded the appearance of the clinical signs of rickets. After citing the opinions of several investigators on the periosteal deposits that develop during rickets (rachitic osteophytes), the author points out that similar deposits, but with a greater calcium content, are observed in syphilitic infants. The periosteal deposits of rachitic or syphilitic origin have been discussed repeatedly, but he maintains that in addition to these there is yet a third type. Summarizing his observations in thirty-one cases of the latter type, he says that in these cases the periosteal deposits on the long tubular bones are symmetrical. No signs of syphilis are observed and the periosteal deposits differ in localization from the rachitic osteophytes. Moreover, rachitic osteophytes develop only in older children, whereas the periosteal deposits discussed here are observed in infants during the first six months of life. The author thinks that a reaction of the highly sensitive periosteum of young nurslings to inflammatory processes is probably the cause of this early form of periosteal deposits, because the anamnesis of the infants who showed these periosteal reactions often disclosed pyoderms. He stresses that Pehu's opinion that periosteal deposits are invariably indicative of syphilis must be rejected. On the other hand, he thinks that great caution is necessary in the evaluation of the periosteal deposits that are visible in the roentgenogram. Each case must be carefully observed in order to exclude syphilis. The cure of the periosteal reactions takes place without treatment in the course of two or three months.

### Klinische Wochenschrift, Berlin

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\*Diagnosis of Schizophrenia by Means of Brain Lipoid Reaction of Iohann Facius in Cerebrospinal Fluid A Jacobi—p 1583  
Pernicious Anemia and Gastric Carcinoma as Stages of Chronic Gastritis W Haring—p 1586

**Brain-Lipoid Reaction in Schizophrenia—Jacobi** directs attention to the brain lipoid reaction on the cerebrospinal fluid of schizophrenic patients, which Lehmann-Facius described in 1936 and the reliability of which was corroborated by several others. After briefly reviewing the technic and the literature of this reaction, the author describes his own experiences with it on the cerebrospinal fluids of twenty-four patients with schizophrenia and twenty-four patients with various mental disorders such as manic-depressive insanity, arteriosclerosis, postencephalic conditions, senile dementia and epilepsy. On all cerebrospinal fluids the test was made two or three times. In one test the sediment was only mildly shaken (five or six times) by hand, in a second test it was shaken vigorously by hand (about twenty times) and finally a whole series of cerebrospinal fluids was shaken simultaneously in an apparatus by mechanical means. The author regarded this procedure as necessary, because he suspected that the outcome of the reaction was to a great extent dependent on the intensity with which the specimen was shaken. Further, he made control tests by employing quantities of physiologic solution of sodium chloride instead of the cerebrospinal fluid. In describing his results, he says that the flocculation was stronger when the amount of cerebrospinal fluid which had been added was smaller, and that at the second reading (after twenty four hours) the specimen showed stronger flocculation than at the first one. The same could be observed in the controls with physiologic solution of sodium chloride, although the reaction was perhaps somewhat weaker. It was never possible to base the diagnosis schizophrenia on the outcome of the reaction. The specimens that were shaken only a few times were all

positive, those which were shaken twenty times were negative, and those which were shaken in the apparatus were positive or negative, depending on the length of time they had been shaken. To be sure, occasionally there were slight differences in the intensity of the reaction. However, intense flocculation was observed not only in the cerebrospinal fluids of schizophrenic patients but also in those with epilepsy and other mental disorders. In many instances schizophrenia showed the lesser flocculation. On the basis of his observations the author reaches the conclusion that the Lehmann-Facijs brain-lipoid reaction on the cerebrospinal fluid is not suitable for the diagnosis of schizophrenia.

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- Computation of Time of Delivery. A. Wiessmann —p. 1613
- Adie's Syndrome. A. Werner and Martha Kruper —p. 1615
- \*Investigations on Serum Cholesterol Value in Patients with Rheumatic Disorders. F. Knuchel —p. 1617
- Point of Attack of Ultraviolet Rays in Inhibition of Cutaneous Reaction. G. Albus and W. Morbel —p. 1619
- Simple Method for Permanent Staining of Cutaneous Fungi and Microorganisms with Azure Eosin Glycerin. E. Hoffmann —p. 1622

**Sedimentation Speed and Physical Exertion**—Deist made studies on 260 soldiers who had had sedentary occupations before their entry into military service and had not practiced athletics or sports. Thus these men were subject to considerable exertion in the change from their former mode of life. It is known that in the higher age groups the sedimentation speed is somewhat accelerated, but since the ages of these soldiers varied between 23 and 37 the author thinks that the age factor can be disregarded. The sedimentation speed of the men was tested during the first week of the service, four or five weeks after that, and again during the seventh week. The blood was withdrawn between 7 and 8 o'clock in the morning, before breakfast. The sedimentation speed was determined according to the original Westergren method. Of the 260 men, 220 (84.6 per cent) showed a normal sedimentation speed in all three tests. The others had an increased sedimentation speed in all three in two or in only one of the tests. In some of these the deviation from the normal sedimentation values could be explained by intercurrent diseases such as febrile catarrhs of the upper respiratory tract, lymphangitis, extravasations or effusions. In two of the soldiers in whom all three tests showed an increase in the sedimentation speed neither a thorough examination nor the anamnesis revealed anything that would explain the increased sedimentation speed. In twelve men in whom only the second sedimentation test showed an increase no explanation could be found for the temporary acceleration and it is possible that the unaccustomed physical exertion might be a factor. The same might also be true in the aforementioned two cases. However, even if the physical exertion should be the causal factor of the increased sedimentation speed in fourteen of 260 cases, in view of so small a proportion (5.4 per cent) it cannot be said that physical exertion regularly influences the sedimentation speed. Consequently the author thinks that a negative answer must be given to the question regarding the influence of physical exertion on the sedimentation speed.

**Serum Cholesterol in Rheumatic Disorders**—Knuchel determined the total, the free and the esterified cholesterol in patients with various types of rheumatic disorders. The results of these tests are recorded in tables. Summarizing his observations, he says that the greater the tendency is to exudative changes in rheumatic disorders, the lower is the cholesterol content, particularly the esterified cholesterol. It has not been determined as yet whether the reduction in the cholesterol values is a cause or one of the prerequisites for the development of rheumatic disorders, or whether it is only an accompanying symptom in that, in the presence of an increased amount of toxins, the organism consumes more cholesterol. If a normal cholesterol content is regarded as an indication of a normal defense power, it must be concluded that in rheumatic diseases the defense mechanism is more or less impaired. This corresponds with other clinical and serologic (comple-

ment content) observations. In attempts to explain the mechanism of Weltmann's coagulation band, the impression was gained that a second factor, perhaps the lecithin content, plays a part. Extractions that were made in the course of the studies on the coagulation band induced the author to determine the cholesterol value of the serum before and after chloroform extraction. He found that the closer the cholesterol values are to the normal ones the greater is the component of cholesterol that is dissolved in chloroform, and that this component decreases in the presence of subnormal values. In the latter cases a chloroform soluble cholesterol component may be entirely absent. The author thinks that it is premature to draw final conclusions from these observations, nevertheless he assumes that the antitoxic component of the serum cholesterol is especially soluble in chloroform and that if it could thus be differentiated from the remaining cholesterol this method might prove valuable in the determination of the defense powers of the organism.

### Zeitschrift für klinische Medizin, Berlin

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- Length of Life of Erythrocytes. A. Vischer —p. 133
- \*Value of Electrocardiogram for Recognition of Cardiac Diseases on Basis of Investigations on One Hundred Healthy Persons. W. Schulz —p. 137
- Studies on Iodine in Blood. K. Gutzeit and G. W. Parade —p. 158
- Pathogenicity of Blastomycetes. C. Mumme and H. Lippelt —p. 187
- Experimental Aspects on Vascular Action of Sex Hormones and Their Relations to Clinical Manifestations of Disturbances in Peripheral Blood Perfusion. M. Ratschow and H. C. Klostermann —p. 198
- Determination of Adrenalin in Plasma of Arterial and Venous Human Blood. Description of Chemical Method of Determination. C. Gior-dano and P. Zeglio —p. 212
- Hormone of Adrenal Cortex in Carbohydrate Metabolism and in Renal Glycosuria. H. Bartelheimer —p. 222

**Electrocardiogram in Cardiac Diseases**—Schulz points out that electrocardiograms of the same person, when made with different apparatus, will show different forms. The author describes his observations on 100 persons ranging in age from 8 to 49 years, the majority being near 20 years of age. None of them had a history of heart disease. They were subjected to electrocardiographic tests during rest and again after exertion. The author says that a negative, an isoelectric or a flat course of the T wave in lead 3 has no pathologic significance. To be sure, if such deviations occur in the first two leads or in all three leads they must be regarded as more serious. He further discusses the changes in the QRS complex, pointing out that a prolongation of this complex after exertion has been regarded as pathognomonic for myocarditis. From observations on his own material he concludes that if this phenomenon occurs in at least two leads it seems to be of pathologic significance. Further he gives his attention to the normal U wave, a little known sixth deflection, in the electrocardiogram. According to some investigators this wave is present in all normal electrocardiograms, chiefly in the second lead. The author observed it in forty-six of the electrocardiograms that were made during rest, and in thirty-five of these it occurred in the second lead. In the electrocardiograms that were made after exertion the U wave was present in eighty-six of the cases, and here again it occurred chiefly in the second lead (in seventy-eight). In only 7 per cent of the cases was the U wave never observed. The author suggests that the U wave should be watched for in pathologic electrocardiograms. He thinks that it is the manifestation of deactivation and that it probably will not appear if the cardiac muscle is weakened. Then he lists the electrocardiographic changes that are usually regarded as pathologic and shows that, if these were all considered, pathologic aspects would be present in a comparatively large percentage of persons, particularly in those of an age (18 to 22) during which a predisposition to myocardial impairment is especially low. On the basis of his observations he made the criteria for myocarditis more strict, but still he observed indications for it in 19 per cent of the cases. He concludes from this that great caution is necessary in the electrocardiographic diagnosis of "myocarditis" in persons who are free from its clinical signs. He emphasizes that as yet the electrocardiogram can be regarded only as a diagnostic aid, not as the only basis of the diagnosis.

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 \*Fractures of Tubular Bones in Childhood as Seen in 726 Cases I G Smolyak —p 505  
 \*Antireticular Cytotoxic Serum in Treatment of Cancer Patients M P Fedyushin —p 534

**Fractures of Tubular Bones in Childhood**—According to Smolyak there were 726 fractures in 720 children treated in the past eleven years in the surgical division of the Filatov Hospital in Leningrad. There were 554 boys and 166 girls (33:1). A follow-up study of the late functional and roentgenologic results was made in 204 children. Among these there were seven instances of fractures of the clavicle, twenty-eight of the humerus, twenty-four of the forearm, eighty-two of the femur and sixty-three of the leg. Fractures of the clavicle gave excellent results in every instance. The late functional results after the fracture of the upper third of the humerus and diaphysis were excellent. Supracondylar and intra-articular fractures of the elbow gave the worst results as to function and to restoration of bony structure. Of fourteen cases in this group only seven presented fruitless function. It is characteristic of this fracture that the resulting deformities do not improve with time. Fractures of the forearm gave satisfactory functional results and no interference with the growth of the extremity. Of the eighty-two cases of fracture of the femur seventy-nine presented normal function and in only three was there a malunion with considerable shortening of the limb. The shortening in three cases amounted to 2 cm, in ten cases to from 1 to 1.5 cm and in sixty-five cases there was no shortening whatever. The alignment was correct in all. Of the sixty-three cases of fracture of the leg, sixty-one presented faultless function while two cases required an operation for correction of malunion. There was one instance of paralysis of the radial nerve after fracture of the humerus. The author concludes that fractures of childhood are characterized by being incomplete and subperiosteal, by the occurrence of an epiphysiolysis and a predilection for the neighborhood of the elbow. Typical Colles fracture and fracture of the ulna are rare in childhood. Epiphysiolysis was observed in 2 per cent of his material. Fractures in childhood heal twice as rapidly as they do in adults, the younger the child, the earlier is the consolidation of the fracture. Pseudarthroses are rare in childhood, the author did not observe a single instance in his series. A plaster of paris cast is applicable from the ages of 1 to 14 for all fractures except the impacted ones and those of the clavicle. The plaster of paris cast has a number of advantages over other methods. It is safe and permits of ambulatory treatment. Skeletal traction is not advisable because it has no advantage over traction of the skin or the plaster of paris cast and is associated with the danger of bone infection. Operative treatment is indicated only when there is interposition of soft tissues and in instances of old faulty union with loss of function of the extremity, in intra-articular fractures with faulty approximation of the fragments and in fractures in which there is pressure on the nerves or vessels. Massage is a valuable therapeutic measure in children above the first year of age.

**Antireticular Cytotoxic Serum for Cancer**—Fedyushin points out that the theoretical concept underlying the use of cytotoxic serum is based on the teachings of the school of A. A. Bogomolets, according to which the reticulo-endothelial system represents a definite physiologic unit the function of which is to resist the proliferative energy of the epithelium. The antireticular cytotoxic serum was prepared by immunizing a mule and later a horse by injecting them with an antigen from the spleen and bone marrow of a fresh cadaver. The titer of the serum, according to the complement-binding reaction, was not lower than 1:100. The serum is diluted in a physiologic solution in the proportion of 1:10. The serum was administered to twenty patients in whom a radical operation was performed, with the view of preventing metastases. In 102 cases the serum was used for therapeutic purposes. The stimulating dose of the cytotoxic serum was arrived at from experimental work of the school of Bogomolets and from clinical

observations of its effectiveness in infectious diseases (scarlet fever, erysipelas). Since it was felt that it would not be proper to deprive patients of proved methods of treatment, only inoperable and incurable patients were selected for treatment. A definite symptomatic improvement was noted in 40 per cent of the eighty patients who received not less than two injections. It was expressed in the improvement of the general condition, in diminution or disappearance of pain, in improvement of appetite and in disappearance of gastrointestinal disturbances. Parallel with the symptomatic improvement there was noted in all but five of the cases an increase in the cancerolytic power of the serum of the patients. All the patients felt stronger, fresher and toned up. In the majority of these cases an increase in monocytes amounting to 2 per cent was noted. The total absence of anaphylactic reactions in multiple injections of serum appears to depend on certain reactive peculiarities of a cancerous organism. A single injection of the serum does not produce a clinical effect. The effect of antireticular cytotoxic serum as differentiated from that of normal serum when used in the same doses is characterized by a definite effect on a cancerous organism. This effect is expressed in the improvement in the general condition of the patient, in symptomatic improvement and in analgesic effect. The serum appears to have a softening effect on the glandular metastases. The author's observations suggest that it is possible with the use of this serum to prolong the life of a cancerous patient. The author concludes that the antireticular cytotoxic serum increases the activity of the mesenchyma and exerts a lytic action on the parenchyma of the neoplasm. The author feels that these observations are to be regarded as the first step in the application of cytotoxins in oncology as a complementary measure to operative and radiation therapy, and as prophylaxis in patients submitted to radical operations.

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 Roentgenologic Differential Diagnosis Between Pleurisy and Empyema and Important Clinical Data S Oldberg —p 337  
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 \*Roentgen Diagnosis of Lung Embolism N Westermarck —p 357  
 Cerebral Changes in Recklinghausen's Neurofibromatosis T Rosendal —p 373  
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**Roentgen Diagnosis of Pulmonary Embolism**—Following a brief review of the incidence, pathology and clinical symptoms of pulmonary embolism, Westermarck reviews earlier investigations on the roentgenologic aspect of pulmonary embolism and then discusses the anatomy of the pulmonary vessels. His roentgenologic studies were made in twenty-six cases in which embolism of the pulmonary artery was subsequently established at necropsy. In all these cases the roentgen examination was carried out within two weeks of the patient's death, in twelve of them a roentgenogram was made during the last two days before death. In the majority of the cases the examinations were repeated, so that it was possible to follow the development of the embolus. Ten of the twenty-six cases presented signs of pulmonary infarct, while the others were free from infarction. The author shows that the roentgenologic diagnosis of embolism of the pulmonary artery is difficult, particularly in cases without infarction. However, careful analysis of the roentgenograms taken in different directions and preferably on repeated occasions makes it generally possible to arrive at a correct diagnosis. Emboli with and without infarction present each their own typical roentgenologic aspects. In embolism of the pulmonary artery without infarction there is ischemia of the branches of the pulmonary artery on the peripheral side of the embolus. On the roentgenogram this ischemia appears as a clarified area with diminished vascular design corresponding to the extent of the embolized artery. The vascularization is maintained in the central parts of the lung. The infarct appears on suitable projection as a wedge shaped massive homogeneous shadow. In most cases, however, in which infarction is present it is possible to observe also within other parts of the lung larger or smaller wedge-shaped clarifications as in embolism without infarction.

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## GOOD AND BAD RESULTS IN THE TREATMENT OF CHRONIC CERVICITIS

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Chronic cervicitis, with accompanying leukorrhea, is doubtless the most common of gynecologic complaints. Many agents have been advocated for its treatment. In current practice, however, electrosurgical treatment is recommended almost universally, having practically supplanted other surgical measures.

Celsus<sup>1</sup> was among the first to use the actual cautery in the treatment of ulcer of the cervix, and Jobert de Lamballe<sup>2</sup> is accredited with the first use of the instrument in treating chronic cervicitis. In this country, Byrne<sup>3</sup> in 1889 introduced the cautery knife as a means of removing cancer of the cervix, and Hunner<sup>4</sup> in 1906 laid the foundation for future work in electrosurgery for chronic cervicitis by his success with the Paquelin cautery. In 1921 Dickinson<sup>5</sup> called attention to the value of nasal cautery points. Hyams<sup>6</sup> in 1928 advised conization of the cervix for chronic cervicitis.

For a thorough understanding of the treatment of cervical lesions, one must be familiar with the anatomy and physiology of the cervix, as well as with the pathologic changes which take place during the course of the disease.

### ANATOMY AND PHYSIOLOGY

Although both the cervix and the uterus are developed from the müllerian ducts, the cervix differs from the uterus histologically, physiologically and pathologically. The lymphatics of the cervix communicate with those from the upper third of the vagina, extend upward through the muscular wall of the uterus, anastomose with the lymphatics from the endometrium and empty into the larger receiving channels which follow the course of the blood vessels and themselves empty into the hypogastric, sacral and iliac glands. The racemose glands of Naboth extend high into the cervix, being embedded in the fibromuscular tissue which constitutes the greater part of the cervix. The endocervix,

including the nabothian glands, is covered by a single layer of columnar epithelial cells, while the lower portion, as well as the vaginal mucosa, is covered by many layers of squamous epithelial cells.

The cervix occupies a vulnerable position, being exposed to infection from below as well as from above. The thick, tenacious, alkaline mucus from the nabothian glands aids in neutralizing the acidity of the vaginal secretion, provides a safeguard against the passage of bacteria upward, acts as a lubricant and affords a bridge over which the spermatozoa may travel into the cervical canal.

### ETIOLOGY

In the majority of cases, infection of the cervix follows laceration. Emge<sup>6</sup> stated that 80 per cent of multiparas have a lacerated cervix. Fulkerson<sup>7</sup> found diseased cervices in 33.16 per cent of 6,480 vaginal examinations, 80.1 per cent of the infections were in women who had borne children. Septic abortion is also a frequent cause.

The organisms usually grown from culture are the streptococcus and staphylococcus. Sistrunk<sup>8</sup> found various types of streptococci in 521 positive cultures. Curtis<sup>9</sup> stated that the streptococcus is the infectious agent in probably 30 per cent of cases. My observations on 103 consecutive cultures of material from the cervix were as follows:

The staphylococcus occurred in 53.4 per cent of the cases. This organism was found alone in 26.3 per cent and was associated with other organisms in 27.1 per cent. Staphylococcus aureus was present in twenty-eight cases, Staphylococcus aureus haemolyticus in four and Staphylococcus albus in twenty-three.

The streptococcus was found in 38.6 per cent of the cases, being alone in 14.4 per cent and associated with other organisms in 24.2 per cent. The nonhemolytic streptococcus was observed in ten, Streptococcus haemolyticus in seven and Streptococcus viridans in four.

The staphylococcus and the streptococcus were associated in 12.6 per cent of the cases. Staphylococcus aureus was isolated in six cases, the nonhemolytic streptococcus in six and Streptococcus haemolyticus in one.

Bacillus coli communis was present alone in 5.7 per cent and was associated with other organisms in 11.6 per cent.

The pneumococcus occurred alone in 6.7 per cent and with other organisms in 6.7 per cent.

Gram negative diplococci, morphologically resembling gonococci, were observed in one case.

Unidentified miscellaneous sporulating bacilli were observed either alone or with other bacteria in 24.2 per cent.

There was no growth in 7 per cent of the cases.

Dr. Black died Dec. 12, 1938.  
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Read before the Section on Obstetrics and Gynecology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 16, 1938.

<sup>1</sup> Quoted by Hunner.<sup>3</sup>  
<sup>2</sup> Byrne, John. A Digest of Twenty Years' Experience in the Treatment of Cancer of the Uterus by Galvanocautery. Boston: M. & S. J. 121, 435, 1889.

<sup>3</sup> Hunner, Guy L. The Cautery Treatment of Cervicitis. An Historical Summary. *Journal of the American Medical Association* 55: 59 (Feb. 1) 1935.

<sup>4</sup> Dickinson, R. L. Endocervicitis and Eversion and the Nasal Cautery Tip. *Am. J. Obst. & Gynec.* 2: 600 (Dec.) 1921.

<sup>5</sup> Hyams, Mortimer N. A New Instrument for Excision of the Diseased Endocervix with Surgical Diathermy. *New York State J. Med.* 28: 646 (June 1) 1928.

<sup>6</sup> Emge, Ludwig A. The Repair of Birth Lacerations of the Cervix Uteri. *Am. J. Obst. & Gynec.* 7: 16 (Jan.) 1924.

<sup>7</sup> Fulkerson, Lynn L. Endocervicitis. A Clinical Study of 1038 Cases. Many Treated with the Cautery. *Am. J. Obst. & Gynec.* 12: 374 (Sept.) 1926.

<sup>8</sup> Sistrunk, Walter E. A Clinical and Experimental Study of Streptococcal Vaginitis and Endocervicitis. *Tr. South. Soc. A.* 44: 318, 1931.

<sup>9</sup> Curtis, A. H. On the Etiology and Bacteriology of Leukorrhea. *Surg., Gynec. & Obst.* 18: 299, 1914.



The gonococcus is a primary factor in a large number of cases of acute endocervicitis. No doubt this organism is at times present with chronic cervicitis yet lies so deep in the tissues as to be undiscoverable in smears or cultures. Occasionally chronic cervicitis is induced by the trichomonas, this organism however, is usually confined to the vaginal mucosa.

Rosenow<sup>10</sup> has shown experimentally that the cervix may become infected through the hematogenous route. Syphilis, tuberculosis, malignant process and rarely, actinomycosis and venereal lymphogranuloma may also be sources of cervical disease.

#### PATHOLOGY

In chronic cervicitis the tissues become hyperplastic and cystic, the peglandular and perivascular structures being involved in the inflammatory reaction. An infected mucopurulent discharge with its chemically changed secretion, causes the squamous epithelial cells to become macerated, producing an erosion. At times only the basal or embryonic type of cell remains. It is from such cells that regeneration takes place after treatment. Fluhmann<sup>11</sup> has suggested that cancer may originate from these embryonic cells. Cysts are the result of deep infection and hyperplasia so excessive as to occlude the ducts by pressure. The cysts may be small and numerous or they may occur singly and

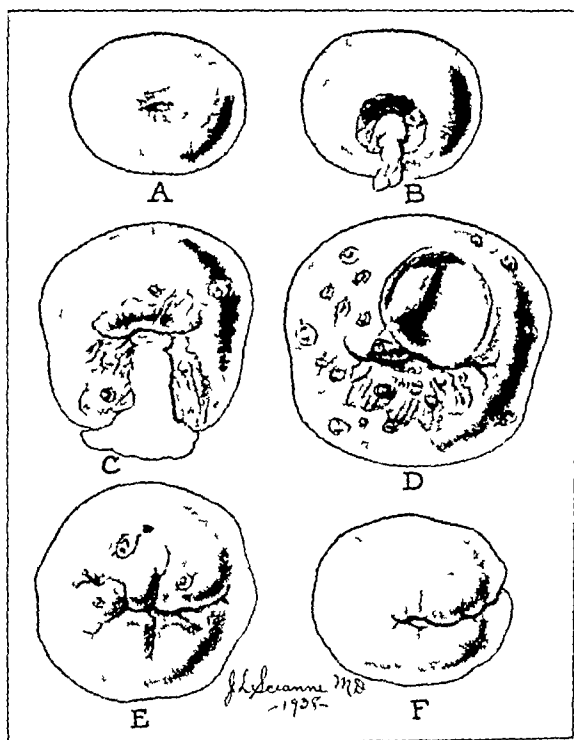


Fig. 1—A normal cervix. B cervix of normal size with chronic endocervicitis treated by light linear cauterization. C hypertrophied cervix chronic interstitial cervicitis with a few cysts treated by cauterization. D chronic cystic cervicitis treated by conization and puncture cauterization of remaining cysts. E stellate laceration with hypertrophy of cervix in sterile patient; amputation necessary. F deep laceration of cervix treated by trachelorrhaphy; smaller lacerations cauterized.

grow large enough to obstruct the external and internal os, interfere with uterine drainage and lead to extension of the infection into the body of the uterus.

#### SYMPTOMS

Leukorrhea is present in the majority of cases. If the nabothian ducts are closed, however, the discharge may be insufficient to attract the attention of the patient. When a trichomonas or mycotic infection is responsible, the discharge comes chiefly from the vagina. The purulent material frequently invades the urethra and

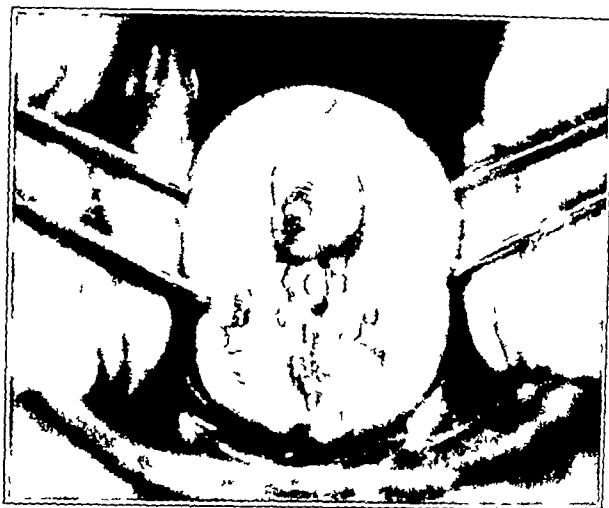


Fig. 2—Hypertrophied cystic cervix with large hemorrhagic cyst on anterior lip and erosion on posterior lip treated by conization followed by puncture of remaining cysts.

bladder meeting symptoms common to the two, or cystitis may develop after extension of the infection through the contiguous tissues. Infection of the pelvic glands and the sacro-uterine ligaments may give rise to dyspareunia. An uncomfortable, bearing-down sensation is a common complaint and vulvovaginitis is often present.

Although pregnancy is possible in the presence of a gross pathologic process, sterility is a sequela of chronic cervicitis in a number of cases. It is my experience that obstruction of the external os by a plug of mucus frequently is responsible for sterility in the nullipara.

I have observed that many patients referred for an abdominal operation for lateral pelvic pain, but without a palpable lesion may be relieved by the cure of a cervical infection. Backaches, menorrhagia and other symptoms may disappear after treatment of chronic cervicitis. Goodall and Power<sup>12</sup>, Sistrunk<sup>8</sup>, Moench<sup>13</sup>, Langstroth<sup>14</sup> and others have reported numerous cases in which symptoms far removed from the cervix were relieved by correction of a pathologic process in this organ. Although relief of remote symptoms by the cure of chronic cervicitis is possible, other foci should be excluded before definite conclusions are formed as to the role of such a lesion.

#### TREATMENT

Opinions differ regarding the treatment of chronic cervicitis. Topical applications are advised by some physicians, I have not, however, found them particularly effective. A cervical infection confined to the portio vaginalis and associated with vaginitis should of course be treated along physiologic lines, as sug-

<sup>10</sup> Rosenow, Edward C. Results of Experimental Studies on Focal Infection and Elective Localization. *M. Clin. North America* 5: 573 (Sept.) 1921.

<sup>11</sup> Fluhmann, C. F. Epidermidization of the Cervix Uteri and Its Relation to Malignancy. *Am. J. Obst. & Gynec.* 15: 1 (Jan.) 1928.

<sup>12</sup> Goodall, J. R. and Power, R. M. H. The Pathology and Treatment of Inflammatory Diseases of the Cervix. *Am. J. Obst. & Gynec.* 33: 1050 (June) 1937.

<sup>13</sup> Moench, Laura M. The Relationship of Chronic Endocervicitis to Focal Infection with Special Reference to Chronic Arthritis. *J. Lab. & Clin. Med.* 9: 289 (Feb.) 1924.

<sup>14</sup> Langstroth, Francis W. Jr. Focal Infection of the Cervix and Its Relation to Systemic and Mental Diseases. *M. Rec.* 99: 357 (May 21) 1921.

gested by Roblee<sup>15</sup> and others, i. e. by keeping the vaginal flora at the normal  $pH$  of 4 or 4.2. Several authors advocate injecting the cervix with germicidal agents, for example, Ross<sup>16</sup> recommended chromic acid, Kennedy<sup>17</sup> alcohol and Moench<sup>11</sup> aniline dyes. Tovey<sup>18</sup> suggested ionization. Injections may be beneficial but will not cure an advanced infection. (I do not believe that alcohol and the dyes are being used at present.)

The surgical treatment of chronic cervicitis consists of amputation, a Sturmdorf operation or a trachelorhaphy. Although these procedures have become less popular during the past few years because of the fact that electrosurgical treatment is equally successful and more economical, surgical intervention still has a place in selected cases. The type of operation should be chosen according to the extent of the disease process and the age of the patient.

In the elderly a badly diseased cervix, especially if elongated, lacerated or prolapsed should be completely removed. Amputation may also be performed in younger women who are sterile. A case in point has recently come under my observation. A woman aged 38 had previously had a bilateral salpingectomy and on examination was found to have a deep stellate tear of the cervix, an erosion and a leukorrheal discharge. The cervix was amputated, as the condition obviously was not suitable for plastic repair or electrosurgical measures.

When the cervix is elongated and hypertrophied, a modified Schroeder or Sturmdorf operation is advisable. In the presence of an extensive laceration trachelor-



Fig. 3—Hypertrophied, cystic and lacerated cervix, treated by cauterization with electrocoagulation of laceration.

rhaphy is indicated. A laceration of 1.5 cm. or less is best treated with the cautery.

Electrosurgical operation is the method of choice for chronic cervicitis as it gives excellent results and

reduces the danger of cancer, as proved by Pemberton and Smith<sup>19</sup> and others. Carcinoma has not developed in several hundred of my cases in which electrosurgical procedures have been used. Cauterization or conization is preferable to electrocoagulation in that they are less often followed by infection. Electrocoagulation, moreover, interferes with the obtaining of a complete biopsy



Fig. 4—Slightly hypertrophied cervix showing a hemorrhagic cyst and other cysts.

specimen. Neither cauterization nor conization should be employed exclusively, however, the nature of the disease process should be the deciding factor in the selection of either of these procedures.

For a superficial endocervical lesion, lineal applications of the smallest cautery point are sufficient for mild cervicitis and the cautery should be lightly applied. Deep cauterization or conization should be avoided. For a small cervix with a persistent mucopurulent discharge, repeated light cauterization is preferable. For more advanced infections, deeper lineal burns are necessary. For the hypertrophied cystic cervix, conization, followed by destruction of cysts left by the cautery point, is the proper treatment. A laceration, if present, may be cauterized at the same time. Rarely is amputation required, even in the presence of extensive disease. In any case, one should avoid entering the uterine cavity as this adds materially to the danger of infection.

Treatment should always be carried out as soon after the menstrual period as possible. In cases of mild involvement the cautery may be applied in the office. Nervous patients and those with a hypertrophied cervix and many cysts should be sent to the hospital and treated under a general anesthetic. When there is even a suspicion of malignant change a biopsy should be made. A diagnosis of carcinoma was made by biopsy in two recent cases in which the condition was unsuspected.

#### POSTOPERATIVE CARE

The patient should be warned that the leukorrheal discharge will increase and informed of the probability of bleeding within ten to fourteen days and the possibility that the following menstrual period will be prolonged. She should also be instructed to begin taking douches after two or three days unless the uterus is retroverted and the cervix patent, in this event the douches should be postponed. Coitus should be discontinued for one month. The patient should see her physician within ten days, again two weeks later and thereafter once each month for four months or longer.

15 Roblee, Melvin A. Treatment of Cervicitis by Cautery and Electrocoagulation. *Am J Obst & Gynec* 22: 64 (July) 1931.

16 Ross, J. W. Chromic Acid for the Treatment of Chronic Infective Endocervicitis. *Am J Obst & Gynec* 33: 348 (Feb.) 1937.

17 Kennedy, W. T. Chronic Endocervicitis. A Partial Review of the Literature with an Introductory Paragraph on the Surgical Use of Ethyl Alcohol and a Preliminary Report of the Treatment of Endocervicitis with Ethyl Alcohol Injected Interstitially. Illustrated by Cases. *Am J Obst & Gynec* 1: 929 (June) 1921.

18 Tovey, D. W. Paper read before the American Association of Obstetric Gynecologic and Abdominal Surgeons. Hot Springs, Va. in 1937.

19 Pemberton, Frank A. and Smith, George Van S. The Early Diagnosis and Prevention of Carcinoma of the Cervix. *Am J Obst & Gynec* 17: 165 (Feb.) 1929.

At the patient's first visit, the physician should avoid loosening the exudate for fear of hemorrhage. A germicide is gently applied to the endocervix at subsequent visits, after one month, dilation of the cervix may be necessary. The mucous membrane regenerates, epithelizes and becomes normal in appearance and function except for a deficiency of mucous secretion.

A condition worse than the original lesion may follow the indiscriminate use of the cautery and conization. The after-care also has an important bearing on the outcome. If the measures described or some similar postoperative treatment is not carried out, serious complications may arise, whether cauterization, conization or electrocoagulation has been employed. Stenosis, atresia, cellulitis, pelvic abscess and even peritonitis with death are possible sequelae of improper operative treatment or postoperative care.

Several years ago I had a case in which cellulitis followed the use of the cautery in the cervix. The operation consisted of dilation and curettage and excision of a cervical polyp, as well as cauterization. Cellulitis developed, and the patient was confined to the hospital for six weeks instead of the usual three or four days. Streptococci were observed on culture. The infection probably would not have occurred had the uterus not been entered. Though this is the only case of its type which I have had in my own surgical practice, I have observed many others, two of which are reported later.

#### REPORT OF CASES

**CASE 1**—Mrs W had a pelvic abscess after cauterization of the cervix by another physician. A posterior colpotomy was performed and the illness was prolonged for several weeks. Six months later the patient consulted me her complaints at



Fig 5—Part of the wall of a single cyst with leukocytic infiltration above and increase of connective tissue. reduced from a photomicrograph with a magnification of 200 diameters.

this time being leukorrhea, dysmenorrhea, pelvic pain, backache, a bearing down sensation, dyspareunia and nervousness. On examination the cervix was found to be eroded and pointing upward, and the uterus was retroverted and fixed. The appendages and sacro-uterine ligaments were painful to palpation. Only a laparotomy offered relief from her symptoms.

**CASE 2**—Mrs M had had a cherry electrode applied to her cervix for fifteen seconds by her husband, who was a physician. Infection developed, and a few days later a pelvic abscess appeared. I drained the abscess through the vagina. Culture revealed staphylococcus and streptococcus organisms. The patient was bedridden for eight weeks.

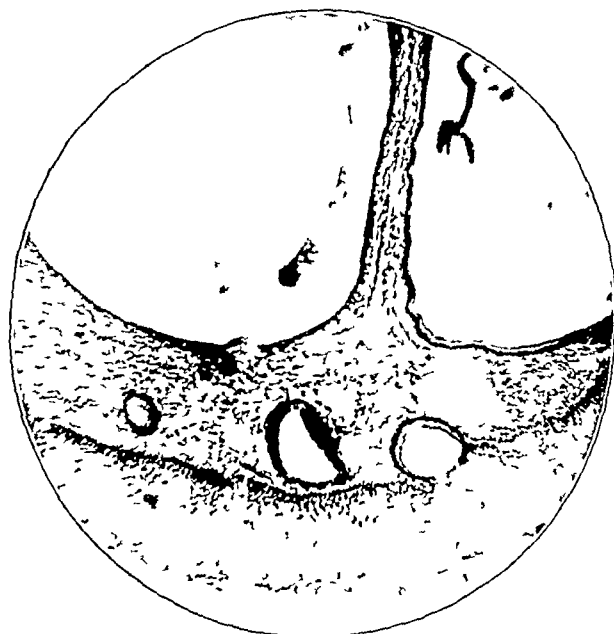


Fig 6—Lining of cervical epithelium below a normal cervical gland, two slightly enlarged glands and two large cysts above. reduced from a photomicrograph with a magnification of 100 diameters.

Hiller<sup>20</sup> reported two cases of cellulitis, in one of which the outcome was fatal. Goodall and Power<sup>17</sup> had a case in which streptococcal septicemia developed after a light cauterization. Masson and Parsons<sup>21</sup> described three cases of pelvic abscess following the use of the cautery. Cannell and Douglass<sup>22</sup> had a similar experience. In two cases with which I am familiar the patients died of peritonitis after cauterization.

Vivid examples of stenosis and atresia as a consequence of neglected after-treatment are presented in the following cases.

**CASE 3**—Mrs S W had a cauterization for a hypertrophied, cystic and easily bleeding cervix. On dismissal from the hospital she was instructed to consult her home physician and to return in one month for observation. She failed to do both and was not seen again until four months later. At that time she complained of dysmenorrhea. On examination the cervix appeared normal, but an opening could not be found. Under local anesthesia the cervix was incised and the canal located. The patency of the canal was established only after repeated dilations.

**CASE 4**—Mrs E had had a cauterization of the cervix by another physician three months earlier. When she visited me she was having excruciating labor-like pains in the pelvis, which she stated had persisted for one month. She had had amenorrhea since the operation. On examination the external os was found to be closed and discolored, and the uterus was enlarged. The closure of the os was punctured and a teaspoonful of dark blood was expelled.

**CASE 5**—Mrs B consulted me March 10, 1938, giving a history of having had a conization and a repair of a urethro-cystocele Nov. 30, 1937. She had not menstruated since

<sup>20</sup> Hiller Robert I. Death Following Coagulation of the Cervix. J A M A 104: 1323 (April 13) 1935.  
<sup>21</sup> Masson James C and Parsons Eloise. Cystic Cervicitis with Special Reference to Treatment by Cauterization. A Clinical Study of 1031 Cases. Am J Obst & Gynec 16: 348 (Sept.) 1928.  
<sup>22</sup> Cannell Douglas and Douglass Marion. Complications Following Cauterization of the Cervix Uteri. Am J Obst & Gynec 30: 376 (Sept.) 1935.

the operation and complained of a sense of fullness and pain in the vagina and frequent micturition. On examination the operative wound was seen to be nicely healed but a mass was discovered protruding against the anterior vaginal wall. The cervix could not be found. The patient was given a gas anesthetic, yet the cervix still could not be palpated. The mass was incised and approximately 1 quart of dark blood was evacuated. On incision of the edematous anterior vaginal wall, which extended across and obliterated the os, the cervix was located. Retained menstrual blood had pushed the recently repaired vaginal wall forward. The vaginal mucosa was sutured to the cervix, which was devoid of mucous covering. The patient's recovery was perfect.

I have found it necessary to amputate the cervixes of three patients who had had cauterizations elsewhere. Improper cervical drainage in stenosis leads to an infectious leukorrhea which results in erosion, providing a favorable soil for the development of cancer. A special dilator which I have devised has become indispensable for treatment in many cases of cervical stenosis.

These experiences are sufficient to prove that disastrous results may follow a procedure generally regarded as of minor import. If one avoids electro-surgical procedures for acute pelvic infection, does not enter the uterine cavity, restores a retroverted uterus to its normal position and carries out the proper treatment postoperatively, usually the outcome will be most gratifying. These measures moreover, will reduce to a minimum the incidence of cancer of the cervix.

#### SUMMARY

1 A specimen should be taken for biopsy from every lesion of the cervix wherein there appears to be even the slightest possibility of malignant change.

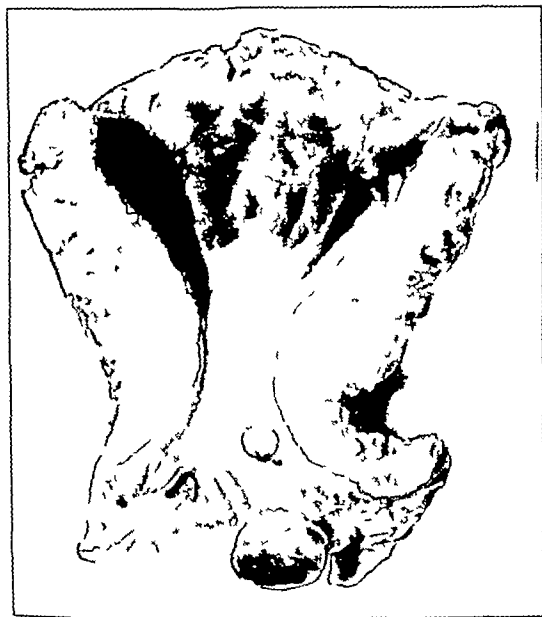


Fig 7—Cystic degeneration of cervix with large cysts in endocervix

2 A bacteriologic study showed that staphylococci and streptococci predominated.

3 Chronic cervicitis as a focus of infection should receive more thoughtful consideration. Pelvic pain, backache, menorrhagia and at times distant symptoms may be relieved by cure of an infected cervix. A gain in weight and correction of nervous instability are often noted after proper treatment of a cervical infection.

4 Penetration of the uterine cavity materially increases the danger of infection, as trauma opens an area for bacterial invasion.

5 Amputation should not be performed during the child-bearing age. A Sturmdorf operation or a modification of it is preferable.

6 Plastic surgery still has a place in the treatment of cervical lesions in selected cases. Electrosurgical measures, however, have almost superseded other methods. A trachelorrhaphy is indicated for a laceration more than 1.5 cm in length, smaller lacerations

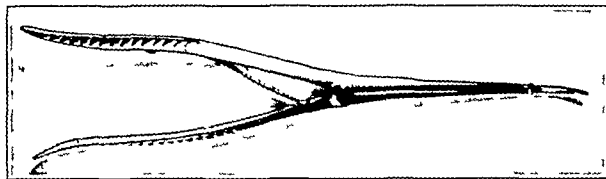


Fig 8—Black's uterine dilator. This was made for Dr. Black a few years ago and copied by the Baptist Hospital in Memphis. On several occasions Dr. Black showed this instrument at meetings at which he gave papers on cervicitis.

are best treated with the cautery, as the result is equally good and there is less danger of subsequent malignant changes.

7 The choice between cauterization and conization should be based on the type of cervical lesion found, i.e., on whether it consists of a laceration, cystic formation or extensive hypertrophy.

8 The nulliparous cervix or the multiparous cervix without extensive disease may be treated by an electro-surgical procedure in the physician's office. In the presence of marked hypertrophy, many cysts and wide laceration, or when the patient is very nervous, the treatment should be carried out in the hospital with the help of a gas anesthetic.

9 If treatment is selected according to the nature of the lesion and the age of the patient and the necessary postoperative care is given, the outcome will, as a rule, be successful.

10 Proper care of the diseased cervix will reduce malignant changes to a minimum.

#### ABSTRACT OF DISCUSSION

DR. R. GLENN CRAIG, San Francisco: Chronic infections of the cervix have long constituted a major problem in gynecologic practice. More recently they have been recognized as a factor in sterility, pelvic pain, bladder irritability, menorrhagia and arthritis as well as in leukorrhea, and as an etiologic factor in carcinoma of the cervix. I agree with the fundamentals that Dr. Black has emphasized. However, I should like to discuss three points. 1. Surgery of the cervix is necessary in an increasingly smaller number of patients in whom equally good results can be obtained by minor procedures. When indicated, the Sturmdorf principle as illustrated by Te Linde affords excellent results. 2. Conization accomplishes its objective efficiently, namely coagulation of the cervical glands with eradication of infection. However, one cannot consider the eradication of these glands without a consideration of their physiologic importance. I believe that the destruction of these glands causes trouble and for this reason have never been able to employ the procedure without reservation. Dr. Erle Henriksen carefully followed fifty patients with this in mind and thirty-seven developed a vaginitis of varying degree. 3. Cauterization of the cervix with small electrodes has given satisfactory results. Among 100 patients two required a second cauterization and a third was operated on later incidentally to another operation. This imposes little expense with no disability and satisfactory results. Even nervous patients can tolerate this as an office procedure if they are not familiar with the details of the treatment before they

are carried out. I would emphasize the danger of intra-uterine manipulation in conjunction with cauterization. Cauterization of the cervix is one of the most valuable office procedures. When done early, the condition does not progress to the point at which surgical intervention is necessary. Infections high in the cervical canal are more difficult to treat. With the small nasal tip platinum cauteries one can coagulate quite high. However, I feel that some of these require anesthesia, dilation and cauterization under anesthesia to be treated effectively.

DR HARVEY B. MATTHEWS, Brooklyn. With reference to the bacteriology of cervical infections some ten years ago I started to do some of this work but the bacteriologist at the Long Island College of Medicine thought we were not getting anywhere because he was not sure about contamination in the enucleated cervixes or those following hysterectomy. The bacteriology that we did, showed conclusively that the streptococcus was the predominating pathogenic organism. Without an accurate diagnosis there can be no intelligent treatment. Therefore in the study of these cervical infections as in other lesions of the body, a knowledge of anatomy, physiology, bacteriology and pathology is prerequisite to proper understanding. And unless we know about the extent of the infection the nature of the infection and the pathologic condition that follows, I do not believe we shall be successful no matter what methods we use. In fact, the method is not so important as a perfected technic. The latter is more important than whether one uses the cautery, conization or what not so long as that method is efficient and the man using it has had enough experience to be classed as an expert. I have made a grouping of these cervixes which I think helps in choosing the proper method of treatment. This grouping is not original. Henry Schmidt long ago made this clinical grouping for cancer, but I think it can be used here with some degree of certainty and a great deal of help in treatment. In group 1, the lacerated cervix with superficial infection, douches are about all one needs. One can use the cautery as a "brush" by the method that Dr. Dickinson recommended years ago. Group 2 is the more deeply infected group with more or less eversion and few if any superficial cysts. Here the cautery or conization or any other method one is familiar with is all that is needed. Group 3 is the lacerated, eroded and still more deeply infected (from two to five years' duration) cervix. The upper half of group 3 can be treated successfully with a cautery or conization or any of the other methods if one knows how. The lower portion of this group has to be operated on to effect a cure. I do not believe that group 4, with the badly lacerated, everted cervix and many deep cysts, with infection of from ten to forty years duration, can be successfully treated by any method other than operation, that is, by the Sturmdorf procedure or by amputation.

DR CHANNING W. BARRETT, Chicago. There is no need to talk about cauterization or amputation or conization of an infected cervix during the acute stage. When the infection has passed or largely passed and one is dealing with a pathologic condition, the procedure should depend on the pathologic condition that is left in the cervix and so much has followed some of these procedures that I should hesitate to use them generally. Too many stenoses have followed cauterization and conization. We heard today that amputation must not be performed in a woman who is not sterile if she is a child-bearer. I cannot agree with that. I would just as soon take care of a woman in confinement after an amputation properly carried out as a woman who has never had an amputation, and usually she will deliver more quickly than a woman who is delivering for the first time.

DR LEO P. T. FITZGERALD, St. Louis. Following obstetric deliveries, I have been using the cautery on cervical tears at a period of about six weeks after the delivery. I have had the patient return to the office for examination, and with a speculum I inspect the cervix. I cauterize all small lacerations in a routine manner. In doing this I follow the area of the laceration where healing is slow. In the process of healing and contraction of the scar after cauterization, the cervix after a period of eight or ten weeks often appears very nearly normal.

DR WILLIAM T. BLACK, Memphis, Tenn. I do not agree with Dr. Barrett regarding amputation of the cervix during the child-bearing age. If electrosurgery is unwarranted a Sturm-

dorf or modification of a Schroeder operation may be performed in preference to a high amputation. If a woman becomes pregnant after an amputation, an abortion or dystocia is apt to occur. Regarding the endocervical discharge after conization, I think probably this woman had an infected endocervical condition due probably to a strictured condition. That is the reason why these cases should be followed up postoperatively for a long time. Many complications have followed the use of electro-surgery, as stated in my paper. I have heard of many complications which were never reported. I know of two deaths from peritonitis following cauterization. The point I wish to make is that women are told that electrosurgery is a very minor procedure, and this is usually true, but severe complications may ensue postoperatively.

## VISUALIZATION OF THE ADRENAL GLANDS BY AIR INJECTION

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The method to be described for the visualization of retroperitoneal tumors is neither original nor new but is presented because I feel that it is not receiving the attention which it merits. Insufflation of a gas into the perirenal space was first used for the visualization of the soft parts of the region by subsequent roentgenograms by Carelli<sup>1</sup> in 1921. Quimby<sup>2</sup> used the method in 1923, Cahill<sup>3</sup> described his modification in 1935 and reported again on its use in 1936 and a report by Mencher<sup>4</sup> appeared in 1937. Aside from these references, however, little has appeared in the American literature.

The procedure is not one to be adopted as a routine, but in view of the current interest in tumors and hyperplasias of the adrenal glands it deserves emphasis as an important special method for the diagnosis of such lesions. Adrenal tumors have occasionally been demonstrated by other methods, such as intraperitoneal air injection (Langeron<sup>5</sup>) and intra-arterial injection of colloidal thorium dioxide (Roux-Berger, Naulleau and Condriates<sup>6</sup>), but the retroperitoneal technic has been more frequently adopted and is more generally useful. The external configuration of the kidney is well demonstrated by the air and may be of diagnostic significance especially when pyelograms are also made.

Essentially the method consists of introducing a quantity of air into the perirenal fat and filming the area several times during the following twenty-four or thirty-six hours. I have simplified the technic considerably from that described previously. The patient lies on the side opposite to that on which the injection is to be made, on a small firm pillow in the costovertebral angle. A procaine hydrochloride wheal is made in the skin at a point about 1 cm. below the twelfth rib, over the depression which occurs between the spinal and the abdominal muscles. Deeper infiltration with procaine hydrochloride, along the path of the needle, may also be made. A 3½ inch 18 gage "army type" spinal puncture needle is then inserted through the

From the Department of Surgery, the University of Chicago.  
Read before the Section on Urology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 17, 1938.

1. Carelli, H. H. Bull. et mem. Soc. med. d. hop. de Paris 65 (Oct. 28) 1921.
2. Quimby, W. C. J. Urol. 9, 13 (Jan.) 1923.
3. Cahill, G. F. J. Urol. 34, 238 (Sept.) 1935. Cahill, G. F. Loeb, R. F., Kurzrok, R., Stout, A. P. and Smith, F. M. Surg. Gynec. & Obst. 62, 287, 1936.
4. Mencher, W. H. Perirenal Insufflation. J. A. M. A. 109, 1338 (Oct. 23) 1937.
5. Langeron and Roux-Berger, Naulleau and Condriates quoted by Cahill.

when being directed at an angle of about 45 degrees from the vertical plane of the patient and slightly (about 30 degrees) forward of the transverse plane. The lumbodorsal fascia is recognized by the sensation of resistance and the sudden release produced when it is perforated, and the needle is introduced 2 or 3 cm beyond this point. Its point should then lie in the perineal fat inside Gerota's fascia.

The chief danger is of injecting air into the kidney from which it may rapidly enter the blood stream. The following precautions should be taken to avoid this: (1) The needle, observed for bleeding after withdrawal of its stylet; (2) is then aspirated with a syringe as a further test for bleeding and (3) the movement of the needle on deep respiration is observed for the needle moves vigorously and its distal end feels fixed when it is in the kidney whereas it moves only slightly and is relatively free when in the perineal fat. Unless air is injected no damage is done by inserting the needle into the kidney but the needle must be withdrawn and reinserted at a more vertical angle.

When the needle is in a satisfactory position, from 200 to 300 cc of air is injected with a 50 cc syringe. The air enters with very slight pressure on the plunger. When considerable pressure is necessary the position of the needle should be checked to avoid injecting the psoas muscle. I have dispensed with filtration of the

or eighteen hours, after the air has become well distributed in the fatty and areolar tissue (figs 1 and 2). It has been suggested that films be made shortly after the air injection with a period of vigorous exercise intervening. It is my opinion, however, that the series of films is likely to give more information than any



Fig 1—The roentgenogram was taken twelve hours after injection of the left side (L) and immediately after injection of the right side (R). The air is distributed about the left kidney visualizing its outline and the left adrenal while the recent injection appears as a blob about the lower pole of the right kidney.

air used and have found a valve unnecessary, as the air does not leak from the needle appreciably.

A single roentgenogram is taken immediately to check the amount and position of the air, and stereoscopic films are made six, twelve, eighteen and occasionally twenty-four or thirty-six hours after injection. The most useful films are usually those made at twelve



Fig 2—The roentgenogram was taken twenty four hours after bilateral air injection. The air has spread upward to a greater extent than in figure 1 especially on the left side where the under surface of the diaphragm is shown.

single film. Such "retroperitoneal pneumograms" have been made in fifteen cases, in eleven of which the injection was bilateral. All the films were diagnostic although it was found that a modicum of experience was necessary for the interpretation of some of them as the normal adrenal varies considerably and, because of its flatness and irregular shape, is visualized less clearly than are tumors. The patients usually complained of a feeling of fullness in the abdomen, which was not severe and which rapidly disappeared. There were no serious complications of any kind.

Most of the examinations were made in hirsute women in whom adrenal cortex virilism was suggested. No tumor was found, while enlargement of one or both adrenals was demonstrated in about half the cases. Subsequent transabdominal explorations in two cases revealed adrenal glands essentially as visualized by the air. A repetition of an injection in one case after an interval of five months showed reasonably constant visualization.

One air injection was used to demonstrate a paraganglioma in the region of the left adrenal which was responsible for paroxysmal attacks of hypertension. This tumor was removed surgically and is described in full elsewhere (fig 3). In another case the air was injected unilaterally to demonstrate the outlines of a



known hypernephroid carcinoma of the left kidney. This is done to evaluate the possible use of air injection to confirm a diagnosis of renal tumor (by the "bump" on the renal shadow) in cases in which the pyelographic appearances are inconclusive, it was thought to be definitely useful in this connection.

## SUMMARY

A simple technic for the visualization by retroperitoneal pneumograms of the adrenal glands, kidneys and other retroperitoneal soft parts was used in fifteen cases, in one of which a paraganglioma was demonstrated. More extensive use of the method is advocated for the demonstration of adrenal lesions and other retroperitoneal tumors.

## ABSTRACT OF DISCUSSION

DR. GRORCE W. FISH, New York. I first employed this valuable diagnostic procedure in 1926 using oxygen instead of air. Air was first used in our clinic in 1930. From that year until the present time approximately 200 injections have been



Fig. 3.—Visualization by air injection of retroperitoneal tumor (paraganglioma) responsible for paroxysmal tachycardia. The tumor is not completely surrounded by air but parts of its circumference are visible (arrows).

made. There have been two deaths, one in 1937 and the other in 1938 both from air embolism and both in my own cases. As far as I know, and as determined by autopsy, there was no error in technic. An inoperable pathologic process was found in the two cases. There was no evidence of direct puncture of a blood vessel, but in all probability the air injected was under sufficient pressure to break and enter a number of small diseased vessels. The symptoms of air embolism developed within five minutes after the injections. These unfortunate incidents should not condemn this procedure, but I believe that oxygen, which is rapidly absorbed, should be employed instead of air. It is the nitrogen in the air which is not rapidly absorbed. Other fatalities from air embolism following the use of air for cystograms and the determination of prostatic intrusion have been reported to me. I have no knowledge of fatalities from oxygen embolism.

DR. NORMAN W. ROOME, London, Ont., Canada. I should like only to point out that while the mortality of the procedure is admitted, the bilateral exposure of both adrenals for the purpose of determining how large they are is also a considerable procedure and carries a considerable mortality. It would seem that air injection would be preferable as a preliminary diagnostic method.

## SUBDURAL HEMATOMA IN INFANCY AND CHILDHOOD

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AND

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Intracranial hemorrhage with the formation of a subdural hematoma is a common condition in infancy and early childhood. In the Infants' and the Children's hospitals during the past ten years we have studied and treated it in more than fifty cases. Of these, the last eleven, occurring in the year ended July 1, 1938, form the specific basis for this discussion.

There are several phases of this question which seem to us to be of general interest, and we should like to suggest a routine for the management of the majority of the patients. The condition occurs more frequently in undernourished children, and in the majority of instances there is a history of trauma. Sherwood<sup>1</sup> pointed out that subdural hematoma occurs more frequently in infants cared for in foster homes, and Peet and Kahn<sup>2</sup> refer to Rosenberg's<sup>3</sup> extensive experience with this condition, during which he had never seen it develop in a "healthy, normally developed, breast-fed child." Ingalls<sup>4</sup> has recently made a thorough study of the relationship of this condition to vitamin C deficiency. We agree that the infant with scurvy or sub-scurvy vitamin C deficiency is more prone to bleeding than the normal infant and is therefore in greater danger of having a subdural hematoma, and we realize that the illegitimate infant, or the one given poor general care, may well have a deficient diet and also be more frequently exposed to trauma than is the child living under ideal conditions, but we feel certain that these elements, although they may commonly be present, are not essential in the causation of the disease. Trauma has been a more constant feature in the history of our cases, although it has not been present in all.

It is of some interest that an apparent rise in the incidence of the disease has come during a period when the diet of the average young infant has been constantly improving, particularly as far as the administration of vitamins is concerned. The increase cannot therefore be considered due to a greater incidence of subclinical or definite scurvy. It is probable also that the general supervision of infants and young children is better now than it was a number of years ago, and this presumably means less danger of trauma.

The frequency with which subdural hematoma is found among children is more or less proportional to the

From the Surgical Service of the Infants and the Children's hospitals and the Department of Surgery, Harvard University Medical School.  
1. Sherwood, David. Chronic Subdural Hematoma in Infants. *Am. J. Dis. Child.* 39: 981 (May) 1930.  
2. Peet, Mary M., and Kahn, Edgar A. Subdural Hematoma in Infants. *J. A. M. A.* 98: 1851 (May 28) 1932.  
3. Rosenberg, O. *Ergebn. d. inn. Med. u. Kinderh.* 20: 579 1921.  
4. Ingalls, J. H. The Role of Scurvy in the Etiology of Chronic Subdural Hematoma. *New England J. Med.* 215: 1279 (Dec. 31) 1936.

intensity with which it is sought. The fact that for the last few years we have been making the diagnosis more often is probably due to our having made a more diligent search. This effort, we feel, is well rewarded, for with adequate treatment the outlook is very promising.

The present trend in the treatment of subdural hematoma is toward conservatism. Many neurosurgeons who in the past have felt that it was important to turn down bone flaps for the removal of clots and membranes<sup>5</sup> are now advocating the much simpler method of suction and irrigation through burr holes or small decompressive openings.<sup>6</sup> It is of great interest and importance that the results of this kind of treatment are as satisfactory in the long run as the more elaborate and definitely more hazardous procedure formerly in general favor.

Because of this distinct change of attitude, it seems to us to be of particular importance to point out the marked difference in the effects of this type of disease in very young patients and in the average adult. When infants and children with subdural hematomas are seen only occasionally in a group of patients most of whom are adults, there is a natural tendency to treat all patients in the same way regardless of age. If, however, one considers the infants and young children as an entirely separate group, it becomes clear that they must be dealt with in a quite different way. We should like to emphasize the factors which make it essential that a more radical treatment be carried out with very young patients.

One must keep in mind that the brain volume is approximately doubled in the first three months of life and doubled again in the following six months. In view of this fact it does not seem unreasonable that even a thin membrane consisting of inelastic tissue should

obliterate the subarachnoid space and (2) the inflammatory reaction to the presence of blood in both the subarachnoid and the subdural spaces. Removal of bloody cerebrospinal fluid at as early a date as possible will tend to minimize this difficulty, but as long as the membrane is present absorption of fluid will be impaired and there will be a tendency to increasing hydrocephalus.



Fig. 2 (case 4)—The roentgenograms were taken after injection of air into the subdural cyst on the right through a rubber catheter inserted through the burr hole in the right temporal region. The cyst represented by the shadow was subsequently removed.

lus. With adults hydrocephalus secondary to untreated hematoma is uncommon, in infants it occurs in the majority of cases.

The question of the relative resistance of the infant brain and of the adult brain to trauma is too complex to consider in detail in this paper. It will be agreed in general that as the numerous functions of the cortex are being developed rapidly there should be as little interference with circulation as possible. To accomplish this end, membranes must be in large part removed.

#### TREATMENT

The procedure which we have adopted as a routine is planned in such a way that the radical management is safe and should be carried out with a very low mortality rate. Obviously any such plan as is here advocated must be modified to suit the circumstances. In almost every case the treatment outlined is accompanied by parenteral administration of fluids and, frequently, by repeated small transfusions.

1. Lumbar Puncture and Withdrawal of Not More Than 10 cc of Fluid. If there is evidence of marked increase in intracranial pressure, the second step should precede lumbar puncture. If the spinal fluid contains blood, daily lumbar puncture should be done until the fluid is clear.

2. Bilateral Subdural Taps Through the Coronal Suture. These taps, well away from the midline, should be done with a short needle, well sharpened but with a short bevel. Great care must be used; it is helpful to place the free thumb and index finger firmly against the scalp, the needle should be held tightly near its point so that the force used is entirely under control. As soon as the dura is penetrated the stylet should be removed, and if fluid is present it should be allowed to escape without the aid of a syringe. Normally it is impossible to remove more than a drop or two of the fluid, which is clear, colorless and has a protein content of between 15 and 35 mg per hundred cubic centimeters (negative Pandey test). If a hematoma is present there will usually be a free flow of blood-tinged yellow fluid

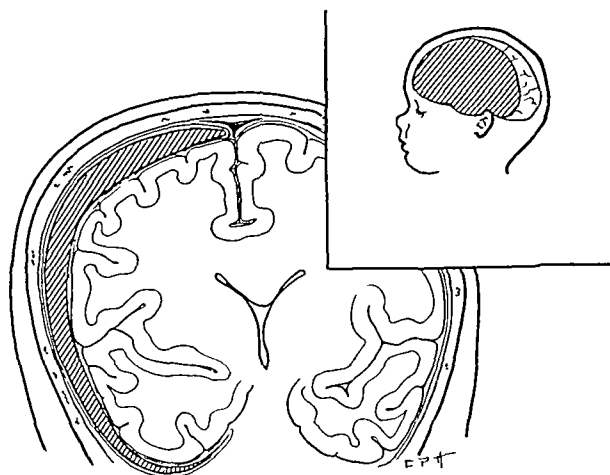


Fig. 1—Position of the hematoma as it occurred most frequently in this series.

do a considerable amount of damage. Obviously the danger from pressure is very great as compared with that which exists when the brain has attained its full growth.

In addition to this "constrictive" effect of the membrane, there is interference with the absorption of cerebrospinal fluid because of (1) the pressure tending to

5 Putnam, Tracy J. and Cushing, Harvey. Chronic Subdural Hematoma. *Arch. Surg.* 11: 329 (Sept.) 1925.

6 Horrax, Gilbert and Poppen, James L. The Frequency, Recognition and Treatment of Chronic Subdural Hematoma. *New England J. Med.* 216: 381-385 (March 4) 1937.

This fluid usually has a high protein content and a variable number of red blood cells. The amount of fluid removed in this way must vary according to the size of the fluid collection and the way in which the patient reacts. At the first tap it is usually desirable to remove no more than 15 cc from each side. It must be kept

treatment includes good nursing care and an adequate diet with liberal administration of vitamins. We believe it significant that all of our patients were better when operated on than when first seen.

It is of some interest that in our series there was no infection of the subdural space although in some cases as many as twenty taps were done through the scalp. The scalp was carefully shaved and cleansed and aseptic technique used. The taps were done by the house officers in their usual rotation, and the fluid cultured at least once weekly, was invariably sterile. Although pleased with the result we are inclined to wonder whether the fluid is as easily infected as is commonly supposed.

The location and the extent of the lesion have been strikingly similar in our patients. The membranous sac has in all but one case extended from the parietal region anteriorly over the frontal pole, superiorly to the longitudinal sinus and inferiorly well under the temporal lobe (figs 1 and 2).

The average convalescence from operation was remarkably rapid. Case 4 is given in detail to illustrate what we expect in this regard. Fluids wisely administered parenterally were an essential factor in the recovery. Practically all the children received at least one blood transfusion (10 cc per pound for babies), which in many instances we did not hesitate to repeat.

#### REPORT OF CASES

**CASE 1—History**—C. C., a girl aged 6 months, admitted June 21, 1937, because of sixteen generalized convulsions during the preceding month, was an illegitimate child cared for in a foster home. She was born by forceps delivery after a difficult thirty-six hour primiparous labor. Early development and diet were normal. There were no infections or history of trauma. The significant observations were listlessness, slight

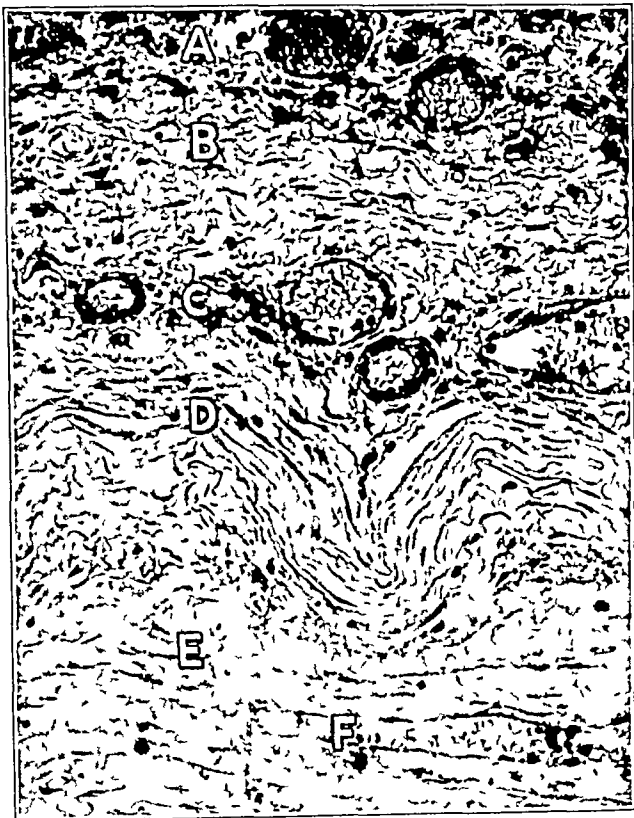


Fig. 3 (case 1)—Section through a thick portion of the membrane showing various stages of fibroblastic proliferation (B, D, E) and blood vessel infiltration (A, C, F). Hematoxylin and eosin stain.  $\times 120$ .

in mind that the finding of as much as 1 cc of fluid with an elevated total protein content is pathologic and that if the needle is near the edge of the clot it may well be impossible to remove more than a very small amount. The sides are then tapped on alternate days for from one week to ten days. This gradual reduction of pressure combined with careful feeding, administration of fluids and transfusion is ordinarily accompanied by marked improvement in the patient's general condition.

**3 Bilateral Burr Holes**—These are so placed that they may later be included in a bone flap. At this time the fluid-containing cavities can be emptied completely and, if it seems desirable, may be filled with air so that roentgenograms can show the extent of the space. If a solid clot is present, it may be washed out, at least in part, at this time. Of chief importance is the determination of whether or not a definite membrane is present; if one is, the fourth step is indicated.

**4 Elevation of a Bone Flap**—Whatever solid clot may be present and as much of the membranous envelope as can be safely reached through the exposure should be removed. If a membrane is known to be present over both hemispheres, a second bone flap must be turned down after whatever interval seems suitable for the particular patient, usually one or two weeks.

We feel that by proceeding according to a regimen such as that outlined it is possible to achieve gratifying results in the treatment of this condition. Naturally the



Fig. 4 (case 1)—Region D of figure 3  $\times 900$  showing older fibroblasts rich in collagen. aniline blue stain.

rachitic beading, hemorrhages in the right retina, a palpable liver, marked bilateral spasticity, hyperactive deep tendon reflexes, bilateral ankle clonus, and Babinski responses. There was no clinical evidence of scurvy. Roentgenograms of the skull and long bones were normal. The blood and urine were normal. The Hinton reaction of the blood and the reaction to tuberculin (1:1,000) were negative. The clotting time was three minutes and the bleeding time ten minutes.

The spinal fluid was normal. Old blood was obtained from both subdural spaces when these were tapped through the coronal sutures. On July 2 burr holes were made in each temporal region and subdural hematoma membranes incised on each side. After this drainage of fluid the child improved. On July 7 an osteoplastic bone flap was turned down on the left side and the greater portion of the membrane on this side excised. An infection of the wound complicated convalescence which was otherwise uneventful. In December an osteoplastic bone flap was turned down on the right side and the membrane on this side removed. The child stood the operation poorly but was given a transfusion and improved, six hours after operation she succeeded in struggling in bed and died suddenly while attempting to get up.

**Pathology.**—The significant abnormalities noted post mortem other than those in the brain included early bilateral interstitial pneumonia, with marked pulmonary edema and moderate atelectasis; there was evidence of generalized acute and chronic infection. There was microscopic evidence of scurvy. The left side of the cerebral cortex, five months after removal of the subdural hematoma, appeared normal and the only abnormality shown by microscopic examination was moderate congestion with slight shrinkage of cells and nuclear pyknosis. There were no adhesions between the dura and arachnoid on this side, and the under surface of the dura had its usual glistening sheen. A considerable portion of hematoma remained over the right frontal pole and temporal lobe and in the middle fossa bilaterally. A fringe of hematoma averaging 2 cm in

was three minutes and the clotting time six minutes. The vitamin C content of the blood was 0.4 mg per hundred cubic centimeters, after five days of intensive vitamin C therapy it was 1.1 mg.

Lumbar puncture released grossly bloody xanthochromic fluid under increased pressure. A similar fluid was recovered from both subdural spaces by tapping through the coronal sutures. This was repeated on alternate sides daily. The child's condition improved steadily. On October 26 and November 2 burr holes were made and bilateral membranes identified. At the second operation, air was injected into the subdural space through a soft rubber catheter to help evacuate fluid. On November 12 an osteoplastic bone flap was turned down on the left side and a subdural cyst with a thick outer and thin inner wall was excised over as wide an area as could be visualized. Convalescence was uneventful, with the temperature 104 F for the first three postoperative days and normal thereafter. On November 19 an osteoplastic bone flap was turned down on the right side and a large amount of subdural fluid released but no membrane was found. Since February 1938 the patient has developed and behaved normally, with no evidence of progressive hydrocephalus.

**Pathology.**—Microscopic study of sections made through the whole membrane revealed a rather definite architecture closely resembling that observed in the preceding case.

**CASE 3—History.**—P. K., a Negro girl aged 3 months, was admitted to the Children's Hospital May 14, 1938 because of vomiting of two weeks' duration. The economic status of the

TABLE 1—Clinical Data

Case	Patient	Age	Economic Status	Head Injury	Scurvy	Infection	Spinal Fluid	Subdural Fluid		Membrane		Bone Flap		Present Status
								Right	Left	Right	Left	Right	Left	
1	O. C.	6 mo.	Poor	+	?	0	0	+	+	+	+	+	+	Dead
2	E. C.	2 mo.	Fair	+	+	0	+	+	+	0	+	+	+	Improved
3	P. K.	3 mo.	Fair	0	+	+	+	+	+	+	+	+	+	Improved
4	I. H.	8 mo.	Poor	+	+	0	0	+	+	+	0	+	0	Improved
5	B. H.	9 mo.	Good	+	?	+	+	+	+	+	+	+	+	Improved
6	D. J.	4 mo.	Fair	0	0	+	0	+	+	+	+	+	+	Improved
7	R. G.	2 mo.	Poor	+	0	0	+	+	+	+	+	+	0	Improved
8	R. N.	3 mo.	Poor	+	+	0	0	+	+	0	0	0	0	Improved
9	J. V.	13 mo.	Fair	+	0	+	0	+	+	0	0	0	0	Improved
10	C. F.	3 yr.	Good	+	0	0	0	+	+	0	0	0	0	Improved
11	D. P.	6 yr.	Fair	+	0	0	+	+	+	+	+	+	+	Improved

width was attached to the falx along the sagittal sinus on both sides. The hematoma was composed of distinct layers which could be dissected easily anatomically and identified microscopically. Around the periphery of the hematoma, for instance along the sagittal sinus, these layers merged into one membranous structure. Microscopic examination of sections taken through the thickest portion of the hematoma showed layers of fibroblasts infiltrated by layers of proliferating blood vessels. There were all degrees of connective tissue formation (figs. 3, 4 and 6), from single fibroblasts growing against a background of fading red blood cells (fig. 5) to sturdy sheets of fibroblasts rich in collagen (figs. 4 and 6). Generally speaking the younger the reaction the more peripheral was its position in the section; this stratification of fibroblasts and blood vessels seemed to give the section a rather definite architecture (fig. 3). In the center of the cross section surrounded by the most advanced fibroblastic proliferation was a cavity containing old blood.

**CASE 2—History.**—E. C., a boy aged 9 weeks was admitted Sept. 30, 1937, because of vomiting of ten days duration. The economic status of the family was fair. He had been born normally of a multiparous mother with rheumatic heart disease. He nursed poorly and was constantly fretful or lethargic. His eyes seemed to stare. The cry became increasingly piercing and the head grew large. Orange juice and cod liver oil were given in adequate amounts when he was 7 weeks old. There was no infection or postnatal trauma. The significant observations were lethargy, mild hydrocephalic facies, a head 15¾ inches in circumference, a tense anterior fontanel, bilateral internal strabismus, bilateral exophthalmos, cold extremities, symmetrically hyperactive reflexes, a subconjunctival hemorrhage on the right and normal optic fundi. Roentgenograms of the skull and long bones were normal. The blood and urine were normal. The Hinton reaction of the blood and the reaction to tuberculin (1:1,000) were negative. The bleeding time

family was fair. She was the first and smaller of twins born after a difficult ten hour labor. She was bottle fed from the time of birth and received adequate cod liver oil and orange juice after the fifth week. Twelve days before entry she had a generalized convulsion and showed residual right hemiparesis. Sulfanilamide was given for otitis media on the right. Vomiting increased during the two weeks prior to admission. The significant observations at the time of entry were temperature 103 F, pulse rate 140, respiratory rate 44, irritability, a bulging fontanel, lethargy, a piercing cry and mild bilateral otitis media. The urine was normal. Examination of the blood showed 10.5 Gm. (67 per cent) of hemoglobin, 2,920,000 red cells and 15,880 white cells per cubic millimeter, 66 per cent polymorphonuclears and 28 per cent lymphocytes. The Hinton reaction of the blood and the reaction to tuberculin (1:1,000) were negative. The vitamin C content of the blood was 9.2 mg per hundred cubic centimeters. Roentgenograms of the skull, long bones and chest were normal. Blood cultures were sterile.

Lumbar puncture yielded slightly xanthochromic fluid, it contained a normal amount of sugar (64 mg per hundred cubic centimeters) and 200 white blood cells, with 90 per cent polymorphonuclears, and 46 mg of total protein per hundred cubic centimeters. On the following day it was unchanged save for an increase in cells and total protein content. Bilateral taps of the subdural space were done through the coronal sutures. Approximately 15 cc of sterile xanthochromic fluid was released from each side in each instance the fluid contained about 1,700 cells per cubic millimeter of which one third were polymorphonuclear leukocytes and the remainder red cells. From then on the baby improved steadily. The subdural spaces were tapped on alternate days. At the end of a week she was symptom free. Bilateral burr holes on May 26 revealed thick subdural membranes on both sides, these were incised, and a free flow of xanthochromic fluid was obtained. On June 1 an

osteoplastic bone flap was turned down on the right side and a thick (one-eighth inch) gelatinous subdural membrane excised from the frontotemporoparietal region. Eight days later the left side was approached in a similar fashion and a similar membrane removed. Convalescence was uneventful and both wounds healed well. The child has remained symptom free.



Fig. 5 (case 1)—Regions B and C of figure 3  $\times 900$  showing early fibroblastic and blood vessel proliferation around extravasated red blood cells, aniline blue stain.

**Pathology**—Microscopic study of sections taken through the membrane showed essentially the same structure as that observed in cases 1 and 2.

**CASE 4—History**—J. H., a boy aged 8 months, was admitted Nov. 29, 1937, because of drowsiness and convulsions during the previous week. The economic status of the family was poor, and the child was boarded out by the working mother in a foster home. Birth and early development were normal. Cod liver oil and orange juice were given irregularly. There had been no chronic illnesses or recognized trauma. Seven days before admission the foster mother reported that the child had a convulsion. The mother found multiple ecchymotic areas over the extremities and the left side of the face. The baby became drowsy. Three days before admission internal strabismus appeared. The significant observations were drowsiness, irritability, a bulging fontanel, bilateral internal strabismus, bilateral retinal hemorrhages and a Babinski response on the left. The urine was normal. There was secondary anemia. The Hinton reaction of the blood and the reaction to tuberculin (1:1,000) were negative. The bleeding time was three and one half minutes and the clotting time five minutes. The vitamin C content of the blood was 97 mg per hundred cubic centimeters. X-ray examination showed separation of the skull suture lines but no fracture, subclinical scurvy and greenstick fractures of both bones in both forearms.

Lumbar puncture yielded clear and colorless fluid with a total protein content of 14 mg per hundred cubic centimeters and an initial pressure of 250 mm. Tap of the subdural space through the coronal sutures November 30 released 15 cc of bloody xanthochromic fluid from each side. The subdural spaces were tapped on alternate days for one week. The baby improved and became symptom free. On December 9 burr holes were made, revealing a substantial subdural membrane on the right and none on the left. On December 14 an osteoplastic bone flap was turned down on the right side and the subdural membrane removed. Since discharge two weeks later, the patient has been followed closely in the outpatient department. He is symptom free and shows no evidence of hydrocephalus. He is now 14 months old and is beginning to walk.

and say words. Psychometric studies indicate that he is about normal for his age.

**Pathology**—Microscopic study of the pathologic specimen showed a thin piece of tissue with well layered fibroblastic organization of hemorrhagic areas, there were a moderate number of monocyctic cells containing golden brown pigment.

**CASE 5—History**—B. H., a girl aged 9 months, was admitted Jan. 14, 1938, because of twitching of the right arm and leg of one hour's duration. The economic status of the family was good. The birth and early development had been normal. She had received inadequate cod liver oil and no orange juice or tomato juice, she had been bottle fed from birth. On January 12 she fell from a high chair to the floor, bruising her right cheek. She was restless that night. The next day a physician found bronchitis and otitis media, with a temperature of 104 F. Change of position of the head caused pain. She had urinary frequency, needing to void hourly. Early in the evening of admission her mother noticed twitching and weakness of the right arm and leg; the child was lethargic. The significant observations on admission were temperature 102 F, pulse rate 120, respiratory rate 30, blood pressure 130/70, drowsiness, bilateral otitis media and flaccidity and sluggish tendon reflexes on the right. The fontanels did not bulge, and there was no papilledema. X-ray examination of the skull and bones gave negative results. The urine was normal. The white blood cell count was 21,000 per cubic millimeter, the cells being predominantly polymorphonuclear. The clotting time was three minutes and the bleeding time five minutes. The vitamin C content of the blood was 0.1 mg per hundred cubic centimeters. The Hinton reaction of the blood and the reaction to tuberculin (1:1,000) were negative.

Lumbar puncture released xanthochromic fluid under increased pressure. From each subdural space about 10 cc of xanthochromic fluid was released. Subdural taps were done on alternate days thereafter. Right hemiparesis continued. On January

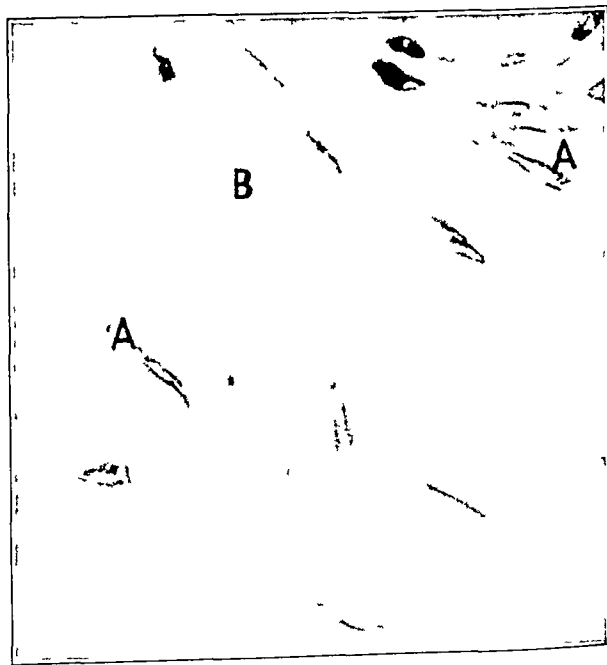


Fig. 6 (case 1)—Region D of figure 3  $\times 900$  showing fibroblasts (A) and collagen (B), hematoxylin and eosin stain.

27, after visualization of a subdural clot through a burr hole, an osteoplastic bone flap was turned down on the left. The underlying dura was blue over its lower two thirds; as it neared the midline it became a more normal color, and over the posterior portion of that exposed it was normal. Beneath the blue area, encased in a transparent membrane, was a thick, jelly-like purple-red clot which extended well down over the temporal lobe. This was removed completely.

After identification of a subdural membrane on the right through a burr hole, a bone flap was turned down March 1

and a thin membrane freed from the dura and removed. Neurologic examination gave negative results at the time of discharge, March 17. No weakness on the right side was demonstrable. The patient's progress has been steady, and psychometric studies show her performance to be normal.

**Pathology**—Left. Microscopic study of sections of the specimen showed a layer of only a few fibroblasts acting as a membrane around the large blood clot. Right. Microscopic study of sections of the membrane showed well established layers of fibroblasts surrounding and invading areas of red blood cell extravasation.

**CASE 6—History**—D. J., a girl aged 4 months, was admitted April 14, 1938, because of fever and convulsions of four hours' duration. The economic status of the family was fair. The birth and early development were normal. She had had adequate vitamin C and had suffered no recognized trauma. The significant observations were pallor and temperature of 104 F, spasmodic extensor movements of the fingers, a palpable liver, mild bilateral internal strabismus, normal optic fundi and a flat open anterior fontanel. X-ray examination showed the skull and long bones to be normal. Examination of the blood showed some concentration of the cell elements and 14,000 white cells per cubic millimeter, predominately polymorphonuclear.

The spinal fluid was normal. Xanthochromic fluid was obtained from each side by tapping the subdural space through the coronal sutures. The subdural spaces were tapped on alternate days, and burr holes revealed substantial bilateral mem-

brane largely removed. The child had an uneventful convalescence and was discharged from the hospital symptom free.

**Pathology**—When studied microscopically, the membrane showed recent extravasation of red blood cells and fibroblastic organization.

**CASE 8—History**—R. N., a boy aged 3 months, was admitted March 14, 1938, because of cyanotic spells and twitching on the right side for eight hours. The economic status of the family was poor. The birth and early development were normal. He was nursed at the breast for the first six weeks, after that he was given a formula with no supplement of cod liver oil or orange juice. One week before the onset of symptoms he was hit on the glabella with a bottle, without any immediate symptoms appearing. The significant observations were coma, pallor, cyanosis, bilateral internal strabismus, nystagmus, sustained right ankle clonus and a liver felt 2 cm below the costal margin. The Hinton reaction of the blood and the reaction to tuberculin (1:1,000) were negative. X-ray examination of the skull and long bones showed them to be normal. Chemical examination of the blood showed a carbon dioxide-combining power of 34 volumes per cent, the vitamin C content was 0.2 mg, the nonprotein nitrogen content 108 mg and the serum protein content 6.8 Gm per hundred cubic centimeters. Three days later the nonprotein nitrogen content was 31 mg and the vitamin C content 0.6 mg per hundred cubic centimeters.

TABLE 2—Additional Clinical Data

Case	Patient	Temperature on Admis- sion F	Vomiting	Headache	Strange Behavior	Stupor	Convulsions	Paralysis	Bulging Fontanel	Fractured Skull	Optic Fundus
1	C. C.	100	+	0	0	+	Right left	0	0	0	+
2	E. C.	99	+	0	+	+	0	0	+	0	0
3	P. K.	100	+	0	+	+	Right left	Right	+	0	0
4	J. H.	100	0	0	+	+	Right	0	+	0	+
5	B. H.	102	+	+	0	+	Right	Right	0	0	0
6	D. J.	104	0	0	0	+	Right	Right	0	0	0
7	R. G.	101	0	0	0	+	Right	0	+	0	+
8	R. N.	99	0	0	+	+	Right	Right	0	0	0
9	J. V.	99	+	0	0	+	0	0	0	0	0
10	C. F.	99	+	0	+	0	0	0	0	0	0
11	D. P.	99	+	+	+	0	0	0	0	0	+

branes. On May 2 an osteoplastic bone flap was laid back on the left side and a large thick subdural membrane excised from the frontal region. On May 20 a similar operation was done on the right side. Since discharge June 4 the patient has been seen regularly and continues to do well, with no evidence of disease of the central nervous system.

**Pathology**—The microscopic picture was essentially the same as that in the cases previously described.

**CASE 7—History**—R. G., a boy aged 2 months, was admitted Oct 10, 1937, because of convulsions during the previous three days. The economic status of the family was poor. He had been thought to be normal at birth and thereafter. Labor was of thirteen hours' duration and forceps was not used; the right parietal portion of the scalp was excoriated during delivery. There was no postnatal trauma. The child was comatose and having repeated convulsive twitching on the right side during examination. Other significant observations were a bulging fontanel, bilateral retinal hemorrhages, spastic legs and right arm, bilateral hyperactive tendon reflexes, positive Babinski responses and left ankle clonus. There was no evidence of infection or scurvy. The urine was normal. There was secondary anemia. X-ray examination of the skull showed no fracture or separation of sutures. The Hinton reaction of the blood and the reaction to tuberculin (1:1,000) were negative. The bleeding time was three and the clotting time four minutes.

Spinal fluid obtained from the lumbar subarachnoid space the day of admission was blood tinged and slightly xanthochromic. On the same day 15 cc of blood-tinged fluid was obtained from each of the subdural spaces, tapped through the coronal sutures. The child was given a transfusion and subdural taps were repeated daily, with increasing returns and steady improvement in the condition. On October 27 a burr hole was made in each temporal region, and a definite subdural membrane was seen on the right. On October 30 an osteoplastic bone flap was laid back on the right and the subdural

Spinal fluid obtained by lumbar puncture was normal. From 0.5 to 1 cc of bloody fluid was released from each subdural space by tapping through the coronal sutures. These taps were repeated daily, and the patient was given a transfusion. He improved, but the twitching persisted on the right. On March 25 bilateral burr holes were made, all revealed normal dura and cortex except the right anterior one. Here a large amount of xanthochromic fluid escaped when the dura and underlying membrane were incised. On April 1 an osteoplastic bone flap was turned down on the right as we expected, there was a large amount of fluid but no significant membrane. However, after this gross release of fluid, the child had no more twitching and improved rapidly. He was discharged April 16 symptom free save for a transient strabismus. An encephalogram made just before discharge showed a moderate symmetrical dilatation of the whole ventricular system.

**CASE 9—History**—J. V., a boy aged 13 months, was admitted May 17, 1938, because of vomiting and apathy of seven days' duration, with a right internal strabismus for the last three days. The economic status of the family was fair. The birth and early development had been normal save that the head had always been moderately large. He received adequate amounts of orange juice and cod liver oil from the age of 3 weeks. Three weeks before admission he fell from a high chair to the floor, bumping his head; he did not lose consciousness and no abnormalities were noted until the onset of his illness two weeks later. The significant observations at admission were temperature 98 F, pulse rate 104, respiratory rate 24, a moderately large head with prominent frontal bosses, right internal strabismus, and repeated projectile vomiting. The urine was normal. A blood count showed 16,000 white cells per cubic millimeter, 65 per cent of which were polymorphonuclear. X-ray examination of the skull showed the suture lines abnormally separated. The Hinton reaction of the blood and the reaction to tuberculin (1:1,000) were negative.



Lumbar puncture yielded normal fluid. Five cc of clear fluid with total protein content of 38 mg per hundred cubic centimeters was obtained from the left subdural space and 8 cc of yellow fluid with a total protein content of 185 mg from the right. Taps through the coronal sutures were repeated on alternate days, with cessation of vomiting and lessening of the baby's apathy. Bilateral burr holes were made and a large amount of fluid was released from the subdural space on both sides. No subdural membrane was seen. The child improved rapidly and now behaves in every way like a normal baby. Pneumoencephalograms made postoperatively showed mild symmetrical dilatation of the ventricular system and an increased amount of air over the cortex.

**CASE 10—History**—C. I., a boy aged 3 years, was admitted Feb. 15, 1938, because of deafness on the right side of one month's duration. The economic status of the family was good. The birth and early development had been normal; there were



Fig. 7 (case 10)—C. I. photo graphed just before discharge from the hospital.

some evidences of physical and intellectual precocity. There had been no infection or trauma until on Aug. 15, 1937, he was thrown against the windshield of a car in which he was riding when it stopped abruptly. He did not lose consciousness. The day of admission he vomited three times. The significant observations were temperature 98.6 F, pulse rate 110, respiratory rate 20, blood pressure 95/60, keen intelligence, complete deafness on the right side and partial deafness on the left side. X-ray examination showed the skull and spine to be normal. Spinal fluid obtained from the lumbar subarachnoid space was normal.

Under hospital observation for the next ten days the patient demonstrated occasional strange behavior patterns and often seemed unsteady on his feet. On March 2 burr holes were made in the parietal and suboccipital regions of the skull bilaterally. An unusually large amount of

clear fluid was released from beneath the dura over the cerebellum bilaterally, but especially over the right hemisphere. The cisterna magna was large. No subdural membrane or clot was visualized. On March 9 a pneumoencephalogram was made, which demonstrated a large space over the cerebellum and symmetrical dilatation of the lateral and third ventricles. Shortly afterward the hearing began to improve and the ataxia disappeared. On March 14 the patient was discharged in a nearly normal clinical state. This recovery has persisted and he now shows no residual effects of his injury, while his mental acuity continues to be of high caliber (fig. 7).

**CASE 11—History**—D. P., a boy aged 6½ years, was admitted June 17, 1937, because of headaches of one month's duration. The economic status of the family was fair. The birth and early development were normal. One month before entry he fell from a wagon, hitting his head on the pavement, he did not lose consciousness, but the next few days marked the onset of headaches, which increased steadily. Eleven days before entry vomiting and epistaxis started and they had recurred increasingly ever since. Significant observations were temperature 100 F, pulse rate 90, respiratory rate 25, blood pressure 100/56, irritability, a large head, early bilateral papilledema with retinal hemorrhage, unsteady gait, positive

Romberg test, symmetrically hyperactive tendon reflexes and involuntary spasms of rolling both eyes in all directions. The bleeding time was eighteen minutes and the clotting time four minutes. X-ray examination of the skull gave negative results. On July 16 burr holes revealed bilateral subdural hematomas and air injected into the subdural spaces showed them to be of great size. On July 17 an osteoplastic bone flap was elevated on the right side and the major portion of a large hematoma removed. On August 5 the procedure was repeated on the left and a hematoma removed from this side. The neurologic status is greatly improved and the original symptoms are gone. There is no evidence of permanent damage to cerebral function.

**Pathology**—Microscopic study of the pathologic specimens showed them to be composed of extravasated red blood cells, mild lymphocytic infiltration and extensive fibroblastic organization.

The clinical data presented in these eleven cases is summarized in tables 1 and 2. In each instance + stands for an abnormal and 0 for a normal condition. The operation was, of course, done only when the + sign appears under "bone flap."

#### SUMMARY

In ten cases of subdural hematoma in infants and one in an older child, we adopted radical treatment. We feel that this treatment should be carried out with a low mortality rate and very satisfactory end results.

300 Longwood Avenue

## EPHEDRINE IN A PHYSIOLOGIC VEHICLE AND LATERAL HEAD-LOW POSTURE

IN TREATMENT OF THE NOSE AND SINUSES

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During the past decade there have been many developments relative to local treatment for infection of the upper part of the respiratory tract. There are two which I wish to discuss. One is the use of head-low posture for making the nasosinal area available for treatment. The other is the use of drugs and vehicles compatible with nasal physiology. The use of head-low posture implies recognition of the intricate and varied anatomy of the nasosinal area. The use of physiologic solutions implies realization of the function of the nasal mucous membrane. The two developments are to a great extent interdependent. Without a physiologic solution the posture would be ineffective or of limited use. Without head-low posture it is doubtful whether the need of physiologic solutions would be so easily recognized and accepted. To Dr. Arthur Proetz<sup>1</sup> more than to any other person physicians owe recognition for initiating these changes.

This situation contrasts sharply with the empiricism of the past and may be considered a new departure in rhinology. There should result a considerable change in our attitude toward the control of infection in this area. Change is inevitable as methods are correlated with anatomy and physiology. With empiricism in treatment there grew up an inordinate use of tampons, cannulas and trocars and too great a readiness to resort to minor as well as major surgical intervention during

Read before the joint meeting of the Section on Pediatrics and the Section on Radiology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 16, 1938.  
<sup>1</sup> Proetz, Arthur W. Displacement Irrigation of Nasal Sinuses. Arch. Otolaryng. 41 (July) 1926.

acute phases of inflammation. Treatment during acute infection was attended by chemical trauma from use of unphysiologic drugs and physical trauma from instrumentation.

I am concerned with the common cold as the means by which infection becomes established in sinuses, ears and other parts of the respiratory tract. Nasal congestion during a cold interferes with venous and lymphatic



Fig 1—The lateral head low position. Ephedrine in saline solution is instilled into both nasal chambers the two sides being treated simultaneously. All the sinist ostiums of both sides are flooded by the solution. In adults this posture may be used for the displacement of iodized oil into the sinuses by the Proetz method.

circulation about the sinist ostiums. This increases the edema and congestion within the sinuses and permits accumulation of mucus which the cilia are unable to remove. This is a common complication. It often initiates a vicious cycle and is universally recognized as unfavorable to tissue defense. This cycle may be terminated if ventilation is obtained by shrinking the mucous membrane. If a sinus is able to empty itself and the circulation of lymph and blood is restored, the ability of the mucosa to rid itself of infection is increased.

The purpose of local treatment during acute infection is ventilation in order to improve drainage. Shrink-



Fig 2—The lateral head low position end view.

age of the nasal mucosa opens the meatuses and the sinist ostiums. Free ciliary drainage then takes place if in the process of ventilation the ciliary mechanism has not been damaged. This is why the selection of the drug and the vehicle is so important. An ideal drug would cause mucosal shrinkage with no evidence of

local toxicity. An ideal vehicle is one which can be in contact with the ciliated epithelium and cause no irritation. In the vehicle this implies isotonicity and a pH compatible with nasal secretion. According to present knowledge ephedrine in Locke's solution or its equivalent constitutes an efficient agent for shrinkage in a harmless physiologic vehicle.

Ephedrine acts by local vasoconstriction. As a drug it is remarkably stable. In physiologic solution of sodium chloride it may be sterilized by boiling and if not contaminated will remain apparently unchanged for months or years. This is fortunate because solutions for intranasal use should not contain antiseptics or preservatives such as are available today. A physiologic solution of ephedrine is odorless and its presence in the nose is entirely free from sensation. There is a general impression that ephedrine has a natural sting that must be disguised in some way. This is not so. Stinging, tickling or any other sensation indicates irritation from an unphysiologic vehicle. This suggests another reason why a solution for nasal use must be as nearly perfect as possible.

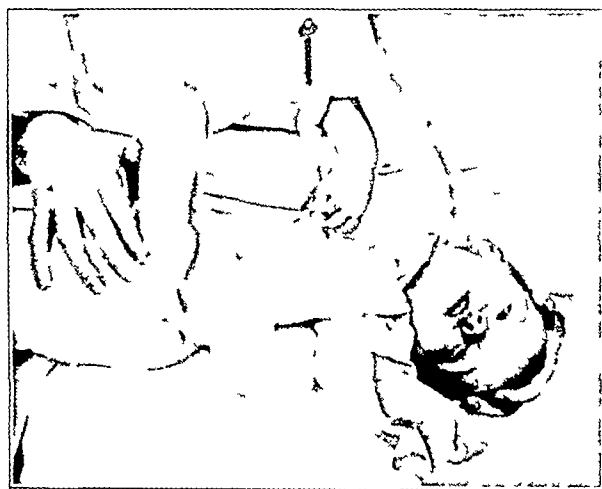


Fig 3—Infants and small children are best held over one's lap.

A child will usually cooperate if he is not hurt. Dr Clifford Sweet has found that with this solution his results with children compare favorably with what can be accomplished with adults. Much as ephedrine has been appreciated for its properties as a vasoconstrictor a full appreciation of its excellence cannot be had until it is used in a physiologic vehicle.

Recently other vasoconstrictor drugs such as neosynephrin hydrochloride, propadrine hydrochloride and benzedrine, have been made available. If these prove to be better than ephedrine, medical practice will be that much richer, and if they are stable in a physiologic vehicle, what has been said of ephedrine applies also to them.

I shall do no more than mention some of the drugs that traditionally have been used in the nose and sinuses during acute infection: silver proteates, volatile oils, epinephrine and cocaine and such traditional vehicles as distilled water and liquid petrolatum. Their shortcomings in local treatment have been aired widely in the literature in the past few years.<sup>2</sup> Their use is empirical and a certain amount of good may seem to be accomplished by some of them, but the closer they

2 Lierle D. M. and Moore P. M. Effects of Drugs on Ciliary Activity of Mucosa of Upper Respiratory Tract. Arch Otolaryng 10: 55 (Jan) 1934. Proetz Arthur W. Effects of Drugs on Living Nasal Cilia. Ann Otol Rhin & Laryng 43: 50 (June) 1934.

are investigated the less useful and the more unphysiologic they appear to be. Under such conditions it is no wonder that it was widely believed that a cold untreated would last two weeks whereas treated it would be over in fourteen days.

Now as to methods of applying vasoconstrictor drugs. The head-low posture advocated by Dr. Proetz is well



Fig. 4—Completion of treatment by turning the child face down permitting the nasal contents to escape from the nostrils. With this technique none of the solution at any time enters the throat.

known. The patient is supine with the head extended. The symmetry of the position makes it readily understandable. The posture which I present is that in which the head is inverted laterally. The patient lies on his side with his head bent downward exactly sidewise, using the shoulder as a fulcrum.

In treatment, preliminary shrinkage is first obtained by the use of ephedrine solution in an atomizer. This may require from five to ten minutes. The patient is

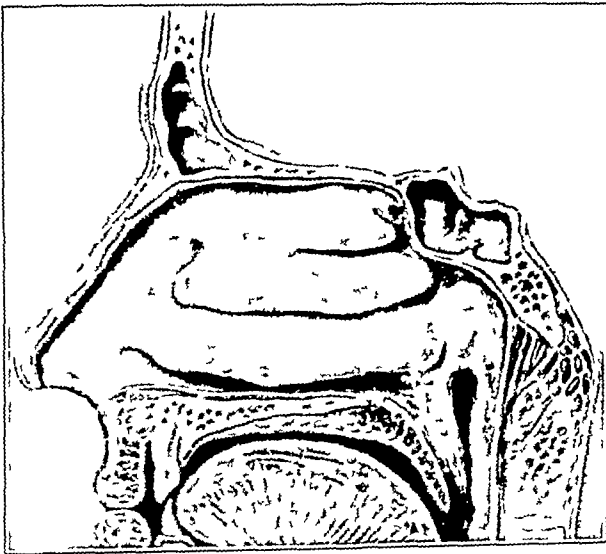


Fig. 5—Lateral nasal wall. All the nasal ostia are in the upper half. This illustration when inverted shows the important area for treatment is the lower half. The orifice of the eustachian tube is above and outside this area.

then placed in the lateral head-low posture, and solution of ephedrine is instilled into both nasal chambers. After from three to five minutes the head is rotated to face down to permit the nasal contents to escape from the nostrils.

On first acquaintance an obstacle to understanding the lateral head-low posture is its asymmetry in relation to the body as a whole, but consideration of the anatomy will reveal that it is symmetrical in its relation to the nasosinal area. In this posture all important parts of the two sides of the nose are available simultaneously for treatment. This is because the nasal chambers are narrow in proportion to their height. In treatment the upper halves of the nasal fossae are flooded and submerged. To demonstrate this I have displaced iodized oil into all the sinuses simultaneously, with the head dependent to an angle of approximately 45 degrees.<sup>3</sup> With all the variations of intranasal structure a few things can be counted on as unvarying and one of these is that all the nasal ostia are in the upper half of the nasal fossae. With the head inverted they are in the lower half and are accessible to fluid and gravity. The eustachian tubes opening on the level of the nasal floor lie outside the treated area.

My reasons for advocating head-low posture in treatment of the nose and sinuses are that it makes available all important structures within the nose and permits treatment that is entirely free from trauma.

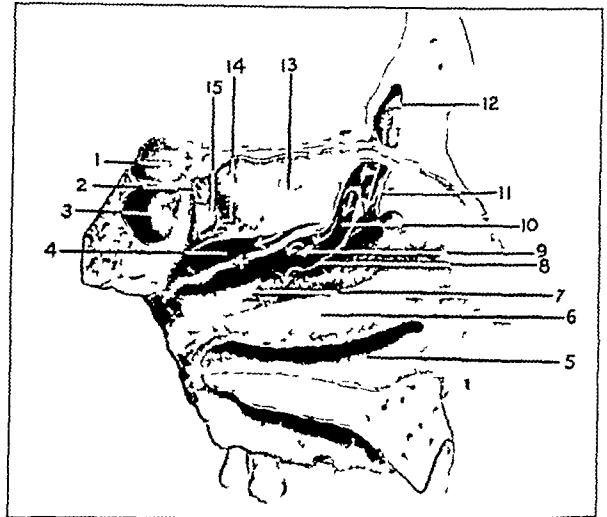


Fig. 6—Lateral nasal wall with nasal ostia uncovered by removal of the middle turbinate. This illustration when inverted shows that fluid instilled into the nostrils when the patient is in the head low position would flood the entire nasal area.

These advantages appear to be most abundantly present in the side position, in fact, some are inherent in this and may be unattainable in any other. I would specify the following as reasons for using the lateral head-low posture:

- 1 It is practicable from infancy to old age.
- 2 It is comfortable, in fact, it resembles the position of sleep sufficiently to cause no fear in small children.
- 3 The head is at the same level as the rest of the body with the exception only of the upper part of the chest. Hence there is no flushing of the face and head with venous blood gravitating from the trunk and extremities. This is of real importance, particularly in elderly persons.
- 4 The posture is easily effected in the home or in the office and requires no special equipment. A cot and a pillow are all one needs. An intelligent mother

<sup>3</sup> Parkinson, Sidney N. A Lateral Head Low Position for Nasal and Sinus Treatment. *Arch. Otolaryng.* 17: 787 (June) 1933. Observations on Postural Treatment of Upper Respiratory Infection. *J. Pediat.* 6: 809 (June) 1935. Ephedrine in Physiologic Solution of Sodium Chloride and Lateral Head Low Posture in Treatment of the Nose and Sinuses. *Arch. Otolaryng.* 23: 344 (March) 1936.

or nurse is easily taught the technic. In the care of infants and young children the posture is best obtained over one's lap.

5 None of the therapeutic fluid need reach the pharynx or mouth in this posture or during any part of this treatment. This is important. Drugs used in the nose are for local effect only, and their general effect when swallowed or aspirated serves no useful purpose.

Those who use iodized oil for contrast radiography in the diagnosis of chronic sinusitis and other types of abnormality will find the lateral head-low position useful for displacement of the oil into the sinuses. For this I prefer unilateral rather than bilateral displacement. With the head only slightly inverted in the lateral position, iodized oil is instilled into the lower chamber. Intermittent suction is then applied. As all the sinal ostiums are submerged, all the sinuses will accept the oil if the ostiums are open. However, in the presence of much abnormality it is common for the oil to fail to enter one or more sinuses. My own use of contrast radiography is restricted to diagnosis during a latent or quiescent stage, not during a period of acute inflammation.<sup>4</sup>

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## THE TREATMENT OF SINUSITIS IN CHILDREN

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Sinal disease in children deserves more thoughtful consideration than it has been given. The current literature on the treatment of sinusitis is fairly comprehensive, yet no pediatric textbook has adequately pointed out the importance of this disease to the pediatrician and the general practitioner. In the hope of stimulating interest in the subject, this paper will present an outline of my experiences with sinusitis in children during twenty years. Many of the patients studied were private patients treated in collaboration with Dr. John J. Shea.

Sinusitis is observed in three stages—acute, subacute and chronic. The treatment, therefore, is not empirical but must be administered in accordance with the manifestations in the individual case. The proper selection of treatment is of course possible only through a familiarity with all those factors, anatomic, physiologic, etiologic and pathologic, which have a bearing on the development and course of the disease.

Heredity plays a definite role in the structure of the sinuses; the child tends to acquire sinuses similar to those of the ancestor whom it resembles in facial appearance. Factors which affect general growth and development, as food, vitamins, internal secretions, environment and life habits, influence the sinuses, and when this influence becomes adverse their growth is interrupted or arrested. Infections and allergy, separately or together, are chiefly responsible for sinal disease. Internal secretions may also play a part. Mortimer,<sup>1</sup> working with Cullop and others, controlled the

development of the sinuses of white rats through the action of the pituitary gland.

The role of environment in sinal infection is particularly noteworthy. I have observed fewer cases in orphanages, dispensaries and charity practice than among the well to do, even though children in more fortunate families are, on the whole, in better physical condition. This is explained by the fact that the poorer children are constantly thrown into contact with diseases of the respiratory tract and therefore gradually become immune. I have also observed that the child reared in the steam-heated home is more prone to sinal infection than the one who lives in the open. Steam heat keeps the mucous membrane congested, providing a fertile soil for bacterial growth.

It is generally known that the incidence of sinal infection is highest in the Mississippi Valley and that this incidence increases from its southern to its northern portions. The fewest cases are found at the coast. In Arizona and along the southern coast of California the infection is uncommon.

Ordinarily sinal infection occurs during January, February and March, when the sun's rays are weakest and the child's resistance is lowest. The prevalence of the infection in the fall is explained by the increased number of contagious diseases which develop at the opening of school.

The effect of tonsillectomy and adenoidectomy on sinal disease has been a subject of wide discussion. At the meeting of the Southern Medical Association in New Orleans in 1924 I<sup>2</sup> reported an analysis of 145 cases in which treatment had been given for a variety of disorders induced by sinal disease. That report contained a tabulation (table 1) of the number of patients whose tonsils and adenoids had previously been removed, including the time of their removal.

The literature of otolaryngology during the past decade has been rich in papers dealing with the action

TABLE 1—Time of Removal of Tonsils and Adenoids

Age	Cases
Under 6 months	3
6 months to 1 year	3
1 to 2 years	14
2 to 3 years	30
3 to 4 years	17
4 to 5 years	20
5 to 6 years	10
6 to 7 years	4
7 to 8 years	1
8 to 9 years	2
9 to 10 years	2
Total	106

of the cilia and their regeneration in the sinuses. Extensive studies have been made of innervation and of vasomotor reactions, yet a wide variance of opinion exists among sinusologists as to whether the sinuses are capable of providing immunization. One can readily understand that infection extends to the sinuses from diseased tonsils and adenoids, that perhaps temporary drainage is promoted by their removal, and again after a time infection closes off this drainage, causing the symptoms to return. But how can one explain the frequent occurrence, as shown by table 1, of sinusitis in young children, in some of whom, undoubtedly, the tonsils removed must have been healthy?

<sup>4</sup> Parkinson, Sidney N. When is Sinusitis Chronic? *Ann. Otol. Rhin. & Laryng.* 45: 721 (Sept.) 1936.  
From the Department of Pediatrics, University of Tennessee College of Medicine.

Read before the joint meeting of the Section on Pediatrics and the Section on Radiology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 16, 1938.

<sup>1</sup> Mortimer, Hector. The Hormone Factor in the Evolution, Development and Growth of the Paranasal Sinuses. *Tr. Sect. Laryng. Otol. & Rhin.* A. M. A. 1935, pp. 50-54.

<sup>2</sup> Mitchell, E. C. The Paranasal Sinus as a Focus of Infection in Children. *South. M. J.* 18: 686 (Sept.) 1925.

The frequent finding of sinal activity in children who have lost their tonsils leaves little question that removal of tonsillar tissue early in life predisposes to sinusitis. This being true, sinuses must play an intimate part in immunization from infections of the upper part of the respiratory tract. When children are enjoying good health the sinuses are peaceful, but with the onset of infection of the upper part of the respiratory tract the sinuses also become involved and the entire system is disorganized. The disease begins as rhinitis and rapidly extends into the sinuses, with or without otitis media, pharyngitis and cervical adenitis. The children

TABLE 2—Conditions Resulting from Sinal Disease

	Cases
Return of adenoid symptoms	62
Chorea	10
Malnutrition or failure to gain weight	28
Carditis	13
Recurrent bronchitis	23
Irregular fever of unknown origin	11
Anemia	5
Arthritis deformans	1
Pyelitis	45
Asthma	18
Cyclic vomiting	2
Nephritis	15
Headache	3

at times become seriously ill, the illness running a septic course. The affected cervical glands are deeper than those which drain the tonsils. To arrest the progress of the infection, one must promote drainage of the sinuses and support the failing immunization. Untreated, the local infection becomes general, giving rise to systemic disturbances, such as chorea, pyelitis, acute nephritis, rheumatism, carditis and, occasionally, septicemia. This fact was brought out by Mullin and Ryder,<sup>3</sup> who attracted the attention of the medical profession by demonstrating the lymphatic drainage from the sinuses to the chest, and was confirmed by Fenton and Larsell.<sup>4</sup>

In my experience this point has been amply proved. To illustrate, I cite again the paper I read before the Southern Medical Association in 1924. The conditions for which the 145 patients mentioned therein were treated as a result of sinal disease are given in table 2.

In order to gain some idea of the popular view regarding the role of the sinuses in immunization, I submitted to fifteen teachers in the field of otolaryngology the question "Do you subscribe to the theory that the sinuses play a part in immunization to infections of the upper respiratory tract?" Four of the replies were in the affirmative, seven in the negative and four noncommittal.

In this connection, Kaiser<sup>5</sup> made the statement that in his experience first attacks of sinusitis occur somewhat more commonly in children whose tonsils and adenoids have been removed.

Before beginning treatment, it is necessary to determine the type of sinusitis present and investigate the etiologic factors involved. This can be accomplished only by obtaining a careful history and making a complete rhinologic survey as well as an examination of the throat, mouth and teeth and roentgenologic and laboratory studies. The chronic sufferer may present all the symptoms which usually accompany infection of

the upper part of the respiratory tract or, on the contrary, may have no local symptoms whatever. Even though there may be no local symptoms, therefore, the examination should be thorough when the diagnosis is doubtful and a focus of infection is sought.

In addition to general physical studies, every patient with sinusitis should have an allergic survey. This should include an inquiry as to the presence of allergy in the patient's family and his own history as to contacts. The symptoms should then be considered in relation to any contacts which the patient may have had with offending allergens. Cutaneous tests are of limited value.

The distinction between infectious and allergic sinusitis usually may be made by an examination of the mucosa. In infectious sinusitis the mucosa is red and there is a thick discharge, in the allergic type the mucosa is pale and boggy and the discharge is thin and serous. The presence of eosinophils in the discharge and the finding of an increased number of eosinophils by differential blood count also indicate an allergic condition.

In table 3 are presented the chief complaints of 100 private patients observed during the past two years. The ages of these patients varied from 2 months through puberty.

None of the children under 7 years of age suffered from headache, this symptom was present principally in those at puberty. The majority of those so affected were allergic.

A comparative tabulation shows that allergy, as demonstrated by a pale membrane, was present in twenty-nine. Of that number, infection also was present in twenty-one. A family history of allergy was given in twenty-five. Tonsils and adenoids had been removed prior to sinal infection in seventy-eight. Tonsils remained in twenty-two.

Probably one of the most important phases of the treatment of sinusitis is prophylaxis. This consists chiefly of proper hygiene, a well balanced diet, cod liver

TABLE 3—Chief Complaints of Private Patients

	Cases
Recurrent colds	19
Otitis media	5
Return of adenoid symptoms	12
Parenteral diarrhea (mild)	5
Dysentery	7
Bronchial asthma	8
Secondary anemia	6
Chorea and rheumatic fever	3
Pyelitis	6
Nephrosis	3
Headache	24
Enlarged cervical glands	2

oil in sufficient amount, vitamins and sunshine, if sunshine is not available, ultraviolet rays are an excellent substitute.

Particular attention should be directed toward infections acquired in swimming pools. Sinusitis is often induced by diving and prolonged swimming.

Early cure of the common cold will go far toward preventing sinal disease. The prevention of contagion is also essential. The patient with a cold should be promptly isolated, the healthy child will withstand a moderate amount of contagion but will succumb if the contact is prolonged.

Diseased tonsils and adenoids should be removed when necessary. Normal tonsillar tissue, however, should not be disturbed.

<sup>3</sup> Mullin W. V. and Ryder C. T. Studies on the Lymph Drainage of the Accessory Nasal Sinuses. *Laryngoscope* 31: 158 (March) 1921.  
<sup>4</sup> Fenton R. A. and Larsell Olof. Research Report on Experimental and Clinical Sinusitis. *Tr. Am. Acad. Ophth.* 40: 241-254, 1935.  
<sup>5</sup> Kaiser, A. D. The Relation of Tonsils and Adenoids to Infections in Children. *Am. J. Dis. Child* 41: 568 (March) 1931.

THE TREATMENT OF ACUTE AND SUB-  
ACUTE SINUSITIS

Rest in bed is an essential feature of the treatment of acute sinusitis. The child with a high temperature should be placed in the hospital since there he is easily confined to bed, and much more can be accomplished away from the parents than is possible in the home.

Mild cathartics should be given as indicated. Salicylates for relief of pain, alkalis, particularly in the form of orange juice, and an abundance of water are necessary. Rhinorrhea should be controlled by means of codeine, belladonna and drugs of similar type. I do not recommend local treatment in the acute stage.

In extremely acute disease, when the prevailing organism appears to be *Streptococcus haemolyticus*, I have found sulfanilamide of value. This should be prescribed according to the child's weight, i.e. a daily dose of 0.2 Gm., or 3 grains, per kilogram of weight, so as to maintain a milligram concentration of 12 to 15 per hundred cubic centimeters in the blood. I have found, however, that this medication sometimes dries up the secretions rather rapidly and for this reason have not used the drug as a routine in mild or moderately severe infections.

In the subacute stage, after the discharge has become more purulent and the fever lower, although the cough may be more troublesome, nasal packs consisting of small pledgets soaked with salt solution and infra-red radiation are recommended. The infra-red lamp is used for ten minutes three times a day, being placed at a distance of 30 inches (76 cm). The discharge is removed by suction under direct inspection. In older children displacement after the modification of Proetz has been found beneficial especially if a post-nasal discharge is present. In this stage I continue to give alkalis and feed the child a substantial but fairly low carbohydrate diet. As improvement takes place, the carbohydrate intake is increased. Continued bed rest is desirable.

After the acute attack the patient should be protected from all danger of cross infection as resistance is low and infection easily recurs. A change of climate is most beneficial, particularly during the winter months. In summer the child should receive heliotherapy by direct exposure to the sun's rays, after the method of Rollier, or by simply going without clothing. Swimming, especially diving, predisposes to recurrence of the infection and should therefore be prohibited for from six months to a year following an attack.

Bryant<sup>6</sup> has recommended the use of fever therapy for acute sinus infection, on the theory that it is a natural adjunct to nature's fight against infection, helping to augment the vascular phase of inflammation. In chronic pansinusitis, however, he found that this form of treatment apparently offers no lasting benefit.

## THE TREATMENT OF CHRONIC SINUSITIS

It is my experience that chronic sinusitis in children offers a much better prognosis than that in adults. This is based on the theory, which I believe is accepted, that the sinuses, particularly the antrums, develop through pneumatization. As the air enters the sinuses, they enlarge in a manner comparable to that of a soap bubble. When the ostium is blocked, this development ceases. During the growing period there is always a possibility that the sinuses will resume their growth

when pneumatization is reestablished. I have also observed that a chronically diseased sinus in a child is an undeveloped sinus, that when development becomes normal the chronic infection no longer exists. It would seem, therefore, that the reestablishment of pneumatization is just as essential as the removal of purulent material.

I have followed a number of patients who at 8 to 10 years of age presented evidence of juvenile sinuses with constantly recurring sinusitis, as well as focal infection. When these patients had reached 15 or 16 several years after drainage, their sinuses had become normal in size and they experienced no further difficulty. I have also followed several patients who refused drainage, at maturity their sinuses remained undeveloped and not infrequently retained an infantile appearance. These persons continued to suffer from sinusitis.

Hansell<sup>7</sup> roughly classified the majority of common disorders encountered in the management of the nose and paranasal sinuses as follows:

1 Functional disturbances secondary anatomic anomalies, disturbances of the vascular mechanism secondary to environmental or external agents and those which arise secondary to some intrinsic disease elsewhere in the body.

2 Acute and chronic infection.

3 Allergic disease.

4 A combination of infection and allergy, complemented or uncomplemented by one or more of the aforementioned factors, particularly in the first and second groups.

Hansell stated that, in the diagnosis and treatment of allergy as manifested in the nose and paranasal sinuses, other diseases should not be overlooked, since the allergic symptoms may be only a part of a syndrome in which infection and secondary factors are also instrumental.

I, too, have found that, when allergic sinusitis is accompanied by infection or anatomic defects, these must be remedied before the allergy can be corrected, and, further, that an infection cannot be materially benefited so long as a coexisting allergic condition is neglected.

*Infectious Sinusitis*—In chronic sinusitis without evidence of allergy the treatment should be based on a study of the clinical picture along the following lines:

1 Are there severe local symptoms referable to the upper part of the respiratory tract, such as coughing, sneezing, running nose and headache?

2 Is there some focal infection which can be definitely attributed to the sinuses?

3 Are the sinuses developed normally according to the child's age? Are they developed equally on the two sides?

4 Is there evidence of a purulent discharge in the roentgenogram and on transillumination?

Palliative local treatment consists of application of nasal packs, suction and displacement. Irrigation of the nose with solution of sodium chloride has been used for many nasal disorders, especially those wherein the membrane is atrophied.

Medication with tincture of iodine and, in the presence of a thick discharge which induces coughing, with potassium iodide, has been effective in my experience. Tonics, vitamins, particularly vitamin C, and a properly supervised diet are essential. The administration three times a day of 5 grains of calcium lactate, one-fourth grain (0.016 Gm.) of thyroid, and  $\frac{1}{20}$  grain (0.003 Gm.) of parathyroid in milk will reduce lymphoid

6 Bryant F. L. Elliott Treatment of Sinus Disease. *Laryngoscope* 48: 833 (Nov.) 1936.

7 Hansell F. K. Allergy of the Nose and Paranasal Sinuses. St. Louis: C. V. Mosby Company, 1936.



hyperplasia in children. The most successful rhythm is five days twice each month in chronic sinusitis and more frequently in acute disease.

A change of climate is most beneficial. The more chronic the infection, the longer the patient should remain in the new environment. I have found that patients who are entirely relieved in a new climate often have a recurrence of symptoms on their return to the former location.

Nickum<sup>8</sup> has been successful with short wave diathermy in the treatment of chronic sinusitis. By this method heat is produced to tolerance, increasing phagocytic action and stimulating lymphatic drainage.

For those patients who require immediate drainage for relief of secondary symptoms elsewhere in the body and for those in whom palliative treatment has failed, antrotomy and drainage for at least three or four days is deemed advisable.

#### OPERATIVE PROCEDURE OF SHEA<sup>9</sup>

If the child's condition warrants, ether is the best anesthetic since by its use the operation may be carried out deliberately and thoroughly. In the presence of renal infection either nitrous oxide or an ethylene mixture is safer than ether, although the operation must be performed rapidly. Use of avertin with amylene hydrate supplemented by the local application of 4 per cent solution of cocaine minimizes the risk of postoperative pneumonia.

The nares are cleansed by suction and the site of the operation is pruned with a 30 per cent solution of alcohol. The ostium of the antrum is sought and dilated; if the ostium is not found, the membranous tissue of the middle meatus is perforated. If the operation is to be a success, the patency of the ostium must be maintained. The material is obtained through a syringe and needle. If the patient is suspected of being allergic, sterile physiologic solution of sodium chloride is instilled and withdrawn; otherwise, brain broth medium is used.

In younger children the naso-antral window is made with an antral trocar, whereas in older children a curved gouge is employed. The aperture is shaped to fit the rubber tube by a series of dilations with Ritter sounds. The catheter is next inserted, one of the smaller Ritter sounds being used as an obturator; one can easily tell when the catheter slips through the window. Suction is then applied to the drain, by means of a medicine dropper, through which the contents of the antrum are visualized. The presence of air bubbles in the antral contents should be noted, as these bubbles indicate the patency of the secondary opening. If no bubbles are visible, saline solution is forced through the tube until it appears in the back of the nose or the nasopharynx, thus forcing out any mucous obstruction to the ostium. Suction is again attempted and if bubbles are still not visible through the glass, the tube is removed and the operation repeated, special attention being given to the ostium.

#### USE OF VACCINES

Krise<sup>10</sup> and Foster<sup>11</sup> reported the experimental production of colds with bacteria-free filtrates. Dochez and his co-workers<sup>12</sup> have demonstrated the susceptibility of chimpanzees to colds simulating those in human beings when inoculated intranasally with bacteria-free filtrates obtained from the nasal washings of human beings with common colds. In 40 per cent of the

animals a typical common cold developed. When these experiments were performed on human beings, colds were produced, though generally of a mild degree. The results of Dochez and his co-workers indicate the complex nature of the infections of the upper part of the respiratory tract and the possible part played by filtrable viruses and visible bacteria.

For many years vaccine has been employed to increase resistance to these infections, nevertheless the therapeutic effect leaves much to be desired. Vaccinated and nonvaccinated groups of persons have been compared as to their susceptibility to infection, and it has been found that the majority of mixed vaccines confer only slight protection against infection of the upper part of the respiratory tract.

It is my custom to use autogenous vaccine during the winter following the antrostomy. Culture material is obtained from the sinuses by suction. This material usually is mixed with a seasonal vaccine made from an active culture of those organisms which seem to be prevalent during the season. The vaccine is given at the first appearance of cold weather, which in Tennessee is generally in the latter part of October, and is repeated during the latter part of December and again in March.

TABLE 4—Treatment Carried Out by Mitchell and Shea

	Cases
Antrostomy	71
More than one antrostomy	6
Removal of tonsils at time of antrostomy	21
Removal of remaining tonsillar tissue	12
Sulfanilamide medication	18
Blood transfusion for secondary anemia	6
Giving of autogenous vaccine	20
Administration of stock vaccine	A few cases

Five small doses are administered in each treatment, at four day intervals. Although I have not found that this prevents colds, I believe it has reduced their severity.

From these studies it appears that the primary infectious agents are filtrable viruses and that ordinary pathogenic bacteria become activated and play a secondary but important part.

#### ALLERGIC SINUSITIS

Allergic sinusitis may be induced by any or all of three different types of allergens: (1) pollens, (2) inhalants other than pollens and (3) food.

The elimination of only one type of allergen is often insufficient, as in the home articles of furniture, such as covers of sofas may contain horsehair or dust to which the patient is sensitive. Every irritant must be excluded before relief can be obtained. If the irritants are inhalants other than pollens, contact with these articles should be avoided.

Immunization to pollens may be acquired by two methods: (1) a complete change of environment to a locality in which the offending pollens do not exist, and (2) the use of pollen extracts. A change of environment often enables the patient's resistance to the allergen to develop so that he may return to his habitual locality without suffering a return of symptoms.

Allergy is so prevalent and so frequently a cause of sinusitis that the practitioner should have at least a working knowledge of this subject. In many cases it is overlooked because the importance of this phase of sinusitis is not appreciated. A large number of my failures to benefit sinusitis, particularly before allergy was well understood, were due to the fact that the

<sup>8</sup> Nickum O. C. Short Wave Diathermy Treatment of Chronic Sinusitis, Nebraska M. J. 22: 14 (Jan.) 1937.

<sup>9</sup> Shea J. J. Fifteen Years Experience with Drainage Tubes after Antrostomy in Children. Arch. Otolaryng. 24: 14 (July) 1936.

<sup>10</sup> Kruse W. Die Erreger von Husten und Schnupfen. Munchen Med. Wchnschr. 61: 1547, 1914.

<sup>11</sup> Foster G. B. Jr. The Etiology of Common Colds, J. A. M. A. 66: 1180 (April 15) 1916.

<sup>12</sup> Dochez A. R., Shibley G. S. and Mills K. C. A Study of Acute Infection of the Respiratory Tract in the Ape. Proc. Soc. Exper. Biol. & Med. 26: 562 (April) 1929. Studies in the Common Cold. Experimental Transmission of the Common Cold to Anthropoid Apes and Human Beings by Means of a Filtrate Agent. J. Exper. Med. 52: 701 (Nov.) 1930.

patients had infection in addition to allergy, and sometimes allergy alone, which was at that time thought to be infection

Table 4 summarizes the treatment carried out by Dr Shea and me jointly in 100 cases of sinusitis observed within the past two years

I shall report several cases, observed for approximately twenty years, which illustrate the effect of treatment on the health and development of the sinuses

#### REPORT OF CASES

CASE 1—E S, a child aged 11 years was brought for examination because of generalized rheumatism. Physical examination revealed infected tonsillar tags and hypertrophied adenoids. Urinalysis indicated the presence of pyelitis. A roentgenogram showed poorly developed frontal sinuses and dark cloudiness of the antrums and ethmoids. The diagnosis was pansinusitis, secondary arthritis and pyelitis.

The adenoids and reformed tonsillar tissue were removed and the sinuses were drained. A roentgenogram made three years later showed the antrums and ethmoids clear and development of the frontal sinuses increased. At the last report four years thereafter, the patient was free from symptoms. We were unable to make a further roentgenographic study at that time.

CASE 2—J McD, a boy aged 4 years, complained of pain in the region of the right maxillary sinus and a mild headache. Two weeks prior to examination he had had a septic temperature ranging from 100 to 104 F. The ethmoids and both antrums were cloudy and the tonsils were inflamed and enlarged. Studies of the urine revealed acute pyelitis.

The tonsils were removed and the sinuses drained. *Staphylococcus aureus* was found on culture. Subsequent roentgenograms at intervals demonstrated a continued improvement in the growth of the sinuses. At the last examination, made eight years after operation, they were entirely normal and the patient was without symptoms.

CASE 3—B C, a boy aged 5 years had suffered from frequent colds since early infancy. The tonsils and adenoids had been removed one year earlier. Temporary improvement thereafter was followed by a return of symptoms. The child was brought for examination because of a cold, loss of weight and recurrent bronchitis with fever. Heavy shadows were observed over both antrums, and the ethmoids were cloudy. Since the season was late spring, it was thought best to prescribe only medical treatment through the summer. He improved to some extent during this time but with the beginning of fall his trouble returned. Examination showed the shadow over the antrums and in the ethmoids to have increased in density. The sinuses were then drained and both *staphylococci* and *streptococci* were obtained on culture.

A roentgenogram made one month after operation showed no change in the shadow. Another, a year later, revealed some improvement. Soon thereafter the child was taken to Switzerland, where he lived in comparatively good health for several years. On his return to Memphis the colds recurred and a streptococcal infection, mastoiditis and secondary meningitis developed, with a fatal termination. The sinuses were never fully developed. It is now believed that an allergic condition was responsible for failure of the treatment.

CASE 4—C L, a boy aged 8 years, had suffered from bronchial asthma since the age of 15 months. A history of allergy in other members of the family was obtained. The child had been placed on a dietary regimen which not only failed to alleviate the asthma but led to a loss of weight. His tonsils and adenoids were removed at the age of 3 years. Several subsequent changes in climate and in diet were ineffectual in relieving the asthma.

On examination the patient presented the typical symptoms and signs of sinusitis. In the roentgenogram a shadow was seen over both antrums, although the floor of the antrums could be clearly distinguished. The diagnosis was ethmoiditis with slight involvement of the antrums.

Medical treatment, including suction, was advised. A culture of the discharge revealed both *streptococci* and *Staphylococcus aureus*. An autogenous vaccine was administered and the

attacks became less frequent thereafter, although the patient continued to suffer on exposure to certain allergens. Roentgenograms repeated at intervals of two years have demonstrated an increasing development of the sinuses.

In this case the sinusitis was both infectious and allergic.

CASE 5—B B, a boy aged 9 years, had been subject to frequent colds since early infancy. His tonsils and adenoids had been removed at the age of 4 years. After influenza and bronchitis three years previously the child had had numerous attacks of bronchitis. He had also been troubled with severe spells of coughing on lying down at night and with considerable sneezing on arising.

The roentgenogram revealed cloudiness of the ethmoids and a shadow over both antrums. The diagnosis was double empyema of the antrums with ethmoiditis.

As summer was beginning and the child was in poor physical condition, it was decided to postpone surgical treatment until fall. Meanwhile he was taken to the Massachusetts coast, where his symptoms subsided. In September he had an acute attack of bronchitis of the asthmatic type. A subsequent examination disclosed an increased density in the antral shadows.

Drainage was instituted, and *Staphylococcus aureus* was seen on culture. An autogenous vaccine was given, and medical treatment was continued at intervals for one year. Since that time he has had no further symptoms. Roentgenograms made every two years have shown a progressive growth of the sinuses, at the last examination they were found to be normally developed.

CASE 6—S S, a boy aged 8 years, was admitted to the hospital for loss of appetite, loss of weight and a ready tendency to fatigue. He had had malaria six months earlier. The child was nervous and underweight, his tonsils were enlarged, his adenoids hypertrophied and several teeth decayed.

After removal of his tonsils and adenoids the patient began to exhibit general improvement. A few months later he had an acute illness resembling influenza. After the acute symptoms subsided a roentgenogram was made, which demonstrated double empyema of the antrums with ethmoiditis. The sinuses were poorly developed.

Drainage was instituted and subsequently injections of autogenous vaccine were given. Three roentgenograms, made during the next few years, revealed continued growth of the sinuses. The patient's general health has also improved and he is now practically free from symptoms.

CASE 7—F P, a girl aged 11 years, was admitted to the hospital because of vomiting, fever, marked general edema of the face and extremities and impaired vision. The child's adenoids and tonsils had been removed at the age of 5 years. Since that time she had remained well except for an occasional cold accompanied by severe frontal headache.

Physical examination revealed swelling of the feet and legs and puffiness under the eyes. The heart was irregular, although there was no murmur. The nasopharynx was inflamed and swollen and there was a purulent postnasal discharge. The urine contained an enormous number of pus cells, numerous casts and blood cells and 3 plus albumin, the quantity of the urine was diminished. A chemical analysis of the blood showed 12 mg of creatinine per hundred cubic centimeters and 31.5 mg of urea nitrogen. In the roentgenograms a heavy shadow was seen over the ethmoids and both antrums. The heart was enlarged in all measurements. Examination of the eyegrounds gave negative results, the ophthalmologist reported that the impaired vision was temporary, being induced by either bulbar neuritis or uremia. The diagnosis was acute parenchymatous nephritis following empyema of the antrums.

Twenty-four hours after the patient's admission the generalized edema had increased and she was unable to retain anything except a small quantity of water. Since the child was so rapidly losing ground, antrotomy with drainage was performed on the second day. A pure culture of *Staphylococcus aureus* was isolated.

The headache ceased within twenty-four hours after operation. Recovery was slow, however, the albumin persisted in the urine for one month. Subsequent analyses showed evidence of mild infection at times. A roentgenogram made two years after operation revealed only a faint antral shadow. At the

it important? The hydrogen ion concentration of blood is about 74, of nasal secretion it varies perhaps from 65 to 85. It differs with individuals and it varies during colds and allergic attacks. In using the solution it has been found that if the  $p_{\text{H}}$  is low, that is if it is around 60, 65 or even 70, it causes stinging or burning in the nose. A child won't tolerate it. It seems best to keep the  $p_{\text{H}}$  above 74, and it is probably well to have it as high as 84. When the solution is introduced into the nose the absorption of carbon dioxide from the respired air brings the  $p_{\text{H}}$  down within a few seconds. In this locality we find it best to use tap water instead of a buffered solution of distilled water. It is much more stable. In Oakland the  $p_{\text{H}}$  of tap water runs about 8.5 and it stays there. When the water is boiled the  $p_{\text{H}}$  goes higher but on cooling it comes down again. We use tap water plus sodium chloride plus ephedrine. The solution is boiled and kept in sterile screw capped bottles. It is isotonic, it has a correct  $p_{\text{H}}$  for nasal use and it is stable. The purpose is to prevent interaction between the solution and the fluid content of the epithelial cells. Does the  $p_{\text{H}}$  change on standing? Not if tap water is used. If distilled water is used, as in Locke's and Ringer's solutions, the  $p_{\text{H}}$  tends to drop too low. How long does one keep the solution? If it is correctly made it will keep for many months.

## CHRONIC SUPERFICIAL GASTRITIS

### CORRELATION OF GASTRIC ANALYSIS AND CLINICAL STUDY WITH GASTROSCOPIC EXAMINATION

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The study of gastritis has received an added impetus with the introduction of the flexible gastroscope of Schindler. Doubt exists in the minds of many physicians as to what constitutes gastritis pathologically. Likewise the criteria for the gastroscopic diagnosis of this condition have been questioned. While clinical diagnosis of gastritis is possible, it is admittedly uncertain. It seems to us that the study of patients with a gastroscopic diagnosis of gastritis offers a logical basis of departure for the investigation of this condition. Like Benedict,<sup>1</sup> Borland,<sup>2</sup> Carey,<sup>3</sup> Schloss<sup>4</sup> and others, we have accepted for purposes of discussion Schindler and Ortmayer's<sup>5</sup> classification of chronic gastritis into the superficial, hypertrophic and atrophic types. The adoption of a uniform nomenclature should aid in the standardization of diagnostic criteria.

The purpose of this investigation is to study the gastric function as judged by fractional gastric analysis and to record other clinical observations in patients for whom a gastroscopic diagnosis of chronic superficial gastritis has been made. We have limited this discussion to chronic superficial gastritis because we believe it advantageous to consider each type of gastritis independently.

This study comprises a group of fifty patients with symptoms in the upper part of the abdomen in whom

no abdominal disease other than gastritis was established. Those with organic gastrointestinal disease or advanced systemic disease were excluded. Each patient's complete history was taken and physical examination, roentgen study of the stomach, colon and gall bladder, examinations of the stool, sigmoidoscopic study, analysis of blood and urine, the Wassermann test, fractional gastric analysis and bile drainages were done. Most of the patients were ambulant and were examined in the office.

The gastroscopic study was performed in the manner advocated by Schindler. The Schindler-Wolf flexible gastroscope was introduced into the fasting stomach after preparatory anesthesia of the pharynx with pontocaine hydrochloride and aspiration of the contents. The gastroscopic diagnosis of chronic superficial gastritis was based on the observation in varying degrees of reddening of the mucosa with patches of adherent greenish gray to white exudate, edema evidenced by a swollen, moist, boggy appearance, diffuse or punctate superficial hemorrhages, erosions, and evidence of friability of the mucosa.

For studying disturbances of gastric secretion and motility the ordinary two hour fractional gastric analysis was performed in each case. After aspiration of the gastric contents during fasting a test meal of approximately 35 Gm of bread and 350 cc of water was given. Extractions were made every fifteen minutes. At the end of the two hour period the stomach was emptied and the contents were measured. Each extraction was titrated for free and total acid and tested for occult blood with benzidine. All the examinations were done under our supervision.

### GASTRIC CONTENTS DURING FASTING

Fasting secretion was considered normal when the free hydrochloric acid was between 10 and 19 and the total acidity between 20 and 34 points. Fasting motility was considered delayed if the gastric contents exceeded 50 cc. In this series free hydrochloric acid was absent in twenty-seven cases (54 per cent), normal in three (6 per cent) and above normal in twenty (40 per cent). Delayed motility of the fasting stomach was infrequent, being noted in only four cases (8 per cent).

### POSTPRANDIAL ACIDITY

Little attention has been paid to the secretion and the gastric motility as judged by fractional gastric analysis in chronic superficial gastritis diagnosed with the gastroscope, although mention is made of secretory data in all cases of gastritis grouped together. Swalm, Jackson and Morrison,<sup>6</sup> in describing forty-eight cases of various types of gastritis, including nine cases of peptic ulcer, pointed out that there was no definite relation between gastritis and gastric secretion but made no mention of the motility. Schindler<sup>7</sup> stated that there is no characteristic acidity in chronic superficial gastritis. Henning<sup>8</sup> expressed the belief that chronic gastritis is characterized by a tendency toward decreased acidity. In various types of gastritis he found achylia in 15 per cent, anacidity in 21 per cent, hypo-acidity in 32 per cent, normal acidity in 21 per cent and hyperacidity in 11 per cent. Larrimore<sup>9</sup> stated that "although a deficiency

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<sup>1</sup> Benedict, E. B. Hemorrhage from Gastritis. *Gastroscopic Study Am. J. Digest Dis. & Nutrition* 4: 657-664 (Dec.) 1937.

<sup>2</sup> Borland, J. L. Present Status of Flexible Tube GastroscoPy. *South M. J.* 30: 310-315 (March) 1937.

<sup>3</sup> Carey, J. B. Use of Flexible Gastroscope. *Minnesota Med.* 19: 652-655 (Oct.) 1936.

<sup>4</sup> Schloss, Jacob. *Gastroscopy Internat. Clin.* 4: 1-32 (Dec.) 1936.

<sup>5</sup> Schindler, Rudolf, and Ortmayer, Marie. Classification of Chronic Gastritis with Special Reference to Gastroscopic Methods. *Arch. Int. Med.* 57: 959-978 (May) 1936.

<sup>6</sup> Swalm, W. A., Jackson, C. L., and Morrison, Lester. Correlation of Clinical and Gastroscopic Findings in Chronic Gastritis with Report of Cases. *Rev. Gastroenterol.* 3: 219-225 (Sept.) 1936.

<sup>7</sup> Schindler, Rudolf. *Gastroscopy*. Chicago: University of Chicago Press, 1937.

<sup>8</sup> Henning, Norbert. Erfahrungen mit dem flexiblen Gastroskop nach Wolf-Schindler. *München med. Wchnschr.* 79: 1269-1270 (Aug. 5) 1932.

<sup>9</sup> Larrimore, J. W. The Significance of Chronic Gastritis. *Am. J. Digest Dis. & Nutrition* 3: 215-219 (June) 1936.

in gastric juice is the most important functional finding, it is by no means pathognomonic. The inference of gastritis from the mere finding of an achlorhydria or an achylia is untenable." Bloomfield and Pollard<sup>10</sup> concluded that gastritis is not a specific lesion of anacidity. Faber<sup>11</sup> said that chronic achylia has an exogenous cause and is produced by external factors acting in the stomach.

The postprandial acidity in our cases was divided into four groups (table 1). Hyperacidity was observed in twenty-five cases (50 per cent). In ten cases (20 per cent) acidity was within normal limits. Subnormal acidity was seen in two cases. Achlorhydria was encountered in thirteen cases (26 per cent), in six of which there was achylia.

Although opinions on the relation of gastritis to secretion differ, it seems significant to us that only 20 per cent of our patients had normal acidity and 50 per cent had hyperacidity. This is contrary to the observations recorded by other authors when they studied all types of gastritis as a group. Can it be that superficial gastritis precedes the development of other forms and that in this superficial or catarrhal stage the acid-secreting elements are stimulated, only to be depressed later by the more advanced forms of gastritis, namely the atrophic or the hypertrophic forms? Whether it is true that the more advanced types increase the frequency of anacidity cannot be surmised from data available in the literature at the present time. Thomsen<sup>12</sup> found that in gastritis produced experimentally with various agents hypersecretion occurred from some and achlorhydria or achylia from others.

The incidence of achlorhydria in our series was less than that reported by Henning<sup>8</sup> for all types of gastritis. However the occurrence of achlorhydria in 26 per cent of our patients with chronic superficial gastritis cannot be unrelated. Vanzant<sup>13</sup> found achlorhydria in 12 per cent of patients without gastrointestinal complaints. Bockus, Bank and Willard<sup>14</sup> noted achlor-

or less than normal amount of secretion during fasting and the fact that in most cases less than half of the two hour extraction was fluid.

MOTILITY

Bell and McAdam<sup>15</sup> have shown that the rate of emptying of a test meal by the stomach was remarkably constant in normal persons. Their observations were checked by roentgenologic examination. Bockus, Glassmire and Bank<sup>16</sup> in a study of 200 cases of duodenal ulcer concluded that fractional gastric analysis carried out in the same manner as in this study is a

TABLE 2—Gastric Motility by Fractional Gastric Analysis in Fifty Cases of Chronic Superficial Gastritis

Type of Motility	Range of Residue at Two Hours	Number of Cases	Percentage
Delay grade 1	50 to 99 cc gastric contents and 20 to 49 cc food	20	40
Delay grade 2	100 cc or more gastric contents and 50 cc or more food	8	16
Normal	Less than 50 cc gastric contents and 20 cc food	21	42
Rapid emptying	Empty in less than two hours	1	2

more delicate measure of gastric motor impairment than the ordinary six hour roentgenologic observation.

For purposes of discussion the delay in motility was divided into two simple groups (table 2). When from 50 to 99 cc of gastric contents with 20 to 49 cc of food remained at the end of two hours, delay was classified as of grade 1. The presence of both 100 cc or more of gastric contents and 50 cc or more of food placed the delay in grade 2.

By these standards a total of twenty-eight patients (56 per cent) showed delayed emptying. Of these, the delay in twenty cases was classed as grade 1 and in eight cases as grade 2. The secretion in the cases of delayed emptying was hyperacid in nineteen, normal in five, hypo-acid in one and achlorhydric in three. Hypermotility was present in only one case (one of achlorhydria), in which emptying occurred in ninety minutes. The presence of delayed motility in 56 per cent of these cases was all the more significant because of the incidence of achlorhydria in 26 per cent of the series (13 cases). Three patients with achlorhydria showed definite delay. Nine of them showed normal emptying. Rapid motility with achlorhydria is a well known clinical observation. The absence of rapid emptying in patients with achlorhydria and gastritis is significant because the gastritis seems to delay the motility. In a series of 210 cases of achlorhydria, Bockus, Bank and Willard<sup>14</sup> found rapid emptying in 41.4 per cent. They also noted that rapid emptying was less frequent in cases of achlorhydria in which gastritis was presumed to exist.

No attempt was made by us to estimate the extent or severity of the gastritis and to correlate it with the secretion and motility. However, in all the cases the gastritis was diffuse and apparently limited to the body of the stomach.

RELATION OF RETENTION (BY ROENTGEN STUDY) TO GASTRITIS

While we are not attempting to discuss the relation of gastritis to ulcer, sixty-five patients with ulcer were studied with the gastroscope for the purpose of estimat-

TABLE 1—Postprandial Acidity in Fifty Cases of Chronic Superficial Gastritis

Secretion	Range Free Hydrochloric Acid	Total Acid	Number Cases	Percentage
Hyperacid	Over 40	60	25	50
Normal	36 to 49	40 to 59	10	20
Hypo-acid	Under 35	41	2	4
Achlorhydric			13	26

hydria in 6 per cent of patients with gastrointestinal symptoms. It is apparent that the incidence of anacidity in chronic superficial gastritis is higher than in the patients who had been examined by the aforementioned authors.

The relation of delayed motility to acidity may be observed from the fact that the delayed motility was greater in the group with hyperacidity (66 per cent) than in the group with hypo-acidity (33 per cent). That the secretion per se is not the dominant factor in the delay is indicated by the occurrence of a normal

10 Bloomfield A I and Pollard W S Gastric Anacidity Its Relation to Disease New York Macmillan Company 1933  
11 Faber Knud Gastritis and Its Consequences New York Oxford University Press 1935  
12 Thomsen C Neurogenous and Cellular Achylia Acta med Scandinav 61 377 432 1925  
13 Vanzant F R Normal Range of Gastric Acidity from Youth to Old Age Proc Staff Meet Mayo Clin 6 297 300 (May 20) 1931  
14 Bockus H L Bank Joseph and Willard J H Achlorhydria with a Review of 210 Cases in Patients with Gastrointestinal Complaints Am J M Sc 184 185 201 (Aug) 1932

15 Bell J R and McAdam W A Variations in Gastric Secretion of the Normal Individual Am J M Sc 167 520 528 (April) 1924  
16 Bockus H L Glassmire Charles and Bank Joseph Fractional Gastric Analysis in 200 Cases of Duodenal Ulcer Am J Surg 12 6 17 (April) 1931

ing the frequency of gastritis in patients with gastric retention demonstrated radiographically. This group consisted of thirty-three patients with duodenal ulcer, thirty with gastric ulcer and two with both gastric and duodenal ulcers. Of these sixty-five patients, six hour retention of varying degrees was manifested by sixteen (24.6 per cent) and gastritis by twenty-six (40 per cent). The incidence of gastritis was not found to depend on the frequency of gastric retention.

The incidence of gastritis was practically the same in the retention (44 per cent of total retention) and the nonretention (38 per cent of total nonretention) groups. Henning<sup>17</sup> and Schindler<sup>18</sup> stated that chronic gastritis is present in approximately 40 per cent of all patients studied with the gastroscope. In the group of patients with ulcer the occurrence of gastritis with retention was not higher than the general incidence of gastritis. Therefore the gastritis cannot be considered the result of the retention.

#### SYMPTOMS

Eusterman<sup>15</sup> called attention to the lack of close correlation between symptoms and the presence of inflammation of the gastric mucosa. Konjetzny<sup>19</sup>

TABLE 3—Duration of Symptoms of Gastritis

Years	Less than One	1-2	2-5	5-10	10-15	15-20	20-30
Number of cases	4	4	11	11	1	4	4

TABLE 4—Incidence of Gastritis According to Age

Age (Years)	Less than 20	20-29	30-39	40-49	50-59	60-69	70-79
Number of cases	1	8	14	11	9	1	2

expressed the belief that gastroduodenitis may produce a syndrome of ulcer without the existence of ulcer. Schindler, Ortmyer and Renshaw<sup>20</sup> found a syndrome of duodenal ulcer in about one third of their selected cases of gastritis and called attention to the presence of periodic or constant distress in cases of superficial gastritis. Faber<sup>11</sup> pointed out that symptoms of ulcer are not necessarily pathognomonic of ulcer but may be due to gastritis.

In four patients of our series, symptoms in the upper part of the abdomen were not present. Thirteen patients (26 per cent) presented symptoms characteristic of duodenal ulcer. The pain was in the epigastrium and was relieved by food and alkali. Pain during the night was frequent in this group. The gastric secretion varied. It was hyperacid in seven cases, normal in two, achlorhydric in one and achylous in one. The gastric motility by fractional analysis was normal in three and delayed in ten.

Intolerance of food and postprandial distress soon after meals were present in thirty-five cases. Pain was noted in thirty-seven and was located in the epigastrium, substernal region and upper right quadrant of the abdomen. The pain was described as gnawing, pressing

or cramplike. A burning sensation was present in nine instances. Vomiting occurred in eight, including one of hematemesis which could not be explained on any basis other than the gastritis.

The occurrence of diarrhea with achlorhydria has been termed "gastrogenous diarrhea," implying gastric origin. The exact cause of the diarrhea is as yet unknown, but the often accepted idea is that it results from absence of acid in the stomach, since it is relieved by the administration of hydrochloric acid. Bockus, Bank and Willard<sup>14</sup> reported the occurrence of diarrhea in twenty-one of 210 cases of achlorhydria. Only two patients had achylia. In addition, they observed fifteen cases of pernicious anemia, in only one of which diarrhea was present. It may therefore be assumed that the degree of reduction of acidity per se was not the underlying factor. It is possible that an accompanying inflammatory process was responsible for the diarrhea. Henning<sup>17</sup> in reviewing 700 cases of gastritis diagnosed with the gastroscope, found diarrhea in 10 per cent.

In our series diarrhea occurred in eight cases (16 per cent). In four of these there was hyperacidity and in four achlorhydria (in one associated with achylia). It is interesting to note that only four of the thirteen patients with an acidity complained of diarrhea. While it is true that the ultimate cause of this type of diarrhea is not definitely proved, the assumption may be made that the gastritis, and perhaps a concomitant intestinal abnormality, may be responsible. In this respect we are in accord with the expressed opinion of Gutzeit<sup>1</sup> that inflammation of the small intestine may be associated with superficial gastritis and produce diarrhea. Bockus, Bank and Willard<sup>14</sup> noted the occurrence of duodenitis, as determined by culture of material from the duodenum in 82 per cent of cases of achlorhydria with gastritis and in 58 per cent of the entire series of cases of achlorhydria, suggesting that gastritis is a factor of importance in the development of duodenitis in cases of achlorhydria.

#### OBJECTIVE OBSERVATIONS

Loss of weight occurred in twenty-three of the fifty cases. The actual loss was recorded in fifteen of these and varied from 6 to 27 pounds (2.7 to 11.8 Kg). The average loss was 17 pounds (7.7 Kg). A mild degree of anemia existed in 8 per cent of the cases. A plus 4 benzidine reaction of the stool was obtained in 42 per cent.

The frequency of foci of infection was outstanding. Teeth were recorded as foci of infection only when multiple apical abscesses were found after extraction. Pyorrhea was recorded when half or all of the teeth had been removed for pyorrhea. In the majority of cases in which tonsils were recorded as diseased, they had been removed since the onset of gastrointestinal symptoms and been found infected. The patients with sinusitis had been treated for years, and many had had to seek a change of climate after other treatment had failed.

Forty-three patients (86 per cent) had definite foci of infection. Of these twenty-seven (54 per cent) had multiple foci. Foci of infection occurred as follows: infected teeth in twenty, pyorrhea twelve, diseased tonsils twenty-four, sinusitis seven, chronic bronchitis two and giardiasis one. It may be significant that nineteen of the patients were edentulous as a result of pyorrhea or infected teeth and had upper and lower

17. Henning, Norbert. Die Entzündung des Magens. Leipzig. Johann Ambrosius Barth, 1934.  
18. Eusterman, G. B. The Gastritis Problem. Notes on Histologically Verified Cases. South. M. J. 29: 684-693 (July) 1936.  
19. Konjetzny, G. E. Das Krankheitsbild der Gastroduodenitis. Med. Klin. 32: 473-475 (April 9) 1936.  
20. Schindler, Rudolf. Ortmyer, Marie and Renshaw, J. F. Clinical Symptoms of Chronic Gastritis. Arch. Int. Med. 60: 143-153 (July) 1937.

21. Gutzeit, K. cited by Schindler and Ortmyer.

dental plates Faulty mastication has been mentioned by some writers as a possible contributing cause of gastritis

The use of alcohol and tobacco is often stated to be a common cause of gastritis The majority of our patients did not drink or smoke In the other cases neither of these agents was used in sufficient degree to be considered an important etiologic factor

#### DURATION OF SYMPTOMS

The prolonged duration of symptoms was a prominent feature in this group The period during which symptoms were present ranged from less than one year to thirty years Four patients complained of symptoms for less than a year Four others had had symptoms from one to two years The remainder had had symptoms from three to thirty years (table 3)

#### AGE AND SEX

The age of patients in this series varied from 19 to 79 years (table 4) Twenty-two were men and twenty-eight women The frequency was greatest in the fourth decade (fourteen cases) Only one patient was under 20 Fifty per cent of patients were between 30 and 49 Chronic superficial gastritis appears to begin in the third and fourth decades and has a prolonged course

#### SUMMARY

A study was made of fifty cases of chronic superficial gastritis diagnosed by means of the gastroscope Although no characteristic secretion was noted, there was a variation of the acidity from the normal value in 80 per cent of the series Hyperacidity was present in 50 per cent and anacidity in 26 per cent The higher incidence of hyperacidity in our series as compared with the figures of other authors may be explained by the fact that the more advanced forms of gastritis, hypertrophic and atrophic types, were excluded from this study The incidence of anacidity was greater among patients with gastritis than among other patients with or without gastrointestinal symptoms

Chronic superficial gastritis is characterized by a tendency toward delayed emptying of the stomach The gastric motility, judged by fractional gastric analysis, was delayed in 56 per cent of this series Patients with gastritis and achlorhydria failed to show the hypermotility usually noted with achlorhydria

Sixty-five additional patients with peptic ulcer were studied with the gastroscope in order to estimate the relation of gastritis to six hour gastric retention demonstrated radiographically The incidence of gastritis was not dependent on the presence of retention

A syndrome of duodenal ulcer was present in 26 per cent of fifty cases of chronic superficial gastritis Other symptoms were present but were not considered characteristic of gastritis Diarrhea occurred in 16 per cent and was not related to the presence or absence of acid Loss of weight was a prominent feature, being present in 46 per cent Chronic superficial gastritis is characterized by a prolonged duration of symptoms Massive hemorrhage was noted in one instance Occult blood was present in the stool in 42 per cent Foci of infection seemed to be an important concomitant observation In 86 per cent foci were present, and in the majority multiple foci existed The use of alcohol or tobacco did not seem to be an important etiologic factor in this series

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## GASTROSCOPIC STUDY COMPARED WITH OTHER METHODS OF DIAGNOSIS IN GASTRIC LESIONS

ELMER B. FREEMAN, M.D.

BALTIMORE

I desire to compare gastroscopic study with other diagnostic procedures in the evaluation of gastric disease The discussion is based on the study of 200 cases and in many of these two, three or more gastroscopic examinations were made In one the gastroscope was used fourteen times A careful summary of the history, physical examination, laboratory studies and roentgen and gastroscopic observations has been made in every case The cases were not especially selected but represent a good cross section of those studied in the gastrointestinal clinic of the Johns Hopkins Hospital and the medical service of the Maryland General Hospital Some of the patients examined were not thought after study by other methods to have an organic lesion of the stomach, in other instances an organic lesion of the stomach was thought to be doubtful, and in still others a diagnosis of an organic lesion had been made by other diagnostic procedures The study really includes a group of normal subjects, a group in which the digestive symptoms were considered functional, a group in which the symptoms were thought to be due to chronic gastritis, a group with definite symptoms of gastric ulcer and a group with symptoms thought to be due to carcinoma Two groups were also studied after either pyloroplasty or posterior gastroenterostomy one in which the gastric symptoms had been completely relieved and one in which partial relief or none at all had been obtained Likewise a group of cases of unaccounted-for gastric hemorrhage were studied This group included only those cases of hemorrhage in which all the other methods of investigation had failed to disclose an organic basis for the bleeding From a comparison of the gastroscopic studies in the different groups under discussion with the results obtained by the other diagnostic methods employed, an effort will be made to evaluate the gastroscope as a diagnostic aid in the study of gastric disease

#### THE NORMAL STOMACH

Before discussing the value of the gastroscope in the study of gastric abnormalities I desire to stress the importance of the gastroscopic appearance of the normal stomach It is of the utmost importance that one be perfectly familiar with the appearance of the normal stomach, otherwise pathologic changes cannot be properly evaluated With the gastroscope introduced to full depth and in the proper position, that is, at about 10 on the clock dial, with slight inflation one will be able to obtain a good view of the pylorus and antrum in from 90 to 95 per cent of cases I am convinced that it is important to go slowly at this stage of the examination In many cases after waiting a few seconds or sometimes a little longer, one is rewarded by seeing the pylorus suddenly come into view and one can see it rhythmically opening and closing with definite regularity No change in rhythm has ever been noted in a given case While watching the pylorus, one not infrequently sees a small amount of duodenal contents

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thrown back into the stomach. This probably does not indicate abnormality, as it occurred in some cases in which there were no digestive symptoms and in which no abnormality could be demonstrated. In two cases, with the closure of the pylorus the duodenal mucosa was seen to protrude through the pyloric sphincter into the stomach, it had much the appearance of a polyp, but in the center of the protrusion the pylorus could be distinctly seen. I am not prepared to state definitely whether this rather unusual observation is associated with symptoms, I am inclined to believe it is not. However, it may be responsible for some of the atypical symptoms that have been attributed to duodenal ulcer when ulcer could not be demonstrated by routine methods of study. When the pylorus is completely closed, the mucosa surrounding it may be thrown into folds which radiate from the pylorus much as the spokes of a wheel radiate from the hub. These folds vary in size, in some cases they are small, while in others they are large. They can scarcely be considered folds in the antial walls, as they come and go only with the opening and closing of the pylorus. Owing to the variation in the number and size of these folds, the normal pylorus when closed does not always have the same appearance. Not only can the functioning pylorus be carefully studied but the antrum may be carefully examined. The antral walls do not contain any folds. The antrum is separated from the body of the stomach by a definite fold, the musculus sphincter antri which may appear perfectly smooth but frequently has the appearance of a twisted rope. At a certain phase of peristaltic activity the musculus sphincter antri closes the antrum off entirely from the body of the stomach. As the musculus sphincter antri relaxes the antrum again comes into view and the peristaltic wave may be seen passing onward over the antrum. The mucosa of the lesser curvature is always smooth, that of the anterior wall, the posterior wall and the greater curvature is thrown into folds when the stomach is empty. The folds course the stomach in a longitudinal direction, beginning high up in the body and converging to and disappearing at the antrum. The folds on the anterior wall are small compared with those on the posterior wall and greater curvature. Branching folds are frequently seen on the posterior wall and greater curvature but rarely on the anterior wall. The size of the folds may be materially changed by inflation, that they may be almost completely effaced must constantly be kept in mind. Overinflation changes materially the gastroscopic image. The best results from gastroscopic studies are obtained with just sufficient inflation to give a clear visual field. Too much inflation interferes greatly with visualization of the antrum and pylorus.

In studying the appearance of the normal gastric mucosa, one must not forget the epoch-making experiments of Beaumont more than a hundred years ago on the stomach of Alexis St. Martin. Among other things Beaumont proved that there is a marked difference in the appearance of the normal gastric mucosa in the fasting state and in the presence of food. This observation, even though made a century ago, is still of great clinical importance and should be borne in mind in the evaluation of the gastroscopic appearance of the normal stomach. I am convinced that there are normal variations in the color of the mucosa which must be given careful consideration in determining whether there is organic disease. While a definite change in

color is important in the diagnosis of organic disease, slight variations from the accepted normal are of no real diagnostic value.

#### CHRONIC GASTRITIS

Chronic gastritis is a rather frequent disease. The etiologic relation of chronic gastritis to more serious gastric lesions especially to gastric ulcer and carcinoma, has been a subject of much discussion for several years. Hurst expressed the belief that a direct etiologic relation exists between chronic gastritis and gastric carcinoma, in that carcinoma never develops in the normal stomach but in a stomach already the seat of chronic gastritis in which atrophic changes have already occurred. Taylor stated that "the view that peptic ulcer is a sequel to an untreated gastritis in a hyperplastic stomach is rapidly commanding acceptance." If the view of Hurst concerning the etiologic relation of chronic gastritis to carcinoma and that of Taylor concerning the relation of chronic gastritis to ulcer are proved, chronic gastritis becomes the most important disease in gastric pathology. Many classifications of chronic gastritis have been discussed in the literature, some are simple and others complex. However, Schindler's classification of chronic gastritis into chronic superficial gastritis, chronic atrophic gastritis, chronic hypertrophic gastritis and gastritis following operation on the stomach is, I believe, the one best adapted to clinical use. It is true in this classification that one type overlaps the other somewhat, but this cannot be avoided in any classification.

The history, physical examination and laboratory studies may suggest the presence of chronic gastritis, but they are of no real diagnostic value. Many digestive symptoms that have been considered functional have been proved gastroscopically to be due to chronic gastritis. The physical examination may show some tenderness in the epigastric region but nothing more. The gastric analysis gives one the degree of gastric acidity. The stool may or may not show the presence of occult blood. But none of these conditions are diagnostic of chronic gastritis. The diagnosis must be made from the gastroscopic and x-ray observations, the former being by far the more important. While x-ray study is of real value in determining the size, shape, contour, peristaltic activity and motility of the stomach, it is of little value in the diagnosis of chronic gastritis beyond giving some idea as to the size and contour of the mucosal folds. On the other hand, gastroscopic study gives one the advantage of actually seeing the stomach and determining by direct inspection whether any change has occurred in the mucosa that could be attributed to chronic gastritis. In making this study, one must look for changes in the color and general appearance of the mucosa, for changes in the size and shape of the mucosal folds and for the presence and the amount of thick, tenacious mucus adhering to the gastric wall. Changes in color can be easily recognized and superficial abrasions, hemorrhagic erosions, hemorrhages into the mucosa and spots of pigment can be readily seen. Likewise the size and contour of the mucosal folds, whether small or large, edematous or nodular, can be readily determined. The amount of tenacious adherent mucus is always an important factor in making a diagnosis of chronic gastritis. Adherent mucus may be found in any type of chronic gastritis. Small or large masses of mucus found free in the stomach are of no diagnostic importance.

*Chronic Superficial Gastritis*—In chronic superficial gastritis the mucosa no longer has its characteristic normal orange red appearance but is of a much deeper red in the diseased areas. This form of gastritis may be found in any portion of the stomach, but most frequently in the body. It is frequently seen in the antrum in cases of duodenal ulcer with obstruction and delay in the emptying time of the stomach. In some cases the greater portion of the stomach seems to be involved in the inflammatory process. Usually, however, the inflammatory areas are irregularly distributed throughout the body of the stomach, occasionally one sees the inflammatory changes confined almost entirely to the antrum. The change to a deeper red is characteristic and creates a striking contrast to the normal color. One must not, however, be confused by the change in color that results from changes in the degree of inflation and in the position of the instrument. With even slight increase in the degree of inflation or slight change in the position of the instrument the area under examination may appear no longer inflamed but normal. In the antrum and to a less extent in the preantral zones, peristaltic activity may be rather troublesome. The mucosa during the peristaltic wave may show definite variations in color. The mucosa in this form of gastritis may appear slightly granular, especially in the antral and preantral zones. One may also see small hemorrhagic areas, the cause of which has not been definitely determined. The question arises: Are these small hemorrhagic areas due to trauma from instrumentation or are they a part of the chronic inflammatory process? I confess that I do not know but I believe they are part of the inflammatory process. In this type of chronic gastritis the mucosal folds are somewhat swollen and slightly edematous. They too may show small hemorrhagic areas. Small areas of tenacious adherent mucus are sometimes found, it does not occur in large amounts. It may be adherent to the antral wall, to the antral folds, to the crest of the folds in the body of the stomach or to the depths between the folds—in fact, to any portion of the stomach that is involved in the inflammatory process. There is usually some increase in the amount of secretion in the fasting stomach, and instead of the fasting contents being clear, as in the normal stomach, they may be cloudy and the mucous content definitely increased.

*Chronic Atrophic Gastritis*—Chronic atrophic gastritis is easily recognized gastroscopically. It is characterized by thinning out of the mucosa in the involved areas, with a definite change in the color in these areas from the normal orange red to a grayish green, as described by Schindler. If the atrophic gastritis is engrafted on a superficial gastritis, as frequently occurs, the contrast in color will be even greater. In determining the change in color in atrophic gastritis, as in superficial gastritis, one must be careful not to confuse again the change due to improper lighting with that due to organic changes in the mucosa. Rotating the gastro-scope from side to side may be all that is necessary to differentiation. Sometimes differentiation can be made by slight inflation, occasionally both procedures may be required before one can decide the question definitely. In the cases of atrophic gastritis that I have observed, the atrophy has occurred in the body of the stomach and not in the antrum and has always been engrafted on or associated with chronic superficial gastritis. I am of the opinion that atrophic gastritis develops only in a stomach that is already diseased.

Not only is there definite changes in color in the diseased areas, but the mucous membrane is so thinned out that the blood vessels may be easily recognized. This finding is of real diagnostic importance, as the blood vessels are practically never visible in normal gastric mucosa. Superficial abrasions and small hemorrhagic areas are frequently found—in fact, more frequently than in superficial gastritis. Large mucosal hemorrhages occur frequently—these rarely occur in superficial gastritis. The mucosal folds are much smaller and fewer in number. The atrophic changes that occur in the gastric mucosa in certain types of anemia are, I believe, entirely different from those that occur in chronic atrophic gastritis and will not be discussed in this paper.

*Chronic Hypertrophic Gastritis*—Chronic hypertrophic gastritis, as well as chronic atrophic gastritis, occurs mostly in the body of the stomach. The gastroscopic picture however, is entirely different. In atrophic gastritis the involved areas are grayish and somewhat depressed, owing to thinning out of the mucosa, whereas in hypertrophic gastritis they are much redder, and the mucosa is definitely thickened and swollen. In this form of gastritis the entire mucosa may be intensely red and angry looking, even the antrum being involved. Many abrasions and small and large mucosal hemorrhages are seen frequently, but I believe that large mucosal hemorrhages do not occur as frequently in this type as in chronic atrophic gastritis. The mucosa in some cases has a distinctly granular appearance, particularly in the preantral zone. Multiple small superficial ulcers may be found, though in my experience rarely. The mucosal folds are definitely enlarged, instead of diminished, and fewer as in atrophic gastritis. The surface of the folds is irregular and frequently nodular and sometimes polypoid. The enlarged nodular folds, the increased redness of the mucosa, the superficial abrasions, the hemorrhagic areas, the superficial ulceration and the granular appearance present a characteristic gastroscopic picture easy to recognize.

#### GASTRIC ULCER

The gastroscopic appearance of gastric ulcer, like that of the different types of chronic gastritis, is characteristic. Gastric ulcer occurs most frequently along the lesser curvature or close to the lesser curvature on the anterior or posterior wall. An ulcer occurring in the pylorus may be difficult to see gastroscopically. As stated before, the most frequent location for gastric ulcer is along the lesser curvature. The closer the ulcer is located to the antrum on the lesser curvature, the easier it is to visualize gastroscopically. An ulcer near the cardia is difficult to visualize, especially if it is located on the posterior wall. An ulcer along the greater curvature is rare. Not infrequently I have been unable to visualize clearly that portion of the stomach just below the cardia, especially the posterior wall. As yet I have not had an opportunity to study an ulcer on the posterior wall in this portion of the stomach. I am of the opinion, however, that sometimes it may be difficult to visualize an ulcer in this area, especially if it is located some distance from the lesser curvature and close to the cardia. Fortunately ulcer rarely occurs in this portion of the stomach.

It is easy to understand how the large mucosal folds on the posterior wall might completely close off the crater of the ulcer from view and thus make impossible

a gastroscopic diagnosis of ulcer in this area. When an ulcer can be properly visualized—and this can be done in nearly every case—the gastroscopic image is characteristic. The yellow or yellowish white base, the mucosal folds converging toward the crater and the edema and inflammation surrounding the crater can scarcely be mistaken for anything else. A superficial gastric ulcer may be diagnosed gastroscopically when the diagnosis is practically impossible from x-ray studies. It is scarcely conceivable that one would confuse the appearance of gastric ulcer with that of carcinoma gastroscopically.

Not only is gastroscopic study of value in the diagnosis of gastric ulcer, but it is equally valuable in determining the results of medical treatment. Observations may be made at frequent intervals, and thus one may determine the results obtained from the treatment being carried out. There can no longer be any doubt as to whether a gastric ulcer is healing under medical care, this can be definitely determined gastroscopically. In many cases reported in the literature frequent gastroscopic observations have been made throughout the entire course of treatment. These observations have proved beyond a question that gastric ulcer may heal completely under appropriate medical treatment.

#### CARCINOMA

The gastroscopic appearance of carcinoma is striking and must be seen to be truly appreciated. It is entirely different from its appearance on the operating table or in the autopsy room. In a gastroscopic study one sees the growth while it is still a part of the living organism. The growth looks entirely different *in situ* and after removal. The circulation of blood through the growth in the living state probably accounts for this difference. The gastroscopic appearance of carcinoma is entirely different from that of ulcer. In ulcer the crater or base appears yellow or yellowish white and is regular, with mucosal folds converging toward the base, and the mucosa surrounding the crater shows inflammatory changes of varying intensity. In carcinoma the ulcerative area is irregular, and sloughing black, brown or grayish tissue may be seen in the floor of the crater. Surrounding the crater the mucosal folds are markedly distorted or completely obliterated and frequently there are cancerous nodules, which vary in size considerably. This appearance is in marked contrast with that of benign ulcer. Not only does one see nodules of varying size surrounding the crater, but nodules may be seen throughout the body of the stomach in some cases, a finding which necessarily limits any operative intervention to a palliative procedure.

Gastroscopic study, I believe, will be found to be of the utmost value in the early diagnosis of carcinoma. Unfortunately one seldom sees early carcinoma. Many patients do not realize that they are suffering from a serious gastric disease until the carcinoma is well advanced, often not consulting a physician until only palliative treatment can be carried out. In another group, however, the digestive symptoms are mild, and by the usual methods of study, including history, physical examination and laboratory and x-ray studies, one is unable to find an organic basis for the symptoms. It is in this group that I am convinced that the gastroscopic method is of the utmost value. If it should be made part of the routine in the study of this group, in many cases carcinoma could be diagnosed and operated

on early in the disease, when operation offers the best opportunity of complete cure.

I am of the opinion that carcinoma can be diagnosed relatively early gastroscopically, probably before it can be diagnosed by x-ray investigations. With the fasting stomach completely emptied and the patient in the proper position, a perfectly clear view of the mucosa can be obtained, and one should be able to detect a lesion when it is too small to be located by x-ray study. If the lesion should be unfortunately located in one of the blind spots, it could not, of course, be seen gastroscopically. Owing to the location of these spots, this will rarely occur. The areas of the stomach in which malignant growth usually occurs are readily seen gastroscopically.

Any method that permits one actually to see the lesion under investigation must necessarily be of the utmost importance. By the gastroscopic method one actually sees what is going on in the stomach. It is of no value or little at most if the growth is large, and particularly when it is located on the lesser curvature and encroaches on the cardia. First, in this type of case, it may be impossible to introduce the instrument, second, if the growth is large the instrument may be so flexed that clear vision cannot be obtained. In the smooth, infiltrating type of carcinoma it is difficult to determine gastroscopically how much of the wall of the stomach may be involved. So far I have been unable to do this. Further experience, however, may enable me to do so.

#### GASTRIC HEMORRHAGE

The discussion of gastrointestinal hemorrhage will be limited to those cases in which the usual diagnostic methods failed to reveal an organic lesion to account for the bleeding—in other words, only those in which the diagnosis of an organic lesion could not be made from the history, physical examination and laboratory and x-ray studies. In this type of case gastroscopic study is of the utmost diagnostic value. The examination should be made as soon after hemorrhage has ceased as seems safe. If the examination is delayed too long, it may be impossible to determine where the bleeding came from. This is especially true if the hemorrhage is due to a superficial mucosal lesion, as I believe it nearly always is. The gastroscopic examination must be made before the lesion has had an opportunity to heal, preferably within a few days after it has occurred, otherwise the lesion may heal and no trace of the source of bleeding can be found. In this group the esophagoscope should always be used before the gastroscope. It must be constantly borne in mind that the source of the bleeding may be in the esophagus and not in the stomach, therefore it is most important to rule out esophageal disease, especially esophageal varices, before proceeding with the gastroscopic examination. Certainly one would not even attempt to introduce a gastroscope in the presence of esophageal varices. The only way to determine definitely whether esophageal varices are present is by esophagoscopy. The following brief report of a case stresses the importance of esophagoscopy in this group.

The patient had had repeated attacks of vomiting of blood and had passed black tarlike stools at irregular intervals for several years. The lower border of the liver was easily felt below the costal margin and the spleen was barely palpable. The x-ray studies showed no abnormality in the esophagus or the gastrointestinal tract. The esophagoscope showed that the bleeding was coming from varices in the lower third of the esophagus. Gastroscopic examination was not performed.

If the examination reveals no abnormalities in the esophagus to account for the bleeding, one may proceed at once with the gastrosopic study. It is important that a most thorough gastroscopic examination be carried out as it is easy to overlook the source of bleeding when it is a superficial mucosal lesion.

In a case recently studied there had been four severe attacks of gastric hemorrhage, evidenced by the vomiting of large quantities of blood and the passage of black tarlike stools at rather long and irregular intervals for five years or more. In some of the attacks, including the last one, the hemorrhage was so severe that transfusion was necessary to save the patient's life. After one of these attacks pyloroplasty was performed, the stomach was opened and a careful search for the cause of the bleeding was made, but none could be found. It was hoped that after pyloroplasty there would be no further recurrence of hemorrhage; however another severe hemorrhage occurred several months later. Three weeks after this hemorrhage the patient came under observation for the first time. An esophagosopic examination showed the esophagus to be perfectly normal. This procedure was followed immediately by a gastroscopic study which showed two rather large mucosal hemorrhages, one about the size of a nickel and the other about the size of a penny, both in the preantral zone. In the same zone there were a few superficial abrasions. The antrum appeared normal except in the pyloric region, where large mucosal folds were seen. The pylorus was patulous; the mucous membrane appeared normal, but the normal rhythmic opening and closing of the pylorus could not be demonstrated. I believe the large mucosal folds in the region of the pylorus and the altered function of the pylorus were both due to structural changes resulting from pyloroplasty. The mucosal folds on the anterior and posterior walls of the stomach appeared normal. The lesser curvature was smooth; no abnormality in this area could be demonstrated. Undoubtedly in this case the attacks of gastric hemorrhage were due to recurring superficial mucosal lesions that healed in a comparatively short time, to recur again at long and irregular intervals.

#### POSTOPERATIVE STUDIES

Postoperative gastroscopic investigation, especially if gastro-enterostomy or pyloroplasty has been performed, presents many difficulties that one does not encounter in the gastroscopic examination of the stomach that has not been operated on. The reasons for this are clear: (1) more difficulty in maintaining the proper amount of inflation, (2) regurgitation of the intestinal contents back in the stomach, and (3) changes in the appearance of the stomach as a result of the operative procedure. After posterior gastro-enterostomy or pyloroplasty has been performed it may be difficult to maintain the proper degree of inflation because the air leaves the stomach much more rapidly after these operations than normally. Regurgitation of intestinal contents back into the stomach, especially after posterior gastro-enterostomy, may be troublesome and blur the field to such a degree that clear vision cannot be obtained. When this occurs, it is better to postpone the examination for a few days. I have noticed in a number of cases that there is much less nervous tension on subsequent examinations. This may account for the satisfactory results obtained in some cases when examination is repeated. In other cases, regardless of the method used, the regurgitation is so troublesome that a clear field of vision cannot be obtained. In this small group gastroscopic examination is of no diagnostic value. Any operation on the stomach changes its contour more or less, frequently distorts the normal landmarks and materially adds to the difficulty in obtaining a completely satisfactory gastroscopic study.

My study of the stomach postoperatively has been limited to cases in which either posterior gastro-enteros-

tomy or pyloroplasty had been performed. These cases have been divided clinically into two groups, one in which the digestive symptoms had been completely relieved after the operation and the other in which only partial relief or none at all occurred. The first group showed no evidence of abnormality gastroscopically, the mucosa appeared perfectly normal. Some of these patients had had pyloroplasty, others had had posterior gastro-enterostomy. I thought that the mucosa would be normal in this group, this proved to be true. This observation agrees well with the observations of other investigators, that no evidence of chronic gastritis or other abnormality is present in the symptom-free stomach postoperatively. In the second group my studies were limited to cases in which gastro-enterostomy had been performed. Gastritis has been the most frequent cause of the symptoms so far studied in this group. The gastroscopic study may show superficial gastritis limited to a small area of the mucosa surrounding the stoma and rapidly fading out into normal mucosa. This type of gastritis may quickly respond to appropriate medical treatment. On the other hand, one may see severe hypertrophic gastritis in which the entire mucosa is involved, characterized by superficial mucosal hemorrhages, enlarged thickened nodular folds and excessive mucous secretion, with areas of adherent, tenacious mucus scattered over the greater portion of the stomach.

While the development of a marginal or a jejunal ulcer may account for the symptoms that sometimes occur after gastro-enterostomy, I do not believe that the symptoms can always be accounted for on that basis. The severity of the gastritis found sometimes in this group has convinced me that gastritis alone in some cases may be responsible for all the symptoms. The only cases in which I have seen severe gastritis following gastro-enterostomy have been those in which there was no evidence of pyloric obstruction roentgenologically, the barium leaving the stomach about as rapidly through the pylorus as through the stoma. What etiologic relation the gastro-enterostomy bears to the gastritis I am unable to state, but I do believe that in certain cases the altered function of the stomach resulting from the gastro-enterostomy, in the presence of a patulous pylorus, is in some way responsible for the gastritis. Further gastroscopic observations will be carried out in this group in an effort to determine definitely this relation, if any. I have seen patients after gastro-enterostomy who had no pyloric obstruction but had symptoms of chronic gastritis which were promptly relieved after the gastro-enterostomy had been undone and the normal continuity of the gastrointestinal tract reestablished.

#### SUMMARY AND CONCLUSIONS

Gastroscopic studies have been made in 200 cases, in many, two or more examinations were made, the total number of examinations being 325. From these studies I believe one is justified in making the following deductions:

- 1 The procedure is helpful diagnostically in the study of gastric disease.

- 2 It bears a supplementary relation to the other diagnostic methods employed in the study of gastric lesions, it does not replace any one of them.

- 3 Before attempting the gastroscopic study of pathologic conditions, one should thoroughly familiarize oneself with the normal variations in the appearance of the stomach so that these will not be confused with variations due to organic disease.

4 In the study of the different types of chronic gastritis I believe that the gastroscope has its greatest field of usefulness. Inflammatory changes in the gastric mucosa can be studied more carefully gastroscopically than by any other diagnostic method.

5 In the diagnosis of gastric ulcer, gastroscopic study is of real value. I am not at all convinced, however, that one can always find an ulcer if it is located on the posterior wall near the lesser curvature. I observed a case recently in which x-ray study showed a definite niche on the lesser curvature, somewhat closer to the cardia than to the pylorus. I was unable to find an ulcer gastroscopically.

6 Gastroscopic study in the diagnosis of carcinoma, especially in the early stages, will be found to be of the utmost value. I believe one should be able to find carcinoma gastroscopically before it can be found roentgenologically. Unfortunately, one seldom sees an early carcinoma. The disease is usually well advanced before the patient himself realizes he needs medical care.

7 Gastroscopic study will often reveal the source of bleeding in obscure gastric hemorrhage and should always be done in cases of undetermined gastrointestinal bleeding.

8 In the postoperative study of the stomach in which symptoms have recurred or in which they have not been completely relieved, the gastroscope is helpful. It may reveal that the symptoms are due to a marginal or a jejunal ulcer, but from observations so far made I believe that in some cases, at least, the symptoms are due to chronic gastritis of varying degree and not to the presence of either a marginal or a jejunal ulcer.

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#### ABSTRACT OF DISCUSSION

ON PAPERS OF DRs BANK AND RENSHAW  
AND DR FREEMAN

DR ROBY JOHN F. RENSHAW, Los Angeles. The comparison of gastroscopic study with other methods of diagnosis is fraught with danger because there are so many variable factors: the skill of the gastroscopist, the experience of the radiologist and the pathologist's conception of gastritis are but a few. Dr Freeman has surveyed the problem, and I think he has arrived at conservative conclusions. His beautiful slides portrayed the problem more dramatically than is possible verbally. His point that one must be familiar with the normal stomach is the most important part of his paper. It has been my experience to hear men condemn gastroscopic examination because of a diagnostic failure, but they have not taken into consideration the examiner's skill or the particular difficulty in that case. Gastroscopists are going through the same process that cystoscopists and radiologists did some years ago. We are establishing our procedure and our normals. Today the physician will interpret a diagnostic failure in radiology—in terms of the radiologist's skill and the particular difficulties in that case—but often that is not true of his criticism of the gastroscopic method. In a consideration of gastroscopic study as related to other procedures the comparative ease or difficulty should be considered. I am not convinced that the gastroscope is safe in awkward hands. I believe that the gastroscopist should be skilled and trained in the passage of that instrument and should possess a delicate sense of touch; furthermore, he should have a trained assistant. If these conditions are fulfilled, gastroscopic study is a safe and simple procedure; furthermore, if one takes reasonable care to exclude contraindications, I see no reason to consider it a dangerous procedure as some men have. I have not been able to find a single case in the literature, nor do I personally know of one, of death resulting directly from the gastroscopic procedure.

DR MILFORD O. ROUSE, Dallas, Texas. As Dr Freeman mentioned, the use of the flexible gastroscope offers a way of more positive differentiation of gastric lesions manifesting them-

selves as x-ray filling defects, as well as of accurate diagnosis of the presence of foreign bodies in the stomach. I have a case on the point in question. Fluoroscopic study and roentgenograms of a patient's stomach showed a marked filling defect in the stomach, immobile and not palpable. Gastric acidity was normal, with occult blood present. My partner, Dr C. O. Patterson, examined the patient with the gastroscope and beheld a black cylindric mass which he diagnosed as a phytobezoar, or so-called persimmon ball. Operation was advised and done the day before I left. The specimen removed on surgical exploration weighed 171 Gm and was of pretty fair size. It was of value to know beforehand that we were dealing with a foreign body and not with an extensive malignant growth, as this might have indicated. The gastroscope should be utilized and mastered by the gastroenterologist rather than by the otolaryngologist, the general surgeon or the general practitioner with a flair for taking up something new. The otolaryngologist can deftly pass the instrument, but he is like a surveyor or landscape architect in describing what he sees. His training and interest do not permit him to interpret what he sees, but gastroenterologists are more like medical geologists; we can both see and interpret what we do see, and so the burden and privilege of advancing gastroscopic practice lies with the members of this section.

DR P. E. T. HANCOCK, London, England. I much appreciate the honor of being allowed to take part in this discussion on the excellent papers of Drs Bank and Renshaw and Dr Freeman. My experience with the gastroscope is limited to some 400 instrumentations extending over two and a half years in London. Drs Bank and Renshaw have done valuable work in correlating the gastroscopic appearances with the acidity and the emptying time of the stomach. They have confined their paper, I think wisely, to one type of gastritis, namely chronic superficial gastritis. In my experience the gastroscopic observations do not correspond with the pathologic picture. My experience extends to some fifty cases in which I have used the gastroscope and in which gastric resection has followed the gastroscopic study, in over half of those I noted extensive gastritis of one type or another. On serial section of the resected stomachs the pathologist was able to show gastritis in most cases, but the type of gastritis did not correspond with the type I had noticed. Particularly was that true of the hypertrophic type, which is commonly seen and is a definite entity gastroscopically, but in none of those fifty cases was any true hypertrophy demonstrable pathologically. Hypertrophic gastritis is recorded so commonly that Henning found 50 per cent of all gastritis to be hypertrophic. I believe a normal must be established, gastroscopically and histologically. The criteria of normal for the stomach are difficult to obtain. In all stomachs apparently there are slight pathologic changes, and to correlate the gastric normal with the histologic normal is, I think, important. I believe gastroenterologists should try, in all cases in which the gastroscope is used, to make careful notes not only on the lesions but on the entire gastric mucosa. We should then be in a position to compare the appearances noted gastroscopically with serial sections of the gastric mucosa and establish this important correlation.

DR JOHN H. FITZGIBBON, Portland, Ore. Although neither speaker dealt with technique, I should like to ask two questions regarding technique, as there are a number of gastroscopists present who may be interested in the answers. I should like to know whether either of the speakers gave atropine before the examination. I have long since discontinued its use because I am able to see active peristalsis in practically every case without atropine, which enables me to get a better view of the lesser curvature of the antrum. The second question is regarding the local anesthetic used. I have used 2 per cent pontocaine hydrochloride in practically every case and have seen four serious reactions. I should like to know whether either of the speakers has had a similar experience. Approximately 13 cc of the solution was used in each case. The reactions have started with what the patient described as a peculiar feeling in one ear, followed by dizziness, loss of equilibrium and marked nystagmus.

DR FREDERIC E. TEMPLETON, Chicago. During the last four years I have had the opportunity to examine roentgenologically most of the patients studied with the gastroscope by Dr Rudolph Schindler. Dr Freeman has emphasized the blindspots in the

stomach which may hide various lesions. In a recent comparison Dr Schindler and I found that in about equal numbers of cases the gastric ulcer could be seen only roentgenologically and only gastroscopically. Occasionally Dr Schindler has had the experience of seeing an ulcer at one examination but not at a subsequent examination. Yet this phantom-like ulcer was always evident at roentgen examination. The reverse was also true—i.e., an ulcer always seen gastroscopically was not seen at every roentgen examination. I am not entirely convinced that the gastroscope can detect a gastric carcinoma earlier than can the x-rays. On the surface this seems likely, but there have been few cases in which Dr Schindler has diagnosed carcinoma missed with the x-rays. In these cases I have been able, by using careful mucosal technic at reexamination, to convince myself of the presence of the lesion. On the other hand, I have seen carcinomas not seen by the gastroscopist. When one speaks of comparing the two methods, the technic and difficulties of the gastroscopic procedure must be considered. If the gastroscopist can see the lesions he can usually diagnose them, but there are places in the stomach, sometimes rather large, that are hidden, therefore it should be emphasized that the two methods are cooperative and not competitive. I should like to ask Dr Freeman whether he has seen carcinomas or ulcers not seen by the roentgenologist.

DR JOSEPH BANK, Phoenix, Ariz. To answer the question of Dr Fitzgibbon, we use atropine and codeine preliminary to anesthesia of the throat in gastroscopic study. Dr Renshaw and I feel that atropine is of some value because it reduces the amount of salivary secretion, making the examination easier. Regarding pontocaine hydrochloride, we have not observed any accidents or ill effects. I don't believe that Dr Schindler has either. There have been deaths from pontocaine hydrochloride one in this country and eight abroad. However, in eight of the nine cases the preparation was used in association with bronchoscopic study and urethral instrumentation in which the examiners used larger quantities than we do. We use 10 cc, in two instillations of 5 cc each.

DR ELMER B. FREEMAN, Baltimore. In reference to the local anesthetic, I have used either 10 per cent cocaine or 2 per cent pontocaine hydrochloride. I have had no untoward effects from either. However, I have not had a great deal of experience with pontocaine hydrochloride having used cocaine as a routine until just recently. In preparation of patients for gastroscopic study 2 grains (0.13 Gm.) of phenobarbital is given at bedtime the night before and 2 grains (0.13 Gm.) two hours before the examination. I have seen no advantage in using atropine. As to whether I have been able to diagnose carcinoma earlier with the gastroscope than with the x-rays, I am frank to say that I have not. Unfortunately, one rarely sees an early carcinomatous lesion, the patient himself not realizing that he needs medical attention until the disease is well established. In the body of the paper the importance of routine gastroscopic study in a certain definite group of cases has been thoroughly discussed. I firmly believe that if gastroscopic examination was made a routine in this particular group one would be able to diagnose carcinoma in some cases at an earlier stage than is possible roentgenologically.

**County Health Departments in Kentucky**—For generations the responsibility for the health and medical care of the people of Kentucky has been placed, by law, squarely on the shoulders of the medical profession. All the policies and practices of the department of health are approved by the medical profession of the state. We not only have a splendidly organized and equipped central state department but ninety-one of our counties are now provided with full-time county health departments which are within reach of all the people with the scientific knowledge that means better health, longer life and increased efficiency. This has all been brought about by long time administrative planning in which the medical profession has taken the leadership and in which they have secured the fine cooperation of dentists, public health nurses, pharmacists, sanitary engineers and educators together with the great organized farm groups—the Federation of Women's Clubs, the Congress of Parents and Teachers and the great labor organizations.—Radio address by Gov. A. B. Chandler Dec. 6, 1938.

## REGULATION OF THE LEVEL OF CALCIUM IN THE SERUM DURING PREGNANCY

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The maintenance of a uniform level of calcium in the serum was called by Cannon<sup>1</sup> an example of physiologic homeostasis. The regulation depends on a combination of factors, chief of which are function of the parathyroid, calcium intake, utilization and excretion, and the availability of a mobilizable calcium reserve.

In considering the subject as it applies to pregnancy it becomes apparent that each of these factors assumes even greater importance than ordinarily; moreover, other relations enter into the picture to make it even more intricate. A significant fact is that the calcium level tends to decline during the later months of pregnancy. The conception that this is related to the withdrawal of calcium for fetal development is only partly tenable; it does not explain, for example, why low values occur in women with a good nutritional history whose mineral intake during pregnancy is more than sufficient to meet both the maternal and fetal requirements.

Just what significance is to be attached to the low serum calcium values is not clear. Are the concentrations subnormal in the true or absolute sense, or is there the possibility of somewhat different normal values for pregnant and for nonpregnant women? If the lowered calcium content is looked on as abnormal in the same way as a low hemoglobin value in anemia of pregnancy is abnormal, then the change probably reflects some deficiency in respect to the calcium intake or parathyroid function, or possibly some other factor. On the other hand if the normal pregnancy level is conceived to be distinct from the normal nonpregnancy level, it would be necessary to seek an explanation for the lower level either in coincidental and related changes in the blood, or in some fundamental differences in the underlying regulatory mechanisms. A unified conception of the regulation of the calcium content during pregnancy must also take into account the relations between the maternal and fetal organisms. In the following discussion consideration will be given to two coincidental changes which could conceivably influence the calcium content, namely (1) dilution of blood and (2) protein concentration in serum. An attempt will also be made to analyze in the briefest possible form the specific roles of factors governing calcium metabolism, which may be supposed to affect the maternal organism, primarily, (3) parathyroid function, (4) calcium intake, (5) seasonal effects, (6) effects of hormones other than the parathyroid. The fetal-maternal relationship will be outlined briefly from the standpoint of the concentration of calcium in the blood on the two sides of the placental barrier and the influence of the calcium level on fetal development.

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From the John Sealy Memorial Research Laboratory and the Department of Pathological Chemistry, University of Texas School of Medicine. Read before the Section on Pathology and Physiology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

Virginia B. Duff is Fellow under grants from the Mead Johnson Company, Evansville, Ind., approved by the Pediatrics Research Council in support of research in the Department of Pathological Chemistry. <sup>1</sup> Cannon, W. B. Organization for Physiological Homeostasis. *Physiol. Rev.* 9: 399 (July) 1929.



## DILUTION OF BLOOD

Dieckmann and Wegner<sup>2</sup> have estimated that at term the volume of blood is increased 23 per cent and the volume of plasma 25 per cent above normal. The analyses of Oberst and Plass<sup>3</sup> showed a rise from an average of 909 to 914 Gm of water per kilogram of plasma, followed by a decline to 906 Gm at delivery. There is, however, a wide range of variation in the various groups with an overlapping of data. Dieckmann and Wegner<sup>2</sup> found the conductivity of the serum at term to be from 4 to 6 millimols below normal, it did not return to normal until from six to eight weeks post partum.

An examination of these and other data does not reveal any significant correlation between the changes in water content of the serum and the calcium concentration. It seems improbable that dilution of blood or the small changes in the water concentration of the plasma, which incidentally differ in protein from the changes in calcium content, could be fundamentally involved in the differences under consideration.

## PROTEIN CONCENTRATION IN SERUM

The proteins in the serum also tend to decrease during pregnancy. Dieckmann and Wegner<sup>2</sup> found the average concentration at term to be 7 per cent below that during the first trimester. A further decrease was

TABLE 1—Calcium Level of Pregnant Rats at Term

	Number of Animals	Calcium Mg. per 100 Gm. of Serum			
		Max.imum	Min.imum	Average	Standard Deviation
Normal	13	11.0	8.2	9.7	0.9
Parathyroid deficient	10	7.4	1.1	5.1	1.12

Diet 7 of Cox and Imboden<sup>18</sup> (calcium 0.19 per cent and phosphorus 0.4 per cent) was given.

noted during the first few days post partum, this was followed by a slow rise to normal at about eight weeks. This trend differs from the changes in calcium concentration, which begins to rise soon after labor and is usually restored to the nonpregnancy level within six to fourteen days post partum.

Further clarification of this point is necessary in view of the evidence that the total protein and calcium concentrations are proportional. The relation has been expressed by empirical regression equations (Hastings, Murray and Sendroy,<sup>4</sup> Greenwald,<sup>5</sup> Peters and Eiser-son,<sup>6</sup> McLean and Hastings<sup>7</sup> and others). A more precise formulation has been attempted recently by the Gutmans<sup>8</sup> in which the total calcium is related to the concentrations of albumin and two globulin fractions. However, it seems that these equations do not apply if there is a primary disturbance in calcium metabolism or in the presence of hyperphosphatemia. From the

data of Oberst and Plass<sup>3</sup> it would appear that these equations also do not hold in pregnancy. Their results showed that the significant correlation between protein and calcium concentrations in nonpregnant and puerperal women is completely lost in late pregnancy and parturition, when the protein range is considerably widened. This lack of correlation, partly confirmed in our studies, sets pregnancy apart from the normal condition, in which there is a predictable relationship between total calcium and protein values. Since hyperphosphatemia may be excluded, there remains only the alternate explanation of a primary disturbance in calcium metabolism. Whether this view is tenable in its entirety or not, the conclusion nevertheless seems justified that effects on the calcium content referable to a change in protein concentration are doubtless overshadowed by other factors.

## PARATHYROID FUNCTION

In the absence of disorders of the parathyroid glands variations in total protein are accompanied by changes in total calcium, the result being approximate constancy of the calcium ion concentration (McLean and Hastings<sup>7</sup>). Deficiency of hormone leads to a reduction in  $\text{Ca}^{++}$  concentration while hyperparathyroidism is accompanied by an increase. The importance of the parathyroid glands in maintaining a constant calcium level in the plasma has been related to a direct action of the hormone on the bone cells, resulting in the production of osteoclasts and the release of calcium (Thomson and Collip<sup>9</sup>). Bauer, Aub and Albright<sup>10</sup> have submitted evidence that the trabeculae of the bones contain the mobilizable reserves. On the other hand, Aaron Bodansky and Jaffe<sup>11</sup> have shown that the most recently formed bone, in whatever site, is the bone most readily dissolved.

It is conceivable that parathyroid stimulation during pregnancy could result from absolute or relative calcium deficiency, the tendency to hypocalcemia and the necessity of maintaining a more active calcium metabolism than ordinarily. Although this conception is logical, the evidence for it at present is fragmentary. It is practically limited to the histologic observations of Seitz<sup>12</sup> and the experiments of Hoffmann and Rhoden<sup>13</sup> and Hamilton and associates,<sup>14</sup> who found that the blood of pregnant women contains a substance which behaves like parathyroid hormone in elevating the calcium level of the blood. However, it is hoped that experimental studies now in progress in our laboratory (Sinclair and Bodansky<sup>15</sup>) will provide adequate proof of parathyroid enlargement as a normal concomitant of pregnancy.

Evidence of the participation of the parathyroid glands is to be found also in roentgenograms of the bones. In rats with intact parathyroid glands, kept on low calcium rations through one or more pregnancies, demineralization of the long bones is much more pronounced than in animals deprived of these glands, in the

<sup>2</sup> Dieckmann W. J. and Wegner C. R. The Blood in Normal Pregnancy. *Arch. Int. Med.* 53: 71 (Jan.) 353 (March) 1934.

<sup>3</sup> Oberst W. F. and Plass E. D. The Variations in Serum Calcium, Protein and Inorganic Phosphorus in Early and Late Pregnancy During Parturition and the Puerperium and in Nonpregnant Women. *J. Clin. Investigation* 11: 123 (Jan.) 1932.

<sup>4</sup> Hastings A. B., Murray C. D. and Sendroy J. Jr. Studies of the Solubility of Calcium Carbonate in Salt Solutions and Biological Fluids. *J. Biol. Chem.* 71: 723 (Feb.) 1927.

<sup>5</sup> Greenwald Isidor. The Relation of the Concentration of Calcium to That of Protein and Inorganic Phosphate in the Serum. *J. Biol. Chem.* 93: 551 (Oct.) 1931.

<sup>6</sup> Peters J. P. and Eiser-son Leo. The Influence of Protein and Inorganic Phosphorus on Serum Calcium. *J. Biol. Chem.* 84: 155 (Oct.) 1929.

<sup>7</sup> McLean T. C. and Hastings A. B. The State of Calcium in the Fluids of the Body. *J. Biol. Chem.* 108: 285 (Jan.) 1935.

<sup>8</sup> Gutman A. B. and Gutman E. B. Relation of Serum Calcium to Serum Albumin and Globulins. *J. Clin. Investigation* 16: 903 (Nov.) 1937.

<sup>9</sup> Thomson D. L. and Collip J. B. The Parathyroid Glands. *Physiol. Rev.* 12: 309 (July) 1932.

<sup>10</sup> Bauer Walter, Aub J. C. and Albright Fuller. A Study of Bone Trabeculae as a Readily Available Reserve Supply of Calcium. *J. Exper. Med.* 49: 145 (Jan.) 1929.

<sup>11</sup> Bodansky Aaron and Jaffe H. L. Parathormone Dosage and Serum Calcium and Phosphorus in Experimental Chronic Hyperparathyroidism Leading to Ostitis Fibrosa. *J. Exper. Med.* 53: 591 (May) 1931.

<sup>12</sup> Seitz L. Eklampsie und Parathyroidea. *Arch. f. Gynak.* 89: 53 1909.

<sup>13</sup> Hoffmann F. and Rhoden E. Untersuchungen über die Wirkung Nebenschilddrüsenhormons aus Schwangerenblut. *Arch. f. Gynak.* 156: 459 (April) 1934.

<sup>14</sup> Hamilton Bengt, Dassel Laura, Highman W. J. Jr. and Schwartz Charles. Parathyroid Hormone in the Blood of Pregnant Women. *J. Clin. Investigation* 15: 323 (May) 1936.

<sup>15</sup> Sinclair J. G. and Bodansky Meyer. To be published.

latter the bones show little, if any, change in density. As will be shown presently, the calcium content in the first group is maintained at approximately the normal level, whereas in the second group it invariably declines, often below 5 mg per hundred cubic centimeters. The explanation is obvious. Calcium deficiency in the normal pregnant animal produces parathyroid stimulation, calcium is withdrawn from the bones in order to maintain the concentration in the blood above the tetany level. On the other hand, with the abolition of this regulatory mechanism in the parathyroid-deficient organism, the calcium level is progressively lowered as pregnancy advances, loss of body calcium is probably reduced thereby, and the calcium reserves are spared.

The frequency of low calcium in the values for serum and borderline manifestations of tetany (Chvostek phenomena and increased excitability to galvanic stimulation) in gravid women directs attention to the possibility of parathyroid insufficiency as a disturbing factor in pregnancy. In cases of this sort it is usually difficult to establish with any degree of certainty the relative importance of nutritional and hormonal factors in the production of hypocalcemia and the attendant symptoms. However, it may be argued that, dietary deficiency notwithstanding, the development of hypocalcemia is in itself evidence of an inadequate parathyroid response and consequently represents a condition of relative hypoparathyroidism. At the same time it must be realized that the parathyroid glands can be expected to accomplish just so much in the homeostatic control of the calcium level of the serum and not more. As the bones are depleted of their more readily mobilizable calcium reserves it must become increasingly difficult to maintain the calcium in the serum at the normal level.

The rise in the phosphatase content of the serum in pregnancy (Meranze and his associates,<sup>16</sup> Bodansky, Campbell and Ball<sup>17</sup>) is consistent with augmented parathyroid function, but since the phosphatase level may be influenced in other ways this rise must be interpreted with caution. This question will receive further attention elsewhere.<sup>18</sup>

Depression of the calcium concentration in the serum below 9 mg occurred frequently in our study of over 300 pregnant women, yet it was impossible to select from this group any persons in whom the hypocalcemia could be unequivocally attributed to parathyroid insufficiency. We are therefore obliged to draw on our experimental material in order to illustrate the importance of the parathyroid glands in governing the calcium level during pregnancy.

In table 1 are summarized the results obtained for a group of animals kept on a diet with a calcium-phosphorus ratio of 1 and a calcium level of 0.49 per cent. This diet has been adjudged, on the basis of weight of the young at 21 days, ash content of the young and change in weight of the mothers, to be the ideal mineral level and ratio for successful gestation and lactation in rats (Cox and Imboden<sup>18</sup>). Parathyroid-deficient rats kept on such rations become pregnant and apparently thrive until toward the end of gestation. From two to four days before term slight tremors of

the paws develop, these being more apparent when the rat is held up. The tremors become progressively more pronounced, the body is stiffened and the tail becomes rigid. The rat moves stiffly and with apparent difficulty even on a flat surface. Anorexia is a prominent symptom. Despite these severe manifestations the rat may improve, go through delivery and recover. Or the downward course may proceed in one of two ways. Rarely, the tremors become more and more severe, ultimately assuming tetanic convulsive proportions, the rat loses consciousness and death occurs rather rapidly. These stages consume in all about twelve to eighteen hours. Much more commonly the tremors cease, the rat becomes more and more quiescent and then lethargic. It can be roused only by pronounced stimuli. Meanwhile the body temperature drops, and finally the rat dies effortlessly.

These events may commence after the onset of labor (appearance of blood at the vagina). As a rule death occurs before any of the young have been delivered, but occasionally it may follow the delivery of part of the litter. A few of the animals in our series died after completing delivery, but in these labor was markedly prolonged (from one to two days). In parathyroid-deficient rats the onset of labor is frequently delayed beyond the normal gestation period, which is from twenty-one and one-half to twenty-two days. As a rule the duration of labor is also prolonged.

Such manifestations have never been observed in rats which have not been operated on. Among several thousand pregnancies and deliveries in our colony during the last five years only three maternal deaths have been recorded.

The combination of pregnancy and parathyroid deficiency favors the development of the low concentrations of calcium in the serum recorded in table 1. In contrast to these data the calcium content is easily maintained in the neighborhood of 6 mg or higher in non-pregnant parathyroidectomized rats kept on an adequate diet. The drop from the higher to the lower level of hypocalcemia probably accounts for the effect of pregnancy in converting latent into active tetany in parathyroid (and thyroparathyroid) deficient animals, as reported by previous observers (Halsted,<sup>19</sup> Carlson,<sup>20</sup> Werelius,<sup>21</sup> Luckhardt and Rosenbloom,<sup>22</sup> Bodansky and Cooke<sup>23</sup>).

As a rule the offspring of parathyroid-deficient mothers are much smaller than normal.

An effective way to combat the effects of parathyroidectomy in rats is by raising the calcium level of the diet to 1.225 per cent and reducing the phosphorus content to 0.245 per cent (diet 16 of Cox and Imboden<sup>18</sup>). On this diet the calcium concentration of the serum at term was either normal or elevated and littering was invariably successful. However, when in any of these animals in a subsequent pregnancy the levels of calcium and phosphorus intake were altered to those of diet 7, which as we have indicated is the optimal diet for reproductive success in the normal rat on whom no operation has been performed, hypocal-

16 Meranze Theodor Meranze D R and Rothman M M Blood Phosphatase in Pregnancy *Am J Obst & Gynec* 33: 444 (March) 1937

17 Bodansky Meyer Campbell K R and Ball E Changes in Serum Calcium Inorganic Phosphorus and Phosphatase Activity in the Pregnant Woman *Am J Clin Path* to be published

18 Cox W M Jr and Imboden Miriam The Role of Calcium and Phosphorus in Determining Reproductive Success *J Nutrition* 11: 147 (Feb) 1936

19 Halsted W S An Experimental Study of the Thyroid Gland of Dogs with Especial Consideration of Hypertrophy of This Gland *Johns Hopkins Hosp Repts* 1: 373 1896

20 Carlson A J The Parathyroids and Pregnancy *Proc Soc Exper Biol & Med* 10: 183 1913

21 Werelius A Do the Parathyroids Functionate in Intra Uterine Life *Surg Gynec & Obst* 16: 141 1913

22 Luckhardt A B and Rosenbloom P J The Control and Cure of Parathyroid Tetany in Normal and Pregnant Animals *Science* 56: 48 (July 14) 1922

23 Bodansky Meyer and Cooke W R Thyroparathyroidectomy and Pregnancy in the Rat *Proc Soc Exper Biol & Med* 36: 188 (March) 1937

cemia developed at the termination of pregnancy and was attended by the symptoms that have been described. A summary is given of a protocol for a typical experiment.

#### Summary of Protocol of Rat MJ-71

11/12/36	Weight 228 Gm age 150 days, parathyroidectomized
11/24/36	Changed from stock diet to diet 16 of Cox and Imboden <sup>24</sup>
11/9 12/36	Mated
1/2/37	Delivered litter of eight weighing 44 Gm Weight of mother after delivery 230 Gm
1/16/37	Infertile mating
2/1 2/37	Mated
2/23/37	Delivered litter of nine, weighing 45 Gm, calcium level during labor 10.8 mg, maternal weight after delivery 252 Gm
2/27/37	Changed to diet 7 of Cox and Imboden <sup>24</sup>
2/27 3/6/37	Mated
3/27/37	Rat weighed 326 Gm and was due to deliver
3/29/37	Rat lost weight (to 314 Gm), was at least two days overdue was in severe tetany with blood at the vagina but failed to deliver. Bled to death. Uterus contained litter of nine all alive weighing a total of 28.5 Gm. Serum calcium content 3.4 mg.

#### CALCIUM INTAKE

The calcium balance may be maintained in the normal nonpregnant, nonlactating woman on a calcium intake of about 0.5 or 0.6 Gm daily. However, during the later months of pregnancy the daily calcium require-

Hypocalcemia of this degree results from severe calcium deficiency continued throughout the period of gestation superinduced on a shortage in the calcium reserve at the onset of pregnancy. Although the combination represents an extreme form of calcium deficiency perhaps never encountered in the United States, we may nevertheless inquire whether the less marked but more common degrees of hypocalcemia do not likewise reflect calcium deficiency, though obviously of less severity. It seems, however, that this interpretation has been generally avoided by other writers.

In relation to the normal standards for nonpregnant women calcium concentrations below 9 mg are definitely subnormal. It is therefore significant that fully 50 per cent of the women examined by Plass and Bogert<sup>29</sup> during the last five months of pregnancy showed calcium levels below 9 mg. Such low values were much less frequently recorded in Mull and Bill's analyses.<sup>30</sup> In our studies (Bodansky, Campbell and Ball<sup>31</sup>) the highest incidence of subnormal calcium values (less than 9 mg per hundred cubic centimeters) occurred in the ninth lunar month, when it comprised 24 per cent.

It was not possible to relate all the low values to dietary calcium deficiency nor were all of the concentra-

TABLE 2—Relation of Maternal Parathyroid Deficiency to Fetal Development and Mineral Composition

Rat and Litter Number (MJ Series)	Maternal Blood			Number in Litter	Weight of Litter Gm	Composition of Offspring			Calcium Consumed by Mother During Gestation Gm	Calcium Stored by Fetus Gm
	Calcium Mg. per 100 Cc	Pho. phorus Mg. per 100 Cc	Phospha- ta to Ca Bodansky Units			Ash Percentage	Calcium Percentage	Phosphorus Percentage		
Normal Animals										
375 F	10.8	7.3	17.8	11	5	17.0	0.218	0.313	1.60	0.180
421 F	9.0	5.4	16.7	11	5	16.2	0.205	0.285	1.86	0.112
Parathyroid Deficient Animals										
978 F	3.0	9.8	4.8	8	11	17.0	0.204	0.290	1.46	0.049
434 F	4.0	10.8	10.6	11	1	14.7	0.111	0.264	1.71	0.045
448 F	3.0	11.08	7.1	8	2.6	14.7	0.174	0.215	1.64	0.067

Diet 7 of Cox and Imboden<sup>24</sup> (calcium 0.4% per cent and phosphorus 0.49 per cent) was given.

ment increases to about 1.5 to 2 Gm (Coons and her associates,<sup>32</sup> Lovcrud,<sup>33</sup> Macy<sup>34</sup>). The dietary habits of a large proportion of women do not change sufficiently during pregnancy to assure the higher level of intake (Coons,<sup>34</sup> Sontag<sup>35</sup>) and consequently considerable variability in nutritional status may be expected. The extent to which the calcium concentration of the serum is influenced by the amount of calcium in the food is obviously a question of much importance.

The lowest values that have been reported in human subjects which may be definitely attributed to calcium deficiency were those obtained by Maxwell<sup>28</sup> in his study of osteomalacia among pregnant Chinese women. He found that the daily calcium intake among the poorest patients was often as low as 0.1 to 0.2 Gm a day. In these women tetany regularly developed at term, the calcium content declining to as low as 3.6 mg per hundred cubic centimeters.

tions above 9 mg in persons receiving an adequate diet. From these observations and from our experimental studies on the rat it seems that for a considerable range of calcium intake, not excluding moderate grades of deficiency, the calcium content of the serum is relatively unaffected. This is partly in accord with the conclusion of Pyle and his associates,<sup>31</sup> that the level of calcium in the food has little effect on the calcium level of the blood. We believe, however, that, barring parathyroid deficiency, values below 8.5 mg, and certainly below 8 mg, are essentially the result of calcium and of vitamin D deficiency.

#### SEASONAL EFFECTS

Mull and Bill<sup>30</sup> found that the values for calcium in the serum for all stages of gestation were on the average higher from June to December than from January to May. We have charted our results according to the month of the year and the month of gestation (fig. 1). The average values for calcium began to decline in November and reached a minimum during

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38 Mathieu Franz Contribution a l'etude de la tetanie de l'oestrus chez les animaux thyroparathyroïdectomises Action du principe Gonad trophe de l'urine gravidique sur la tetanie et la calcémie de chiennes thyroparathyroïdectomises *Compt rend Soc de biol* **113** 903 (May 27) 1933

offspring of normal and parathyroid-deficient rats. The latter are almost invariably smaller than normal and are otherwise retarded in development. Frequently, though not invariably, the ash content and especially the calcium content are low (table 2). It would seem that these abnormalities are specifically related to the hypocalcemia in the mothers and the consequent low calcium level of the fetal circulation.

#### CONCLUSIONS AND DEDUCTIONS

If the difference in the calcium concentration of the blood on the fetal and the maternal side of the placental barrier were explained, it would contribute materially to a fuller comprehension of the regulation of the calcium in the blood during pregnancy. First, it is necessary to reconcile the depressed calcium level in the maternal circulation with the apparent increase in maternal

guesses as pregnancy advances and is relieved soon after it is terminated, may be dependent on some intrinsic factor. It is logical to look to the placenta as the possible source of such a substance. Tangible evidence is lacking, however, since the results obtained so far have lacked uniformity. While certain observers (Frommer,<sup>40</sup> Mathieu<sup>46</sup>) have induced active tetany in animals with latent tetany (question of calcium depression), others have recorded a calcium-elevating effect (Bomskov and Bremm,<sup>40</sup> Peritz<sup>44</sup>).

It has been found that in the cow the fetal part of the placenta, especially early in pregnancy, is richer in calcium than the maternal part (Fenger<sup>45</sup>), from which it may be generalized that the fetal placenta serves as a reservoir of calcium, mobilizable perhaps by the fetal parathyroid gland, or by some other mechanism, for use in fetal development of bone. Work now in progress prompts us to suggest that a relative elevation of fetal serum calcium may be desirable, promoting normal fetal development of bone.

Bakwin<sup>46</sup> in a recent discussion of tetany in the newborn explains the tendency to hypocalcemia and the attendant hyperphosphatemia on the basis of hyporeactivity of the parathyroid glands at birth. It is, however, conceivable that another factor in the causation of hypocalcemia in the newborn may be the withdrawal of the labile calcium reserve of the fetal placenta. There is the additional possibility, however remote, that in acquiring independent existence the newborn infant is deprived of some other placental factor which in intra-uterine life helps to maintain the higher calcium level.

Figure 2 represents an attempt to integrate tentatively, the known and hypothetical relations involved in the regulation of the calcium level, particularly in the maternal circulation. It is presented at this time primarily for the purpose of indicating the direction for future research.

#### SUMMARY

Within certain limits (not lower than 8.0 mg) the depression of calcium in the serum observed in late pregnancy may be considered a normal condition, conducive perhaps to a greater economy of utilization of calcium derived from food and maternal bodily reserves.

Severe hypocalcemia during pregnancy may reflect either parathyroid deficiency or marked nutritional deficiency. Both are comparatively rare in ordinary clinical experience. The importance of the parathyroid glands in the regulation of the calcium content becomes especially impressive in the parathyroid-deficient pregnant animal at term.

Abnormalities in fetal skeletal development occur if hypocalcemia is severe, as shown by the results in experimental parathyroid deficiency and in clinical osteomalacia (Maxwell's studies<sup>28</sup>). The somewhat elevated calcium level in the fetal circulation may therefore be looked on as normal for fetal development.

Nutritional, hormonal and seasonal factors influence the maternal calcium level. The influence of season may be only partly related to the amount of available sunshine.

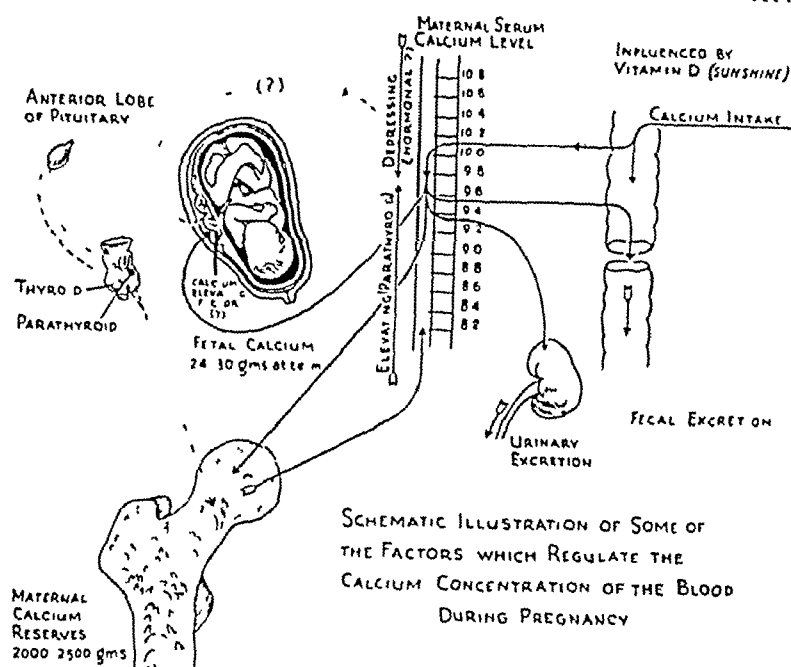


Fig. 2.—The solid lines indicate migration of calcium; the broken line hormonal influences.

parathyroid activity. Second, an explanation must be found for the elevated calcium level of the fetus, which presumably receives no parathyroid hormone from the mother (Hoskins and Snyder<sup>43</sup>) and in which parathyroid function is generally thought to be held in abeyance.

It is relevant to point out that the difference between the maternal and the fetal calcium level is independent of the protein content, which is in fact lower on the fetal than on the maternal side of the placental barrier. Physicochemical considerations based on distribution of protein cannot be invoked, therefore, to explain the difference.

A significant observation is that after birth the calcium content of the mother rises, whereas that of the offspring declines, often abruptly.

We may look on a moderately lowered calcium level in the gravid organism as a normal and, within limits, even a desired condition, conducive perhaps to a greater economy of utilization of the dietary and reserve calcium. Accordingly, it is possible that the depression in the calcium content of the maternal blood, which pro-

43. Hoskins, I. M. and Snyder, F. F. Calcium Content of Maternal and Fetal Blood Serum Following Injection of Parathyroid Extract in Fetuses in Utero. *Proc. Soc. Exper. Biol. & Med.* 25: 264 (Jan.) 1928.

44. Peritz, Georg. Ueber das Nebenschilddrüsenhormon und über die Frage seines Vorkommens in anderen Organen. *Deutsche Med. Wchnschr.* 2: 1354 (Aug. 26) 1932.

45. Fenger, J. The Chemical Composition of the Placenta. *J. Biol. Chem.* 29: 19 (Feb.) 1917.

46. Bakwin, Harry. Pathogenesis of Tetany of the New Born. *Am. J. Dis. Child.* 54: 1211 (Dec.) 1937.

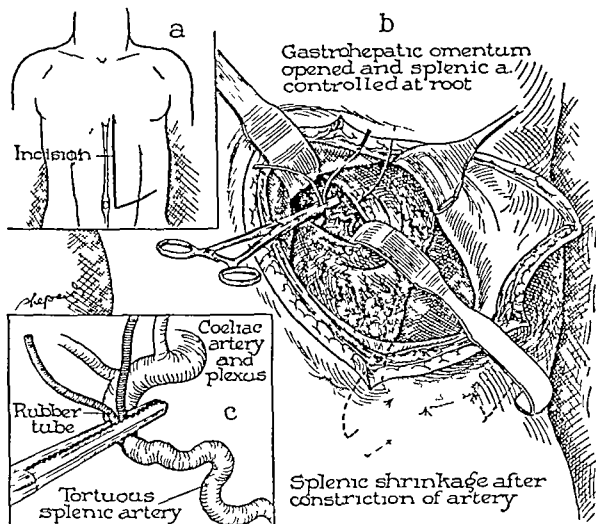
It is possible that in pregnancy the maintenance of a subnormal calcium level in the maternal serum, as judged by nonpregnancy standards, despite the augmentation in parathyroid function, is dependent on an intrinsic calcium-depressing factor. The maintenance of a relative elevation of calcium in the fetal serum may also indicate the participation of some factor in the fetal organism independent of the fetal parathyroid glands. The rise in the maternal calcium level after parturition and the decline in that of the newborn infant suggest that these factors may reside in the maternal and fetal portions of the placenta respectively, each playing a distinct and important role in the regulation of the maternal and the fetal calcium level. The decline in calcium content observed in the newborn may also be conditioned by the sudden withdrawal of the labile calcium reserve of the fetal placenta.

## Clinical Notes, Suggestions and New Instruments

### TEMPORARY COMPLETE CONTROL OF THE MAIN BLOOD SUPPLY AS A PRELIMINARY STEP IN DIFFICULT SPLENECTOMIES

EDWIN M. MILLER, M.D., CHICAGO

Splenectomy may be a very simple or a very hazardous procedure. I have found that a difficult splenectomy may be much simplified by complete control of the main blood supply as the first step in the operation. With the stomach emptied by aspiration immediately before operation, the lesser curvature is easily



Simple and effective means of temporarily shutting off practically all of the blood supply to the spleen during difficult splenectomies

retracted downward toward the left and the tortuous splenic artery is identified close to its origin (b). A piece of small soft rubber tubing is then passed around the artery at this point and an artery forceps is placed across the tubing so as to shut off completely the main blood supply during the operation (c). Immediately the huge spleen can be seen to diminish greatly and one may then proceed with splenectomy in the usual way, without fear of hemorrhage. After the spleen has been removed and the vessels at the pedicle have been securely tied off, the rubber tubing is removed from the splenic artery.

Actual ligation of the splenic artery has often been done as a substitute for splenectomy and for many years has been carried out as a preliminary step during splenectomy, but such a procedure may deprive the pancreas of a considerable amount of its blood supply if performed very near the coeliac axis and if

done near the tail of the pancreas, may be technically difficult. I have therefore chosen to employ this very simple and effective means of temporarily shutting off practically all the blood supply to the spleen and thus making difficult splenectomies relatively simple procedures.

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### ESOPHAGEAL OBSTRUCTION RESULTING FROM AN INJUDICIOUS METHOD OF INGESTING A HYGROSCOPIC GUM LAXATIVE (SARAKA)

ESOPHAGOSCOPIC REMOVAL

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In the practice of medicine and surgery, emergency conditions arise that call for treatment though the conditions have never been seen before, but if similar conditions have been reported by others and the means of handling them have been described, they become much simpler. It is for this reason that I am reporting a case of sudden esophageal occlusion due to the ingestion of Saraka, a hygroscopic gum laxative, which resulted in an extremely uncomfortable and progressive condition because of its progressive swelling.

Mrs. H. B., aged 59, had been taking Saraka as a laxative. She took 1 or 2 drachms (4 or 8 Gm.) each day by putting a drachm on the back of her tongue and helping it down with a glass of water. She did not object to the taking of the Saraka but considered it as a means to an end (relieving constipation). Nov. 16, 1937, she hurried things along by swallowing 1 drachm and immediately swallowing the second drachm with only a small amount of water.

Almost immediately after swallowing the second drachm she experienced the sensation of obstruction, inability to swallow, some substernal pain which increased as time progressed and a feeling of fullness and distention as though her insides were being forced apart. Water was tried but was immediately regurgitated. Dr. J. H. Berge, who was called, sent the patient to the Seattle General Hospital and called me in. He stated the facts of the case as reported and told me that Saraka is a gum laxative which cannot be dissolved except with inorganic acids—information given to him by his druggist. He also stated that an article in *THE JOURNAL*<sup>1</sup> had reported a case in which the Saraka had been removed by breaking up the mass and scooping it out through an esophagoscope.

Not having time to find and review the article I experimented with Saraka before seeing the patient. I found that it could not be aspirated through the regular esophageal aspirating tube but that it could be aspirated through a stiff rubber tube which would just fit a 10 mm. esophagoscope. Our decision was to try this and then break up the mass if necessary with a forceps. This procedure worked beautifully until a mass which later proved to be 1 inch (2.5 cm.) in diameter by 1 3/4 inches (4 cm.) in length remained as a plug at the cardia. This could not be broken up but was movable; the aspirating tube going all the way around it. In desperation I forced the end of the instrument against the mass and applied the end of the aspirating tube against the mass and gently pulled esophagoscope, aspirating tube and mass out together. The esophagoscope was reinserted and the esophagus was found to be clear, no apparent damage had been done. About two thirds of a pint (330 cc.) of gelatinous material was recovered with the plug.

It has now been seven months since this occurred and the patient has experienced no esophageal symptoms of any kind, outside of constipation, which is not now being treated with Saraka; she has been in good health.

The condition was due to haste in carrying out the directions given, but it emphasizes the danger in administering a hygroscopic gum laxative and the necessity for exact instructions and the importance of rigidly following these instructions.

According to the report of the Council on Pharmacy and Chemistry of the American Medical Association, Saraka owes its activity to the elements—an indigestible gum called bassorin, which has the power to absorb water and increase greatly in bulk and the drug frangula, which is much like cascara.

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<sup>1</sup> Goldman, J. L. Esophageal Obstruction from a Hygroscopic Gum Laxative (Saraka). *J. A. M. A.* 108:1408 (April 24) 1937.



**Special Clinical Article****THE RATIONAL CONSIDERATION OF  
PERIPHERAL VASCULAR DISEASE**

BASED ON PHYSIOLOGIC PRINCIPLES

CLINICAL LECTURE AT SAN FRANCISCO  
SESSION

ALTON OCHSNER, M.D.

AND

MICHAEL DeBAKEY, M.D.

NEW ORLEANS

The rapid strides that have characterized the developments in the treatment of peripheral vascular disease during the past decade have been due in the main to a more rational comprehension of the disease process. Whereas previously studies were based on the apparent anatomic-pathologic changes, the recent concept emphasizes the less obvious alterations in physiologic function. The recognition of the associated fundamental physiologic derangement has permitted an approach toward accuracy in prognosis and efficacy in therapeutics.

Peripheral vascular disease signifies simply a disturbance or actual diminution in the normal amount of circulating blood to a part. This is usually due to a decrease in the intraluminal volume of the peripheral vessels and may be caused by two factors operating either singly or together depending on the type and stage of disease: (1) obliterative structural change in the vessels and (2) abnormal vessel spasticity. Whereas the former is an unalterable pathologic lesion, the latter represents a physiologic or functional disorder which can be satisfactorily influenced by appropriate therapy. Thus it is obvious that a rational consideration of peripheral vascular disease is possible only from a pathologic-physiologic standpoint which forms the basis of the following classification: (1) vasospastic functional disease, (2) vasospastic organic disease, and (3) organic degenerative disease. The presence or absence of vessel spasticity obviously forms the basis of this classification and its decisive importance is clearly understood when one realizes that it is the one controllable factor and therefore of prognostic and therapeutic significance. Since the degree of vasospasm varies in each case, it is necessary to determine not only its presence or absence but also its extent. Thus it becomes increasingly important that some simple and accurate diagnostic means or methods be developed for such determinations.

Although a detailed survey of the various procedures designed during the past decade by investigators all over the world for studying vasospasm is beyond the scope of this presentation, it is considered desirable to review them briefly. Since vasospasm is a physiologic function of the autonomic nervous system, the fundamental principle of most of these procedures is the same and allows them to be classified on this basis into two groups: (1) temporary interruption of impulses over the sympathetic pathways by anesthesia and (2) the use of some physiologic stimulus to produce transient inhibition of sympathetic tone. A detailed classification is given in table 1. After the vasospastic influences are removed or diminished by one of the methods listed,

the effect on the peripheral blood supply is determined by the objective methods shown in table 2.

It has long been a well established fact that interruption of impulses in a peripheral nerve results in increased temperature of the cutaneous areas supplied by that nerve.<sup>1</sup> Conduction block of the peripheral nerve by infiltration with procaine hydrochloride has been used as a diagnostic procedure in determining the vasospastic influence in peripheral vascular disease. Lewis,<sup>2</sup> White,<sup>3</sup> Morton and Scott<sup>4</sup> and de Takats.<sup>5</sup> The injection into the peripheral nerve of procaine hydrochloride is indicated in relatively few cases because of technical difficulties and because of trauma to the nerve itself and the surrounding tissue which in persons with a basal blood supply is a potential danger. We have observed several cases in which this diagnostic procedure was used with consequent tissue necrosis, ulceration, secondary infection and eventual gangrene of the extremity requiring amputation.

The injection of an analgesic agent into the subarachnoid space also can be used to produce interruption of sympathetic impulses to the lower extremity. Spinal analgesia for this purpose has been recommended by Brill and Lawrence,<sup>6</sup> Morton and Scott,<sup>7</sup> and White.<sup>8</sup> While it may be justified during an operative procedure, its use is not warranted as a routine diagnostic test in cases of peripheral vascular disease because of its potential dangers and because it interrupts all the regional pain impulses, with consequent difficulty in evaluating the significance of the vascular occlusion.

As the vasospastic impulses are conducted over the sympathetic nervous system, the ideal procedure for determining the degree of vasospasm would be one which completely interrupted only these impulses to the involved area. Such a procedure can be performed with relative facility and safety by a procaine hydrochloride block of the ganglions where the pathways over which these impulses travel converge. Leriche<sup>9</sup> in 1927 was the first to advocate this as a diagnostic procedure in determining the extent of vasodilatation in peripheral vascular disease and it has since been popularized by White,<sup>8</sup> Flothow,<sup>10</sup> de Takats,<sup>5</sup> and us.<sup>11</sup>

- 1 Mitchell S. Weir. The Influence of Nerve Lesions upon Temperature. Arch. Sc. & Pract. Med. 1: 151, 1873.
- 2 Braun H. Experimentelle Untersuchungen über Leitungsanästhesie. Arch. f. klin. Chir. 71: 179, 1903.
- 3 Wiedhoff O. Experimentelle Untersuchungen über die Wirkung der perirarteriellen Sympathectomie und der Nervenverbindung auf die Gefässe der Extremitäten. Beitr. z. klin. Chir. 130: 399, 1923.
- 4 de Takats Geza. Local Anesthesia. Philadelphia: W. B. Saunders Company, 1928.
- 5 Lewis Thomas and Landis E. M. Some Physiological Effects of Sympathetic Ganglionectomy in the Human Being and Its Effect in a Case of Raynaud's Malady. Heart 15: 151 (Mar), 1930.
- 6 Lewis Thomas. Vascular Disorders of the Limbs Described for Practitioners and Students. New York: Macmillan Company, 1936.
- 7 Lewis Thomas. Experiments Relating to the Peripheral Mechanism Involved in Spasmodic Arrest of the Circulation in the Fingers: a Variety of Raynaud's Disease. Heart 15: 7 (Aug.), 1929.
- 8 White J. C. Diagnostic Novocain Block of the Sensory and Sympathetic Nerves. A Method of Estimating the Results Which Can Be Obtained by Their Permanent Interruption. Am. J. Surg. 9: 264 (Aug.) 1930.
- 9 Morton John J. and Scott W. J. Merle. Methods for Estimating the Degree of Sympathetic Vasoconstriction in Peripheral Vascular Diseases. New England J. Med. 204: 925 (May 7) 1931.
- 10 The Quantitative Determination of Vasoconstrictor Spasm as a Basis for Therapy in Peripheral Arterial Diseases. Ann. Surg. 96: 754 (Oct.) 1932.
- 11 de Takats Geza. The Differentiation of Organic and Spastic Vascular Occlusions. Ann. Surg. 94: 321 (Sept.) 1931.
- 12 Brill Selling and Lawrence L. B. Changes in Temperature of the Lower Extremities Following the Induction of Spinal Anesthesia. Proc. Soc. Exper. Biol. & Med. 27: 728 (May) 1930.
- 13 Morton J. J. and Scott W. J. M. The Measurement of Sympathetic Vasoconstrictor Activity in the Lower Extremities. J. Clin. Investigation 9: 235 (Oct.) 1930.
- 14 White J. C. Diagnostic Blocking of Sympathetic Nerves to Extremities with Procaine. J. A. M. A. 94: 1382 (May 3) 1930.
- 15 Leriche Rene. Personal communication to the authors.
- 16 Leriche Rene and Fontaine Rene. L'anesthésie insoude du ganglion étoilé: sa technique ses indications ses résultats. Presse méd. 42: 849 (May 23) 1934.
- 17 Flothow P. G. Diagnostic and Therapeutic Injections of the Sympathetic Nerves. Am. J. Surg. 14: 591 (Dec.) 1931.
- 18 Ochsner Alton and DeBakey Michael. Diagnostic Significance of Novocain Block of the Cervicodorsal Sympathetic Ganglions. Description of a New Technique to be published.

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Read in the Surgical Division of the General Scientific Meetings at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 14, 1933.

In the lower extremity this block is accomplished by the injection of the second, third and fourth lumbar ganglions on the affected side with procaine hydrochloride by the Labat<sup>12</sup> or the Kappis<sup>13</sup> technic. Although the posterior approach also may be employed for the upper extremity<sup>14</sup> the anterior approach, i.e. injection of the stellate ganglion directly,<sup>11</sup> is preferable in our opinion because of its greater facility.

General anesthesia has long been known to exert a vasodilatory effect.<sup>15</sup> Because of this, Morison and Scott<sup>4</sup> suggested general anesthesia as a diagnostic method of demonstrating the presence or absence of vasospasm. However, general anesthesia is undoubtedly not justified as a routine diagnostic measure because of the discomfort which it causes the patient, because of the added risk of the anesthesia itself and because it obviously does not produce complete generalized vasodilatation. Probably the only cases in which general anesthesia is justified as a diagnostic procedure in determining the degree of vasospasm are, as suggested by White,<sup>16</sup> those in which there is an obvious vasospastic functional disease for which an operative procedure is indicated. After the induction of the anesthesia but before the operation is performed, the degree of vasodilatation can be determined relatively quickly, and the anesthesia need be prolonged very little.

A number of other methods can be employed to relieve vasospastic influences. These probably produce an inhibition of the sympathetic impulses to the peripheral vessels resulting in their decreased vascular tone. The artificial induction of fever following injection of foreign protein was used first by Brown<sup>17</sup> in 1926 and

Although Brown deserves considerable credit for calling attention to the necessity of determining the degree of vasospasm, injection of foreign protein as a routine diagnostic procedure is considered undesirable because of the severe reaction, the extreme discomfort experienced by the patient and the fact that complete generalized vasodilatation is obviously not produced.

TABLE 2—Methods for Determining Effect of Vasospasm on the Peripheral Blood Supply

I	Calorimetric
A	Thermocouple
B	Mercury thermometer
II	Oscillometric
A	Pachon's method
B	Recording
III	Plethysmographic
A	Arterial
B	Arteriolar
IV	Vascular visualization
A	Direct Microscopic examination of capillaries
B	Indirect Arteriograms

The fact that a slight increase (from 0.01 to 0.04 degree C) in the temperature of the blood, as shown by Pickering,<sup>20</sup> produces vasodilatation in the skin through the action of the central heat-regulating mechanism has led to the development of several simple tests for determining the degree of vasospasm. Lewis and Pickering<sup>21</sup> first utilized this fundamental principle for such a purpose by placing the patient's body in a cabinet heated by electric light bulbs. A somewhat similar procedure has been recommended by Collier and Maddock<sup>22</sup> and consists of wrapping the patient up to the clavicular line in three woolen blankets and a rubber sheet. Landis and Gibbons<sup>23</sup> have developed an even simpler test in which the uninvolved arms or legs are immersed in warm water (45 C for thirty-five minutes) while the extremities to be tested are not exposed to heat. The chief disadvantages of these methods are the discomfort caused the patient, the fact that complete generalized vasodilatation undoubtedly cannot be produced and the fact that a room with constant temperature and controlled humidity is required. However, the application of heat to a relatively small portion of the body, as in the immersion of the legs in warm water when the upper extremities are involved, is a relatively simpler and more generally applicable method. The procedure recently proposed by Reynolds<sup>24</sup> of determining the ability of the peripheral arterial system to dilate and to carry off heat applied to it by diathermy cannot be considered justifiable. The disadvantage and even danger of such a method lies in the fact that, everything else being equal, the poorer the blood supply to an extremity the higher will the temperature of the part become because of the diminished vascularity and the consequent inability of the circulating blood to carry off the increased heat. The fact, too, that the subjective changes experienced by the

TABLE 1—Procedures for Studying Vasospasm

I	Interruption of sympathetic impulses by analgesia or anesthesia
A	Localized (procaine hydrochloride)
1	Peripheral nerves
2	Spinal cord
3	Sympathetic ganglions
B	General anesthesia
1	Inhalation
(a)	Ether
(b)	Nitrous oxide
2	Intravenous
3	Rectal
II	Inhibition of sympathetic tone
A	Physical (heat)
1	Indirect Injection of foreign protein
2	Direct application
(a)	Generalized Increased environmental temperature
(b)	Localized
(1)	Involved area
(2)	Uninvolved area
B	Physiologic Reactive hyperemia
C	Pharmacologic
1	Alcohol
2	Nitrites

was one of the first diagnostic methods advocated for determining the degree of vasospasm in peripheral vascular disease. It has subsequently been used by Allen and Smithwick<sup>18</sup> and by Crisler and Horton<sup>19</sup>

- 12 Labat Gaston. *Textbook of Regional Anesthesia*. Philadelphia: W. B. Saunders Company, 1928.
- 13 Kappis M. Ueber Leitungsanästhesie am Bauch, Brust, Arm und Hals durch Injektion ans Foramen intervertebrale. *München med. Wchnschr.* 59: 794, 1912.
- 14 White<sup>8</sup> Flothow<sup>10</sup>
- 15 Ipsen Johannes. Les arteres et l'anesthésie. *Acta chir. Scandinav.* 65: 487, 1929. Fojed Jens. Influence of Various Anesthetics on Peripheral Blood Vessels. *Hospitalstud.* 72: 983, 1003, 1031, 1929. Morison and Scott.
- 16 White James C. *The Autonomic Nervous System*. New York: Macmillan Company, 1935.
- 17 Brown G. E. The Treatment of Peripheral Vascular Disturbances of the Extremities. *J. A. M. A.* 87: 379 (Aug. 7) 1926.
- 18 Allen A. M. and Smithwick R. H. Use of Foreign Protein in the Treatment of Peripheral Vascular Diseases. Results of Intravenous Injections of Typhoid Vaccine. *J. A. M. A.* 91: 1161 (Oct. 20) 1928.
- 19 Crisler G. R. and Horton B. T. Differential Effect of Fever on Digits in Thrombo-Angitis Obliterans and in Raynaud's Disease. *Proc. Staff Meet. Mayo Clin.* 11: 486 (July 29) 1936.

20 Pickering G. W. The Vasomotor Regulation of Heat and Loss from the Human Skin in Relation to External Temperature. *Heart* 16: 115 (July) 1932.

21 Lewis Thomas and Pickering G. W. Vasodilatation in the Limbs in Response to Warming the Body. With Evidence for Sympathetic Vasodilator Nerves in Man. *Heart* 16: 33 (Oct.) 1931.

22 Collier Fred A. and Maddock Walter G. The Differentiation of Spastic from Organic Peripheral Vascular Occlusion by the Skin Temperature Response to High Environmental Temperature. *Ann. Surg.* 96: 719 (Oct.) 1932.

23 Gibbon J. H. Jr. and Landis E. M. Vasodilatation in the Lower Extremities in Response to Immersing the Forearms in Warm Water. *J. Clin. Investigation* 11: 1019 (Sept.) 1932. A Simple Method of Producing Vasodilatation in the Lower Extremities. *Arch. Int. Med.* 52: 785 (Nov.) 1933. Landis E. M. Observations on the Diagnosis and Treatment of Peripheral Vascular Disease. *Ann. Int. Med.* 8: 282 (Sept.) 1934.

24 Reynolds Gardner S. A Proposed New Diagnostic Test for Peripheral Arterial Insufficiency. *Minnesota Med.* 20: 236 (April) 1937.

patient form the criterion of the test makes it less accurate than the more objective methods

Bier<sup>25</sup> and Moskowitz<sup>26</sup> made the original observations that immediately after the release of circulation to a part, when the circulation has previously been arrested for a few moments, there appears a bright flush (reactive hyperemia), which rapidly spreads distally. The intensive studies of Lewis and Grant<sup>27</sup> led them to believe that this phenomenon is due mainly

are theobromine,<sup>31</sup> acetyl  $\beta$ -methylcholine<sup>32</sup> and sodium nitrite<sup>33</sup>. While such drugs have the advantage of being easily administered, with little or no discomfort to the patient, a distinct disadvantage of their use is that the effect is generalized, which is unnecessary, and since it is generalized it obviously cannot be complete without a marked fall in blood pressure.

The extent of vasodilatation resulting from release of vasospastic influence by the various procedures

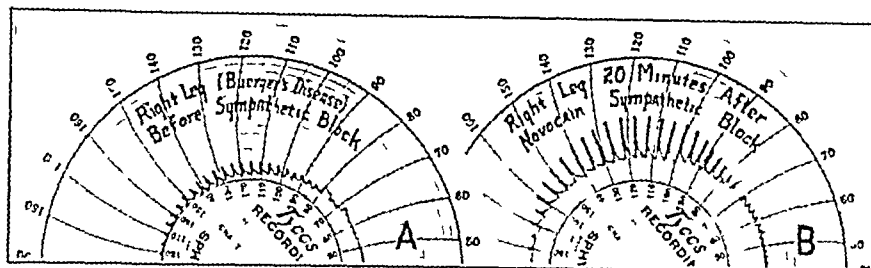


Fig. 1—Oscillometric graphs of a patient with vasospastic organic disease of the lower extremities. A before sympathetic block the oscillometric index is approximately 1.75. B twenty minutes after procaine hydrochloride block of the right lumbar sympathetic the considerable increase in pulse volume demonstrated by an increase in the oscillometric index from 1.75 to 5.25 clearly reveals the presence of vasospasm.

to the accumulation of chemical substances in the tissues during the period of circulatory arrest. These fundamental principles form the basis for the development of the reactive hyperemia tests as used and advocated by Lewis, Pickering and Rothschild<sup>28</sup> in the determination of vasomotor tone. The test is performed in a room with a temperature of 20 C or over with the subject comfortably warm. The extremity to be tested is elevated and the circulation abruptly arrested by inflating above systolic pressure a sphygmomanometer cuff applied to the arm or thigh. After the extremity is lowered to the horizontal position and five minutes is permitted to elapse, the pressure is released. The course of the flush is observed. In normal subjects and patients with pure vasospastic functional conditions the flush reaches the tip of the digits within five to fifteen seconds and rapidly disappears. However, in patients with organic change in the vessels the flush spreads slowly, occasionally requiring a minute or more, usually has a cyanotic hue and frequently lasts for a longer period.

Certain drugs are known to have a vasodilatory action and therefore have been used diagnostically as well as therapeutically. The vasodilatory effect of alcohol has been repeatedly observed,<sup>29</sup> and the optimum dose for maximum vasodilatation has been estimated to be 0.5 cc per kilogram of body weight.<sup>30</sup> Other drugs that have been found to produce this effect

obtained by means of either a mercury thermometer or a thermocouple, but the latter is by far the more accurate. However, it is necessary that these observations be made in a room with constant temperature and controlled humidity.

The determination of peripheral pulsations is of diagnostic importance in cases of peripheral vascular disease because diminution in pulsation may be due to decrease in intraluminal volume consequent to either organic occlusion or vasospasm. The extent of vascular expansive pulsations can be determined by oscillometric or plethysmographic methods. Pulsations in larger vessels can be determined either by the Pachon method or by the recording oscillogram. The disadvantage is that determinations so obtained represent

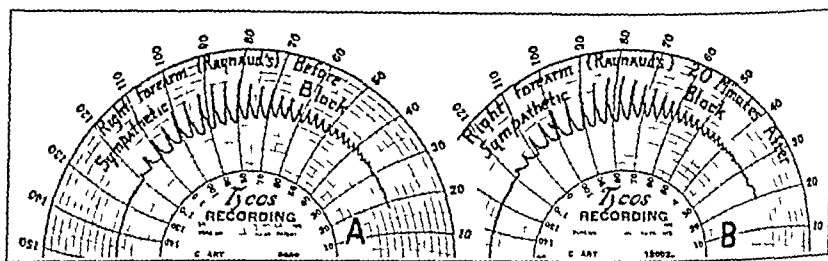


Fig. 2—Oscillometric graphs of a patient with vasospastic functional disease of the upper extremities. A before sympathetic block the oscillometric index approximately 5.5 is apparently normal. B twenty minutes after procaine hydrochloride block of the right cervicothoracic sympathetic the oscillometric index is practically the same as before the block. However the acceptance of these observations as indicating absence of vasospastic influence would be misleading as is clearly demonstrated by figure 3.

pulsations of the large vessels in the main and are of little or no value when the disease is more peripheral. On the other hand, pulsations of the smaller vessels can

25 Bier August "Die Entstehung d. collateral Kreislaufs" Virchows Arch f. path. Anat. 147: 256-447 1897.

26 Moskowitz Ludwig "Die Diagnose des Arterienverschlusses bei Gangrena pedis" Mitt. d. Grenzgeb. d. Med. u. Chir. 17: 216 1907.

27 Lewis Thomas and Grant Robert "Observations on Reactive Hyperemia in Man" Heart 12: 73 (June) 1925.

28 Lewis Thomas, Pickering W. W. and Rothschild Paul "Observations upon Muscular Pain in Intermittent Claudication" Heart 11: 151 (April) 1924. Pickering George W. "On the Clinical Recognition of Structural Disease of the Peripheral Vessels" Brit. M. J. 2: 1106 (Dec. 6) 1933.

29 Miles W. R. "Alcohol and Human Efficiency" Experience with Moderate Quantities and Dilute Solutions of Ethyl Alcohol on Human Subjects. Carnegie Institution of Washington, 1924.

30 Cook F. N. and Brown G. E. "Vasodilating Effects of Ethyl Alcohol on the Peripheral Arteries" Proc. Staff Meet. Mayo Clin. 7: 449 (Aug. 3) 1932.

31 Scaphum C. W. "Some Clinical Observations on the Use of Theobromine in Peripheral Vascular Disease" J. Clin. Investigation 10: 165 (April) 1931.

32 Starr Isaac Jr. "Acetyl  $\beta$ -Methylcholine: Its Action on Paroxysmal Tachycardia and Peripheral Vascular Disease with a Discussion of Its Action in Other Conditions" Am. J. M. Sc. 186: 330 (Sept.) 1933. Britto A. and Lanari, A. Jr. "Inveccion Intraarterial de acetilcolina su valor diagnostico en las afecciones vasculares perifericas" Rev. argen. de cardiol. 3: 31 (March-April) 1936. Kramer David W. "The Use of Acetyl  $\beta$ -Methylcholine Chloride by Iontophoresis in Peripheral Vascular Disease" Am. J. M. Sc. 192: 405 (March) 1937. Goldsmith Grace A. "The Effectiveness of Acetyl  $\beta$ -Methylcholine Given by Mouth as a Vasodilating Agent" Ann. Int. Med. 9: 1196 (March) 1936.

33 de Takats Geza "The Effect of Sympathectomy on Peripheral Vascular Disease" Surgery 2: 46 (July) 1937. Beck W. C. and de Takats Geza "The Use of Sodium Nitrite for Testing the Flexibility of the Peripheral Vascular Bed" Am. Heart J. 15: 158 (Feb.) 1938.

be accurately determined and graphically recorded by means of plethysmographic methods

For the past eight years we have used oscillometricograms in the diagnosis of peripheral arterial disease and have observed that they are of value when the larger vessels are involved but are of little or no diagnostic value when the involvement is more peripheral. This is well illustrated by two of our cases. In one, of vasospastic organic disease, the oscillometric index of the lower extremities was definitely decreased (fig 1 A). After procaine hydrochloride sympathetic block the increased oscillometric index revealed marked vasospasm (fig 1 B). In a case of vasospastic functional disease involving the upper extremity oscillometricograms both before and after injection of procaine hydrochloride into stellate ganglions were normal (fig 2). On the other hand, plethysmographic tracings of the distal phalanges revealed absence of pulsations prior to the procaine hydrochloride sympathetic block (fig 3 A). However, the presence of normal pulsations after the block demonstrated that this was simple, marked arteriolar vasospasm (fig 3 B). Therefore the method employed should depend on the type of lesion suspected, i. e. on whether the lesion involves the larger arteries or the smaller vessels. While oscillometry is of diagnostic value in the former case, plethysmography should be employed when the smaller vessels are involved. Because in the purely vasospastic functional diseases the spasm apparently involves the smaller vessels, particularly those in the fingers, and in the early stages is frequently limited to these small vessels, the ordinary plethysmograph may not record the changes sufficiently accurately. For this reason a very sensitive plethysmograph is necessary. In that respect we have been particularly fortunate in having the cooperation of Dr Turner and his co-workers Drs Sodeman and Buch in studying our cases. With the ingenious and highly sensitive plethysmograph devised by Turner<sup>34</sup> it is possible to measure accurately and record either quick changes in pulse volume as small as 0.1 cu cm or slower changes of relatively greater magnitude, i. e. up to 800 cu mm. Moreover, there is no influence of instrumental origin, such as mechanical pressure, causing constriction and consequent distention or emptying of blood vessels or the production of pain, fear or other discomforts which may modify the physiologic phenomena. Because the portion of the extremity included in this plethysmogram is the phalanx, the apparatus is particularly applicable to the study of changes of volume in the very small vessels (fig 3). Thus it has been possible to make highly accurate determinations of the presence or absence and the degree of vasospasm in small vessels which could not be recorded by previous inadequate and insufficiently sensitive methods. The method of study lends itself as well to the determination of the degree of venous tone which is particularly evident with acrocyanosis.<sup>35</sup>

Visualization of the vascular tree either directly by microscopic examination of capillaries or indirectly by arteriograms will give graphic demonstrations of the status of large and small vessels. The former method was introduced by Lombard<sup>36</sup> in 1912 and has since

been used by a number of investigators.<sup>37</sup> By direct observation it is possible to determine the number and size of capillary loops, the relative rate of blood flow through them signifying the degree of vasospasm or dilatation. However, the application of direct observation as a routine clinical method is somewhat limited because of technical difficulties and the considerable relative variability in individual interpretation.

Roentgenograms taken during and immediately after the intra-arterial injection of an opaque substance indirectly reveal the presence or absence of vasospasm. The Portuguese school, headed by dos Santos and his co-workers,<sup>38</sup> probably has made the most extensive use of such roentgenograms. In this country they were originally made by Pearse and Warren<sup>39</sup> and have been used most intensively by Allen and Camp<sup>40</sup> and Veal.<sup>41</sup> Although they are of undeniable value in the accurate determination of the extent and location of

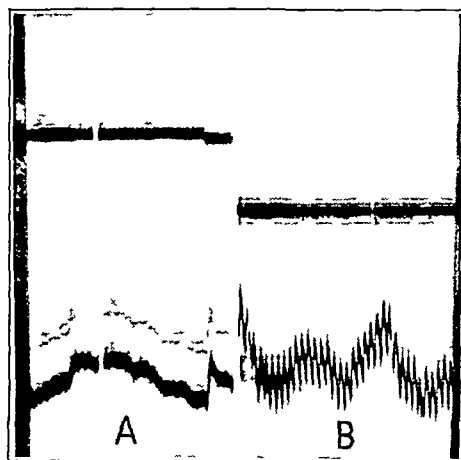


Fig 3—Plethysmographic tracings of the distal phalanx of the patient represented in figure 2. A prior to sympathetic block, pulsations are practically absent. B twenty minutes after procaine hydrochloride block of the cervicodorsal sympathetics the pulsations are now practically normal indicating the marked vasospasm present in the smaller vessels.

vascular occlusion and collateral circulation in the case of peripheral vascular disease when organic changes have occurred, their significance in the case of vaso-

34 Turner Roy H. Studies in the Physiology of Blood Vessels in Man. Apparatus and Methods. I. A Sensitive Plethysmograph for a Portion of the Finger. *J Clin Investigation* 16: 777 (Sept.) 1937.

35 Sodeman W. A. Burch George E. and Turner Roy H. Studies in the Pathology of Blood Vessels in Man. IV. Volume Changes in Human Fingertip Following Sudden Venous Obstruction. *Proc Soc Exper Biol & Med* 36: 259 (April) 1937.

36 Lombard W. P. The Blood Pressure in the Arterioles, Capillaries and Small Veins of the Human Skin. *Am J Physiol* 29: 335 1911.

37 Weiss E. Ueber mikroskopische Kapillarbeobachtung. *Wien klin Wchnschr* 33: 840 (Sept 16) 1920. Muller O. Die Kapillaren der menschlichen Körperoberfläche in Gesunden und Kranken. Stuttgart Ferdinand Enke 1922. Boas E. P. The Capillaries of the Extremities in Acrocyanosis. *J A M A* 79: 1404 (Oct 21) 1922. Wright Irving Sherwood. The Clinical Value of Human Capillary Studies. *J A M A* 101: 439 (Aug 5) 1933. Brown G. E. Observations on Surface Capillaries in Man Following Cervicodorsal Sympathetic Ganglionectomy. *J Clin Investigation* 9: 115 (Aug.) 1930. Leader Sidney D. Capillary Microscopy in Children. *Am J Dis Child* 44: 403 (Aug.) 1932. Duryce A. W. and Wright I. S. Modern Technique for the Study of Human Capillaries. *Am J M Sc* 185: 664 (May) 1933. Roboz P. Beitrage zur Funktionsprüfung der Capillaren. *Klin Wchnschr* 15: 968 (July 4) 1936.

38 dos Santos R. Lamas, C. and Pereira Caldas J. L'arteriographie des membres de l'aorte et de ses branches abdominales. *Bull et mem Soc nat de chir* 55: 587 (May 4) 1929. dos Santos R. La radiographie de las arterias Med Ibera 1: 609 (May 11) 1929. dos Santos R. Lamas C. and Pereira Caldas J. Les recentes progres dans la technique de l'arteriographie de l'aorte abdominale. *Presse med* 39: 574 (April 18) 1931. dos Santos R. and Pereira Caldas J. Les derives du thorium dans l'arteriographie des membres. *Med contemp* 49: 234 (June 28) 1931. dos Santos R. Lamas C. and Pereira Caldas J. L'arteriographie des membres. *Bull et mem Soc nat de chir* 58: 635 (May 7) 1932.

39 Pearse H. E. Jr and Warren S. L. The Roentgenographic Visualization of the Arteries of the Extremities in Peripheral Vascular Disease. *Ann Surg* 94: 1094 (Dec) 1931.

40 Allen E. V. and Camp J. D. Roentgenography of the Arteries of the Extremities. *Proc Staff Meet Mayo Clin* 7: 657 (Nov 16) 1932. Allen E. V. and Camp J. D. Diagnostic Value of Arteriography with Reports of Two Cases. *Minnesota Med* 17: 167 (April) 1934. Allen E. V. and Camp J. D. Value of Arteriography. *Radiology* 22: 678 (June) 1934. Edwards E. A. Status of Vasography. *New England J Med* 209: 1337 (Dec 28) 1933.

41 Veal J. R. and McFetridge Elizabeth M. Arteriography in Gangrene of the Extremities by the Use of Thorium Dioxide (Stabilized). *Ann Surg* 101: 766 (Feb) 1935. Adequate Circulation in the Extremities. *J A M A* 104: 542 (Feb 16) 1935.

spastic functional disease is not great. Moreover, the contrast substances most commonly used iodide compounds and thorium dioxide, for the intra-arterial injection have certain distinct disadvantages. The former is frequently associated with so much pain that the injection must be performed with the aid of an anesthetic, in some instances it probably produces vasospasm which undoubtedly increases damage to vessels, thus diminishing the already impaired circulation. Thorium dioxide is radioactive and becomes indefinitely fixed in the tissues. Several years ago the Council on Pharmacy and Chemistry directed attention to the possible deleterious effect of such radioactive substances.<sup>42</sup> Since then the results obtained in numerous clinical and experimental investigations have emphasized the proclivity of this material to produce damage to tissue.<sup>43</sup>

In addition to these objective methods of determining the presence or absence and the extent of vasospasm there are certain clinical factors which indicate and in some instances influence vessel spasticity (table 3).

It is a well known fact that other things being equal the younger the patient with peripheral vascular disease the greater is the likelihood of vasospasms playing a prominent part. The condition is usually of the vaso-

degenerative type, their total absence being observed more frequently with vasospastic lesions. However, the recent investigations of Reich<sup>44</sup> which clearly demonstrate that pulsation may be absent from one or more of the main vessels of the foot in persons with perfectly normal peripheral circulation, stress the necessity of not placing too much emphasis on such observations in the absence of other evidence of peripheral vascular disease.

Hyperhidrosis, or excessive sweating, is characteristically associated with vasospastic diseases and is an indication of hypertonus of the sympathetic nervous system.<sup>45</sup> It is usually a prominent manifestation of vasospastic functional disease but is rarely observed with degenerative organic conditions.

The most influential factors in vasospastic conditions are emotional excitement, exposure to cold and tobacco smoking. While emotional disturbances are particularly likely to aggravate and even precipitate vasospasm in patients with vasospastic functional disease, they are relatively insignificant in patients with organic lesions. Similarly, exposure to cold is a considerably more important precipitating factor in vasospastic functional conditions, although all peripheral vascular diseases are aggravated by decreases in temperature.

It has long been a well established fact that tobacco smoking produces definite deleterious effects on the vascular system.<sup>46</sup> Numerous investigators have clearly demonstrated that it produces marked vasoconstriction of the peripheral vessels in normal persons as well as in patients with peripheral vascular disturbances.<sup>47</sup> While it is especially harmful to patients with vasospastic functional and vasospastic organic lesions, it probably produces a deleterious effect on patients with degenerative organic disease by affecting the collateral vessels.

As previously stated, peripheral vascular disease merely signifies a disturbance in the normal amount of circulating blood, which in turn is dependent on two factors either or both of which may be present: (1) obliterative structural change and (2) abnormal spasticity. The former is an unalterable pathologic lesion and therefore cannot be effectively influenced by

TABLE 3—Clinical Factors Indicating and Influencing Spasticity

A. Indicative factors	
1	Age
2	Sex
3	Color changes
4	Pulsation
5	Hyperhidrosis
B. Influential factors	
1	Motion
2	Environment
3	Tobacco

spastic functional type in persons less than 30 but of the degenerative organic variety in patients past 50. This applies particularly to females with regard to the former group. Between these two extremes of age are persons in whom organic occlusion is associated with considerable vasospasm. Men are much more prominent in this middle age group. The conditions most typical of the three groups are Raynaud's phenomenon in the first, arteriosclerosis with or without diabetes in the second and thrombo-angitis obliterans in the third.

Certain color changes may indicate the presence or absence of vasospasm, particularly with regard to various positions of the extremity. In vasospastic functional disease the typical triphasic color changes are likely to occur independently of position. In vasospastic organic disease the skin of the extremity presents a prominent paleness in the elevated position and a violaceous discoloration in the dependent position, and in degenerative organic disease the conspicuous cutaneous pallor changes little or not at all in different positions.

The presence or absence of peripheral pulsations is also of undeniable significance. In the purely vasospastic functional disturbances these pulsations are usually perfectly normal. On the other hand, they are most commonly diminished or absent in patients with organic lesions of either the vasospastic or

42 Thorotrast, Preliminary Report of Council on Pharmacy and Chemistry, J. A. M. A. 99:2183 (Dec. 24) 1932.

43 Potential Hazards of the Diagnostic Use of Thorium Dioxide, editorial, J. A. M. A. 108:1656 (May 8) 1937.

44 Reich, R. S. Pulses of Foot. Their Value in Diagnosis of Peripheral Circulatory Disease. Ann. Surg. 99:615 (April) 1934.

45 Poznanski, L. and Kohan, A. Examen des reflexes vegetatifs dans l'endarterite oblitterante. Rev. de chir. 75:5 (Jan.) 1937. Ad. on, Alfred W. Physiologic Effects Produced by Ablation of the Autonomic Central Influence. Various Forms of Sympathectomy in the Treatment of Diseases. Surgery 1:425 (March) 1937.

46 Huchard, Henri. Traite clinique des maladies du coeur et de l'aorte, ed. 3. Paris: G. Doin, 1899. Feb. W. Ueber Dysphasia angiosclerotica. Munchen med. Wochenschr. 51:905 1904. Przewinski, J. Ueber den Einfluss unwillk. Nerven (des Nikotin) auf die Gefasse und das Herz. Ztschr. f. klin. Med. 80:284 1914. Meyer, Willy. The Pathology of Thrombo-Angitis Obliterans. M. Rec. 95:901 (May 31) 1919. Buerger, Leo. Circulatory Disturbances of the Extremities. Philadelphia: W. B. Saunders Company, 1924. Silbert, Samuel. Treatment of Thrombo-Angitis Obliterans by Intravenous Injection of Hypertonic Salt Solution. J. A. M. A. 56:1759 (June 5) 1926.

47 Lee, Emerson. The Action of Tobacco Smoke with Special Reference to Arterial Pressure and Degeneration. Quart. J. Exper. Physiol. 1:35 1908. Bruce, James W. Miller, James R. and Hooker, Donald R. The Effect of Smoking upon the Blood Pressures and upon the Volume of the Hand. Am. J. Physiol. 24:104 1909. Simic, D. and Marcu, I. Recherches plethysmographiques sur l'action vasculaire de la fumee du tabac chez l'homme. J. de physiol. et de path. gen. 25:57 (March) 1927. Kalli, Chino P. and Oppenheimer, B. S. Changes in Peripheral Circulation Accompanying Tobacco Angina. Proc. Soc. Exper. Biol. & Med. 26:9 (Oct.) 1928. Maddock, Walter G. and Collier, Fred A. Peripheral Vasoconstriction by Tobacco and Its Relation to Thrombo-Angitis Obliterans. Ann. Surg. 98:70 (July) 1933. Johnson, H. J. and Short, J. J. The Effect of Smoking on Skin Temperature. J. Lab. & Clin. Med. 10:962 (June) 1934. Wright, I. S. and Moffat, Dean. The Effects of Tobacco on the Peripheral Vascular System. J. A. M. A. 103:18 (Aug. 4) 1934. Lampson, P. S. A Quantitative Study of the Vasoconstriction Induced by Smoking. J. A. M. A. 104:1063 (June 1) 1935. Herrell, W. E. and Cusick, P. L. Vascular and Retinal Abnormalities Following Inhalation of Tobacco Smoke. Preliminary Report. Proc. Staff Meet. Mayo Clin. 13:73 (May 4) 1938.

therapeutic measures, the latter is a physiologic or functional derangement and can be satisfactorily controlled by appropriate therapy. Since vasospasm is the one controllable factor it becomes increasingly obvious that its release must form the basis of efficacious therapy. Thus rational treatment of vascular disease of the extremity consists of (1) the avoidance of those factors which increase vessel spasticity and (2) the institution of measures which produce vasodilatation.

As previously emphasized, the three most important vascular spasmogenic factors are emotional disturbances, exposure to cold and tobacco smoking. These factors are harmful in all cases of peripheral circulatory disturbances, but they are particularly injurious in cases of vasospastic functional or vasospastic organic disease. Obviously, every attempt should be made to avoid emotional excitement such as anxiety, fear and anger. When possible the patient should live in a warm climate, and under any circumstances he should have all the surface of the body protected during cold weather because exposure of one portion of the body is likely to produce a reflex vasoconstriction in other parts. Thus patients with vascular disturbances involving primarily the lower extremities should be careful to protect the upper as well as the lower extremities and during cold weather should wear warm mittens as well as warm socks.

As emphasized, tobacco smoking produces marked vasoconstriction of the peripheral vessels. This process by further diminishing an already impaired peripheral circulation is obviously injurious. Thus in all cases of peripheral vascular disease tobacco smoking must be absolutely prohibited. We have repeatedly observed its spasmogenic significance and it is our firm conviction that of all the precipitating factors it is by far the most important.

In addition to the avoidance of precipitating factors, effective therapy consists in the institution of active vasodilatory measures. These may be classified as (1) conservative and (2) radical. The conservative measures include the administration of vasodilatory drugs, the application of heat, vascular exercises and the induction of reactive hyperemia.

In our experience alcohol is one of the most valuable vasodilatory drugs, as it is simple to administer and readily obtainable. The patient is usually advised to take one or two highballs. In many instances alcohol imbibition and the application of heat as outlined hereafter are sufficient to prevent a vascular catastrophe. Other vasodilatory drugs which have been employed are acetyl- $\beta$ -methylcholine,<sup>48</sup> theobromine<sup>51</sup> and paverine hydrochloride.<sup>49</sup>

The proper application of heat to the body is one of the simplest and yet one of the most efficacious vasodilatory measures. As emphasized, because of the danger of injuring an extremity in which the circulation is diminished, it is desirable not to apply the heat directly to the involved extremity. It has been demonstrated by Lewis and Pickering<sup>50</sup> and emphasized by Gibbon and Landis<sup>23</sup> that the application of heat to a localized portion of the body induces generalized vasodilatation. Thus the patient with a vascular disturbance involving the lower extremity is instructed to immerse the hands and forearms in warm water for from twenty to thirty minutes three or four times daily.

Other conservative measures which have been advocated and may be helpful in the treatment of vasospastic organic lesions are postural exercises as described by Buerger<sup>46</sup> and intermittent venous occlusion.<sup>51</sup> In cases of degenerative organic lesions, passive vascular exercises may also be valuable.<sup>52</sup>

In the presence of marked and progressive vasospasm which is not relieved by conservative measures it may be justifiable to resort to more radical procedures. The concept that in such vasospasm sufficient vasoconstrictor impulses are transmitted over the sympathetic pathways to cause diminished circulation and that the interruption of these impulses may be enough to permit the return of circulation to normal forms the rational basis of sympathectomy.<sup>53</sup> This interruption may be accomplished either by chemical block or by resection. Chemical block may be obtained by the injection of the appropriate paravertebral ganglion with procaine hydrochloride or alcohol. The obvious disadvantage of procaine hydrochloride is the short duration of the block. A satisfactory alcohol block may be secured for a period of from six to eight months but it is not infrequently associated with undesirable sequelae. This applies particularly to the cervicodorsal region, where the proximity of the brachial plexus so increases the likelihood of neuritis of the brachial plexus that the procedure is not justifiable. For this reason sympathetic denervation of the affected part by a surgical procedure, unless there is some definite contraindication to operation, is considered preferable.

While the immediate effect of sympathectomy on vasospastic disease both of the upper and of the lower extremities is almost invariably excellent, it has been observed that the end results in the lower extremities are considerably better than those in the upper.<sup>54</sup> The comparative failure of cervicothoracic sympathectomy to maintain chronic vasodilatation has been attributed to a number of factors. However, the most satisfactory explanation has recently been indicated by White, Freeman and Smithwick<sup>55</sup> and by Ascroft,<sup>56</sup> who directed attention to the significant fact that, after the customary procedure of cervicothoracic ganglionectomy for the upper extremity, degeneration of the postganglionic

51 Collens W S and Wilensky Nathan D. The Treatment of Peripheral Obliterative Arterial Disease. *J A M A* 107 1960 (Dec 12) 1936. Collens W S Wilensky Nathan D and Ginsberg H. Intermittent Venous Occlusion in Peripheral Vascular Disease. *Arch Phys Therapy* 19 261 (May) 1938. de Takats Geza Hick Ford K and Coulter John S. Intermittent Venous Hyperemia in the Treatment of Peripheral Vascular Disease. *J A M A* 108 1951 (June 5) 1937.

52 Landis E M and Gibbon J H Jr. Effects of Alternate Suction and Pressure on Circulation in the Lower Extremities. *Proc Soc Exper Biol & Med* 30 593 (Feb) 1933. Herrmann Louis G and Reid Mont R. The Pavaex (Passive Vascular Exercise) Treatment of Obliterative Arterial Disease of the Extremities. *J Med* 14 524 (Dec) 1933. Herrmann L G. Nonoperative Treatment of Inadequate Peripheral Distribution of the Blood. Passive Exercise and Local Hyperthermia. *J A M A* 105 1256 (Oct 19) 1935.

53 Leriche Rene and Fontaine Rene. *Chirurgie du sympathique*. Rev. *neuro* 1 1046 (June) 1929.

54 Allen Arthur W. Results Obtained in the Treatment of Raynaud's Disease by Sympathetic Neurectomy and in Thrombo-Angitis Obliterans by Desensitization of Peripheral Sensory Nerves. *Ann Surg* 96 867 (Nov) 1932. Jelsma Franklin and Spurling R G. The Role of Sympathetic Nerve Surgery in Vascular Disorders of the Extremities. *Am J Surg* 15 76 (Oct) 1932. Gask G E. The Surgery of the Sympathetic Nervous System. *Brit J Surg* 21 113 (July) 1933. Telford E D. Sympathectomy. A Review of 100 Operations. *Lancet* 1 444 (March 3) 1934. Ross J P. The Results of Sympathectomy. An Analysis of the Cases Reported by Fellows of the Association of Surgeons. *Brit J Surg* 23 433 (Oct) 1935.

55 Smithwick Reginold H Freeman Norman E and White James C. Effect of Epinephrine on the Sympathectomized Human Extremity. *Arch Surg* 29 759 (Nov) 1934. Adrenal Secretion in Man. The Reaction of the Blood Vessels of the Human Extremity Sensitized by Sympathectomy to Adrenalin and to Adrenal Secretion Resulting from Insulin Hypoglycemia. *Am J Physiol* 107 529 (March) 1934. White James C. Surgery of the Sympathetic Nervous System. *J A M A* 107 350 (Aug 1) 1936.

56 Ascroft P B. The Basis of Treatment of Vasospastic States of the Extremity. An Experimental Analysis in Monkeys. *Brit J Surg* 24 787 (April) 1937.

48 Starr<sup>22</sup> Goldsmith<sup>27</sup>

49 de Takats Geza. Acute Arterial Occlusions of Extremities. *Am J Surg* 33 60 (July) 1936.

50 Pickering<sup>24</sup> Lewis and Pickering<sup>25</sup>



neurons occurred with resultant hypersensitization of the denervated vessels to the circulating hormone epinephrine. On the other hand, the conventional lumbar sympathetic ganglionectomy is actually a preganglionic neurectomy permitting the postganglionic fibers to the vessels of the foot to remain intact, thus avoiding degeneration and consequent hypersensitization. These statements are based on the original observations of Elliott<sup>57</sup> and the more recent investigations of Rosenbluth and Cannon,<sup>58</sup> Grant,<sup>59</sup> Hampel,<sup>60</sup> and White, Okelberry, and Whitelaw,<sup>61</sup> who demonstrated by animal experimentation that smooth muscles innervated by the sympathetic nervous system become hypersensitive to epinephrine after denervation.

Basing their work on these investigations Smithwick<sup>62</sup> and Telford<sup>63</sup> recently described and advocated a technic for cervicodorsal sympathectomy in which the preganglionic fibers are sectioned and the postganglionic fibers are left intact. However in both procedures the white communicating ramus of the first thoracic nerve is allowed to remain intact on the assumption that preganglionic components of the first thoracic nerve have no significant function in the sympathetic innervation of the upper extremity. On the basis of their recent experimental observations Kuntz, Alexander and Furcolo<sup>64</sup> took exception to this supposition and concluded that in order to produce complete functional sympathetic denervation it is necessary also to interrupt the white communicating ramus of the first thoracic nerve.

It has been affirmed repeatedly that peripheral vasoconstriction can be initiated by reflex activity of the autonomic nervous system and by an increased secretion of epinephrine. The stimuli cold and emotional excitement produce vascular spasm by reflex excitation of vasoconstrictor impulses to blood vessels and by reflexly increasing the secretion of epinephrine. Thus the mechanism of peripheral vasoconstriction under such circumstances may be humeral as well as neurogenic. The surgical procedures indicated represent an attempt to diminish the neurogenic activity. However, the part played by the humeral factor in vasospastic functional and vasospastic organic conditions may be important. In an attempt to decrease also the reflex activity of this humeral factor, Leriche, Pereira and DeBakey<sup>65</sup> recently advocated simultaneous resection of the splanchnic nerves and the first and second lumbar

sympathetic ganglions. In cases of vasospastic functional and vasospastic organic peripheral vascular disease of the lower extremities in which lumbar sympathectomy is indicated, the additional performance of splanchnic section can be readily accomplished with little or no technical difficulty through a new extra peritoneal approach which they describe.

1430 Tulane Avenue

## Special Article

### SECOND ANNUAL SUMMARY OF FOURTH OF JULY INJURIES

DUE TO FIREWORKS AND EXPLOSIVES

#### SECOND SERIES

In 1937 the American Medical Association resumed its annual summaries of injuries resulting from the celebration of the Fourth of July with fireworks.<sup>1</sup> As pointed out in that report, the considerable increase in the number of such injuries made it expedient to renew the annual reviews.

#### DEATHS

In 1938 there were eighteen deaths reported as directly due to the celebration of the Fourth of July with fireworks and other explosives and seven addi-

TABLE 1—Deaths by State

State	1938		1937
	Directly Due to Firework	Indirectly Due to Firework	Directly Due to Firework
California	0	0	1
Connecticut	1	0	0
Florida	0	0	1
Idaho	0	0	6
Illinois	1	0	0
Indiana	0	1	0
Maryland	2	1	1
Massachusetts	0	0	2
Mississippi	1	0	0
New Jersey	0	0	1
New York	2	2	3
Ohio	1	0	1
Oklahoma	0	1	0
Pennsylvania	6	2	0
Rhode Island	0	0	1
Texas	0	0	1
Utah	0	0	2
West Virginia	1	0	0
	18	7	20

tional deaths indirectly due to the same cause. The distribution by states is given in table 1. It may be noted that in 1938 Pennsylvania led all other states with six deaths from fireworks and two additional deaths attributable indirectly to this cause.

There were two main causes of death—the body burns suffered by little girls when their flimsy dresses caught on fire from sparklers or firecrackers, and the mutilations received by boys or men as the result of their experiments with home-made explosives. The first of these causes took the lives of eight little girls, three of them in South Bend, Ind. The stuffing of lead pipes with firecrackers and similar ventures resulted in death for five boys and men. One such accident cost an 11 year old boy his life, while a companion had his

57 Elliott T. R. The Action of Adrenalin. *J. Physiol.* 32: 401, 1905.  
58 Rosenbluth A. and Cannon W. B. Studies on Conditions of Activity in Endocrine Organs. Some Effects of Sympathin on the Nictitating Membrane. *Am. J. Physiol.* 99: 398 (Jan.) 1932.

59 Grant R. T. Further Observations on the Vessels and Nerves of the Rabbit's Ear with Special Reference to the Effects of Denervation. *Clin. Sc.* 2: 1 (Sept.) 1935.

60 Hampel C. W. The Effect of Denervation on the Sensitivity to Adrenaline of the Smooth Muscle in the Nictitating Membrane of the Cat. *Am. J. Physiol.* 111: 611 (April) 1935.

61 White, James C., Okelberry Alfred M. and Whitelaw George P. Vasomotor Tonus of the Denervated Artery (Control of Sympathetic Innervated Blood Vessels by Sympathomimetic Hormones and Its Relation to the Surgical Treatment of Patients with Raynaud's Disease). *Arch. Neurol. & Psychiat.* 56: 1251 (Dec.) 1936.

62 Smithwick Reginald H. Modified Dorsal Sympathectomy for Vascular Spasm (Raynaud's Disease) of the Upper Extremity. *Ann. Surg.* 101: 339 (Sept.) 1936.

63 Telford J. D. The Technic of Sympathectomy. *Brit. J. Surg.* 23: 418 (Oct.) 1935.

64 Kuntz Albert, Alexander W. F. and Furcolo Charles L. Complete Sympathetic Denervation of the Upper Extremity. *Ann. Surg.* 107: 25 (1938).

65 Leriche, René and Froelich F. Recherches expérimentales sur origine des artérites oblitérantes. Production d'artérites oblitérantes à la suite de greffes répétées de surrenales. *Ann. anat. path.* 13: 1039 (Dec.) 1936. Henneberger, Peter and Bishop C. H. The Mechanism of Sympathetic Vascular Disease and Its Treatment. *Ann. Surg.* 107: 270 (Feb.) 1938.

66 Leriche, René, Pereira Sousa and DeBakey Michael. La resection des nerfs splanchniques. Technique et résultats de quelques observations de thromboembolie oblitérante hypertension paroxystique megacolon et dolichocolon. *Med. contempor.* 55: 311 (July 4) 1937.

1 First Annual Summary of Fourth of July Injuries. Second Series. *J. A. M. A.* 109: 1806 (Nov. 27) 1937.

left leg and fingers blown off and another lost the toes of his left foot. Another experiment caused a man to have both hands blown off with subsequent loss of life and his brother to lose one eye and suffer other injuries. Among the other deaths were those of a young man employed in a fireworks factory in Ohio, who died of burns when he was trapped in a room with exploding fireworks, and of a 2½ year old girl when a torpedo under a can shot the jagged tin against her, resulting in evisceration of her stomach, intestine, omentum and liver.

Three of the seven deaths reported as due indirectly to the Fourth of July celebration resulted from the careless use of firearms. In another accident a 4 year old boy, frightened by a lighted firecracker which he had picked up, jumped from a porch and landed on a stick. He died later from intra-abdominal perforation. An elderly woman fractured her hip when she fell to the sidewalk, frightened by a firecracker, she died of pneumonia which developed as a result of this accident. While attempting to escape the explosion of a firecracker he had just lighted, a Baltimore youngster ran into an automobile and died from resultant injuries.

TETANUS

In 1938, as in 1937, only two cases of tetanus were reported—one in New York and the other in Pennsylvania. The New York patient had a gunshot wound in the palm from a blank cartridge. No antitetanic serum was given and eighteen days later he developed spasm of the muscles of mastication. Tetanus bacilli were isolated from the wound by culture. In the succeeding seven days he received 1,075,500 units of antitoxin. He recovered completely and was discharged from the hospital after forty-eight days.

The Pennsylvania patient was injured by a torpedo which struck a limb of a tree and exploded close to him, causing a puncture wound in the area of Scarpa's triangle. He was treated for the resulting hemorrhage and given 1,500 units of tetanus antitoxin. Eight days later symptoms of tetanus began to appear. He was given 40,000 units of tetanus antitoxin intraspinally, 40,000 units intramuscularly and 10,000 units intravenously, after which the symptoms of tetanus subsided and the tetanus was considered to be controlled. He died shortly after from secondary hemorrhage.

SERIOUS INJURIES

Newspaper clippings and hospital questionnaires recorded a number of serious or extraordinary injuries resulting from fireworks. Nearly three times as many persons lost the sight of one or both eyes as in 1937, while there were over twice as many amputations as in that year. A woman was hit in the eye with a rocket, jumped back, fell and sustained a fracture to the spine. A man in Michigan had some fingers blown off by an aerial bomb, amputation of his left arm was later required. A 6 year old girl was burned so severely that she required extensive skin grafts and was still hospitalized three and a half months after the injury. Similar injuries requiring extended hospitalization were recorded in 1938 with great frequency.

INJURIES

In table 2 are listed the injuries recorded from fireworks in 1938 and in a parallel column the injuries for 1937. In 1938 the total number of injuries recorded

was 7,933 as compared with 7,205 in the preceding year. Since these figures do not take into consideration the injuries treated in hospitals which failed to report or those treated by physicians in their offices, they obviously err on the side of underestimation.

New Jersey, with a state law banning fireworks, again has a low record of injuries from fireworks,

TABLE 2—Injuries, by Type, Caused by the Celebration of the Fourth of July with Fireworks and Other Explosives

State	1938						1937
	Burns and Lacerations	Loss of Vision of One or Both Eyes	Injury to Eye	Loss of Finger Hand or Other Member	Internal Injury Fracture or Other Serious Accident	Total Injuries	Total Injuries
Alabama	15					15	7
Arizona	16					16	32
Arkansas	2					2	7
California	484	2	17	5	1	509	485
Colorado	10		1	1		21	119
Connecticut	113	1	7	3	1	123	104
Delaware	39					39	25
District of Columbia	29	1	1			31	78
Florida	28			1		29	23
Georgia	7					7	9
Idaho	3	1	1			5	52
Illinois	485		22	3	3	513	485
Indiana	314	1	25	4	2	346	278
Iowa	5		1			6	76
Kansas	68	2	3	1		74	93
Kentucky	11					11	61
Louisiana	2					2	12
Maine	74				1	75	67
Maryland	102	1	2	2	3	110	123
Massachusetts	441	2	15	6	3	467	376
Michigan	93	2	4	6	2	107	100
Minnesota	135		4	1	3	143	89
Mississippi	1					1	0
Missouri	550	1	20		2	553	510
Montana	27		2		1	30	50
Nebraska	10		2		2	14	49
Nevada	1					1	0
New Hampshire	24		6	2		32	40
New Jersey	81		6		1	88	72
New Mexico	2	1	2			5	1
New York	1,553	7	48	10	12	1,630	1,371
North Carolina	2					2	4
North Dakota	7		1			8	14
Ohio	526	3	28	10	18	585	353
Oklahoma	39	1	2		1	43	101
Oregon	22	2	4		1	29	45
Pennsylvania	1,020	10	26	20	10	1,702	901
Rhode Island	20		5			210	381
South Carolina	3					3	0
South Dakota	8					8	9
Tennessee	9					9	1
Texas	58		2			60	33
Utah	17		1			18	31
Vermont	2					2	20
Virginia	9			1		13	18
Washington	61	4	2	2	1	70	153
West Virginia	36		3	1	1	41	28
Wisconsin	110	1	4	1	1	117	92
Wyoming	4		1		1	6	10
Unknown							37
Totals	7,485	43	251	80	71	7,933	7,205

although the slight rise from the previous year may be interpreted as indicating the necessity for continued efforts at enforcement. Michigan, Kentucky and Wisconsin also exhibited evidence of reasonably effective legislation. Some of the other states appear to show what amounts to a serious increase in the number of injuries from a level already much too high.

Pennsylvania, besides contributing one third of the deaths, has also the doubtful honor of recording the highest total number of injuries and is second only to Rhode Island in the ratio of injured to the total

population. Furthermore there were twice as many amputations in Pennsylvania as in any other state. Other states with notoriously bad records were Indiana, New York, California, Massachusetts, Connecticut, Illinois, Minnesota, Missouri and Ohio. A few states, however, have shown a definite reduction of accidents from the previous year. Of these Iowa, which in

TABLE 3—Recapitulation of Total Injuries by Type

Injuries	1935	1937
Burns and lacerations	718	1,535
Loss of vision of one or both eyes	41	16
Injury to eye	251	291
Loss of finger, hand or other member	80	57
Internal injury, fracture or other serious accident	71	Not classified
Total injuries	793	7,201

1937 recorded seventy-six injuries, had in 1938 only six, this improvement being obviously attributable to antifireworks legislation enacted in the interim. Idaho, Kentucky, Nebraska, Oklahoma, Oregon, Vermont, Washington and the District of Columbia also showed some improvement over the preceding year. Michigan, which has possessed a state law for several years, showed evidence of good enforcement by a further reduction of recorded injuries from 190 to 107, which while still too high, is much better than the records of such neighboring states as Indiana and Illinois without state laws.

Although displays by competent operators are to be preferred to individual celebration with fireworks, injuries due to such displays have by no means been eliminated. A display at Portage Park in Chicago resulted in the injury of at least seventeen persons, three children and a woman requiring hospitalization. In a similar accident at Rock Island Ill. a man and his wife were so severely burned on the legs, hands and abdomen that they required hospitalization for several days, while seven others received minor injuries. In Mississippi a Negro hired to engage in a six boat roman candle fight for the amusement of others was drowned when forced to jump overboard to escape being burned.

TABLE 4—Injuries in Principal Cities

City	1935		1937	
	Injuries	Rate per 100,000	Injuries	Rate per 100,000
St. Louis	295	15.88	372	9.17
Philadelphia	418	21.22	201	10.30
Los Angeles	380	14.9	45	3.63
New York	1,008	14.43	324	7.56
Cleveland	123	14.2	64	7.11
Baltimore	68	8.43	56	6.97
Chicago	176	21	227	6.66
Detroit*	27	1.39	62	3.95

\* Of thirty cards of inquiry sent to Detroit hospital only four were returned.

The Southern group of states again reported few injuries from fireworks. This appears to be due, as pointed out last year, to the fact that in most regions of the South there is no fireworks celebration on the Fourth of July. In the South the Christmas season is usually celebrated with fireworks, and the accident toll at that time is in some states not inconsiderable.

Many large cities in states without antifireworks laws possess ordinances against the sale and in some

instances against the use of fireworks within their corporate limits. Nevertheless in 1938 as in 1937 most of the large cities recorded numerous injuries, many of them serious (table 4). St. Louis again led all other cities in the ratio of injuries to the population. Philadelphia, Los Angeles, New York and Cleveland showed large increases not only in the total number of injuries recorded but in the rate of injuries per hundred thousand of population. In these four cities and St. Louis alone there were 2,030 injuries as compared with only 1,156 in 1937. Again it is obvious that local regulations are only partly effective in preventing fireworks injuries in big cities since, without state laws forbidding fireworks can easily be purchased outside the city limits and brought in by automobile.

## COMMENT

More striking than ever is the evidence in 1938 that many regions are woefully lacking in adequate legislation for the prevention of injuries and fatalities from fireworks. Numerous states and cities have shown serious increases in recorded accidents. In general only those states which have enacted and enforced statewide laws have shown any evidence of satisfactory control. Some of the states with antifireworks legislation have failed to realize the benefits which might have been expected because of the lack of such legislation in neighboring territories and the ease of transportation. With the high incidence of injuries from fireworks continuing unabated in spite of the knowledge of how to overcome this danger, there is no longer any excuse for failure to adopt effectual state legislation.

## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT H. A. CARTER, Secretary

## NOMIS PURE AIRE UNIT (OZONE GENERATOR) NOT ACCEPTABLE

Manufacturer: The Nomis Corporation, Lafayette, Ind.

At times, in order to fulfil its assumed obligations to the medical profession and to the public, the Council may consider itself called on to investigate and prepare reports on devices which have not been submitted, if such reports, in the opinion of the Council, are important to public health and welfare.

The Nomis Pure Aire is advertised as coming in two sizes. The smaller unit was purchased on the open market and investigated. This "Standard Model" weighs approximately 6 pounds while a larger one weighs a few ounces more. According to the information in the advertising of the firm the smaller unit produces 0.075 Gm. of ozone per hour, while the six plate or larger model produces 0.225 Gm. per hour.

Equipment includes a transformer and small electric motor with fan and four plates. Each plate consists of a flat conductor embedded in an insulator about  $4\frac{1}{4}$  inches long and  $1\frac{3}{4}$  inches wide. When it is suitably connected to the high tension leads of the transformer and the primary current is turned on, a corona is produced between the plates. There did not appear to be a true electric spark. Ultraviolet rays present in the corona appear to be the principal agent creating ozone. The investigator reported that the machine was cheaply and poorly constructed. However, it is believed that the unit complied with standard requirements concerning safety and fire risk. It is operated on 110 volts alternating current and draws 25 watts. The electromotive force on open circuit across the condenser lead wires is about 50,000 volts. The high voltage wires are protected.

A similar device may be made by connecting the high tension leads of a step-up transformer to a condenser made in the following manner. Four metal strips are separated from each other by alternate glass insulators. Two strips are connected in parallel at one end and in turn connected to one lead from the transformer, and the other two remaining strips connected to the other lead, thus making a metal and glass condenser. With an alternating current passing through the primary transformer, an alternating high tension current is induced in the secondary, and a corona is observed within the laminated structure.

The Nomis Pure Aire unit and the home-made one were examined in a laboratory acceptable to the Council.

A spectrogram of the corona formed between the fiber strips was made with a Bausch and Lomb medium quartz spectrograph, using a slit width of 1 mm and slit length of 22 mm with an exposure of eleven hours in a dark room. Spectrogram A consisted of a series of eight bands with the maxima at approximately 2,810, 2,960, 3,140, 3,360, 3,550, 3,770, 4,000 and 4,270 angstrom units. These bands probably consisted of a series of lines but, owing to the width of the slit, appeared as bands on the plate.

Another spectrogram was made using as a source the corona made by the home made condenser consisting of four metal strips separated by alternate glass insulators. Spectrogram B shows bands at the same wavelength as those shown by the unit under consideration. The time of exposure was seven hours.

In addition, the apparatus was investigated and the advertising reviewed by a reliable physiologist. He stated that the fact that the Nomis machine does produce ozone is not to be disputed. The therapeutic and physical claims which the company makes for its unit as an ozone producing device are the points under question. For example, the statement that the current comes in contact with no metal<sup>1</sup> is absurd because it is common knowledge that electric current is largely generated with the aid of metal, carried to a machine by metal and distributed throughout a machine by metal.

The statement 'the Nomis is scientifically gauged so as to furnish only the proper amount of exhilarating ozone' is patently inaccurate, since only an on and off switch is provided to control the amount of ozone no matter how large or how small the room.

A further statement, 'turned on continuously it would not create an undesirable excess of ozone in the atmosphere of the room in which it is installed even if run all day,' is equally misleading, since the assumption is made that this would apply not only to a tiny dressing room but also to a large living room.

According to one claim in the pamphlet 'Pure Air,' 'the primary purpose of the Nomis is destruction of fumes, gases, odors and germs and thus the creation of proper air for the lungs and skin and blood stream of healthy people. This promotes health and efficiency. Throughout the pamphlet there are recorded statements such as 'kills poisonous gases, destroys fumes, kills germs, destroys odors' 'in 10 to 15 minutes the germs and poisonous gases have been oxidized—burnt up' 'the lurking germs that cause colds and more serious ailments killed by ozone,' 'it literally burns up disease germs and bacteria,' 'this form of oxygen, so rich in tonic for the human body and so deadly to fumes, odors, and germs, is called ozone' 'the Nomis 'Pure Aire' instrument supplies ozone to burn up 1 c to destroy the poisonous gases, odors, fumes, and germs that are created or entrapped inside of every four walls'.

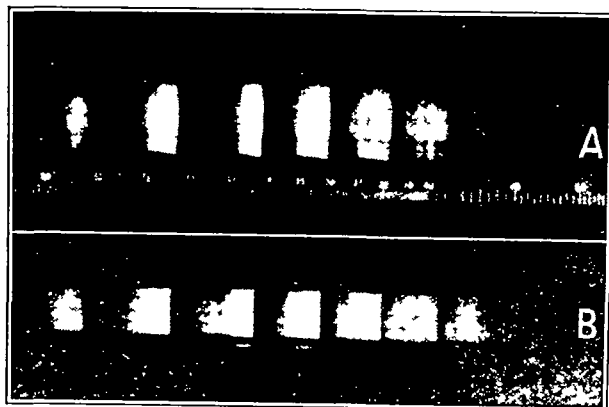
An analysis of these statements apparently indicates that the Nomis Corporation claims for its machine at least two major points: that (1) ozone destroys disease germs and bacteria, and (2) ozone destroys poisonous gases, odors and fumes.

With regard to the first of these claims, long ago qualified investigators showed that ozone had little or even no effect on germs and bacteria let alone "literally burning them up."<sup>1</sup> These experiments were performed on all kinds and types of

bacteria (germs) in both the dry and the moist condition. Ozone to be even a little effective had to be present in such concentrations as were shown to be distinctly harmful to the delicate membranes of the nose, throat and lungs of a human being. Modern work has verified these observations,<sup>2</sup> whereas the Nomis Corporation has presented no critical evidence to support the claims in its advertising matter.

As for the second of these claims, critical investigators have shown that the action of ozone as a deodorant is merely that of a masking agent—in other words merely a substitute.<sup>3</sup> Investigations show that, when the ozone is dissipated, the odors, fumes and "poisonous gases" remain practically unaffected. The reason for this is twofold: (1) Ozone has been shown to be quite ineffective as an oxidizer for fumes, odors or gases, and (2) ozone tends to fatigue the sensory nerve endings governing the sense of smell so that human beings can no longer smell these odors. Again let it be said that more modern work<sup>4</sup> has served to establish this previous work more firmly, and again the Nomis Corporation has not presented critical evidence to substantiate its claims.

A further consideration is that of the general physiologic effect of ozone on the human being—a thing which the Nomis Corporation apparently failed to consider. Scientific work has shown that ozone in sufficient quantities to be even partly effective causes definite harm to man<sup>5</sup> and is therefore not a 'tonic



Spectrogram of (A) corona on Nomis Pure Aire Unit (B) corona on homemade device

for the human body." Among other things ozone causes (1) irritation of the mucous membranes of the nose, throat and lungs, (2) headaches, (3) drowsiness, (4) fatigue and (5) burning sensations in the eyes. All these are noticed after exposure to concentrations of ozone which are below the level at which ozone is even partially effective. At the level at which ozone does have some small power to destroy germs and odors, these sensations are noticed within five to ten minutes and are of longer duration and greater intensity.

The Council draws from the foregoing discussion the following conclusions: (1) Ozone is effective (and then only slightly so) in such concentrations as are definitely injurious to the well being of man and (2) the Nomis Corporation either has a machine capable of doing harm to man or of being useless to man, points which the Nomis Corporation has not given critical evidence to disprove or confirm.

In view of the foregoing report the Council on Physical Therapy voted not to accept the Nomis Pure Aire Unit for inclusion in its list of accepted devices, since the Council believes that the marketing methods and advertising claims employed by the firm are inimical to the public welfare.

<sup>1</sup> Jordan L. O. and Carlson A. J. Ozone. Its Bactericidal Physiologic and Deodorizing Action. *J. A. M. A.* 61: 1007 (Sept. 27) 1913. Sonntag H. Ueber die Bedeutung des Ozons als Desinficiens. *Ztschr. f. Hyg.* 95: 1890. Swanz. Ueber Luftreinigung mittels Ozon. *Ges. Ing.* 33: 448 1910. Kendall and Walker.<sup>2</sup>

<sup>2</sup> Kendall A. I. and Walker A. W. Effects of Ozone on Certain Bacteria. *J. Infect. Dis.* 58: 204 (March-April) 1936.

<sup>3</sup> Welfhugel. *Ztschr. f. Biol.* 9: 408 1895. Swardemahr. Die Physiologie des Geruchs. Leipzig 1895. Erlund en and Swanz. *Ztschr. f. Hyg.* 67: 391 1910. Ozone in Ventilation. Jordan and Carlson.<sup>4</sup>

<sup>4</sup> Ozone in Ventilation. *Pub. Health Rep.* 35: 989 (April 23) 1920.  
<sup>5</sup> Koprich. Zur Verwendung des Ozons in der Luftung. *Ztschr. f. Hyg. u. Infektionskrankh.* 73: 443 1913. Jordan and Carlson.<sup>1</sup>

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SATURDAY, JANUARY 21, 1939

## ALCOHOLIC INTOXICATION AND PNEUMOCOCCIC INFECTION

Clinicians have observed for many years that alcoholic intoxication is a predisposing cause of pneumonia and that the death rate in pneumonia in alcoholic addicts is definitely higher than the mortality of abstainers from alcohol. Osler<sup>1</sup> believed that the most potent predisposing factor in pneumonia is the lowered resistance due to alcohol. A most convincing clinical report on alcohol as a predisposing factor in pneumonia was published in *THE JOURNAL* fifteen years ago by Capps and Coleman.<sup>2</sup> Among 3,422 cases of pneumonia at Cook County Hospital in Chicago they found that the mortality rate among the excessive drinkers was 49.87 per cent, among the moderate drinkers 34.4 per cent and among the abstainers or occasional drinkers 22.45 per cent.

Medical literature contains many reports of both clinical and experimental observations which point strongly to the fact that alcoholic intoxication lowers the resistance not only to pneumococcic infections but to other infections as well. This literature has recently been reviewed by Pickrell<sup>3</sup> of Johns Hopkins University. In 1884 Robert Koch reported observations that during cholera epidemics most of the people who became sick had been guilty of alcoholic excess. Koch followed his clinical studies by experimental work, in which he showed that intoxicated rabbits died sooner of cholera than did similarly infected nonintoxicated animals. Abbott<sup>4</sup> demonstrated that the resistance of rabbits to infection by *Streptococcus pyogenes* was diminished through the influence of alcohol and that the susceptibility of such animals to certain other types of infection was increased by alcoholic intoxication. Laitinen<sup>5</sup>

demonstrated unmistakably the deleterious effect of alcohol on the resistance of animals to anthrax, practically all his alcoholized animals died of anthrax, whereas most of those that had not been given alcohol recovered. In reviewing the literature, Pickrell was impressed by the fact that few of the studies had been adequately controlled and that none of them gave a satisfactory explanation for the effect apparently brought about by alcoholic intoxication. He therefore devised and with the assistance of Dr. Arnold R. Rich carried out an extensive series of experiments in an attempt to discover the mechanism by which this occurs.

In brief the experiments consisted of immunizing rabbits by intravenous injection of type I pneumococcus serum, then of intoxicating some of them with ethyl alcohol until stuporous and then of infecting all of them and the control animals with the same dose of type I pneumococci injected into the skin. In a type experiment twelve rabbits were immunized against type I pneumococci. In a few hours intoxication with alcohol was induced in six of these animals, and all of them, as well as the control animals, were injected in the flank with 0.1 cc. of an eight hour type I pneumococcus culture. In four hours the nonimmunized rabbits gave a positive blood culture and all such animals died within eighteen hours. The immunized rabbits which had been intoxicated showed a positive blood culture at from nine to ten hours and death occurred within twenty-four hours. The immunized rabbits which were nonintoxicated did not develop a positive blood culture and they survived. The immunized group which had not become intoxicated developed only a minute erythematous lesion at the site of injection. The nonimmunized rabbits which had not been intoxicated developed about the site of injection a large purpuric, edematous, hyperemic lesion which extended to the belly surface. In striking contrast, no macroscopic lesion developed in any of the intoxicated rabbits at the site of the injection. In all the nonintoxicated animals microscopic examination revealed a dense leukocytic infiltration at the sites of injection but in the intoxicated rabbits there was practically no leukocytic emigration, and bacteria swarmed in the tissues in the immunized as well as in the nonimmunized alcoholic animals. There was an abundant leukocytic exudate in the nonintoxicated immunized animals and no bacteria could be found in the sections about the site of injection after nine hours.

To determine whether a similar result would occur in the lung, four rabbits were immunized and in a few hours two of them were intoxicated with alcohol. These four, together with two normal control rabbits, were given into the trachea 0.2 cc. of the same type of pneumococcus culture. The normal control rabbits and the intoxicated nonimmunized rabbits showed a positive blood culture within five hours and they died within twelve hours. The immunized intoxicated rabbits did not develop septicemia until eighteen hours, and they

<sup>1</sup> Capps J. A. and Coleman G. H. Influence of Alcohol on Progress of Pneumonia in the Cook County Hospital. *J. A. M. A.* 80: 750 (March 17) 1923.

<sup>2</sup> Pickrell Kenneth I. The Effect of Alcoholic Intoxication and Ether Anesthesia on Resistance to Pneumococcal Infection. *Bull. Johns Hopkins Hosp.* 63: 238 (Oct.) 1938.

<sup>3</sup> Abbott A. C. Effect of Acute Alcoholism on the Vital Resistance of Rabbits to Infection. *J. Exper. Med.* 1: 447 1896.

<sup>4</sup> Laitinen T. Ueber den Einfluss des Alkohols auf die Empfindlichkeit des Thierischen Korpers fur Infektionsstoffe. *Acta Societatis Scientiarum Fennicae* 29: 1902.

died at twenty-two and twenty-four hours respectively. The immunized rabbits which were not intoxicated did not develop a septicemia and were in excellent condition when killed later for comparison of their lesions with those of the other rabbits.

Another experiment was carried out to determine the effect of intoxication on the phagocytic power of the leukocytes. A suspension of pneumonot was injected into the pleural cavity of twenty-four rabbits, and hours later there was an abundant exudate in the pleural cavity rich in leukocytes. Then twelve of the rabbits were made profoundly intoxicated and after two hours a concentrated culture of an avirulent strain of pneumococci was injected into the pleural cavity. After forty-five minutes stained smears of the pleural exudate were made. The leukocytes in these smears were found to be engorged with pneumococci, and there seemed to be no difference between the intoxicated and the nonintoxicated animals with regard to the number of leukocytes containing bacteria or the average number of bacteria in them. Phagocytosis was very active in these pleural exudates. This experiment demonstrates that the effect of intoxication in destroying immunity is not due to paralysis of the phagocytic power of the leukocytes.

An experiment was performed to show the effect of intoxication on the motility of the leukocytes. Blood was taken from both patients and rabbits in alcoholic stupor and vital preparations were studied in the warm chamber; differential counts showed no difference in the number of nonmotile leukocytes in the blood of the intoxicated subjects as compared with the number of normal controls.

These and other experiments reported by Pickrell indicate that the loss of immunity during alcoholic intoxication is due to the failure of the leukocytes to emigrate. The motility of the leukocytes apparently is not affected nor is their phagocytic power. The failure of the leukocytes to emigrate in the intoxicated state appears to be due to the effect of intoxication on the vascular inflammatory mechanism. Previous investigators have shown that the normal reaction of the capillaries to an inflammatory incitant is dilatation, changes in the rate of blood flow through them and changes in the distribution of the blood cells whereby the red cells tend to occupy a position as a core in the center of the stream, while the leukocytes are segregated laterally along the capillary wall. Thus the leukocytes normally are brought into position for emigration before they become adherent to the endothelium and escape through the capillary wall into the surrounding tissue. In the intoxicated organism the margination of the leukocytes in the capillaries does not occur. The evidence seems clear that in the intoxicated organism the capillaries fail to respond to the presence of an inflammatory incitant with dilatation and increased permeability. In what manner intoxication acts to prevent the usual inflammatory changes in the capillaries is as yet obscure.

These experiments offer convincing evidence that alcoholic intoxication maintained at a point of stupor destroys resistance to infection with the pneumococcus in rabbits, even in animals previously rendered highly immune.

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#### THE FIRST ANNUAL CONGRESS ON INDUSTRIAL HEALTH

Early in the deliberations of the Council on Industrial Health its members determined to hold a series of conferences to aid in clarifying the objectives of the industrial health movement. The first Annual Congress on Industrial Health was conducted January 9 and 10 in Chicago.

Part of the Council's plan for the advancement of industrial health is a stimulation of clinical discussions on industrial medical problems through the state and county medical organizations. There has been no forum particularly designed for the consideration of non-clinical problems of administration and integration. These may on occasion be fully as troublesome as diagnosis and treatment. The first conference of the Council dealt with these problems. As discussions are continued and regular opportunity is supplied for expression of opinions on industrial health by all interested members in the profession, the usefulness of these conferences will become apparent.

The keynote of the first congress was contained in the report of the chairman of the Council on Industrial Health. Dr. Seeger pointed out that the practicing physician must attempt to orient himself in this expanding field. The aims and accomplishments of other organized agencies must be made plain. The progress of industrial medicine must be appraised periodically. Its scope and interrelationships must be constantly reemphasized and redefined. The program of this first conference undertook to express the points of view of organized medicine and of the principal professional, governmental and lay agencies responsible for the health of the working population.

Approximately 250 leaders in industrial health attended. Industrial medicine has progressed greatly in twenty-five years. Within the profession a career in preventive industrial practice is recognized increasingly as a worthy aim in itself. There was every indication that lay organizations welcomed the opportunity to learn at first hand the attitude which organized medicine takes toward industrial practice. There can be no essential incompatibility between their purposes and those of the medical profession which the conference table cannot solve. This method is much to be preferred to any legislative approach. Likewise it was frequently and emphatically expressed that organized medicine through both tradition and structure has a preeminent opportunity and responsibility to exert a salutary effect on standards and training in the sphere of industrial medical practice.



## Current Comment

### THE FOURTH OF JULY RECORD

Elsewhere in this issue (page 236) appears a summary of injuries due to Fourth of July fireworks in 1938. Last year after a lapse of twenty-one years a similar analysis was presented, because of the increase which was being shown by this form of injury. Again fireworks have been demonstrated as a serious menace to life and health, in fact, this year there were actually more individual accidents leading to death from fireworks than in 1937, in spite of the wide publicity given to the 1937 summary by newspapers and public-spirited organizations. The control of fireworks must originate in the legislatures of the respective states. With the present day ease of transportation, only statewide laws can be considered adequate, even their effectiveness is endangered by adjacent states which may lack control measures. In some states, such as Pennsylvania, Indiana and Missouri, the need for effective and enforced legislation is only too obvious. A repetition of the tragedies of 1938 can be construed only as gross negligence in relationship to a controllable situation.

### ELECTROLYSIS FOR SUPERFLUOUS HAIR

An increasing number of electrolytic instruments designed particularly to remove hair, moles and warts are appearing on the market. There is a growing tendency for laymen, unqualified by experience and training, to undertake the use of such apparatus. The electrolytic instruments may be found in beauty shops and in offices conducted by self-designated electrologists, hair specialists, lay dermatologists, depilatory experts and the like. Because of the seeming simplicity of the processes, people are often misled into believing that they are quite safe with these lay operators. Actually there are a number of reasons why such safety is not assured. First, untrained operators are apt to have little knowledge of aseptic technique. The importance of proper sterilization of the patient's skin, the operator's hands and arms and the needle holders and needles, as well as the proper precautions to avoid infections, are largely unknown to or may be disregarded by these technicians. Infection may be mild, such as a small pustule, or may result in abscess formation. Erysipelas has been known to develop around one of the infected regions. If the infection occurs in the nose, glabella or upper lip, it may cause death because of the direct venous communication between these areas and the lateral sinuses. When moles and warts are treated by lay operators there are additional dangers resulting from lack of diagnostic ability. As they are unable to differentiate between benign moles and those which are malignant or may become malignant neoplasms as the result of trauma during treatment, serious sequelae may follow. To avoid the hazards of infection and improper diagnosis the operator should have some understanding of anatomy, physiology, bacteriology, antiseptics and tissue tolerance to trauma, as well as the chemical reac-

tion involved in electrolysis and the physics and mechanics of the apparatus used. Pitting and scarring may result from the application of too much current or too long a treatment, as well as from improper insertion of the needle into the hair follicle. If the operator makes several stabs at a single follicle or treats too many hairs in a given area, infection and scarring may be expected to ensue. Because of the serious consequences that may result when electrolytic machines are misused, the Council on Physical Therapy approved an article on the subject by Dr. Anthony C. Cipollaro, which appeared in a recent issue of *THE JOURNAL*.<sup>1</sup> The article merits attention by every physician, since all of us are frequently asked for advice on this subject.

### DRUG ADDICTION

Although addiction to drugs has long been known, only recently has medical knowledge begun to play a part in the treatment of this condition similar to that enacted in the reforms which took place in the management of insanity during the last century. Certainly, as pointed out by Surgeon General Thomas Parran,<sup>2</sup> opium and its derivatives are by far the most important addicting drugs. The vast majority of the addicts want to be relieved of the habit, punishment alone is never effective, but these unfortunates have been despised and neglected by society. Now it is recognized that the excessive and continued use of narcotics, especially opiates, brings about changes in the physical constitution that must be corrected and that the continued use of these drugs denotes in many cases an emotional imbalance or disintegration of personality that must be corrected if permanent cure is to be effected. The rehabilitation of an addict requires time, during which, in addition to receiving special treatment, he should be encouraged to develop healthful habits of work and recreation. In connection with the two hospitals (at Lexington, Ky., and the newly dedicated institution at Fort Worth, Texas) now open for the treatment of drug addiction, laboratory studies have been designed to uncover the fundamental mechanism of addiction and the pathologic changes of function caused by narcotics. The establishment of these two government hospitals marks a definite step forward in the management of one of society's most difficult problems and offers hope that the permanent therapeutic results will, at least eventually, wholly justify this new venture.

<sup>1</sup> Cipollaro A. C. Electrolysis. *J A M A* 111: 2488 (Dec. 1) 1934.

<sup>2</sup> Parran Thomas. The Problem of Drug Addiction. *Pub Health Rep* 53: 2193 (Dec. 16) 1938.

<sup>3</sup> A narcotic addict desirous of entering the United States Public Health Service Hospital at Lexington, Ky., or Fort Worth, Texas for treatment is a voluntary patient will on application to the Surgeon General of the United States Public Health Service, Washington, D. C., be furnished the necessary blanks and instructions. A charge of \$1 a day is made but if an applicant is impecunious this charge will be waived on presentation of certain proof. In order to be eligible for treatment a person must be a citizen of the United States and be a habitual user of opium or coca leaves or their derivatives or of Indian hemp or peyote. A medical examination by a physician designated by the applicant or by a United States Public Health Service medical officer is required. Should the report of this medical examination indicate that the applicant is an addict the Surgeon General addresses a letter to him authorizing his admission any time within four weeks of the date of the letter. He cannot be confined without his consent. At the present time there are no accommodations for women patients but it is anticipated that such accommodations will be available early in 1940.

# ORGANIZATION SECTION

## AMERICAN MEDICAL ASSOCIATION STUDY OF MEDICAL CARE

### OHIO STATE MEDICAL ASSOCIATION REPORT

The first summaries by states of the Study of the Need and Supply of Medical Care are now being received. One feature already forecast in the reports from county medical societies stands out even more prominently in the summaries for entire states—that is, the splendid cooperation received from affiliated agencies. Nearly every county medical society so far reporting has stated that a larger percentage of replies has been received from the eight questionnaires sent to welfare organizations, health departments, hospitals, nurses schools and colleges than from those sent to physicians and dentists. The Ohio State Medical Association reports the same results from an entire state.

This emphasizes one of the peculiarly valuable characteristics of the survey by the American Medical Association. While the study is conducted under the auspices of organized medicine, information is sought from every source that may be able to contribute any facts as to the need and supply of medical care in any locality. This characteristic is in strong contrast to the surveys that have been made by governmental and private organizations and which have been used as the basis of exaggerated reports of a lack of medical care and also of unjustified attacks on the medical profession for not providing such medical care. A large number of such surveys have almost completely ignored the largest source of authoritative information concerning medical care and the only source capable of judging the quality of that care. In the survey by the American Medical Association these organizations are especially urged to report any information which they may have as to a lack of medical facilities or as to the existence of individuals or classes of individuals who have desired and been unable to obtain medical care.

There are practicing physicians in every county in Ohio, but there are two counties in which the number of physicians is less than one for every 2,000 persons resident in the county, and this is considered to be an insufficient number. There are fifteen counties having a total population of 120,518 in which there are no hospitals, information is not furnished as to the extent to which hospital facilities are available to the residents of those counties from outside their boundaries.

There are two islands in Lake Erie in which, in accordance with a state law, the township trustees maintain a house as a residence of a resident physician in a township that is inaccessible from the mainland at some time of the year for any reason.

The Ohio State University College of Medicine operates a hospital with a bed capacity of 256 for the care of indigent persons from any part of the state. Legislative appropriations, however, have been insufficient to meet the hospital's operating expense; this condition has necessitated a reduction in the number of pay patients admitted. During 1937, 35 per cent of the patients were treated free, 23 per cent were part pay and 42 per cent were full pay.

The present capacity of state institutions for mental and nervous diseases, the feeble-minded and the epileptic is insufficient. Every one of the twelve mental hospitals in the state is overcrowded. The total rated capacity of these institutions is 21,478 and the average census is 25,412. During a special session of the legislature in 1937 a bill was passed creating a public institutional building authority for the construction and improvement of buildings for the use of state institutions. This bill contemplates an expenditure of \$7,500,000 for this purpose, to be matched by federal funds. However, the legislature failed to make the necessary appropriation. These institutions are available not only to the indigent, since those who are financially able to do so are required to pay \$5.50 a week. In the case of the feeble-minded, the county from which the indigent patients are committed must bear the expense.

The Ohio State Medical Association has summarized the agencies concerned with medical care which operate on a statewide basis. Four departments of the state government devote all or part of their efforts to health or medical service, namely the State Department of Health, the State Department of Public Welfare, the State Department of Education and the State Industrial Commission.

### DEPARTMENT OF HEALTH

The Ohio Department of Health is composed of the following divisions and bureaus: Division of Administration, which includes the Bureau of Health Organization, Division of Communicable Diseases which is composed of the Bureau of Tuberculosis and the Bureau of Venereal Diseases, Division of Hygiene, including the Bureau of Child Hygiene, the Bureau of Dental Hygiene, the Bureau of Occupational Diseases and the Bureau of Hospitals, Division of Laboratories, Division of Vital Statistics, Division of Sanitary Engineering and the Division of Nursing.

The Public Health Council, a quasi-judicial body, consists of the State Director of Health and four members, two of whom "shall be physicians who shall have had training or experience in sanitary science." This board has no administrative or executive duties. It is empowered to make sanitary regulations of general application throughout the state, consider appeals from decisions of the State Director of Health relating to the approval or disapproval of plans for local sanitary projects such as sewage disposal and water supply, and to make recommendations to the State Director of Health concerning any matters relating to the improvement and preservation of public health.

Since the inauguration of the Federal Social Security program in February 1936 and the influx of federal funds from the United States Children's Bureau and the United States Public Health Service, the activities of the State Department of Health have been amplified considerably. The personnel of the department has been increased from ninety-one to one hundred and sixty-seven. In 1935 there were seventy-six full-time health units in Ohio, forty counties and thirty-six cities, there

are now eighty-eight full-time units, fifty counties and thirty-eight cities, and in these districts there are thirty-three sanitary engineers and trained sanitarians. Funds have been made available for the training of personnel in public health administration.

In general it can be said that during the past four years the State Director of Health has cooperated fully with the Ohio State Medical Association. Before new programs have been initiated, questions of policy have been discussed with officials of the State Medical Association and the Association's Committee on Public Relations and Economics. In local health activities, such as immunization and school health programs, local health officials have been requested by the state department to work with the county medical societies, a procedure which has usually been followed.

As in all governmental departments, political interference has been a handicapping factor in the administration of the State Department of Health. A change in the state administration invariably means a new director. There has been no continuity in the office. In an attempt to remedy this situation, legislation will be introduced at the 1939 session of the legislature, proposing to set up a commission of six members, including three physicians, serving for six year terms, which would submit the names of five qualified physicians from which the governor would select one to serve as director. Such appointee would be removable only for cause. It is believed that this method of appointment will result in a minimum of political interference.

#### DEPARTMENT OF PUBLIC WELFARE

Medical programs for dependent and crippled children and the blind have been developed by the Division of Public Assistance in the State Department of Public Welfare. The approximate number of beneficiaries under this program is 3,200 crippled children, 31,000 dependent children in 11,000 families, and 4,000 blind persons.

The program for medical care for dependent children was worked out by officials of the Division of Public Assistance in cooperation with the Committee on Public Relations and Economics of the Ohio State Medical Association. After details of the plans were agreed on, local county medical societies were requested to assist in the formation and administration of the program in the various counties in the state. According to officials of the division, about one half of the eighty-eight counties in the state have established ADC medical and health programs. Progress in the other counties has been hindered by lack of local funds. Under the Bureau of Charities, surgical treatment and hospitalization have been provided for indigent crippled children throughout the state for many years. Only recognized orthopedic surgeons are permitted to do this work. An Advisory Professional Committee has been of great assistance in the supervision of this program.

Medical treatment of the needy blind has been administered by the Bureau of Aid to the Blind, which has sought the advice of the officials of the Ohio State Medical Association. An advisory committee of ophthalmologists has assisted in the development of this program. Since the bureau has been receiving federal Social Security funds it has concentrated on early and corrective treatment to prevent total blindness.

The Division of Aid to the Aged has no definite program for the medical care of 112,000 old-age pensioners. In the suggested budgets to its wards, the

division advises that \$1 per month of the average monthly pensions, which are approximately \$27, be allocated for medical care. Obviously this is inadequate even if the old-age pensioners set aside that amount each month.

#### STATE INDUSTRIAL COMMISSION

Every employer of three or more persons in Ohio is required to pay premiums to the State Industrial Commission for the purpose of providing compensation to workmen and their dependents for death, injuries or occupational diseases sustained in the course of employment. Awards include payment for the medical and hospital treatment necessitated by any such injuries. Injured workmen are permitted to choose their own physician.

Payment for medical services is on the basis of a fee schedule which went into effect Feb. 1, 1926 following conferences between officials of the commission and a special committee of the Ohio State Medical Association. Few complaints have been made as to the fees allowed. There has been general dissatisfaction with the slowness of administrative procedure, particularly the handling of correspondence. It is believed that this situation could be remedied if the legislature would appropriate sufficient funds to enable the commission to improve its personnel.

Relations between the Industrial Commission and officials of the State Medical Association have been friendly throughout the years. While the Medical Section has been handicapped by lack of sufficient funds, there has been improvement in its administration and personnel in the last three years.

During 1937, Ohio physicians received \$3,278,434 from the Workmen's Compensation Fund for services rendered to injured workmen. Payment for hospital and nursing care for the same year totaled \$1,293,141.90.

Since Jan. 1, 1934, the Industrial Commission has been authorized to set aside an amount not to exceed 1 per cent of the monies contributed to the State Insurance Fund for the investigation and prevention of industrial accidents and diseases. This program of education and inspection is carried on by the Division of Safety and Hygiene, which conducts safety campaigns and enforces rules and regulations for the health and safety of employes.

#### DEPARTMENT OF EDUCATION

During 1937 a Bureau of Health and Physical Education was reestablished in the State Department of Education for the purpose of developing a well rounded program of physical education and health instruction in the public schools. During the school year 1936-1937 health instruction was included in the curriculum of 75.73 per cent of Ohio schools. Only 52.22 per cent required physical examinations before entrance.

A campaign is being conducted in the schools and before lay groups on the evils of narcotics, particularly marijuana, and alcoholic liquor.

The Ohio Congress of Parent-Teachers, through its local units, has sponsored preschool physical examinations and school health programs. State officials of the Parent-Teachers' Association have frequently sought the advice of the Ohio State Medical Association in planning health phases of their program. It has always been the policy of this organization to have the local Parent-Teachers' Associations work out the method of conducting these preschool physical examinations with the local county medical societies.

The Ohio Public Health Association, an affiliate of the National Tuberculosis Association, has been concerned principally with an educational campaign against tuberculosis through the sponsorship of local anti-tuberculosis societies. These activities are financed through the sale of Christmas seals and private donations. The association has always been active in advocating adequate financing of health departments and higher standards of public health personnel.

The Ohio Society for Crippled Children, an organization financed by private donations, has been responsible for the rehabilitation of many needy crippled children throughout the state.

The American Legion, Veterans of Foreign Wars, the Masonic Order and other fraternal orders, including luncheon clubs such as Rotary, Kiwanis, Lions and Mercator, and the Junior Chamber of Commerce have supported various types of local health programs. They include support of bond issues for new hospitals and the like, raising funds for medical and surgical treatment of worthy persons, and furnishing of milk, provision of eye glasses for indigent children and others.

#### POOR RELIEF LAWS

Ohio is operating under a system of poor relief which is woefully in need of revamping. Laws dividing the responsibility for the care of the indigent among eighty-eight counties, 110 cities and 1,344 townships and more than 7,000 public officials have been in effect, with only slight variations, since 1853. The situation was further complicated in 1932 with the entrance of the state into the financing and administration of poor relief, appointment of a state relief commission, and a parade of "stop-gap" relief legislation during the past six years. The situation has been generally unsatisfactory to the medical profession.

An attempt will be made at the coming session of the state legislature to repeal the antiquated relief statutes and to provide for the concentration of all public assistance administration in one county-wide agency. The proposed legislation contemplates a medical bureau under medical supervision in this agency, which would supervise the provision of medical care to recipients of all types of public assistance.

The total amount of public money expended in Ohio during 1937 for all types of public assistance and general relief was \$142,436,000. Of this amount the federal government provided approximately three fourths, the state of Ohio a little more than one sixth, and local governments about one twelfth. WPA accounted for slightly over one half of the expenditure, social security nearly one fourth, general relief about one eighth, and miscellaneous federal agencies about one eighth. No figures are available to show what proportion of these funds was spent for medical care.

#### FARM SECURITY ADMINISTRATION

There are 26,302 families, representing approximately 110,000 dependents, receiving assistance from the Farm Security Administration in Ohio. Following a series of conferences between officials of the Farm Security Administration and the Ohio State Medical Association an agreement was reached as to the basic features which should be included in any local program for the medical care of Farm Security Administration clients.

A medical program for Farm Security Administration clients has been arranged with the cooperation of the county medical societies in the following thirteen

counties: Geauga, Portage, Perry, Pike, Clermont, Fayette, Madison, Champaign, Union, Delaware, Logan, Hardin and Paulding.

#### MOTOR VEHICLE INJURY ACT

Since 1933 the sum of 19 cents for each motor vehicle registered in the state has been placed in a special fund administered by the Bureau of Motor Vehicles for the purpose of reimbursing hospitals for the expense of caring for indigents injured in motor vehicle accidents. During 1937 claims paid from this fund numbered 1,914, in an amount of \$228,162.24.

#### GROUP HOSPITALIZATION

Under the Ohio statutes, group hospital associations on a county-wide basis are exempted from having to qualify under the state insurance laws. Unsuccessful attempts have been made at recent sessions of the state legislature to permit these associations to insure their clients against hospitalization expense incurred outside the county in which the association is located. At the present time group hospitalization associations are operating in the following Ohio counties: Cuyahoga, Lucas, Summit, Mahoning, Licking, Scioto, Stark, Erie, and Franklin. The number of subscribers is more than 200,000, of whom 150,000 are located in Cleveland and Cuyahoga County.

#### GENERAL OBSERVATIONS

1 In general, Ohio has an adequate number of physicians, and medical facilities are probably more plentiful and efficient than in many other states. However, there is need for a more equitable distribution of physicians and facilities between urban and rural counties in some parts of the state.

2 The medical relief program in Ohio has not been entirely adequate, both from the standpoint of the amount of money made available for this purpose and the compensation actually paid to physicians. However, this is a state and local program and one which at the present time is receiving serious consideration from all groups concerned, including the state legislature. Despite the inadequacy of the program there is plenty of evidence to support the statement that there are very few persons in Ohio actually suffering from lack of medical attention for serious disabilities.

3 The medical profession is making a constructive effort to meet the various problems. A special committee of the Ohio State Medical Association has made a study of the poor relief statutes and is now formulating legislation which, if enacted, will simplify the administration of medical relief through the coordination of the various separate agencies into one county board responsible for the medical care of all persons receiving public assistance.

In a number of the larger counties, notably Cuyahoga, Hamilton, Summit, Montgomery, Mahoning and Franklin, the local medical societies are working on plans designed to make medical service more readily available to all the people, particularly indigents and those in the low income groups. Plans developed by the county medical societies are reviewed by a special coordinating committee of the Ohio State Medical Association, which hopes to evolve a flexible plan or plans which can be adapted to local needs throughout the state.

4 The state medical association is working with other interested statewide groups in a movement to make the administration of the State Department of Health more efficient through higher standards for

personnel, a minimum amount of political interference, and by making the selection of the state health director a merit appointment, with continuity of office, rather than a political appointment subject to change with each new state administration.

The summary by the state medical association was accompanied by reports and other material from the various agencies concerned in medical care. A further analysis of reports from thirty-four counties which have been received by the Bureau of Medical Economics showed that, according to returns from 1,400 physicians, these physicians had rendered medical ser-

vice without pay to 138,000 persons in their offices or at hospitals and clinics. These same physicians had given 128,584 free hours to hospitals and clinics. This was for a population of 2,860,000. Since only about 50 per cent of the physicians returned questionnaires, the free service thus listed is by no means a full measure of all the care that was given without payment. It would seem to be a fair estimate—based on the returns received, which constitute a far larger sample of the population than in any comparable survey—that at least 10 per cent of the population in these counties received medical care without payment.

## ACTION OF HOUSE OF DELEGATES OF MICHIGAN STATE SOCIETY

At a special session in Detroit January 9 of the house of delegates of the Michigan State Medical Society the council made a report on group hospital service and group medical care plans, which was in part, as follows:

At the seventy third annual meeting of the Michigan State Medical Society, held in Detroit last September the House of Delegates received considerable material from the Committee on Distribution of Medical Care covering (a) group hospitalization and (b) group medical care plans. The House of Delegates Reference Committee presented the following report on the Committee's activities:

We approve the principle of voluntary hospital insurance provided that hospital insurance be so defined that it does not include professional services by a doctor of medicine. We also recognize the merits of certain principles in voluntary health insurance and we therefore urge that recommendation IV of the General Program of Medical Care as defined by the American Medical Association September 17 be adopted in principle by the Michigan State Medical Society. We further recommend that the Committee on Distribution of Medical Care continue with more detailed studies of an acceptable insurance program, the results to be presented to a special meeting of the House of Delegates in the near future.

The members of the council have become convinced that the membership of the society generally, throughout the state, desires to put into active operation a statewide system for the prepayment of medical care and hospital service through the pooling of funds therefor. The public desire is evidenced in numerous ways. In the problem of bringing adequate hospital service and medical care within the reach of every citizen of the low income group some have mistakenly supposed that the doctors of medicine had to assume the whole burden, furnish the plan, raise the money, take all the risks and do all the work. By enlisting the community in such an enterprise the greatest barrier against governmental interference would be built. Therefore the Committee on Distribution of Medical Care presents to us a statewide community health service founded on the development of lesser community groups and based on the principles laid down in the plans developed by the Committee on Distribution of Medical Care.

The projected plan of group medical care contains matters to which the council directs your particular attention: (1) the plan is open to all licensed doctors of medicine in the state who agree to the rules and regulations; (2) the subscribers have complete freedom of choice; (3) the control of the administration and policy of medical service is to be vested in the medical profession; (4) the medical services are to be paid out of available pooled funds on a unit system. Such a system affords freedom of action, insures the success of the plan and it dues are not placed at a proper figure they can be rectified at any time. The situation is entirely different from that where the doctors agree to work on a unit system with dues fixed by an intervening agency over which the doctors have no control. The true insurance principle—definite rates and definite benefits—is preserved under this system.

So far as possible district administration will be put on an autonomous basis. The council suggests that discussion here should be centered on fundamentals and not on details. In the deliberations of this body it will be impossible to work out or discuss details in the inauguration of a plan designed

for statewide coverage eventually. Details must be entrusted to representatives from various geographic areas and differing conditions of medical practice.

The council recommends that this house of delegates after due consideration and discussion instruct the council to take the necessary actions to create and put into operation an organization or organizations containing the essential provisions embodied in the tentative drafts as presented by the Committee on Distribution of Medical Care.

### Action of House of Delegates

The house of delegates approved the principles of group hospitalization, approved the principles of group medical service and empowered the council in cooperation with the hospitals and civic groups to proceed with the establishment of plans embodied in the foregoing principles.

The following report of the reference committee on Reports of Standing Committees was approved by the house of delegates:

The matters contained in the material presented by the Committee on Distribution of Medical Care have been considered and your reference committee begs to report as follows. It has reaffirmed the principles endorsed by this body last September relative to group hospitalization and sickness insurance schemes and recommends that all future action in group hospital and medical service plans conform to these principles.

It then considered separately for purposes of clarity (1) group hospitalization and (2) group medical service.

### GROUP HOSPITALIZATION

Your reference committee recommends:

1 That the council continue its efforts with the Michigan Hospital Association and the representatives of labor, industry, agriculture, religious and educational organizations, community councils and other interested groups to obtain a non-profit group hospitalization plan sponsored jointly by the medical profession, the hospitals and the public.

2 It is further recommended that the council be empowered to cooperate with or assimilate any one or more of the group hospitalization organizations which are now formed and may be formed to transact such business.

### GROUP MEDICAL CARE

Your reference committee by a majority vote recommends that we empower the council to cooperate with labor, industry, agriculture, religious and educational organizations, community councils and other interested groups in the formation of a non-profit group medical care organization.

The following additional motion was passed by the house of delegates:

The council of the Michigan State Medical Society is empowered to use its judgment in the matter of cooperating in introducing necessary legislation in the legislature of the state of Michigan at the present session to make it possible to legally handle both group hospitalization and group health insurance.

## OFFICIAL NOTES

## RADIO BROADCASTS

The fourth series of programs broadcast in dramatic form portraying fictitious but typical incidents of significance in relation to health by the American Medical Association and the National Broadcasting Company, entitled "You Health," began Wednesday October 19 and will run consecutively for thirty-six weeks. The program is broadcast each Wednesday over the blue network of the National Broadcasting Company at 2 p m eastern standard time (1 p m central standard time, 12 noon mountain time, 11 a m Pacific time).<sup>1</sup>

<sup>1</sup> Owing to program conflicts there will be no Chicago broadcast of the network program. Instead a recording of the program will be broadcast over station WENR at 8 p m each Wednesday. This recording will be an identical rebroadcast of the network program broadcast earlier the same day.

These programs are broadcast on what is known in radio as a sustaining basis, that is, the time is furnished gratis by the radio network and local stations and no revenue is derived from the programs. Therefore, local stations may or may not take the program, at their discretion, except those stations which are owned and operated by the National Broadcasting Company.

The next six programs to be broadcast, together with their dates and their topics, are as follows:

January 25	Smallpox and Diphtheria
February 1	Preventing Epidemics
February 8	Avoiding Arthritis
February 15	Healthy Hearts
February 22	Cancer Can Be Cured
March 1	Diabetes

## MEDICAL LEGISLATION

## Medical Bills in Congress

**Bills Introduced**—S 85, introduced by Senator White, Maine, proposes to grant pensions to male nurses who served under contract during the Spanish-American War. S 471, introduced by Senator Murray, Montana, proposes to authorize an initial appropriation of \$5,000,000 and for each fiscal year for four consecutive years a sum "sufficient to carry out the purposes of this act," to enable each state to make adequate provisions for hospital beds for tuberculous patients. The bill contemplates that the money to be appropriated shall be allotted by the United States Public Health Service to the states that submit approved plans. S 497, introduced by Senator King, Utah, proposes to provide for the incorporation of certain persons as "Group Hospitalization, Inc." The corporation is to be authorized (a) to enter into contracts with individuals or groups of individuals to provide for hospitalization of such individuals, on the payment of specific rates or premiums, and to issue to such individuals appropriate certificates evidencing such contracts; (b) to enter into contracts with hospitals for the care and treatment of such individuals, in accordance with the terms of such certificates; and (c) to cooperate, consolidate or contract with groups or organizations interested in promoting and safeguarding the public health. H J Res 103, introduced by Representative Coffey, Washington, proposes to authorize the United States Public Health Service to make a survey of the conditions in the United States with respect to the importation, production, distribution and use of narcotics. The bill contemplates that the Surgeon General of the Public Health Service shall make a report to Congress and recommend legislation. H R 38, introduced by Representative Dowell, Iowa, proposes to authorize an appropriation of \$400,000 to construct a 300 bed patient capacity addition to the existing veterans' facility at Des Moines, Iowa, for the treatment of general medical and surgical disabilities. H R 42, introduced by Representative Fitzpatrick, New York, proposes to amend the Social Security Act so as to provide for the payment of benefits to permanently and totally disabled individuals. H R 77, introduced by Representative Maas, Minnesota, proposes to authorize an appropriation of \$425,000 to construct a domiciliary building of 350 bed capacity at the veterans facility, Fort Snelling, Minn. H R 101, introduced by Representative O'Day, New York, proposes to amend the Social Security Act so as to include under its unemployment and old-age provisions employees in nonprofit organizations. H R 114, introduced by Representative Voorhis, California, proposes to establish a Cooperative Home Board and a system of Cooperative Home Associations. No member is to be accepted in such an association until he reaches the age of 62 years. Membership to be sold at not less than \$2,000. will entitle the member to housing, food, medical attention and other living necessities for the term of the membership. The United States Public Health Service, the bill contemplates will be authorized and directed to supply and supervise the medical service which is to be made available to association members and to supervise

the sanitary facilities of the association home units. H R 128, introduced by Representative Arends, Illinois, proposes to establish service origin connections, for veterans of the World War, for spastic paralysis, chronic arthritis, chronic rheumatism or chronic heart disease not the result of the veteran's own misconduct. H R 129, introduced by Representative Arends, Illinois, proposes to authorize an appropriation of \$787,500 to construct a 175 bed patient capacity addition to the veterans' facility at Dwight, Ill., for the treatment of general medical and surgical disabilities. H R 172, introduced by Representative Knutson, Minnesota, proposes to amend the Social Security Act to provide grants to states for furnishing aid to needy individuals who are physically handicapped. H R 204, introduced by Representative Bradley, Pennsylvania, proposes to authorize an appropriation of \$2,500,000 to construct a veterans' hospital for the Philadelphia area. H R 245, introduced by Representative Culkin, New York, proposes to impose an additional tax of 10 cents per pound on oleomargarine. H R 246, introduced by Representative Culkin, New York, proposes to prohibit not only the importation and interstate transportation but also the manufacture, sale, offering for sale or possession for sale of (1) any oleomargarine, margarine, butterine, or other substitutes for butter, manufactured from any fat other than that of milk or cream, and (2) any milk or cream or substitute therefor which contains any fat or oil other than that of milk. H R 295, introduced by Representative Parsons, Illinois, H R 922, introduced by Representative Spence, Kentucky, and H R 1951, introduced by Representative Bland, Virginia, propose to create a Division of Water Pollution Control in the United States Public Health Service. H R 802, introduced by Representative Jenkins, Ohio, proposes to provide that where an honorably discharged veteran suffers or has suffered an injury or contracted a disease and an emergency develops requiring immediate hospitalization on account of such injury or disease, and no veterans' facility is feasibly available and delay would be hazardous, the Administrator of Veterans' Affairs is authorized to pay the reasonable value of such service received from sources other than the Veterans' Administration. H R 889, introduced by Representative Rogers, Massachusetts, proposes to authorize an appropriation of \$1,400,000 to construct a new veterans' hospital and diagnostic center at or near Boston. H R 891, introduced by Representative Murdock, Arizona, proposes to authorize an appropriation of \$500,000 to erect additional buildings for veterans at Tucson, Ariz., to take care of at least 200 general medical patients. H R 902, introduced by Representative Smith, Washington, proposes to provide hospitalization, without charge for certain employees in the Bureau of Marine Inspection and Navigation of the Department of Commerce and for licensed local pilots of the United States at hospitals and other stations of the United States Public Health Service. H R 1008, introduced by Representative Welch, California, proposes to confer on certain persons who served in the Quartermaster Corps or under the jurisdiction of the Quartermaster General during the War with Spain, the Philippine Insurrection or the China Relief



Expedition the benefits of hospitalization and the privileges of soldiers' homes. H. R. 1776, introduced by Representative Bland, Virginia, proposes to provide for the assignment of medical officers of the Public Health Service for duty on vessels of the Coast and Geodetic Survey. H. R. 1800, introduced by Representative Maloney, Louisiana, proposes to authorize an appropriation of \$1,200,000 to construct in New Orleans or adjacent thereto, a 300 bed patient capacity veterans' hospital for the diagnosis, care and treatment of general medical and surgical disabilities. H. R. 1813, introduced by Representative Boland, Pennsylvania, proposes to authorize an annual appropriation of \$11,580,000 to enable each state to establish, extend and improve services for educating physically handicapped children. H. R. 1834, introduced by Representative Colmer, Mississippi, proposes to extend the benefits recorded veterans of the Spanish American War to contract veterinarians. H. R. 1945, introduced by Representative Allen, Louisiana, proposes to authorize an appropriation of \$450,000 to construct a 300 bed patient capacity addition to the veterans' facility at Alexandria, La., for the care and treatment of general medical, surgical and neuropsychiatric disabilities. H. R. 1960, introduced by Representative Izac, California, proposes to amend the Social Security Act to provide assistance for needy individuals who are permanently crippled. H. R. 2000, introduced by Representative Thomas, Texas, proposes to amend the Social Security Act to provide for grants to the states for assistance to needy incapacitated adults. H. R. 2003, introduced by Representative Van Zandt, Pennsylvania, proposes to authorize an appropriation of \$2,500,000 for the construction of a veterans' hospital with a capacity of at least 800 beds in the area of Blair, Centre and Clearfield Counties, Pa., for the accommodation of veterans entitled by law to such facilities. H. R. 2423, introduced by Representative May, Kentucky, proposes to establish a United States postgraduate medical and surgical college and research institute to provide properly trained medical, surgical and health personnel for the military, naval and public health services and to coordinate and improve health research activities of the federal government. The United States Medical and Surgical College, it is proposed, will be located in the District of Columbia and graduates of accredited medical and surgical colleges may be admitted to the institute for training for army, navy or public health work on designation by senators and representatives in Congress. Such trainees are to receive, it is proposed, \$1,200 a year while in training in the institute. The institute is to be authorized to provide medical, surgical and clinical facilities for the diagnosis and treatment of all types of illness and physical and mental disabilities. Such facilities are to be made available to all patients of any age, but no patient may be admitted whose income is in excess of \$1,000 a year except in police cases and in cases of emergency arising from accident. All medical, surgical and public health research activities conducted by or under the jurisdiction of the federal government with respect to foods, drugs, alcoholic liquors, maternal and child welfare, and medicine and surgery are to be under the jurisdiction of the board of regents of the institute. An appropriation of \$10,000,000 is to be authorized for the construction and improvement of buildings and equipment for the use of the institute and annually such sums are to be authorized as may be necessary to carry out the duties and functions of the institute and the board of regents. H. R. 2540, introduced by Representative Smith, Washington, provides that, for pension purposes, any person who served under contract with the War Department as acting assistant or contract surgeon during the Spanish American War shall be considered to have been in the active military service of the United States for the period of such contract service.

#### District of Columbia

**Bills Introduced**—H. R. 73, introduced by Representative Lemke, North Dakota, proposes to prohibit the making of any form of vaccination or inoculation a condition precedent to admission to any public or private school or college, or the exercise and enjoyment of any right or privilege, in the District of Columbia. H. R. 278, introduced by Representative Smith, Virginia, proposes to regulate the practice of optometry in the District of Columbia. The bill defines the practice of optometry to mean the science and art devoted to the examination of the eyes,

the analysis of the ocular functions and the employment of preventive or corrective "optometric methods and agents for the relief of visual and ocular anomalies."

#### California

**Bills Introduced**—S. 79 and A. 32 propose to make it unlawful for "the county clerk of any county to issue a license to marry to any person unless there is on file with him a certificate, signed by a physician, certifying that the applicant has" on a specified date not more than twenty days prior to the application "been given examination as is necessary for the discovery of venereal disease and that, in the opinion of the physician, the applicant is either not infected with a venereal disease or is not" in a stage of any such disease which is or may become communicable." The bill proposes that the examination referred to in the certificate include a thorough physical examination a Kahn or Wassermann test for syphilis, a dark field test where indicated, or any other recognized test for syphilis approved by the state department of public health, and a microscopic examination for gonococci where indicated. S. 80 proposes to require every physician or other person engaged in antepartum attendance on a pregnant woman to obtain a specimen of her blood within thirty days after the first professional visit and to submit the specimen to the laboratory of the state department of public health or to a laboratory approved by the department, for the performance of a Kahn, Wassermann or other standard laboratory blood test for syphilis. A. 10 and A. 33, to amend the Retail Sales Tax Act of 1933, propose to exempt from the tax imposed by the act "the gross receipts from sales of all medicines and preparations recognized in the United States Pharmacopoeia or National Formulary for internal or external use, and any substances or mixture of substances intended to be used for the cure, mitigation or prevention of disease of man." A. 11 and A. 34 to amend the Use Tax Act of 1935, propose to exempt from the tax imposed by that act "all medicines and preparations recognized in the United States Pharmacopoeia or National Formulary for internal or external use, and any substance or mixture of substances intended to be used for the cure, mitigation or prevention of disease of man."

#### Illinois

**Bill Introduced**—S. 9, to amend the old age assistance law, proposes to increase the benefits paid recipients "not less than \$5 nor more than \$15 per month for medical services actually rendered to such recipient, provided that such additional allowance shall only be paid while such recipient actually needs such medical care." Under the present paupers' act it is the duty of the appropriate poor relief official to supply at the expense of the county or town necessary medical care not only to poor and indigent persons but also to any other person who does not have "money or other property to pay his board, nursing and medical aid." What effect the enactment of S. 9, which would provide aid by state provided funds, would have on local aid is not clear.

#### Massachusetts

**Bills Introduced**—H. 60, to supplement the medical practice act, proposes to require every licensed physician to register annually with the department of registration in medicine and to pay an annual fee of \$2. H. 61, to amend the medical practice act, proposes to strike out the provision that no more than three members of the board of registration in medicine shall at one time be members of any one chartered state medical society. H. 69, to amend the pharmacy practice act, proposes to require applicants for licenses to practice to be graduated from schools or colleges of pharmacy approved by the board of registration in pharmacy. H. 70, to amend the pharmacy practice act, proposes to give the board of registration in pharmacy discretionary power in granting permits to stores to transact a retail drug business. Under the present law the board has no discretion in the matter and must grant a permit with respect to an application made in proper manner. H. 73 proposes to require the physician in attendance at the birth of a child born with visible congenital deformities or birth injuries to report within thirty days after birth to the state department of public health and the city or town clerk of the place where the birth occurred. H. 74 proposes to require the appropriate clerk or registrar, when an application for marriage or a license to marry is made to him, to hand each applicant such literature concerning gonorrhea and

syphilis and the importance of premarital examination as may be furnished for that purpose by the state department of public health. H 75 is a proposal to make the laws of Massachusetts correspond generally with the provisions of the new federal food, drug, cosmetic and therapeutic devices law relating to food and drugs.

#### New York

**Bill Introduced**—A 57 and S 74, to amend the law in relation to cadavers, prohibits the delivery to the medical colleges and universities of the state by any hospital, prison, reformatory, asylum, almshouse or morgue of the corpses of recipients of old age assistance whose burial cost is provided for by the public welfare law.

#### Oklahoma

**Bill Introduced**—H 76 proposes to authorize the state commissioner of health to appoint one regularly licensed physician for each county in the state to give medical treatment free of charge to such persons as make affidavit that they are unable to pay for such medical treatment. Such physicians are to be paid from \$150 to \$200 a month, may not engage in the private practice of medicine, are to be furnished an automobile by the state, and are to receive drugs, medicines, bandages and medical equipment on requisition to the state commissioner. Such physicians are not to perform major surgical cases, which are to be referred to state hospitals.

### Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

#### CALIFORNIA

**Cancer Survey**—A survey to determine the incidence of cancer in San Francisco and Alameda counties will be carried out by the U. S. Public Health Service. The survey was to begin January 1 and continue for three months. The county medical societies are cooperating. It is planned to send a letter to each physician asking for certain information concerning malignant conditions seen during 1938.

**Society News**—A symposium on tuberculosis was presented before the Los Angeles County Medical Association January 5 by Drs. Reginald H. Smart, Jacob J. Singer and Frank S. Dolley. The Los Angeles Surgical Society was addressed among others January 13 by Dr. William H. Snyder, Jr. on 'Spontaneous Hematoma of the Rectus Muscle, Simulating the Acute Abdomen'. 'Medicine Tomorrow' was the theme of a symposium before the Hollywood Academy of Medicine January 12 with Drs. Donald J. Frick and Egbert Earl Moody and Mr. S. K. Cochems, chairman, board of trustees, councilor and executive secretary respectively of the Los Angeles County Medical Association, as the speakers.

#### DISTRICT OF COLUMBIA

**Campaign Against Cancer**—An educational program on cancer control will be carried on in the District by the Medical Society of the District of Columbia in cooperation with the Women's Field Army for the District, the health department, the local council of social agencies and the American Society for the Control of Cancer. Lectures will be given by members of the medical society before luncheon clubs, civic bodies and similar organizations. The action followed a report by the society's subcommittee on cancer control, showing an increase in cancer mortality.

**Psittacosis in Washington**—Three cases of psittacosis were recently reported in Washington. Two of the persons developed symptoms November 9 and 16 and the third December 2. Two love birds were purchased by the family of the patients from a local merchant October 23. One of the birds died November 11 and the other November 16. An inspection of unsold birds at the merchant's place of business showed that there were three sick ones, these in addition to 109 others were destroyed. According to *Public Health Reports*, it is worthy of note that the pathologists of the National Institute of Health reported that the psittacosis virus was found also

in apparently healthy birds of these shipments. All the love birds involved came from a single source in southern California. In seven other shipments from different sources in California no sick birds were found, it was stated.

#### FLORIDA

**Florida Midland Medical Society Disbands**—Since the Southwest Medical District Society (D) of the Florida Medical Association covers territory identical with that of the Florida Midland Medical Society, the latter, after twenty-two years' service, has decided to disband. The name of the independent society will be perpetuated in the form of a midsummer social assembly for members and their families.

**Special Society Meeting**—At the third annual meeting of the Gulf Coast Clinical Society in Pensacola recently the speakers included Drs. Charles W. Mayo, Rochester, Minn., on "Factors Influencing Prognosis of Cancer of Colon", James S. McLester, Birmingham, Ala., "Recent Discoveries in the Science of Nutrition", Guy A. Caldwell, New Orleans, "Post-reduction Treatment of Simple Fractures," and Robert B. McIver, Jacksonville, on "Plastic Surgery of the Renal Pelvis". Dr. James H. Dodson, Mobile, was chosen president, Drs. Edward C. Parker, Gulfport, Miss., and John S. Turberville, Century, vice presidents, and Dr. Clyde C. Rouse, Mobile, secretary-treasurer, succeeding Dr. Jacques H. Baumhauer, Mobile. The next annual session will be held in Mobile, Ala.

**Clinical Conference**—The Florida Medical Center, Venice, will sponsor a clinical conference January 23-24. The speakers will include Drs. John B. Lauricella, New York, on "History of Industrial Medicine", Custis Lee Hall, Washington, "Ewing's Tumor", Joseph F. Londrigan, Hoboken, N. J., "History of Rehabilitation in State of New Jersey", Temple S. Fay, Philadelphia, "Presence of Intramedullary Cord Tumors in Chronic Scoliosis", and Arthur Krida, New York, "Treatment of Congenital Dislocation of the Hip in Infancy". Out of state speakers participating, among others, in a symposium on arthritis included Drs. Frank L. Eskridge, Atlanta, Ga., Charles H. Slocumb, Rochester, Minn., and Robert L. Preston, New York. Dr. Fred Albee, New York and Venice, will discuss elongation of lever at the hip for infantile paralysis.

#### IDAHO

**Personal**—Dr. Marion W. Caskey, Lewiston, has resigned as health officer of the North Central Idaho health district, composed of Nez Perce, Latah and Clearwater counties.

**Hospital News**—A new \$120,000 dormitory and clinic building was to be dedicated at the state mental hospital at Orofino December 20. It will provide space for 200 patients.

#### ILLINOIS

**District Meeting**—Dr. Sidney A. Smith, Chillicothe, was elected president of the North Central Illinois Medical Association at its sixty-fifth annual meeting in LaSalle December 6. He succeeded Dr. Wendall A. Potter, Sandwich. Vice presidents are Drs. Howard P. Sloan, Bloomington, and John F. Lewis, LaSalle, Dr. George A. Dicus, Streator, was reelected secretary-treasurer, an office he has held since 1899. A memorial resolution honoring Dr. Ezra T. Goble, Earlville, who died Feb. 23, 1938, was adopted during the meeting. Dr. Goble was a life member of the association who was admitted to membership in 1879. A life membership certificate was presented to Dr. Frank William Nickel, Eureka. Speakers at the meeting included Dr. Jacob Arnold Bargen, Rochester, Minn., who discussed 'Diagnostic Aids in the Management of Cancer of the Colon'.

**Health Officer Wanted**—Competitive civil service examinations will be held soon by the state department of health to fill the position of health officer of the Champaign-Urbana Public Health District at a beginning salary of \$4,500. Applications on special forms available on request must be on file in the offices of the department at Springfield not later than noon February 4. Applicants will be notified by letter as to the definite date of the examinations, which will be held in Chicago. To be eligible for examination, applicants must have graduated from a medical college of recognized standing, be eligible for a license to practice medicine and surgery in all its branches in Illinois and meet the qualifications set up for health officers by the Conference of State and Territorial Health Officers. Details and application forms may be obtained from Dr. Albert C. Baxter, acting state health director, Springfield.

## Chicago

**Dr Wangenstein to Give McArthur Lecture**—The fifteenth Lewis Linn McArthur Lecture of the Frank Billings Foundation of the Institute of Medicine of Chicago will be given by Dr Owen H Wangenstein, professor of surgery, University of Minnesota Medical School, Minneapolis, at the Palmer House January 27. The subject of the illustrated lecture will be 'The Genesis of Appendicitis in the Light of the Functional Behavior of the Vermiform Appendix.'

## INDIANA

**Secretaries' Conference**—The annual secretaries' conference of the Indiana State Medical Association will be held in the Green Room at the Indianapolis Athletic Club, Indianapolis, January 22. The program includes the following speakers:

- Dr Walter F Vest, Huntington, W. Va., 'The National Medical Situation';  
Dr George C Stevens, Indianapolis, 'Mental Hygiene Clinics';  
M. I. Hays and Frank A. Meriwether, Indianapolis, 'Farm Security Administration';  
Drs Donald A. Coyalt and Earl G. Montkomey, Muncie, 'Outline of Delaware-Blackford County Medical Society Plan for Postgraduate and Public Health Education';  
Dr Verne K. Harvey, Indianapolis, 'Indiana State Board of Health';  
J. K. Helsby, Kansas City, Mo., 'Hospital Insurance';  
Drs Norman M. Beatty and Joseph William Wright, Indianapolis, 'Legislative Problems';  
Dr James Harvey Crowder II, Sullivan, 'Some Observations on Plans to Establish District Health Units'.

**County Program for Medical and Lay Education**—The Delaware-Blackford County Medical Society, cooperating with the Muncie Academy of Medicine, has launched a program of medical graduate education and lay health education. The portion of the program designed for physicians has been developed along the lines of the Indiana Plan. Members of the society will be available for lectures to their own society as well as to others. The graduate aspect also includes weekly hospital ward rounds, clinical pathologic conferences, hospital staff meetings, surgical meetings and study club. In order that physicians may exercise a certain amount of control over the practical nurses in the vicinity, a practical nurses' training course and an American Red Cross course in home nursing have been included. Health exhibits, health education lectures, radio programs, high school talks, inter-high school debates and essay contests and the county fair health exhibit will be important instruments in carrying out the division of the program designed for lay education.

## LOUISIANA

**The Stanford E. Chaille Oration**—Dr Porter P. Vinson, professor of bronchoscopy, esophagoscopy and gastroscopy, Medical College of Virginia, Richmond, delivered the thirteenth annual Dr. Stanford E. Chaille Oration of the Orleans Parish Medical Society in New Orleans December 12 on 'Aid in the Early Diagnosis of Primary Bronchial Malignancy'.

**Society News**—The Ourchuta Parish Medical Society was addressed recently by Dr. Paul H. Herron, Monroe, on 'Diabetes in Infancy and Childhood'.—At a meeting of the Rapides Parish Medical Society in Alexandria November 7, Dr. Paul King Rand read a paper entitled 'The Painful Breast'.—Dr. Henry Theodore Simon, New Orleans, addressed the Tangipahoa Parish Medical Society November 10 on fractures of the extremities.

**Lectures on Medical Jurisprudence**—Lectures in medical jurisprudence have been added to the fourth year curriculum of the Louisiana State University Medical Center, New Orleans. The subjects include medical evidence and testimony, expert testimony, rights of medical witnesses, privileged communications, dying declarations, medicolegal postmortem examinations, malpractice, insanity, criminal acts determined by medical knowledge, and the legal relationships of the physician to his patients and to the public, according to the New York Times.

## MASSACHUSETTS

**District Meetings**—The Suffolk District Medical Society was addressed in Boston November 30, among others, by Drs. Grantley W. Taylor on 'Carcinoma of the Lip', Joe V. Meigs, 'Presacral Neurectomy for Dysmenorrhea', and Fuller Albright, 'In Vitro Dissolution of Kidney Stones'. A motion picture was shown by Dr. Marius N. Smith-Petersen on 'New Method of Arthroplasty of the Hip'.—At a meeting of the Norfolk District Medical Society in Boston November 29, Dr. Champ Lyons spoke on 'Clinical Immunology of Staphylococcus Infections'.

**Causes of Success and Failure**—Under a grant of the William T. Grant Foundation, a five year study into the causes of personal success and failure will be carried on at Harvard University, Cambridge. In charge of Dr. Arlie V. Bock, head of the department of hygiene, the study, to be undertaken by each student voluntarily, will deal with the heredity, constitution, family, school life and other elements pertaining to the makeup of the individual, according to the New York Times. The investigation proposes to analyze the forces that have produced normal young men. According to the report the term 'normal' means that combination of sentiments and physiologic factors which in toto is commonly interpreted as successful living. It is believed that through the study the students cooperating with the eight members of the staff who will work with Dr. Bock will make a memorable contribution to their own well being and to the process of education in its broadest sense. Facilities for the study have been provided in new offices adjacent to the hygiene building.

## MICHIGAN

**Society News**—Dr. Arnold Knapp, New York, discussed 'Chronic Glaucoma' before a joint meeting of the Detroit Ophthalmological and Otolaryngological Society and the Wayne County Medical Society January 6. The West Side Medical Society presented the program before the Wayne County Medical Society December 5, the speakers were Drs. Howard C. Walser on 'Asphyxia Neonatorum', Norbert M. Bittrich, 'Premedication and Spinal Anesthesia', and Robert L. Novak, 'Useful Drugs in Cardiac Therapy'. All are of Detroit.

**Dr. Ragsdale Superintendent of Butterworth Hospital**—Dr. Lucy V. Ragsdale, Boston, assistant superintendent of the Massachusetts General Hospital, Boston, has been appointed superintendent of the Butterworth Hospital, Grand Rapids, effective this month. He will succeed Dr. Norbert A. Wilhelm, who has been named superintendent of the Peter Bent Brigham Hospital, Boston. Dr. Ragsdale graduated at Harvard Medical School in 1924 and served for a time on the faculty of the University of Alabama School of Medicine. He was made assistant superintendent of the Massachusetts General Hospital in 1931.

**Advisory Committee on Health**—An advisory committee for the expansion of public health activities in Michigan was appointed by Governor Frank Murphy before expiration of his term according to the state medical journal, to act as the main steering committee to put into operation the plans advanced at the conference on public health in Lansing in September. Members of the committee include Dr. Edward J. O'Brien, Detroit; Henry F. Vaughan, Dr. P.H. Detroit; Dr. Cyrus C. Sturgis, Ann Arbor; William J. Scripps, Detroit; Louis J. Nims, Lansing; Paul de Kruif, Ph.D., Holland; and Dr. Henry A. Lucc, Detroit, chairman.

**Cancer Center**—A training center for the study of cancer will be established in Detroit under the auspices of the National Advisory Cancer Council, U. S. Public Health Service, Washington, D. C., newspapers report. Wayne University College of Medicine and Receiving, Women's and Grace hospitals will aid in establishing the center and give the courses to graduate physicians. The public health service will make appointments from nominations made by the faculty of the university. First year courses at Wayne will be directed by Dr. Edgar H. Norris, professor of pathology, and at Receiving Hospital by Dr. Osborne A. Brines. Second year courses will be conducted at Grace and Women's hospitals, while the third year will be devoted to general surgical experience at Receiving Hospital under supervision of Dr. Charles G. Johnston.

## MINNESOTA

**Personal**—Dr. Raymond J. Gully, formerly of the staff of the state hospital at St. Peter, has been appointed superintendent of a new state hospital in Cambridge.

**Society News**—Dr. Joseph D. Waller, Wilmont, was chosen president of the Southwestern Minnesota Medical Society at the annual meeting of the society and its women's auxiliary in Worthington recently. Dr. Rock Sleyser, Wauwatosa, Wis., President-Elect of the American Medical Association discussed 'Problems of the Day' before the Hennepin County Medical Society, Minneapolis, January 9.

## MISSOURI

**The Hodgen Lecture**—Dr. Frederick A. Collier, professor of surgery, University of Michigan Medical School, Ann Arbor, delivered the Hodgen Lecture of the St. Louis Surgical Society January 10, his subject was 'Studies on Altered Chemistry in Surgical Patients'.

**Personal**—Dr Ralf Hanks, superintendent of Fulton State Hospital, has been transferred to St Joseph State Hospital. Dr Orr Mullinax, superintendent of the latter, has been transferred to Nevada State Hospital, whose superintendent, Dr Thomas R Frazer, has been transferred to Fulton, according to *Modern Hospital*.

**Society News**—The resident staff of Firmin Desloge Hospital presented the program before the St Louis Medical Society at its meeting December 20, the speakers were Drs William H Vogt Jr on "Abdominal Pregnancy," case report with x-ray results, Kenneth R Andrews, Effects of Diet on Arterial and Venous Glucose Tolerance in Rheumatoid Arthritis," and John E Greutter Jr, Treatment of Gonococcal Arthritis with Typhoid Vaccine and Neoprontosil." Dr Albert Graeme Mitchell, Cincinnati, Ohio discussed 'Pediatric Aspects of Endocrinology' before the society December 13, under the auspices of the St Louis Pediatric Society.

## NEW JERSEY

**Care of Bedridden Indigents**—The Essex County Medical Society announces the formation of a volunteer list of physicians to care for bedridden indigents at home.

**Society News**—Dr Frank H Lahey, Boston, addressed the Camden County Medical Society, Camden, January 3, on 'Thyroid Disease'.—Dr Harrison S Martland, Newark addressed a stated meeting of the Academy of Medicine of Northern New Jersey, Newark, January 19 on "The Medical Examiner Looks at Obstetrics and Gynecology".—Dr David L Farley, Philadelphia, addressed the Gloucester County Medical Society, Woodbury, December 15 on 'Diagnosis in Fever of Obscure Origin'.—Dr Cary Eggleston New York, addressed the Hudson County Medical Society January 3 on 'The Use of Digitalis and Diuretics in Heart Disease'.—The Society of Surgeons of New Jersey will hold its annual meeting in Newark January 28.

## NEW MEXICO

**Society News**—Drs Ralph H Homan and Maurice P S Spearman, El Paso, Texas, addressed the Lea County Medical Society, Hobbs, recently on "Cardiac Neuroses" and "Peroral Endoscopy" respectively.—Drs Louis W Breck and Orville E Egbert, El Paso, Texas, addressed the Eddy County Medical Society recently at Artesia on "The Problems of State and Socialized Medicine".

## NEW YORK

**District Meeting**—The Second District Branch of the Medical Society of the State of New York held its annual meeting in Garden City November 16 with a program devoted to gastro-enterology. The speakers included Drs Albert F R Andresen, Brooklyn, on Medical Management of Peptic Ulcer, Benjamin W Seaman, Hempstead, "Surgical Indications in Diseases of the Gastroduodenal Tract," and Matthew Walzer, Brooklyn, "Gastrointestinal Allergy".

**Hospital News**—The Rochester General Hospital has established a tumor clinic to meet weekly. All known cases of malignant tumor in the outpatient department and in the ward service are to be reviewed and suggestions for treatment made by the clinic are to be followed. Suspected cases may be referred to the clinic for diagnosis and private cases may be reviewed by the clinic if the attending physician desires.—Tarrytown Hospital, Tarrytown received \$100,000 from the will of the late Edward Benedict Cobb retired lawyer of New York and Washington, who died at Pittsfield, Mass in November. It is reported that the bequest must be used for the endowment of beds in the maternity ward for charity patients.

### New York City

**New Foundation Established**—The Dazian Foundation for Medical Research was established through the will of the late Henry Dazian, who left \$1,325,288 to finance its work, according to the *New York Times*. It will operate by awarding funds for education of individuals and for research by individuals and institutions. It is to function for twenty-five years, after which its funds are to be apportioned among such hospitals and similar institutions as the directors may select. If the bequest is held invalid or subject to inheritance taxes, the funds are to be distributed to hospitals at once.

**Hospital Building Funds Approved**—Eight new dispensaries are to be begun immediately in connection with city hospitals with funds made available in the capital outlay budget of the city as finally approved. The hospitals are Coney Island, Cumberland and Kings County hospitals in

Brooklyn, Harlem and Bellevue in Manhattan, Morrisania and Lincoln in the Bronx, and Queens General Hospital in Jamaica, L I. Mayor La Guardia has persuaded Dr Sigismund S Goldwater, commissioner of hospitals, who recently announced his wish to retire, to remain in office another year to supervise these and other pending projects in the department.

**Cornell Withdraws from Welfare Hospital**—Cornell University Medical College has withdrawn its affiliation with Welfare Hospital, the city hospital for patients with chronic diseases on Welfare Island. Instead of the Cornell division there will now be an open division, to which members of the medical profession in general will be eligible. Dr Thomas A McGoldrick, Brooklyn, has been appointed attending physician and director of the medical service of the open division and Dr Condict W Cutler Jr, attending surgeon and director of the surgical service. Columbia University and New York University are affiliated with two other divisions. Their representatives are Drs Walter G Lough, attending physician, and William Barclay Parsons, attending surgeon, in the Columbia division and Drs Norman H Jolliffe, attending physician and William Howard Barber, attending surgeon, in the New York University division. Dr Willard C Rappleye, dean of Columbia University College of Physicians and Surgeons, and Dr Currier McEwen, dean of New York University College of Medicine, are ex officio members of the medical board.

## PENNSYLVANIA

**Society News**—D Roy McCullagh Ph D, Cleveland and Dr Lauric D Sargent Washington addressed the Washington County Medical Society January 11 on "Recent Advances in Endocrinology" and 'Pertinent Facts Concerning the Present Medical Situation' respectively.—The annual meeting of the Pennsylvania Tuberculosis Society will be held in Pittsburgh February 14-15.

### Philadelphia

**Personal**—Arno Viehoever, Ph D, research professor of biology at the Philadelphia College of Pharmacy and Science has received a leave of absence to serve as scientific adviser to the government of Siam. His special task will be to organize and direct a special research unit to explore, evaluate and utilize domestic curative and nutritional agents of the country.

**Medical Economics Night**—The meeting of the Philadelphia County Medical Society January 11 was designated 'Medical Economics Night'. The speakers were Drs Rosco G Leland, director, Bureau of Medical Economics, American Medical Association, Chicago, on "Present Trends in Medical Economics" and Walter F Donaldson, Pittsburgh 'Medical Progress at Stake'.

**Society News**—Dr Walter Bauer Boston, delivered the twenty-first Nathan Lewis Hatfield Lecture of the College of Physicians of Philadelphia January 4 on 'Studies Pertaining to the Origin and Nature of Hypertrophic Arthritis'.—Dr Ralph Rhett Rathbone, Washington, D C, among others, addressed the Philadelphia Roentgen Ray Society January 5 on "Roentgen Diagnosis and Treatment of Sinusitis in Children".—Dr Theodore Cianfrani addressed the Obstetrical Society of Philadelphia January 5 on "A Series of Thirty-Five Cases of Primary Malignancy of the Ovary" and Dr Joseph A Ritter and Walter J Crocker, V M D on 'Macrocytic Anemia of Pregnancy and Anemia of the Newborn'.—Dr Henry C Bazett addressed the Philadelphia Rheumatism Society January 5 on 'Physiologic Effects of Heat'.

### Pittsburgh

**Society News**—Speakers at the meeting of the Allegheny County Medical Society December 20 were Drs Frank M Kern, on "Silicosis and Tuberculosis", William Glenn Srodes 'One Year of Insulin Shock Therapy for Schizophrenia', James H Rankin Jr "Metrazols Place in Psychiatric Treatment," and Verner B Callomon Treatment of Pneumonia with Type-Specific Immune Rabbit Serum.—Drs John B McMurray, Washington, and James H McCready addressed the Pittsburgh Otological Society December 5 on sinusitis.

**New Dean Appointed**—Dr William S McEllroy, professor of physiologic chemistry, University of Pittsburgh School of Medicine has been appointed dean to succeed the late Dr Raleigh Russell Huggins. Dr McEllroy has been acting dean since February 1938. He is a native of Pittsburgh and graduated from the university medical school in 1916. He was made an instructor in the same year he graduated and became assistant professor in 1920 and professor in 1921. He has conducted research on blood pigments, protein and iron metabolism, kidney functions determining of reducing sugars and a emias.

## VERMONT

**University News**—Harold B. Pierce, Ph.D., professor of biochemistry, University of Vermont School of Medicine, Burlington, has been appointed head of the department of biochemistry and acting head of the department of pharmacology.

**Governor Discusses Health Insurance**—In his message to the legislature January 5 Governor Aiken had the following to say concerning medical care in the state:

We recognize that many people who should be getting medical care or hospitalization are not now receiving it. It is also an accepted fact that much improvement could be brought about through cooperative efforts by communities or possibly on a statewide basis.

There may be federal legislation concerning health insurance. Vermont wants no part in any plan which would permit political selection of doctors or the direction of their activities by the government. But we ought to be ready to cooperate either among ourselves with the people of other states or with the federal government on any plan providing for cooperative and voluntary efforts to promote better health among our citizens.

Hospital doctors and laymen in Vermont are all working toward this end. It may be that some plan will be devised before this legislature adjourns that will appear practicable and will permit the broadening of our present sporadic efforts to a statewide basis. If such a plan is devised and legislation appears necessary to make it effective, I hope such legislation will be enacted.

## WISCONSIN

**Society News**—Dr. Charles R. Austrian, associate professor of medicine, Johns Hopkins University School of Medicine, Baltimore, gave the Juppitt Memorial Lecture of the Medical Society of Milwaukee County January 13 on "Chronic Nontuberculous Pulmonary Infections."—Dr. William A. Deerbake, superintendent of the Central State Hospital for the Insane, Waupun, addressed the Dodge County Medical Society December 1 at a meeting at the hospital on "Shock treatment of dementia praecox." Dr. Campbell C. Edmondson, Waukesha, addressed the society December 29 on "rheumatism."—At a meeting of the Green Lake Waushara County Medical Society in Berlin December 19 the speakers were Dr. William J. Blockwenn, Madison, on diagnosis and treatment of head injuries and Harry R. Foerster, Milwaukee, on industrial dermatoses.—The Outagamie County Medical Society met with the Outagamie County Dental Society December 3 when Isaac Schour, D.D.S., Chicago, gave an address on "Calcium Metabolism and Teeth."—Speakers before the Racine County Medical Society, Racine, December 15 were Dr. John F. Bennett, Burlington, on Mesenteric Phlebotomy and David J. Anshel, Milwaukee, "Posture in Childhood" and Mr. J. C. Gamroth, director of the compensation division of the Works Progress Administration, Madison, "WPA as It Affects Doctors in This State."

## GENERAL

**New Members of Cancer Council**—Dr. James B. Murphy, chief of the cancer research division of the Rockefeller Institute for Medical Research, New York, and Mont R. Reid, professor of surgery, University of Cincinnati College of Medicine, have been appointed members of the National Advisory Cancer Council for three year terms. They succeed Dr. Francis Carter Wood and James Ewing, New York.

**New Special Society**—The Southwestern Society of Eye, Ear, Nose and Throat Specialists was organized Oct. 27, 1938, during the annual meeting of the Southwestern Medical Association in El Paso. Officers elected were Drs. Percy Dale Biddle, Tucson, Ariz., president, William C. Burton, Santa Fe, N. M., vice president, and Maurice P. S. Spearman, El Paso, secretary. Meetings will be held annually during the sessions of the Southwestern Medical Association.

**South Atlantic Obstetricians and Gynecologists to Meet**—The South Atlantic Association of Obstetricians and Gynecologists will hold its annual meeting February 10-11 in Charleston, S. C. The guest speakers will be Drs. Edward H. Richardson, Baltimore, on "Surgical Management of Uterine Prolapse and Associated Benign Pathology" and George W. Kosmak, New York, "What Do We Mean by Conservatism in Obstetrics?" Dr. James R. McCord, Atlanta, Ga., is president of the association and Dr. Robert A. Ross, Durham, N. C., is secretary.

**Offer Gold Medal in Ophthalmology**—The University of Buffalo offers again its annual gold medal for a work on an ophthalmologic subject, according to an announcement. Any physician is eligible to compete for the medal and there are no restrictions as to length of the work. Contributions should be in the hands of the committee before May of each year, as the award is made in June. The committee is composed of Drs. Frederick H. Verhoeff, Boston, Arthur J.

Bedell, Albany, N. Y., and Harold W. Cowper, Buffalo. For details address Dr. Cowper at 543 Franklin Street, Buffalo, N. Y.

**Special Society Elections**—Dr. Bernard H. Nichols, Cleveland, was elected president of the Radiological Society of North America at its annual meeting in Pittsburgh Nov. 28-Dec. 2, 1938. Drs. William Walter Wasson, Denver, James J. Clark, Atlanta, and Manuel F. Madrazo, Mexico D. F., were elected vice presidents. Dr. Donald S. Childs, Syracuse, N. Y., was reelected secretary.—Dr. Walter H. Nadler, Chicago, was elected president of the Central Society for Clinical Research at its eleventh annual meeting in Chicago Nov. 4-5, 1938. Dr. Charles A. Dorn, Columbus, Ohio, was chosen vice president and Dr. Lawrence D. Thompson, St. Louis, was reelected secretary-treasurer. The next annual session will be at the Drake Hotel, Chicago, November 3-4.

**Theobald Smith Award**—Dr. Charles F. Code, Rochester, Minn., received the Theobald Smith Medal and cash prize of \$1,000 awarded by the medical section of the American Association for the Advancement of Science at its midwinter meeting in Richmond, Va. Dr. Code was honored for research showing that histamine is present in increased amounts in the white blood cells of persons suffering from hay fever, asthma and some other allergic diseases. He is 28 years old and graduated from the University of Manitoba Faculty of Medicine, Winnipeg, in 1934. The award was established in 1935 by Eli Lilly & Co., Indianapolis, to be presented to an investigator under 35 years of age for demonstrated research in the field of the medical sciences taking into consideration independence of thought and originality.

**Infantile Paralysis Foundation**—Preceding the annual birthday balls on President Roosevelt's birthday January 30 by which funds are raised to fight infantile paralysis, a nationwide campaign for funds called "The March of Dimes" is being carried out. The slogan is "Give a Dime and Wear a Button" and citizens are asked to contribute 10 cents and wear a button publicizing the campaign. Cards holding ten dimes are also being distributed; recipients are asked to fill them and send them to the President. Among other phases of the campaign is a series of sports events sponsored by the sports council of the Committee for the Celebration of the President's Birthday. Grantland Rice is chairman of this activity to raise funds. This year the funds will be divided in half: one part to remain in the localities where the money is raised and the other half to be sent to the National Foundation for Infantile Paralysis for support of research and new treatment centers. The foundation has just announced grants of \$140,990 to universities and hospitals for research the following grants were made:

Yale University School of Medicine	New Haven Conn.	\$6,500
Long Island College of Medicine	Brooklyn N. Y.	\$15,000
University of California Medical School	San Francisco	\$5,000
University of Southern California School of Medicine	Los Angeles	\$10,000
Stanford University School of Medicine	San Francisco	\$12,000
University of Michigan Medical School	Ann Arbor	\$2,000
University of Wisconsin Medical School	Madison	\$3,300
Ohio State University College of Medicine	Columbus	\$3,000
Western Reserve University School of Medicine	Cleveland	\$4,800
Washington University School of Medicine	St. Louis	\$6,800
Cornell University Hospital	Ithaca N. Y.	\$7,500

In addition the following hospitals received grants for prevention and treatment of after-effects:

Orthopedic Hospital School	Los Angeles	\$7,800
Children's Hospital School	Baltimore	\$7,500
St. John's Hospital	Springfield Ill.	\$2,500
Michael Reese Hospital	Chicago	\$4,600
James Whitcomb Riley Hospital	Indianapolis	\$6,000
Children's Hospital	Martin Texas	\$2,500
New York Hospital	New York	\$4,580
University Hospitals	Iowa City	\$8,500
Hospital for Joint Diseases	New York	separate grants in different departments \$4,250, \$3,800, \$5,500 and \$5,500
Scottish Rite Hospital	Dallas Texas	\$10,000

Dr. Thomas M. Rivers, New York, is chairman of the foundation's advisory committee on scientific research, which approved all grants for research. Dr. Philip Lewin, Chicago, is chairman of the committee on prevention and treatment of after-effects, which approved all grants for that purpose.

**Plan for Examinations in Ophthalmology**—The American Board of Ophthalmology announces a change in its methods of examining candidates. Examinations are to be divided into two parts, written and oral. Candidates whose applications are accepted will be required to pass a written examination, which will be held simultaneously in various cities about sixty days prior to the date of the oral examination. The written examination will include all the subjects previously covered by the practical and oral examinations. Oral exami-

nations will be held at the time and place of the meeting of the American Medical Association and of the American Academy of Ophthalmology and Otolaryngology and occasionally in connection with other important medical meetings. The oral examination will cover external diseases, ophthalmoscopy, pathology, refraction, ocular motility and practical surgery. Only those who have passed the written examination and who have presented satisfactory case reports will be permitted to appear for the oral examination. Written examinations will be held March 15 and August 5, oral examinations will be held in St. Louis May 15 and in Chicago October 6. Applications for the March 15 examination must be filed before February 15 with the secretary, Dr. John Green, 6830 Waterman Avenue, St. Louis, Mo.

### CANADA

**Society News**—Dr. Karl Haig, Vancouver, B. C., addressed the Vancouver Medical Association December 6 on "Diagnosis of Congenital Dislocations of the Hip, with Treatment of Those Which Are Reducible"—Dr. Reginald Fitz Boston, addressed the Academy of Medicine of Toronto at its stated meeting December 6 on "The Periodic Health Examination as a Method of Clinical Investigation."

**Laboratories for Electro-Encephalography**—New laboratories for research on electro-encephalography were to be opened at the Montreal Neurological Institute early this month according to *Science*. Herbert H. Jasper, Ph.D., recently assistant professor of psychology at Brown University and director of the neurophysiologic laboratories and the psychologic clinic at Bradley Home, Providence, R. I., will be in charge of the work, which will be financed by a grant from the Rockefeller Foundation. Epilepsy and dementia will be the subjects of special study. Since the institute was opened in 1934 extensive research on epilepsy has been carried on by Dr. Wilder Penfield, director of the institute and professor of neurology and neurosurgery at McGill University Faculty of Medicine. Citizens of Montreal contributed funds for an extension of the institute building for the new laboratories.

## Government Services

### Division for Research on Quinine Derivatives

The National Advisory Health Council approved the establishment of a division in the National Institute of Health, U. S. Public Health Service, to carry on research into possible new uses of quinine derivatives. It is reported. The new division will also study the possibilities of raising the plant on American soil. At the present time most of the output of quinine comes from the East Indian colonies of the Netherlands. Lyndon F. Small, Ph.D., research associate in organic chemistry, University of Virginia, Charlottesville, has been appointed to be in charge of the new unit, effective next summer, it was stated.

### Examination for Medical Corps of the Navy

An examination of candidates for appointment as Lieutenant (junior grade) in the Medical Corps of the Navy will be held at all naval hospitals in the United States and at the Naval Medical School, Washington, D. C., beginning May 8.

Candidates for admission to this examination must be citizens of the United States between the ages of 21 and 32 years at time of appointment, graduates of class A medical schools and must have completed an internship of one year in a hospital accredited for interns by the American Medical Association and the American College of Surgeons.

Those who are interested should write the Surgeon General, U. S. Navy Bureau of Medicine and Surgery, Navy Department, Washington, D. C., for further information with regard to the examination and the procedure to follow for them to appear before one of the examining boards.

Graduates of class A medical schools who have completed an internship in a civilian hospital and who successfully pass the competitive professional examination and the physical examination will be commissioned as assistant surgeons with the rank of Lieutenant (junior grade) and assigned to the Naval Medical School, Washington, D. C., for a graduate course prior to assignment to sea or foreign shore duty. Formal applications to take the examination should be forwarded in duplicate to the Bureau of Medicine and Surgery of the

Navy, Washington, D. C., at least a month in advance of the examination. The application should be accompanied by (a) letters or certificates from two or more persons of good repute, testifying from personal knowledge to good habits and moral character, (b) satisfactory evidence as to citizenship and age, (c) a certificate of graduation in medicine and a certificate of internship from a civilian hospital (do not submit diplomas), (d) recent photograph (preferably 5 by 6 inches) and (e) if the candidate has had special educational or professional advantages, a certificate to this effect, signed by the proper authority, should be forwarded.

If the credentials are satisfactory the Bureau of Medicine and Surgery will recommend that a permit be issued to the candidate to appear before an examining board nearest his medical school or place of residence. On accepting appointment as assistant surgeon with rank of Lieutenant (junior grade), the officer receives compensation of \$2,699 a year if he has no dependents and \$3,158 a year if he has dependents. There is an allowance of 8 cents per mile for travel to his first station of duty. No allowance is made for expenses of candidates appearing for examination. After officers have been in the service long enough to assure the Bureau of Medicine and Surgery of their remaining in the service and have become thoroughly familiar with the naval officer's duties and have demonstrated their professional qualifications, special courses may be authorized at various institutions to enable the officer to specialize along lines of his choice. Medical officers are eligible for promotion in the navy under such provision of law as may be in effect at the time. Naval officers are retired from active service at the age of 64 years and then receive annual pay for life amounting to three fourths of the base pay of their grade at the time of retirement.

### Examination for Appointment to U. S. Public Health Service

An examination to establish eligibility for appointment in the commissioned corps of the United States Public Health Service in the grade of assistant surgeon (medical only) is hereby announced to be held on the dates mentioned below. Applicants must not have passed their thirty-second birthday on the date the examination is taken, must be citizens of the United States, graduates of a class A medical college and must have completed or will complete by July 1, next, at least one year of internship or its equivalent.

The compensation of officers in the grade of assistant surgeon, both regular and reserve corps, is \$3,158 per annum with dependents and \$2,699 per annum without dependents.

The board of examiners will be in the following places at the time specified for the purpose of making the necessary physical examinations and conducting certain other portions of the examination:

U. S. Marine Hospital Boston 9 a. m. January 31  
U. S. Marine Hospital Stapleton N. Y. 9 a. m. February 1  
U. S. P. H. S. Hospital Lexington Ky. 9 a. m. February 9  
U. S. Marine Hospital New Orleans 9 a. m. February 14  
U. S. Marine Hospital St. Louis 2 p. m. February 27  
Colorado Psychopathic Hospital Denver 9 a. m. March 1  
U. S. P. H. S. Relief Station Los Angeles 9 a. m. March 3  
U. S. Marine Hospital San Francisco 9 a. m. March 6  
U. S. Marine Hospital Seattle 9 a. m. March 10  
Indian Field Service Office 161 Federal Bldg. Minneapolis 9 a. m. March 14  
U. S. Marine Hospital Chicago 9 a. m. March 16  
U. S. Marine Hospital Cleveland 9 a. m. March 18  
U. S. P. H. S. Building Washington D. C. 9 a. m. March 27

Applicants desiring to take this examination should make arrangements to appear before the board at any of the places mentioned at the time and on the dates specified.

Those who complete the physical examination and certain other portions of the examination will be permitted to participate later in the written portion of the examination beginning March 30 either at the place where the physical examination is conducted or at some other nearer point, or candidates may elect to come to Washington, D. C., March 27 to take the entire examination. The written and clinical portions of the examination will consume about three days. Any travel expenses to be incurred must be defrayed by the applicant.

If time will permit, applicants may obtain formal application blanks by writing to the Surgeon General, U. S. Public Health Service, Washington, D. C. These forms may be filled out and delivered personally to the board of examiners or blanks may be had from the board at the time the applicant appears for examination. Applicants will be required to present their diplomas to the board.



## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Dec 21, 1938

#### Research on the Anemias

The most important work on pernicious and other anemias done in the last few years in this country has been produced by Dr John F Wilkinson, director of the department of clinical investigations and research of the University of Manchester. His report for 1937-1938, which has just been published shows important advances

#### ADRENAL CORTICAL EXTRACT IN ADDISON'S DISEASE

Last year the department completed a research at the request of the Medical Research Council on the effect of adrenal cortex extract in the treatment of Addison's disease. The patients then successfully treated have now remained alive and well for a further twelve months under much decreased or minimal doses of the extracts with marked improvement in general health. The longest surviving patient has now been under observation for four and one half years. At the council's request a further investigation of the new synthetic adrenal cortex extract—desoxycorticosterone acetate—doses of which are much less than those of the extracts previously used, has been begun. Three patients have been treated with these small doses and the results have been most encouraging.

#### ETIOLOGY AND TREATMENT OF THE ANEMIAS

Investigations have been continued on the etiology and treatment of pernicious anemia, achrestic anemia (first described in 1935 by Wilkinson and Israels under this name), hemolytic anemia and hypochromic anemias. The treatment of hypochromic microcytic anemias has been subject to further inquiries, but so far satisfactory preparations of iron suitable for parenteral administration have not been found, massive doses of ferrous salts orally is still the best treatment.

#### THE TREATMENT OF PERNICIOUS ANEMIA

Work has been done on the improvement of liver and stomach preparations for the treatment of pernicious anemia. Potent extracts containing very small quantities of solids have been used but there appears to be evidence that accessory factors may be necessary for a complete return of the patients to normal. Thus it has been noted that the highly purified liver extracts may produce only reticulocytosis and partial or slow improvement in the red cells and hemoglobin percentage without the complete and rapid return to normal that follows the use of less highly purified liver extracts. Much further work is required to elucidate the nature of these possible accessory factors, but it is improbable that they are vitamins B and C. By incubation experiments with stomach tissue and beef muscle and administration of the products to patients suffering from pernicious anemia it has been shown, by the curative effects, that hemopoietin is present in the normal human stomach but absent from the stomachs of patients suffering from pernicious anemia both in remission and in relapse. This confirms previous work with gastric juice. The intrinsic activity of livers from animals has been investigated, in general, mammalian and fish livers proved active but reptilian (giant monitor, alligator and others) and different snake livers were inactive. The significance of these experiments is under consideration.

#### A STUDY OF BONE MARROW OBTAINED BY STERNAL BIOPSY

The assistant director, Dr M C G Israels, has been chiefly engaged in a study of bone marrow obtained by sternal biopsy for tissue culture experiments. Marrow cells from patients with leukemia have been grown in a medium containing human placental extract. A photomicrographic apparatus has been used for recording the results. The morphology of bone marrow

in blood diseases has been closely studied and there is no doubt that valuable diagnostic information can be so obtained. The researches have greatly aided in the classification and therefore in the treatment of patients with anomalous anemias. Some of these appear to be due to disturbances of erythropoiesis and others to be related to the leukemias. (The results suggest that pernicious and allied anemias are alone characterized by the appearance of megakaryoblasts in the bone marrow, other disturbances involve the normoblastic series of cells.) Dr Israels has been elected to the Foulerton Research Fellowship of the Royal Society and therefore has resigned his appointment as assistant director.

#### Medical Services in Air Raids

Gradually the preparations made to render medical services to civilians during air raids should the threat of war have materialized in the recent crisis are being disclosed. The government plan was a regional organization for dealing with casualties on the basis of first making available beds in existing institutions and then expanding these institutions by satellite annexes. For personnel there was a register of physicians and of nurses. Some months ago the British Medical Association on the invitation of the Committee of Imperial Defense, compiled a register of the medical personnel available in war. This register now included 95 per cent of the physicians in the country. If war had come, they would have been directed to the places where the needs were greatest. But clearly the best place for a physician on the outbreak of war was with his own patients. There was bound to be a heavy strain on his practice particularly in areas into which the populations from crowded places were to be evacuated. In any case the most obvious air raid post was the physician's office. The problem of coordinating the claims of the fighting services on the physicians with those of the civilian population was being discussed.

A survey of the whole hospital accommodation of England and Wales had been made with a view to expansion. It covered 3,000 hospitals and institutions and just over 40,000 beds. Hospital officers were sent to every region with instructions to free as many hospital facilities as possible in the more congested areas so that in case of emergency more elaborate schemes could be evolved. At the outbreak of war 150,000 beds would have been available for air raid casualties and at the end of a fortnight another 100,000. These did not include the beds in London, for which there was special organization. A circular had been sent to every hospital stating that the personnel must be ready to clear as many beds as possible on receiving warning from the government and must prepare schemes for expansion in case of need. There was the hospital officer on the spot ready to assist in working out scheme. Arrangements were made for first aid posts, each staffed by a physician. The government ordered 50,000 bedsteads and mattresses, 15,000 blankets and 9,000 stretchers.

#### TRANSPORT SCHEMES

Transport was a vital question in clearing the London hospitals. In addition to the patients who were to be sent home to make room for casualties, between 3,000 and 4,000 patients in thirty-four of the larger general hospitals which would be most valuable to the casualty organization, were to be removed on stretchers to smaller towns about fifty miles distant. Three hundred omnibuses were to be converted at from twelve to twenty-four hours' notice into ambulances, each capable of taking eleven stretchers. Fitters were standing by to do the work. Arrangements were also made to assemble twenty-one ambulance trains at selected stations (not the terminals), and the St John Ambulance Brigade arranged to provide stretcher bearers to carry the patients from the omnibuses to the trains. Detailed plans were worked out with the transport board and the railway companies to insure synchronization, and Septem

ber 24 the necessary stretchers were distributed to each evacuating hospital. From that point the hospital evacuation of London could have been put into force at twelve hours' notice. The government is now making a comprehensive house to house survey of practically all rural England as a first step in the evacuation of children from cities in war time. An evacuation division of the ministry of health has been constituted. Plans for the evacuation of adults will be made later.

### The Jubilee of the British Journal of Dermatology

The only British journal devoted to dermatology has celebrated its jubilee by a special number devoted to a survey of its work during the past fifty years, which means a survey of British dermatology during that period. It is strange that, although the foundations of modern dermatology were laid in London at the beginning of the nineteenth century by William and Bateman, there was no society devoted to it until the Dermatological Society of London was founded in 1882 by Stowers and Sangster and not until six years later was a special periodical, the *British Journal of Dermatology and Syphilis*, founded. Yet corresponding periodicals had been published on the European continent and in America for many years. In "A Retrospect" J. M. H. Macleod tells how the journal was founded by Morris and Brooke and at first issued under their combined editorship at a time when dermatology as a specialty received scant and grudging recognition. In London only a few of the teaching hospitals had dermatologists on their staffs, and their dermatologic departments were staffed by young physicians and surgeons whose interest in them was apt to be ephemeral and who regarded them only as stepping stones. A few physicians—Pye-Smith, Mackenzie, Payne, Omerod and Galloway—made important contributions to dermatology though engaged in the practice of general medicine. Excellent portraits are given of the successive editors of the journal. Sir Ernest Graham-Little gives interesting sketches of celebrated British dermatologists of the past fifty years. He describes that greatest of clinicians, Sir Jonathan Hutchinson, as a fascinating teacher attracting crowded audiences to his lectures and demonstrations which were 'better than a play' and ranging, as his experience allowed him to do, over multifarious subjects. Thus in a hospital lecture on 'Fairy Rings and Allied Phenomena' he passed from the rings of fungi in the fields to ringworm and herpes. In making syndromes and discerning connections between diseases not obviously connected he was a past master.

### The Recognition of Chiropodists

After some opposition, chiropodists were recognized by the British Medical Association as medical auxiliaries for the treatment of corns and bunions. The chiropodists have now consolidated their position by forming a Chiropody Group Council as the qualifying body in chiropody to the Board of Registration of Medical Auxiliaries. An immediate outcome of the work of the council will be the preparation of an official register of chiropodists. This will be circulated to physicians, hospitals and municipalities and other bodies. The practice of chiropody will be entirely directed and controlled by the council.

### Bill for the Use of Blood Tests in Affiliation Cases

In this country the courts cannot order blood tests in affiliation proceedings. As these cannot prove paternity but only nonpaternity, the woman has nothing to gain in allowing them. A bill has been introduced in the House of Lords giving the court power, at the request of either party, to require a woman who brings affiliation proceedings to undergo blood tests to ascertain whether the defendant can be excluded from the paternity of her child. If she refuses, her application will be refused. If she consents the court shall nominate an approved person to carry out tests on her blood, the blood of her child and that of the defendant.

## PARIS

(From Our Regular Correspondent)

Dec 17, 1938

### Preoperative Serotherapy in Appendicitis

At the November 29 meeting of the Académie de médecine, Professor Weinberg, bacteriologist at the Pasteur Institute, read a paper advocating the use of an antigangrene serum as a preoperative measure in cases of appendicitis, especially if complicated by peritonitis. Such excellent results followed the use of a polyvalent antigangrene serum in the French army during the World War that the author of the paper recommended its use in serious cases of appendicitis. Prof. Paul Delbet in 1920 was the first to follow this suggestion. Since then 441 cases of perforated and nonperforated gangrenous appendicitis have been treated with a serum containing the polyvalent antigangrene serums, the anti-colon bacillus serum and a complementary serum which aims to combat other secondary bacteria, such as the enterococcus, streptococcus, *B. ramosus*, *B. funduliformis*, *B. fusiformis* and *Staphylococcus parvulus*, which play an important part in the evolution of a gangrenous appendicitis. This antiperitonitis serum has given excellent results in France, in Poland, in Russia and at the Mayo Clinic.

Professor Weinberg was of the opinion that the mixed serum acts as a specific and cited eight cases in which operative intervention could not be carried out for "moral or material reasons" with recovery following the use of the mixture of antigangrenous and anti-colon bacillary serum. He said that whenever it was impossible to perform an emergency operation the patient should be given the benefit of serotherapy. A large dose, from 80 to 100 cc of the antiperitonitis serum diluted with from 200 to 500 cc of physiologic solution of sodium chloride, ought to be injected immediately by the intramuscular or subcutaneous route. The injection should be repeated two or three times within the first twenty-four hours. As soon as the acute symptoms subside, operation is indicated.

In the discussion, Professor Vincent said that he had found the mixed serum very efficacious in the treatment of cases of gangrenous appendicitis, especially if complicated by peritonitis. Appendectomy, however, should be performed whenever possible.

Prof. Pierre Duval warned against a false interpretation of the recommendation of Professor Weinberg to use the mixed serum in cases in which operation could not be performed for "moral or material reasons." In acute appendicitis, especially the gangrenous form, operation should be performed as soon as possible.

Prof. A. Gosset said that every effort must be made by the profession to eliminate such 'moral or material reasons' for delay in performing operations in acute cases.

### Inhalations of Oxygen and Carbon Dioxide in Pneumonia

Two naval surgeons, Hederer and Andre, read a paper at the November 15 meeting of the Académie de médecine of Paris in which they reported their observations on the use of various mixtures, such as 5 per cent carbon dioxide and 95 per cent oxygen in the treatment of acute pulmonary conditions at the Toulon naval hospital. Their conclusions were that the Henderson mixture (5 per cent carbon dioxide and 95 per cent oxygen), like oxygen, increases the oxygen content of the hemoglobin. Five per cent carbon dioxide will not do this. Both of these, as the result of stimulation of the respiratory center, increase the dyspnea to such an extent as to exhaust the patient. Hence this method of treatment is not to be recommended at present in the treatment of any acute pulmonary condition of bacterial origin. In pulmonary conditions of chemical origin the use of Henderson mixture is distinctly contraindicated. In the latter group of cases the

experience acquired during the World War and more recent experimental studies have demonstrated the value of absolute rest with reduction of pulmonary excursions to the minimum. The administration of a carbon dioxide oxygen mixture to such patients, by increasing the respiratory rate, favors the extension of the congestion and edema at all stages of the intoxication by gases such as those now employed in warfare. Only oxygen in pure form should be given in such cases.

### Well Known Quack and Assistant Are Fined

A foreigner who looks over the advertising columns of French newspapers will be astonished at the space occupied by quacks of all types. One of the most successful charlatans is Dr. Vidal, who claims to be able to diagnose and cure any form of disease by pressure exerted on the sympathetic nerve endings in the nasal mucous membrane. This super quack has numerous offices in Paris and larger cities all over France. In spite of every attempt to check his activities by the medical organizations, the leniency of the courts permits him to escape with a fine which is out of all proportion to his receipts. An exception to this leniency has just been reported in a case in which Dr. Vidal had employed a foreign physician who did not have a French diploma. Dr. Vidal was fined 5,000 francs and the assistant 1,000 francs but this will not deter the former from continuing to exploit the credulity of the public.

### Influence of Sulfanilamide on Experimental Tetanus

A possible extension of the application of chemotherapy to acute infections such as tetanus formed the subject of a paper read by Dr. R. J. Mayer at the Académie de médecine of Paris. It is comparatively easy to produce tetanus in mice by the subcutaneous injection of earth containing the bacilli. Of the two drugs which were employed in his experiments sulfanilamide and alpha para amino-phenyl-sulfonamide, the former is four times more toxic than the latter but its activity toward all bacteria except streptococci is less marked. Of thirty control animals, only one, or 3.3 per cent, lived after the injection of earth containing tetanus bacilli, whereas of ninety-five mice which were given one of these drugs forty one or 43 per cent, survived. The author expressed the opinion that in the future chemotherapy may play an important part in the prevention and treatment of tetanus.

### Anniversary of Ophthalmic Society

The Société d'ophtalmologie of Paris celebrated the fiftieth anniversary of its foundation November 20. The program included a paper on encephalomalacia by Professor Lhermitte, a review of the fifty years' work of the society by Dr. Magitot, the secretary, and a paper on retinopathy in hypertension by Dr. Dubois-Poulsen. In the secretary's report, mention was made of such distinguished ophthalmologists as Galewowski, de Wecker, Patin and Landolt, who had been members. Representatives of the Swiss, Belgian and other foreign societies were present at the meeting and praised the work of the Paris organization since its foundation fifty years ago.

### Honorary Degrees Conferred on Biochemists

At the opening session of the University of Paris, held at the Sorbonne November 5, honorary degrees were conferred on Professors Karrer of Switzerland, Szent-Györgyi of Hungary and Sorensen of Denmark. The first two have received the Nobel prize. Professor Karrer is head of the department of chemistry at the University of Zurich. His work on the chemical composition of the colors of flowers and vegetables, as well as his research on the synthesis of vitamin E, has attracted the attention of the scientific world. Professor Szent-Györgyi is head of the department of medical chemistry at the University of Szeged, Hungary, and is especially known for his work on ascorbic acid, which he demonstrated as being

identical with the antiscorbutic vitamin. Professor Sorensen is director of the Carlsberg research laboratory at Copenhagen and has made important contributions in the field of biochemistry.

### Program of 1939 French Tuberculosis Congress

The ninth annual meeting of the French Tuberculosis Society will be held at Lille, in northern France, April 11-13. The program includes discussions on the specific characters and role of various types of tubercle bacilli other than the human type in tuberculous infection in man, puriform and purulent pleural exudates following artificial pneumothorax and their treatment, and preventive measures against tuberculosis by systematic examination of the population.

### Opposition to Compulsory Antidiphtheria Vaccination

France is divided into ninety departments or counties, in each of which there is a local governing body termed the general council. At a recent meeting of such a council at Lyons which is located in one of the most densely populated departments (Rhône), the mayor, Mr. Herriot, stated that there is a noteworthy increase in the number of cases of diphtheria in spite of the use of diphtheria toxoid vaccination. In another department, Aude, several physicians protested against accepting a subsidy for compulsory vaccination against diphtheria on the ground that deaths had followed the use of the vaccine.

### Honorary Degree Conferred on American Surgeon

At the opening exercises of the University of Strasbourg, November 5, an honorary degree was conferred on Dr. Elliott C. Culler, professor of surgery at Harvard University, in recognition of his important contributions to surgery.

### BERLIN

(From Our Regular Correspondent)

Dec 12, 1938

### Diarrheas of Nurslings

Professor Besenau Berlin, ordinaris in pediatrics, in discussing the pathogenesis and treatment of the diarrheas of nurslings before the Berlin Medical Society, said that as a rule diarrhea of nurslings is not caused by the nutriment. Artificial feeding may, however, lead to a predisposition to diarrhea. The greater part of cases of diarrhea in nurslings are based on infection. The colon bacteria are of paramount importance. The very young infant harbors no bacteria of this group. During the first weeks of life the large intestine first adapts itself to these bacteria. The sole physiologic flora of the large intestine of the nursling is *Lactobacillus bifidus*, which usually does not permit the advance of a *B. coli* flora. The mechanism of the action of *B. coli* consists in the destruction of the carbohydrate. These fermentative processes are physiologic in the large intestine but pathologic in the small intestine. The acid products of fermentation stimulate peristalsis. It is the living micro-organisms that are injurious, not their products of decomposition. Premature infants are physiologically dysergic since in them *Lactobacillus bifidus* is not developed at the proper time. The therapy of diarrheas of nurslings must have as its objective elimination of pathologic flora from the gastroenteric tract. Starvation treatment removes the products of decomposition and therewith the nutrient medium of saprophytes. Feeding of gruel soups acts similarly to starvation, besides, the mealy substances exert a special favorable influence which cannot be explained. Feedings with buttermilk, in which *B. coli* cannot be cultured, represent a further therapeutic measure. In addition, the effort must be made to produce the proper flora by means of breast milk. It is extremely difficult, of course, to eliminate *B. coli* by culture of *Lactobacillus bifidus*. Furthermore albumin milk has a noticeable

influence, it leads to formation of a quite water-deficient stool containing calcium soaps, in the large intestine, the colon bacilli can thrive but poorly in this medium. After feeding with whey the B coli flora disappears almost immediately. Bessau recommends that the treatment of diarrheas of nurslings begin with a period during which the infant receives only tea, subsequently a mixture of about one half whey, one half water and 8 per cent rice water together with sodium citrate is given. The worth of this dietary has been verified in practice.

#### The Prevalence of Brucellosis

In the years 1936 and 1937 there were 597 and 586 cases, respectively, of infection with *Brucella abortus* Bang officially reported, which were serologically authenticated. In the table are set forth the number of such cases reported each year during the last decade.

It will be seen that during the first four years the number of reported cases declined, only to rise again in subsequent years but without attaining the peak of 1929-1930. The male sex was preponderantly affected. 1936, 462 males and 135 females, 1937, 431 males and 155 females. As in earlier years, most of the patients were men in their active years, whereas few old persons and children were affected. Each appearance of the infection was an isolated case. Transmissions from

*Number of Cases of Infection with Brucella Abortus*

Years	Cases Reported
1929-1930 (Oct 1 to Sept 30)	626
1930-1931	520
1931-1932	498
1932-1933	483
1933-1934	530
1934-1935	513
1935 (Oct 1 to Dec 31)	146
1936 (Jan 1 to Dec 31)	597
1937 (Jan 1 to Dec 31)	586

person to person were nowhere determined. In 1936 one case of abortion as a sequel of brucellosis was reported. In the same year there were five fatalities ascribable to the disease, in 1937 there were three such fatalities. Diseases with which brucellosis in its critical stages was confounded were cholecystitis, tuberculosis, cancer, pernicious anemia, articular rheumatism, cystopyelitis and typhoid. In two cases Widal reactions were positive for brucellosis and typhoid. *Brucella abortus* was cultured from the blood in forty-four cases during 1936 and in thirty-nine cases during 1937. In each instance culture was obtained from puncture material and from pus. With regard to sources of infection, contact with infected cattle and ingestion of raw milk and dairy products were far the most notable. Besides, during 1936 four cases of infection acquired in laboratories were reported, during 1937 only one such case was reported. As was to be expected, most cases occurred among agricultural workers, yet in 1936 six physicians and eighteen veterinarians were also infected and in 1937 four physicians and nineteen veterinarians were infected.

#### Protection of the Youth Against Tuberculosis

A recent decree by the minister of the interior is designed to protect youthful domestic servants against infection from tuberculous members of a household. It is provided that a local health bureau as a routine duty must notify the head of a household which harbors a case of open tuberculosis that no young person can be employed in that house. If this order is violated with resultant harm to other persons, the householder is liable, both criminally and civilly, and may be placed in custody. Under certain circumstances the authorities can intervene. The health bureau can also serve notice on a householder enjoining him from employment of young persons in his domicile.

#### Prof G A Wagner Retires

Prof Georg August Wagner, for many years director of the women's clinic of Berlin University, the Charité, has been relieved of his post, having reached the age of retirement. He will, however, continue in his professorship on a pro tempore basis. A native of Prague, he is 65 years old. In 1917, after service as assistant at the Women's Hospital of Vienna, he became ordinarius in gynecology at the University of Prague, and in 1928 he was called to Berlin in a similar capacity. He has published a great deal on gynecologic problems, especially tuberculosis of the female genitalia and gonorrhea in females.

#### JAPAN

(From Our Regular Correspondent)

Nov 28, 1938

#### Dietetic Hospital Opened

The first dietetic hospital has been founded at the cost of 150,000 yen (\$40,000) attached to the Dietetic Research Institute, the director of which is Saeki, an authority on dietetics. The institute celebrated its inauguration November 8 in Tokyo. The hospital will be devoted to the treatment of diseases caused by deficiency of vitamins, and the betterment of constitutional predisposition, by means of dietetic treatment. In the calory room is a tank which looks something like a small submarine. Patients will be placed in this tank, which is isolated from outside, and their expired gases are to be carefully separated and measured. The hospital has only fifteen beds at present. The equipment is modern.

#### Memorial to Hideyo Noguchi

A memorial to the late Dr Hideyo Noguchi was completed in October. His admirers, hoping to preserve his place of birth, have rebuilt the cottage, which stands in a village in Fukushima Prefecture in northern Japan. Many people at home and abroad offered contributions, which will be used in part in planting trees in the garden about the house next spring after the snow has melted away. The trees will commemorate the contributors also. The opening ceremony will be held May 21.

#### Dr Hata Is Dead

Dr Sahachiro Hata, professor at the Keio Medical University and vice president of the Epidemic Research Institute, died of arterial sclerosis November 22 at the age of 66. He assisted in the research on arsphenamine when with Ehrlich in Germany in 1907. He was made a member of the Imperial Academy in 1933.

### Marriages

BENEDICT RAYMOND WALSKE, Independence, Wis., to Miss Mary June Leydorf, Toledo, Ohio, Nov 3, 1938.

JOHN G WISHARD, Wooster, Ohio, to Mrs Blanche K Pollock of Aspinwall, Pa., in November 1938.

WILLIAM EUGENE APPERSON, Charlottesville, Va., to Miss Ellen Cosby Carter of Halifax, Oct 29, 1938.

CLARENCE RHODES BENNETT to Miss Gay McKenzie, both of Eufaula, Ala., in Camilla, Ga., Nov 24 1938.

JOHN J MULLOWNEY, Nashville, Tenn., to Mrs Esther G Thomas of Wilson, N C., Nov 1, 1938.

ALEXANDER R ALTOSF, Los Angeles, to Miss Viola Louise Lichtenstein of Chicago, Sept 14, 1938.

ERNEST PERRY BLUNT JR to Miss Anna Heath Williams, both of Richmond, Va., Nov 5 1938.

ALLEN EUGENE HALCK, Atlanta, Ga., to Miss Irene Christie in Spartanburg, S C., Nov 20 1938.

HAROLD MCCOMB HOBART to DR IRMA HAZLETT BELK, both of Washington, D C., Dec 27, 1938.

WILLIAM W MEAD Guthrie, Okla., to Miss Eunice Ellen Sacia, Rockford, Ill., Sept 21, 1938.

## Deaths

**George Wilkins Swift** \* Seattle, Northwestern University Medical School, Chicago, 1907, member of the Western Surgical Association and the Pacific Coast Surgical Association, fellow and member of the board of governors of the American College of Surgeons, past president of the Pan-Pacific Surgical Association, Pacific Northwest Medical Association and the Pacific Coast Otolaryngological Society, a founder and past president of the Public Health League of Washington, served during the World War, president of the Neuro-Surgical Clinic, served in various capacities on the staffs of the King County Hospital Children's Orthopedic Hospital, Swedish Hospital and the Seattle General Hospital on the editorial board of the *Western Journal of Surgery, Obstetrics and Gynecology* and the *American Journal of Surgery*, contributor to the "Cyclopedia of Medicine", aged 56, died suddenly Dec. 18, 1938, in Whidby Island, Wash.

**Victor Hugo Bassett** \* Savannah, Ga., Johns Hopkins University School of Medicine Baltimore, 1903, instructor of pathology and bacteriology at the Northwestern University Medical School, Chicago 1904-1905, at one time professor of pathology at the Wisconsin College of Physicians and Surgeons and director of the Marks Laboratories of Pathology and Bacteriology, and associate professor of pathology at the Milwaukee Medical College, formerly assistant superintendent and resident pathologist to the Milwaukee County Hospital Wauwatosa, Wis., bacteriologist to the city health department 1908-1922, city health officer and county health commissioner, past president of the Georgia Medical Society, past president of the Southern Branch of the American Public Health Association, curator of the Georgia Historical Society, aged 67, died Nov. 3, 1938, of acute yellow atrophy of the liver following prostatectomy performed six weeks previously.

**William Miller Ford** \* New York University of Virginia Department of Medicine Charlottesville 1899, formerly clinical professor of obstetrics at the University and Bellevue Hospital Medical College, fellow of the American College of Surgeons, served during the World War at various times and in various capacities served on the staffs of the Manhattan Maternity Hospital Women's Hospital, St. Clare's Hospital, St. Vincent's Hospital and the New York Hospital for Ruptured and Crippled, aged 59, died, Nov. 26, 1938.

**Louis Israel Harris** \* New York Columbia University College of Physicians and Surgeons New York, 1905, chairman of the Section on Preventive and Industrial Medicine and Public Health of the American Medical Association, 1927-1928, chief of division of industrial hygiene, New York City Department of Health, 1915-1917, director, bureau of preventable diseases, 1917-1926, and commissioner of health, New York City, 1926-1928, consultant in public health, aged 56, died, January 7, in the Mount Sinai Hospital.

**Hickson Field Hart**, Peekskill, N. Y., College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1886, member of the Medical Society of the State of New York, served during the World War, formerly member of the board of education, past president of the village and member of the board of trustees, at one time member of the state assembly, on the staff of the Peekskill Hospital, aged 75, died, Nov. 7, 1938, in the Doctors Hospital New York.

**Rand Percy Crandall** \* Medical Director, Captain U. S. Navy, retired, New York University of Pennsylvania Department of Medicine, Philadelphia, 1887, entered the navy in 1888 and retired in 1930 on or after attaining statutory retirement age, veteran of the Spanish-American and World wars, formerly member of the city board of health, aged 72, died, Dec. 8, 1938, in the U. S. Naval Hospital, Brooklyn, of pyelonephritis and bronchopneumonia.

**Samuel Leonidas Ledbetter Sr.**, Birmingham, Ala., University of Louisville (Ky.) Medical Department, 1879, member of the Medical Association of the State of Alabama, member of the House of Delegates of the American Medical Association in 1910, formerly on the staffs of St. Vincent's Hospital and the Hillman Hospital, aged 83, died, Nov. 30, 1938, of auricular fibrillation and fractured femur due to a fall.

**John Cicero Hutchinson**, Shady Valley, Tenn., University of Tennessee Medical Department Nashville 1907, past president of the Sullivan-Johnson Counties Medical Society, formerly postmaster and justice of the peace, member of the board of education, aged 67, died Nov. 12, 1938, in the George Ben Johnston Memorial Hospital, Abingdon, Va., of injuries received in an automobile accident.

**Lester Lovett Powell**, Portland, Maine, University of Pennsylvania Department of Medicine, Philadelphia, 1905, member of the Maine Medical Association, served during the World War, consulting physician to the Webber Hospital, Biddleford on the staff of the Maine Eye and Ear Infirmary formerly on the staff of the state hospital, aged 63, died, Sept. 30, 1938, of coronary thrombosis.

**Daniel George Castell** \* Pontiac, Mich., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1899, past president and secretary of the Oakland County Medical Society, formerly city health officer, on the staff of the Pontiac General Hospital, aged 69, died, Nov. 16, 1938, in the University Hospital Ann Arbor, of carcinoma of the pancreas with metastases.

**Oliver Paxon Holt** \* Cincinnati, Miami Medical College Cincinnati, 1886, professor emeritus of medicine, University of Cincinnati College of Medicine, formerly professor of physiology and pathology at his alma mater, aged 77, on the staffs of the Cincinnati General Hospital and the Christ Hospital, where he died, Nov. 20, 1938, of uremia and malignancy of the prostate.

**J. Guy Hoover**, Boonville, Ind., Central College of Physicians and Surgeons, Indianapolis, 1904, member of the Indiana State Medical Association, member of the city council, for several years member of the school board, aged 59, on the courtesy staff of the Protestant Deaconess Hospital, Evansville, where he died, Nov. 7, 1938, of coronary thrombosis.

**Joshua Fanning Abel** \* Weynesville N. C. Baltimore University School of Medicine, 1892, member of the Southeastern Surgical Congress, fellow of the American College of Surgeons, for many years county superintendent of health, served during the World War, on the staff of the Harwood County Hospital, aged 70, died, Nov. 30, 1938.

**George Warren Hyde** \* Detroit, University of Michigan Medical School Ann Arbor, 1925, president of the Detroit Dermatological Society, served during the World War, on the staffs of the Eloise (Mich.) Hospital Shurly Hospital and the Harper Hospital, aged 40, died, Nov. 17, 1938, of coronary thrombosis and myocarditis.

**Benjamin Clyde Barnard**, Alliance Ohio Western Reserve University Medical Department, Cleveland, 1907, member of the Ohio State Medical Association, served during the World War, fellow of the American College of Surgeons, on the staff of the Alliance City Hospital, aged 61, died, Nov. 4, 1938, of carcinoma of the prostate.

**Lewis K. Onsgard** \* Houston Minn., Eclectic Medical Institute, Cincinnati, 1887, an Affiliate Fellow of the American Medical Association, formerly member of the board of health and coroner, company surgeon for Chicago, Milwaukee St. Paul and Pacific Railroad, aged 72, died Oct. 24, 1938, of cerebral hemorrhage.

**Martin Joseph Fardy** \* Minot, N. D. Washington University School of Medicine, St. Louis, 1918, fellow of the American College of Surgeons, served during the World War, on the staffs of St. Joseph's Hospital and the Trinity Hospital, aged 45, died, Oct. 27, 1938, in Los Angeles of cerebral hemorrhage.

**Hugh Elliott Eaglesham**, Weyburn Sask. Canada, Trinity Medical College Toronto, Ont. 1903, past president of the Council of the College of Physicians and Surgeons of Saskatchewan, at one time liberal member for Weyburn in the legislature of Saskatchewan, aged 66, died, Oct. 12, 1938.

**John Henry Wilms** \* Cincinnati, Pulte Medical College, Cincinnati, 1902, fellow of the American College of Surgeons, formerly professor of anatomy at his alma mater on the staff of the Bethesda Hospital, served during the World War, aged 59, died Nov. 26, 1938, of cirrhosis of the liver.

**Edward Thomas Dillon** \* Los Angeles, University of Southern California College of Medicine, Los Angeles, 1901, member of the Pacific Coast Surgical Association, fellow of the American College of Surgeons, formerly on the staff of St. Vincent's Hospital, aged 61, died, Oct. 14, 1938.

**Alfred Larson**, Savannah Ga., University of Illinois College of Medicine Chicago 1929, assistant city health officer and county health commissioner formerly associate in bacteriology, University of Georgia Medical Department, Augusta, aged 54, was found dead Nov. 3, 1938, of heart disease.

**Arthur V. Emerson**, Tulsa, Okla., College of Physicians and Surgeons of Chicago School of Medicine of the University of Illinois, 1902, past president of the Tulsa County Medical Society, formerly city superintendent of public health, aged 59, died, Oct. 29, 1938, in a local hospital.

**Philip Garfield Hood** ♂ Newark, N J, Columbia University College of Physicians and Surgeons, New York, 1904, served during the World War, on the staffs of the Newark City Hospital, St Michael's Hospital and St James Hospital, aged 57, died, Nov 19, 1938, in Port au Peck

**George Freeman Allison**, East Providence, R I, Boston University School of Medicine, 1891, for many years member of the school committee, formerly on the staff of the Homeopathic Hospital, Providence, aged 75, died, Nov 9, 1938 of coronary thrombosis

**George Waller O'Grady**, Rochester, N Y, Cleveland Homeopathic Medical College, 1899, director of the Monroe County Bacteriological Laboratory, formerly health officer of Lancaster, Ohio, aged 63, died, Oct 28, 1938, of carbon monoxide poisoning

**Chester Blaine Crumpacker**, South Bend Ind, Northwestern University Medical School, Chicago 1905, member of the Indiana State Medical Association formerly county coroner, aged 55, died, Nov 23, 1938, in St Joseph Hospital of cerebral hemorrhage

**Thomas Langford Butler**, Louisville, Ky, University of Louisville Medical Department, 1890 at one time professor of surgery and clinical surgery at his alma mater, aged 70, died, Nov 18, 1938, in a hospital at Baltimore of epithelioma of the right ear

**William Wesley Kergan**, Oakland, Calif, Michigan College of Medicine and Surgery, Detroit, 1892, aged 76, died, Oct 27, 1938, in the Stanford University Hospital, San Francisco, of lymphatic sarcoma and intestinal obstruction

**Hollis Lee Brownson**, Western, Neb, Jefferson Medical College of Philadelphia, 1920, member of the Nebraska State Medical Association, aged 51, died Oct 22, 1938, in a hospital at Lincoln of cholelithiasis, hepatitis and appendicitis

**Alexander Brumfield Taylor**, Des Moines, Iowa, Chicago College of Medicine and Surgery, 1909 aged 55, died, Oct 6, 1938, in the Veterans Administration Facility, Jefferson Barracks, Mo, of nephritis and secondary anemia

**Arthur E Becker** ♂ Brenham, Texas (licensed in Texas under the Act of 1907) past president and secretary of the Washington County Medical Society, aged 63, died, Nov 15, 1938 in St Francis Hospital of peptic ulcer

**John W Botts**, Glencoe, Ky, Louisville Medical College, 1897 at one time health officer of Owen County, aged 64 died in November 1938 in St Elizabeth's Hospital, Covington, of multiple abscesses and bacterial endocarditis

**George M Gowney** ♂ Rochester, N Y, University of Buffalo School of Medicine, 1906 on the staffs of the Highland Hospital and St Mary's Hospital aged 69, died, Oct 13, 1938, of duodenal ulcer and arteriosclerosis

**Emma L Sutro Merritt**, San Francisco University of California Medical Department, San Francisco 1881 Universite de Paris Faculte de medecine France, 1887, aged 81, died, Oct 17, 1938 of chronic myocarditis

**Henry L Curtis**, San Francisco, University of Pennsylvania Department of Medicine Philadelphia 1880 for many years member of the city board of health, aged 79, died in Oct 3, 1938 of cerebral hemorrhage

**Herbert Hall Plumer**, Union Maine Boston University School of Medicine 1898 member of the Maine Medical Association, on the staff of the Jones Sanitarium, aged 64 died, Oct 7, 1938, of hypostatic pneumonia

**David T Cardwell**, Gary, Ind Howard University College of Medicine Washington D C, 1905, formerly member of the board of health, aged 58 died Nov 18, 1938, in San Antonio Hospital of pulmonary tuberculosis

**Odia Martin Carter**, Monticello Ky, University of Nashville (Tenn) Medical Department 1905, Hospital College of Medicine Louisville Ky 1906, aged 59 died, Oct 28, 1938 of edema of the brain and lungs

**Shirley William Lane**, Kankakee Ill Chicago College of Medicine and Surgery 1908 member of the Illinois State Medical Society on the staff of St Mary's Hospital, aged 53 died, Nov 21, 1938 of myocarditis

**Raymond Francis Osborne**, Washington, D C Georgetown University School of Medicine, Washington 1920 aged 41, hanged himself, Oct 12 1938, at the Sheppard and Enoch Pratt Hospital Towson, Md

**William Stewart McMurray**, Multnomah Ore, University of Louisville (Ky) Medical Department 1908 member of the Oregon State Medical Society, served during the World War, aged 58 died Oct 9 1938

**Charles F Hitchcock**, Sodus, N Y, Homeopathic Medical College of Missouri, St Louis, 1891, member of the Medical Society of the State of New York, aged 76, died, Oct 22, 1938, of carcinoma of the prostate

**Reuel Earnest Bartlett** ♂ Berea, Ky, Vanderbilt University School of Medicine, Nashville, Tenn, 1907, aged 68, on the staff of the Berea College Hospital, where he died, Nov 4, 1938, of diabetes melitus

**Orlando Ducker**, Washington, D C, Jefferson Medical College of Philadelphia, 1877, veteran of the Spanish-American War, aged 88, died, Oct 22, 1938, of injuries received when struck by an automobile

**C Nelson Raymond** ♂ New Rochelle, N Y, Queens University Faculty of Medicine Kingston, Ont, Canada, 1891 on the staff of the New Rochelle Hospital, aged 73, died, Oct 6 1938, of heart disease

**Edward E Hummel**, Williamsville, N Y, University of Buffalo School of Medicine, 1897 at one time coroner of Genesee County, aged 64, died, Nov 17, 1938, in Bradenton, Fla, of cerebral hemorrhage

**George W Darling**, South Rye, Vt, University of Vermont College of Medicine, Burlington, 1882, member of the Vermont State Medical Society, health officer, aged 80, died, Oct 22, 1938

**James Clark Bell**, Bowmanville, Ont, Canada, M B, University of Aberdeen Faculty of Medicine, Scotland, and M D, in 1917, F R C S, Edinburgh, Scotland, 1920, aged 52, died, Oct 22, 1938

**John C Blossom**, Richmond, Ind, Kentucky School of Medicine Louisville, 1900, past president of the Wayne County Medical Society, aged 66, died, Nov 24, 1938, of carcinoma of the stomach

**Isaac Newton Sanders**, Salem, Ore, Willamette University Medical Department, Salem, 1900, member of the Oregon State Medical Society, aged 62, died, Oct 16, 1938, of coronary thrombosis

**T J Holton**, Groesbeck Texas (licensed in Texas, under the Act of 1907), member of the State Medical Association of Texas bank president, aged 68, died, Nov 1, 1938, of coronary thrombosis

**Olin Huntley Hoffman** ♂ Baltimore, Jefferson Medical College of Philadelphia, 1891 on the staff of the Franklin Square Hospital, aged 78, died, Oct 29, 1938, of coronary thrombosis

**Benjamin Clyne**, Yale Mich, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1883, aged 82 died, Nov 9, 1938, of carcinoma of the prostate and bronchopneumonia

**James Edward Trueman**, San Jose, Calif, McGill University Faculty of Medicine, Montreal, Que, Canada, 1881, aged 83, died, Oct 19, 1938, of carcinoma of the liver and secondary anemia

**Joseph Edwards Harris**, Nashville Tenn University of Nashville Medical Department, 1868 Bellevue Hospital Medical College, New York, 1870, aged 92, died, Oct 5, 1938 of influenza

**Bradford W Giveans**, Maplewood, N J, New York Homeopathic Medical College and Hospital, New York, 1893, aged 69, died, Oct 7, 1938, of cerebral hemorrhage and arteriosclerosis

**Robert Walter Brown**, Santa Maria Calif, Manitoba Medical College, Winnipeg, Man Canada, 1893, aged 76, died, Oct 15, 1938, of cerebral hemorrhage and hypertension

**Daniel Philip Kincard**, Memphis, Tenn University of Tennessee College of Medicine Memphis, 1913, aged 48 died, Oct 2, 1938, of cerebral hemorrhage

**Edward Charles Krause**, Bridgeport Conn, Yale University School of Medicine, New Haven, 1902, aged 67, died Oct 8 1938 of coronary thrombosis

**Raymond Power Higgins**, Philadelphia Hahnemann Medical College and Hospital of Philadelphia, 1896, aged 63 died Oct 18 1938, of coronary thrombosis

**David Henry Williams Jr**, Chicago Rush Medical College, Chicago 1897, aged 69, died Oct 2, 1938

# CORRECTION

The location of the University of Pennsylvania Department of Medicine should obviously have been Philadelphia instead of Ann Arbor as mentioned in the obituary of Dr William Moore Guilford of Lebanon Pa, in THE JOURNAL January 7, page 74



## Bureau of Investigation

### "MAHATMA" WILLIAM ESTEP

#### A Disciple of Albert Abrams with a Long, Long Record

Prof William Estep once again appears on the medical horizon—this time the "professor" is promoting a device which he calls the "Estemeter"

#### ESTEP'S HISTORY

For years inquiries concerning William Estep, modestly urging himself as a 'Renowned World Traveler Educator, Philosopher, Exponent of the World's Religions, Founder of Super Mind Science, President of the Super Mind Science Temple,' and so on have come to the Bureau of Investigation. In one of his pamphlets, advocating a course of lessons in the mysteries of the Oriental sects and headed 'A Complete Sacrifice of Master Adopts Secrets to Make A Temple Possible in Detroit,' appears the following comic-on:

#### PROFESSIONAL MATTERS METHODS USED BY THE WORLD'S MASTER MATTERS

"Consisting of Metaphysical Methods to Stimulate and Control the body energy methods for Tuberculosis, Arthritis, Cancer and Ulcers, Blindness and many other so called incurable diseases. Hundreds of testimonials prove they are Master Methods. No Faith, No Suggestion, No Affirmations used. The methods are scientific and were formerly taught to physicians only. They are worth thousands of dollars (more or less) —I have arranged complete in a booklet for (Healers Only).

This work will be taught to 500 people only. After that it will not be taught. This is a sacrifice of a lifetime, practically given away at \$100.00 FOR THE FIVE DAY PERIOD.

#### YOU CAN BECOME

a Professional Analyst, Mind Reader, Healer, Occult Astrologer or Expert Psychologist. Platform Workers that are Experts can earn from One Hundred Dollars per week up to Thousands if they know their work.

ALL THAT IS NEEDED IS IN THIS COURSE OF LESSONS  
THIS IS THE WORK OF THE MAGI

Advertisements for a similar series of free lectures to be given in Chicago contain recommendations from officials of the local lodge of the Loyal Order of Moose in Pittsburgh from the "Executive Engineer" of the Satapur Canal, India, and from an "Indian King." A further inducement to those who 'fall for' this type of stuff is the following:

"If you want this course you must get it now as it will be soon taken off the market for good since it is only a temporary necessity that these great secrets gathered from all over the world will need to be sold. Two hundred is the limit—first come first served. Only need of immediate financial assistance would prompt Prof Estep to offer these wonderful secrets to his students.

What, Professor! You need financial assistance, but in ten days you can teach 'platform workers' how to make 'One Hundred Dollars a week up to Thousands'—"if they know their work." Did any one suggest that you subscribe to and attend your own course?

When Estep played Chicago in April 1930 he had the aid of a trained monkey and also a number of complimentary press notices. Estep claimed at that time that he had "degrees" from two universities—"Western University" of Portland, Ore, and the "College of Nutrition," Chicago. No "College of Nutrition" in Chicago, or "Western University" in Portland could be located.

About the only "degree" referred to in his advertising is detailed in what purports to be an abstract of an article accredited to the India Daily Leader, Lucknow, India, 1928, in which it is stated that Estep is "the only American to ever qualify to become a mahatma. He was sponsored by Swami Ram Karan Dass, India's most noted Master Prophet." The Indians also have a word for such promoters, but it is spelled differently.

A follower of Estep's admitted that the receipts from Estep's Chicago meetings were about \$40,000. Estep was charged with obtaining money under false pretenses and the case came up on June 18, 1930. Unfortunately, Estep was dismissed when he made restitution.

A report of the Chicago Better Business Bureau for July 1, 1930, containing an article headed "Estep in Trouble Again" reads:

Professor William Estep who was recently dismissed in a Chicago court is now accused of racketeering in his home town Detroit, Michigan. Warrants have been sworn out for Estep, his wife known as Dora L. Tillinger, Florence J. Sorell, Bascom W. Maxwell and Rev. Samuel Maxwell, charging the five with violation of the insurance law of Michigan 'with racketeering under the guise of religion and with obtaining money by false pretenses.

Estep's fraternity, the Order of Temple Builders has been obtaining memberships at \$10.00 including a supposed \$500.00 life insurance benefit to members under fifty. The Order and the Temple have no license to sell insurance and thus forms the basis for the technical charge.

In Chicago Maxwell presented himself as a voluntary convert and former minister. A Detroit resident advises the Bureau that Maxwell is Estep's brother in law and that most of the prominent workers are related either to Prof or to his wife. He also states that Estep's \$120,000 Super Mind Science Temple was paid for by zealous students but is in Estep's own name.

In Chicago Estep's business did not take on the aspect of a reform until after his arrest. In his lectures he used mystical demonstrations a live monkey and other well known stage devices to attract attention and funds. In court he became the most glib of men and even refused to let the State Attorney's fortune teller the proper atmosphere was lacking.

Detroit police raided the Temple at 51 Spruce Street and found only one man, a Kansas City insurance salesman according to newspaper account.

#### ESTEP'S LATEST PROMOTION

The Better Business Bureau of Kansas City, Mo. informed the Bureau of Investigation under date of March 24, 1933 that Prof William Estep was selling literature published by the Positive Christianity Publications, 1926 H Street N.W., Washington, D.C. and taking \$100 fees for courses leading to a degree he calls MSD (Doctor of Metaphysics). It was also stated that Estep had asked one person to invest \$1,000 in four of his machines which he calls 'Estemeters' and which are supposed to measure the energy of various glands. Later the Kansas City Bureau reported that the following item appeared under the heading "Corporations Chartered" in the Kansas City Daily Record (Aug 15, 1933):

Grand Estemeter Corp. Kansas City to manufacture buy sell and deal in medical supplies equipment machines and devices for therapeutic uses to manufacture buy and sell electrical appliances to build equip and maintain institutions for the treatment and cure of the sick to manufacture and sell Prof Estep's Grand Estemeter (patent applied for) to engage in the printing business to deal in health foods to deal in and dispose of such real and personal property and securities as are necessary to the conduct of said business. 50,000 shares par value \$1. \$50,000 authorized. William Estep Kansas City Kan. 25,500 shares. Dora L. Estep Kansas City Kan. 1,000 shares. Wallace Maxwell Kansas City Mo. 1,000 shares. The above named parties shall compose the board of directors. Walter R. Barnes atty. 710 14 Rialto Bldg., Kansas City, Mo. rep're entirety.

A physician has recently forwarded to the Bureau of Investigation an advertising folder for the Estemeter. This folder contains the by-line "Copyright 1933 by Prof Wm Estep." The material contained in it indicates such blatant ignorance that it is astounding that any one would ever bother putting it in type. Still harder to believe is the idea that it could induce the prospect to purchase one of these machines the reported cost of which is \$250 (price not mentioned in folder).

The device includes a single dial, a push button and a control lever and the informative 'U S Pat Pending. There are two leads for application to various parts of the body, and the dial reads from zero to 1000. According to this folder:

If Your Chords Are Normal They Register	
Pineal Gland 580	Controls mental processes head nerves
Pituitary gland 600	Controls bone marrow and size of the body also childbirth and delivery
Parathyroid gland 600	Controls healing of tissue
Thyroid gland 580	Controls nerves and digestion
Thymus gland 550	Controls energy change circulation
Spleen Gland 600	Controls disease resistance
Adrenal Glands 500	Controls heat and sex force activates the heart
Pancreas gland 550	Controls insulin production
Gonads 600	Controls sex function

What a burlesque on scientific endocrinology and on science itself!

Among other statements made in the folder are the following:

"Any dietitian who attempts to teach diet but cannot test your glands will fail. Because the vitamins in food feed the glands and we cannot supply vitamins which are deficient unless we know which vitamins are

needed to correct the gland function. Doctors who ignore the glands or use inefficient methods to examine them will fail to get their patients well because the gland deficiency is the only cause of disease.

Thus the professor clammers aboard current interest in the science of nutrition.

Prof William Estep is listed as inventor of the Estemeter, and, in a general discussion on the ductless glands and health, reference is made to the "wonderful" discovery of Dr Albert Abrams, once the apotheosis of quackery. Incidentally, "Mahatma" Estep wanders into the writings of two well known men of medicine. Reference is made to Dr Alexis Carrel's "Man the Unknown" and Dr G W Crile's (spelled Crille) "The Phenomena of Life." Among the statements concerning Carrel is the following:

He states he had witnessed demonstrations in Thought Transmission and had known cancer to be healed in two hours by the scientific application of Metaphysics which in its strictest sense means the raising of body vibration [not according to Webster—Ed]. This noted authority advises the medical profession to learn more about these electrical energies which are in the human body to perform a definite function.

It is stated under Crile's name that

This noted scholar offers his discoveries in this fascinating field to all interested in the subject.

Without stopping to catch his breath, the author of this pamphlet continues with these statements, which reach a new high in ignorance and pseudoscience.

The discoveries of all the greatest authorities in the field of Electronic Science seem to point to these fundamental facts of value in healing disease:

1 All disease is congestion of body electronic energy produced by a condition of low body vibration and temperature.

2 The low vibration of any organ including the ductless glands whose hormone produces balance of the forces of life can be measured in terms of body resistance by a special sensitive instrument.

3 Just as congestion is produced by low body temperature and low body vibration so can health be restored by raising the body temperature and raising the vibration.

4 As disease heels in the body so electronic energy increases at a corresponding rate and the increase can now be measured by special instruments. Thus the progress from disease to health can now be checked and understood in terms of increased electronic energy by a scientific knowledge of body electricity.

The "scientific" evidence back of the Estemeter is indicated in the following statement:

The inventor of the Gland Estemeter has experimented on thousands of patients in order to reach the norms of the different glands during this time he used the same method of correcting gland disorders which is now used by all technicians who use this invention [apparently all those who use it—use it—Ed] and the result was that in every case there were improvements while under the supervision of Dr J H Barkley of Indianapolis he demonstrated on Chronic Bronchitis, Palpitations, Tumors and various Arthritic cases the results were the same in all cases when the glands became normal on the Estemeter the patient was well if the patient was not well but improved the progress of the glands toward normal on the Estemeter was directly correspondent to the improvement noted in the patient. This physician who had practiced for forty years was astonished at the results. [He might have been at that if he had any way of knowing that the glands had not been and had become normal—Ed].

Of special interest in this folder is the following paragraph:

Who can use Estemeters? The Estemeter is now used in Kansas City by laymen. Since it does not diagnose disease or treat disease it is exempt under Medical license laws. The Health Food Salesmen make a chart of the glands for each customer then supplies the proper food shown on the Chart to correct Vitamin and mineral deficiency. The customer returns in about five days to check progress and get their second reading. When a Health Food Store uses an Estemeter they win thousands of new friends and always triple their sales. The Public Likes to Have a Correct Analysis.

It is stated in the leaflet that "The Gland Estemeter Registers the Power of the Glands—Reveals what vitamins are deficient, shows if the body is acid or alkaline, reveals the blood energy and its power analyzes the positive or negative, mental condition of the brain centers."

Disregarding the imaginative fantasy that is used in the promotion of this machine, the most astounding feature is the supreme audacity displayed by one who has never indulged in the study of science in promoting a machine to provide such information, since there is no such information. It was naturally expected, from the recent scientific developments in the fields of nutrition and endocrinology, that charlatans and

quacks would soon prostitute this knowledge. Whenever a new discovery is made in any field of science, the quack will exploit the discovery for personal gain. But who could ever have foretold that any one would concoct such a ridiculous device in an attempt to capitalize on the public interest in vitamins and glands?

The manner in which those responsible for this device have so blatantly bragged that it is exempt under medical license laws suggests a careful study of those laws to determine just how correct these boasts are. Even though those who use the device do not diagnose and treat disease by name, they claim to determine deficiencies and to treat those deficiencies by diet. The folder carries the following statements:

Notice—The Estemeter does not diagnose or cure disease. It reveals the cause so it can be eliminated.

Nevertheless, the intention is apparently that of diagnosis and treatment of conditions which should be under the purview of a physician.

Abrams promulgated his "Oscilloclast" to obtain the "vibratory frequency of disease." His device has had many successors. Although the application of the "theory" is different in the case of the Estemeter, the analogy is clear. This device is more vicious because it is suggested that a salesman use it on the credulous individuals who patronize "food fad" stores. Abrams has long since passed to his reward (?), but as a major prophet in the field of quackery he seems to have developed an inordinate number of disciples.

## Correspondence

### REACTION FROM MERCURY IN THE NEWBORN

To the Editor—Several months ago I was called to a small community hospital on consultation regarding repeated outbreaks of what was thought to be impetigo contagiosa. Despite constant routine treatment with 3 per cent ammoniated mercury ointment, strict asepsis and expensive sanitary repairing of two nurseries in succession, the eruptions continued to appear. Examination of three infants affected showed erythematous, papulovesicular eruptions in the axillary and crural folds, typical dermatitis due to mercury. There were also periodic attacks of diarrhea.

Since that time I have inquired at various hospitals about the occurrence of impetigo and diarrhea. While impetigo was found only sporadically, diarrhea among the newborn was fairly common and in some cases was so severe as to cause considerable concern.

At one large hospital there had been several cases of severe diarrhea thought to be infectious. Such cases continued to occur despite changing and repairing of the nurseries.

It was found that the rubber nipples and rectal thermometers were kept in a solution of 1:4,000 mercury bichloride. As the solution was kept for a considerable time, there is no question that its strength increased from evaporation. The infants were anointed for five days with 3 per cent ammoniated mercury ointment. When the use of all forms of mercury was stopped, the patients with diarrhea recovered from it and no new cases developed.

As a rough estimate, if they remained in the hospital for ten days and received ten feedings a day, their temperatures being taken once a day and if the equivalent of only one drop of mercury bichloride was on each nipple and thermometer, there would be ingested during this time 110 drops (0.001375 Gm) in a 1:4,000 solution, equivalent to 0.001016 Gm of mercury. In five days approximately 77.5 Gm of ointment would be applied to the skin, representing 2.325 Gm of ammoniated mercury, or 0.58138 Gm of mercury.

There is considerable disagreement as to the amount of absorption of mercury byunction. Such a study was made by Cole and his associates (*Mercurial Inunctions in the Treatment of Syphilis, *Arch Dermat & Syph* 27:1 [Jan] 1933*), a series of rubs with mild mercurous chloride were administered to six adult male patients, and even in this small series one patient showed salivation at the end of fourteen days, but this was dismissed as a probable idiosyncrasy. Possibly some newborn infants inherit an idiosyncrasy to mercury.

At the last meeting of the American Dermatological Society at Del Monte, Calif., several speakers mentioned the surprising increase in reactions from ammoniated mercury ointment, so marked that most dermatologists believed that only 3 per cent ammoniated mercury ointment should be used. This increase may be due to sensitization caused by the overvigorous prophylaxis of impetigo contagiosa. In the case reported here the prevention was worse than the disease. I believe that hospitals in which ammoniated mercury ointment is not used to prevent impetigo contagiosa immediately after delivery will show as few cases as those in which it is used.

J. G. DOWLING, M.D., Boston

### PREPARATIONS OF SULFANILAMIDE

*To the Editor*—We would like to correct a source of confusion regarding the terminology as used in our article "Peripheral Neuritis Following Sulfanil-Sulfanilamide (Disulfanilamide)" published in the Oct. 29, 1938 issue of *THE JOURNAL*, page 1641.

Disulon prepared by the Albra Pharmaceutical Company, Inc., is sulfanil-Sulfanilamide (synonyms DB 32, disulfanilamide, DPR 374, disceptal C).

Ulcron prepared by the Winthrop Chemical Company, is dimethyl disulfanilamide (synonyms, DB 90, DPR 373, disceptal A).

There is a third "disulfanilamide" compound termed Disceptal B, or DB 87, which is monomethyl disulfanilamide.

Patient 2 in the article received Ulcron, which was not furnished by the Winthrop Chemical Company but was obtained by the family physician from Germany. The other patients received Disulon.

R. S. WICKSON, M.D.

S. H. JOHNSON, M.D.

Philadelphia

### RECTAL ULCERATION FOLLOWING IRRADIATION

*To the Editor*—There is a discussion in the London letter on page 2316 of *THE JOURNAL* for Dec. 17, 1938, which appears to me not to take account of certain reports that have been published and the heading of which seems not to accord with the content.

The discussor deals with an article presented by Mr. T. F. Todd on page 1120 of the *Lancet* for Nov. 12, 1938. The article in the *Lancet* is properly entitled "Rectal Ulceration Following Irradiation" but the title of the article in *THE JOURNAL* is "Rectal Ulceration Due to Cancer of Cervix." The latter article seems to imply that the subject is new, stating "It is only recently that it has been discovered that the radium treatment of cancer of the cervix uteri may produce chronic ulceration of the rectum."

An article in which this condition was described was presented before the American Proctologic Society in June 1930 (*Factual Proctitis: A Justifiable Lesion Observed in Patients Following Irradiation, Internat Clin* 3:68-77 [Sept] 1930). Several articles have appeared since that time.

LOUIS A. BUIE, M.D., Rochester, Minn.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### TREATMENT OF PEMPHIGUS

*To the Editor*—I am treating a case of pemphigus vulgaris. The patient is a man over 70 years old and he has had this disease about four months. Have there been any new developments in the treatment of pemphigus?

M. D., Massachusetts

ANSWER—Sulfanilamide is the latest treatment for pemphigus (Caro M. R. Pemphigus Treatment with Sulfanilamide. Preliminary Report. *Arch Dermat & Syph* 37:196 [Feb] 1938). Caro used it in two cases. A man aged 52 with diabetes who had had a vesicular and bullous eruption for three weeks tested by the Pels-Macht photopharmacologic method, was given a rating of only 46 per cent, a confirmation of the diagnosis of pemphigus. Because of his diabetes the dose of sulfanilamide was kept low, 0.3 Gm (5 grains) four times a day. In a month of this mild treatment he made decided improvement. A woman aged 55, who had had pemphigus for a year and had been treated with various methods for nine months without benefit had grown decidedly worse and was apparently moribund. Given 0.65 Gm (10 grains) of sulfanilamide six times a day each dose followed by 1 Gm (15 grains) of sodium bicarbonate she developed a temperature of 102 F the second day and the dose of sulfanilamide was reduced to 0.65 Gm five times a day. On the fourth day the temperature became normal the skin showed improvement and the dose of the drug was reduced to 0.3 Gm five times a day. At the end of a week no new lesions had appeared.

Caro acknowledges that in each case a spontaneous remission of the disease might have been coincidental with the administration of sulfanilamide.

I am and I am (Treatment of a Pemphigoid Eruption with Sulfanilamide, *Arch Dermat & Syph* 37:840 [May] 1938) report a case of pemphigus in a farmer aged 48 who had had pemphigus for two months, with extensive eruption on the skin and beginning formation of vesicles in the mouth. Sulfanilamide was given 2.6 Gm (40 grains) a day, and in one week the eruption had subsided completely. The dose of the drug was then decreased to 1 Gm a day. An erythematous eruption appeared on the buttocks and posterior surface of the thighs on the sixth day, clearing up on reduction of the dose of sulfanilamide. A similar eruption was seen later on the face and hands. The medicine was discontinued and this eruption also vanished. At the time the report was made, the patient had been free of eruption for four weeks. The authors state that they realize that a much longer time must pass before a cure can be claimed.

Others have tried sulfanilamide for pemphigus without seeing any benefit from its use. It is probable that sulfanilamide will take its place with the Davis treatment, mercurochrome, quinine, trypanamide and many others which clear up certain cases of pemphigus often in spectacular fashion but fail dismally in others. The dangers of sulfanilamide therapy, particularly in those with pemphigus, whose resistance to toxins is already taxed heavily must be recognized and a sharp watch maintained on clinical signs, urinary disturbances and blood changes.

Older remedies are still achieving success in the treatment of pemphigus. A recent report by Brade (*Lebertherapie bei Pemphigus vulgaris, Dermat Wchenschr* 104:389 [March 27] 1937) reports success in two cases within a year by the administration of liver extract. At the time his report was written one patient had been well for six months, the other for nine months.

Loreti (Alcune considerazioni terapeutiche sul pemphigo vulgare, *Riv med* 53:1607, 1937) recently reported relief of a severe case of pemphigus by a series of six blood transfusions, one every second day.

It should be kept in mind that for every case cleared by any one of the many methods there are scores that resist every effort to control them. Pemphigus is subject to spontaneous remissions, unexplainable with our present ignorance of its etiology. That these are always coincidental with the administration of a new type of treatment seems doubtful, but they are often evoked as the explanation for its erratic response to treatment after a long effort has been unavailing. Riecke (*Handbuch*

*der Haut und Geschlechtskrankheiten*, Berlin, Julius Springer 7 527 [part 2] 1931) says "Pemphigus shows such a fitful and paradoxical spontaneous course that only too easily can erroneous conclusions on the value or lack of value of any line of treatment be drawn."

#### FOUR LEAD ELECTROCARDIOGRAPHY

*To the Editor*—I am somewhat confused with regard to the new method of taking the fourth lead with the electrocardiograph as described by Wilson. I have a Hindle electrocardiograph No. 017143 and I am taking the fourth lead with the left leg wire attached to the precordial electrode, the left arm wire attached to the left leg electrode and the right arm wire remaining attached to the right arm electrode. The lead switch is then turned to lead 3. I should like to know whether this method is the new method of Wilson and if so what the diagnostic criteria are in the fourth lead tracing taken in this manner in coronary infarction. I would appreciate it if you would give me this information or let me know where I can obtain it.

M D Pennsylvania

**ANSWER**—The connections described for obtaining the fourth lead are correct and probably the easiest way to obtain curves having the polarity advised by the special committee of the American Heart Association for the Standardization of Precordial Leads. A curve identical in all respects would be obtained if the left arm wire should be attached to the precordial electrode, the right arm wire connected to the left leg and the lead switch turned to lead 1, or if the left leg wire should be attached to the chest electrode, the right arm wire connected to the leg and the lead switch turned to lead 2. In all instances, in the recorded chest lead an upward deflection indicates positivity of the precordial electrode with respect to the leg.

Under these circumstances, infarction of the anterior heart wall causes in acute cases elevation of the S-T segment, which disappears usually within a few days and is replaced by sharply inverted T deflections. The QRS change seen in anterior infarction is the absence of the initial upward deflection or, in other words, the presence of Q waves. When infarction of the posterior myocardium occurs, depression of the S-T segment followed by the appearance of large upright T waves is seen. Characteristic QRS changes do not occur with infarction of the posterior heart wall. Wood, Wolfarth and Bellet have recently pointed out that marked depression of the S-T segment in the fourth lead may be a sign of infarction of the left lateral heart wall, as occurs after occlusion of the circumflex branch of the left coronary artery.

#### FALLING HAIR

*To the Editor*—I have noted your comment concerning dandruff in *THE JOURNAL* Sept. 10, 1938, page 1036 but no mention was made concerning loss of hair. I have had dandruff since the age of 15 and am now 45. Nothing from mange cure to sulfur and thirty other heroic measures has ever affected it. My hair has always been heavy until three months ago it is now getting thin—not an alopecia in one spot but generally thin as the result of falling hair. My health is excellent. I have no unusual worries aside from my inability to break 80. Can you suggest anything?

M D New Jersey

**ANSWER**—A rapid diffuse loss of scalp hair may be a toxic alopecia such as is seen several weeks after typhoid or influenza. Continued loss of hair for three months is a little too extended for this but not impossible. Looseness of the hair behind the ears is a strong argument for such a condition. If this is the case, the prognosis for the return of the hair is favorable.

If, on the contrary, the alopecia that has come on so rapidly is of the senile or seborrheic type, it will spare the low occipital hair and that on the sides of the head and behind the ears—and the prognosis is bad for anything more than arrest of the progress of the disease.

The treatment of the toxic and the seborrheic form is the same active stimulation of the scalp. Massage deserves first mention, performed at least three times a week by a professional masseur or daily by the patient. The lubricant used for this may well be a sulfur cream, from 5 to 20 per cent precipitated sulfur in rose water ointment. Other stimulants, such as 5 to 15 per cent oil of cade or rectified oil of birch tar, resorcinol monoacetate 5 per cent and salicylic acid 5 per cent may be also included.

Brushing the hair vigorously with a stiff bristle brush is an excellent form of massage. Other forms of stimulation are erythema doses of ultraviolet rays and painting the scalp with solutions of cresol in alcohol. Massage however, must be omitted during a sharp reaction to these methods. Both of them cause habituation, so that the dose of light or the percentage of cresol solution must be increased as the scalp becomes toughened.

After the acute loss of hair has been arrested, milder methods may be used. The favorite of dermatologists for many years has been an alcoholic solution of pilocarpine, 1 per cent or less

in 50 per cent alcohol or bay rum. This is said to have a specific stimulating effect on the growth of hair, possibly related to its action on the vegetative nervous mechanism.

Chloral hydrate, from 3 to 10 per cent in the same vehicle, or mercury bichloride 0.3 resorcinol monoacetate 6, spirit of formic acid 20, in bay rum or perfumed alcohol to make 120 may be used. If needed, 5 per cent castor oil may be added to the alcoholic lotions to prevent their drying tendency. Vigorous brushing however, should stimulate the production of enough natural oil.

The chief ingredient of all prescriptions for the control of alopecia is persistence. Furthermore, it is generally considered unwise for a physician to treat himself.

#### RED LINE OF GUMS NOT RELATED TO DENTURE

*To the Editor*—A man aged 65 had his teeth extracted two years ago. His gums healed normally and in the course of time a dental plate was prepared for him. He used the plate intermittently for one or two months but complained that he could not stand it because it hurt his gums in spite of the fact that the dentist insisted that it was a perfect fit. Ever since he wore the plate he has had a red line just outside the margin of the upper gums in other words on the labial side of the gums near the biting surface. This remains tender so that he cannot stand the pressure of a plate and cannot chew even semisolid food. The dentist is of the opinion that this is caused by sucking his gums which the patient denies. On the possibility that there might be a vitamin deficiency factor he has had a thorough course of vitamin medication particularly of vitamin C. I feel that syphilis and pellagra can be ruled out. He has been in the depressed phase of manic depressive psychosis for four years. Prior to that he was in the elevated phase. I have thought of the possibility of chemical irritation of the gums by the plate but since the plate has not been used for almost two years I do not see how this could be a factor at this time.

M D Virginia

**ANSWER**—It requires more than one or two months for a denture to be fairly comfortable after the extraction of teeth. The time required now is often reduced materially by surgical preparation of the mouth for dentures, which in such cases as this consists essentially of smoothing the outlines of the alveolar process. If this is left to be accomplished by nature through the absorption of the pointed spicules, it requires approximately two years. Many patients have said that for two years they could not bite with force on an artificial denture without having pain. Several cases have come to attention in a denture clinic in which a red line was noted, similar, it is presumed, to the one discussed in this case. These red lines were found in diabetic patients and in some patients with apparently a form of blood dyscrasia. In these instances the redness and tenderness have evidently not been caused by the denture because, as in the case cited, the line remained whether the denture was worn or not. It is apparently a symptom of the presence of a systemic condition. It is believed that the mental condition of the patient is not related and it is probably also not due to a vitamin deficiency. A careful physical examination to discover whether there is any systemic disturbance is advised and if not, that now, after the lapse of two years, new dentures be made.

#### COCOA AND CHOCOLATE

*To the Editor*—Please send me a list of contraindications to the use of cocoa. What is the active drug contained therein and what is its therapeutic action?

M D Utah

**ANSWER**—The chief active principle in cocoa and chocolate is theobromine (from 15 to 22 per cent) but it also contains small amounts of caffeine and tannic acid (0.16 per cent). Theobromine is similar in chemical structure to caffeine, found in coffee and tea, and its physiologic effects are also similar, though not identical. The principal effects are cardiac and respiratory stimulation, elevation of the basal metabolism, diuresis, and nervous and mental stimulation. A considerable tolerance may, however, be developed to these drugs so that the amount required to produce definite effects will vary with individuals. Theobromine differs from caffeine in the degree of effect produced though there are no precise experimental data on this point. Some authorities state that it is a more powerful diuretic but less of a nerve stimulant than caffeine. The amounts given clinically to produce physiologic effects range from 0.065 to 0.3 Gm (1 to 5 grains). Holt suggests 0.13 Gm (2 grains) at 5 years as a heart stimulant, and the U. S. Pharmacopoeia XI gives 0.2 Gm (3 grains) as an adult dose.

In considering cocoa as a beverage for children it should be regarded as a stimulant similar to coffee. If made with milk and a small amount of cocoa (two-thirds teaspoon per cup) the theobromine contained will be only about 0.03 Gm (one-half grain) if however, amounts up to from 1½ to 2 teaspoonfuls are used the theobromine content may be from 0.08 to 0.1 Gm (12 to 16 grains) or more. It would seem safe to conclude

from these facts that cocoa is contraindicated for young children at least and that if used at all for older children it should be in limited amounts, chiefly as a flavoring for milk. A fuller discussion of this question is given in the White House Conference Report, Growth and Development of the Child, volume III, pages 484-501.

#### NEPHRITIS IN ANESTHETISTS

To the Editor—I understand that some literature on nephritis in anesthetists has been published indicating that possibly there is an occupational hazard involved. If there is any literature with regard to this matter covering the disease and particularly its prognosis I would appreciate it if you will forward it to me. I have an anesthetist under my care who has nephritis at the present time and am anxious to obtain information.

M D Texas

ANSWER—There is not a great deal in the literature bearing directly on the question of nephritis among anesthetists when the nephritis is considered as being due to the effect of the inhalation of anesthetic agents. It is generally felt however that the amount of anesthetic agent inhaled by the average anesthetist is not sufficient to account for nephritis in an otherwise healthy person. Unusual circumstances might bring about such a condition, that is if an anesthetist is in the habit of inhaling either either deliberately or unintentionally because of the habit of keeping close to the ether. However in the literature regarding the effect of anesthetics on the kidney some workers have indicated certain results that may be expected if existing conditions are conducive to the development of nephritis in the patient. The following are some references to articles concerning this question:

Babacci and Behl. The Action of Ether and Chloroform on the Kidney. *Polidruco* May 1 1896. *Abstr. Brit. M. J. Epitome* 2 12 (July 12) 1896.

Bertram Ernst. Effect of Inhalation Anesthetics upon the Kidney. *Arch. f. Klin. Chir.* 122 69 1924.

Franken Herman and Miklos Erdos. Experimental Investigations on the Question of Organ Damages After Carbon Narcoses (Acetylene, Ethylene and Nitrous Oxide). *Zentralbl. f. Anal.* 57 2493 (Oct. 21) 1931.

Galezzi and Crillo. The Influence of Anesthetics on Renal Permeability. *Polidruco* Sept. 15 1899. *Abstr. Brit. M. J. Epitome* 2 80 (Nov. 11) 1899.

MacNider W. de B. The Inhibition of the Toxicity of Anesthetics for the Nephropathic Kidney. *J. Pharmacol. & Exper. Therap.* 9 116 1916.

A Study of the Toxic Effect of General Anesthetics in Naturally Nephropathic Animals and the Prevention of the Toxic Action. *Am. J. Surg. (Anesthes. supp.)* 31 15 (Jan.) 1920.

Concerning the Type of Injury to Renal Epithelial Cells Which Increases the Susceptibility of the Cells to the Action of General Anesthetics. *Boston M. & S. J.* 186 150 (March 16) 1922. *cf. Chem. Abstr.* 17 3142.

A Consideration of the Susceptibility and the Resistance of Tissues to the General Anesthetics. *Diplomate* 7 11 (Jan.) 1935.

Miller R. H. and Chohat Hugh. The Effect of Anesthesia and Operation on the Kidney Function as Shown by the Phenolsulfonephthalein Test. *Arch. Int. Med.* 15 369 (March) 1915.

#### DERMATITIS FROM KUBOTON

To the Editor—Can you tell me anything about the contents of Kuboton, a German product used by farmers to kill bean beetles? It is a powder. I have a man with a severe dermatitis who has been using this substance. He is covered—body, extremities and neck—with a macular eruption like measles. The powder is sold by the Eastern States Cooperative Grange, Chilfonce, Ia. P. J. JUKENS, M.D. Ambler, Pa.

ANSWER—An insecticidal preparation, Kuboton, is used to kill bean beetles; it is manufactured by the Ansbacher-Siegle Corporation, Brooklyn. According to the label it contains cube resins 2.25 per cent, sulfur 4.75 per cent and inert ingredients 93 per cent. There have been cases of dermatitis reported from the Derris group, and it may be that the case in question represents another of these.

#### DERMATOSIS IN SUGAR WORKERS

To the Editor—Is there a furunculosis associated with working in sugar? Men who have been working in a beet sugar mill for twenty years state that there are sugar boils due to the juice's getting on their skin. These seem to be more prevalent than in men engaged in similar occupations and not exposed to the juice. What can be done for prophylaxis?

WILLIS P. BAKER, M.D. Santa Ana, Calif.

ANSWER—A variety of dermatoses have been described in work involving the handling of sugars, molasses and sugary fruits. So different are some of the lesions mentioned that specificity may be doubted. The lesion most frequently described is paronychia. The theory has been advanced that the sugar or syrup deposited at the base of the nails or otherwise on the skin serves as a suitable growth medium for common bacteria such as staphylococci and that "sugar dermatitis," "sugar onychitis" or "sugar boils" result. Other reports suggest that wetness, such as around sugar juices, either in the beet or in the

cane industry, is a contributory cause. In crude dried sugars, parasites have occasionally been encountered and on occasion they have been regarded as the source of skin disease among exposed workmen. Still further it may be observed that, in the class of workers in the beet and cane fields and at times in the sugar mills, personal hygiene possibly may be of a grade inferior to workers in general.

By way of prophylaxis best results are from strict attention to personal cutaneous hygiene. Among sugar mill grinders and in other operations that provide extensive wetness, such wetness and particularly drying on the skin of beet or cane juices should be avoided.

#### SUBACUTE BACTERIAL ENDOCARDITIS

To the Editor—Has any valuable therapeutic agent been found for subacute bacterial endocarditis?

M D New York

ANSWER—Subacute bacterial endocarditis, when unqualified, means *Streptococcus viridans* endocarditis. It is quite possible for other organisms to produce subacute bacterial endocarditis but it is a clinical fact that in about 95 per cent of the cases the bacterial cause is *Streptococcus viridans*.

There is no specific treatment for this infection. The mortality is still exceedingly high. Arsenic preparations still remain the favorite therapeutic measure. Sulfamylamide has been tried without appreciable effect.

Blood transfusion, used in addition to drug therapy, gives some encouragement. Transfusion from donors who have recently recovered from a streptococcal infection has been practiced. Donors have been selected and vaccinated with a stock *Streptococcus viridans* vaccine before the transfusion is given. A further step consists in making a vaccine from the organisms recovered from the blood of the patient. This vaccine is given to previously selected donors and transfusion is done when the donors have developed immune bodies.

In spite of these measures, the prognosis remains grave.

#### INHERITANCE OF MYOPIA

To the Editor—According to the fundamental laws of heredity if a man with a moderate myopia whose mother and two maternal aunts suffer from high myopia (no myopia on the father's side) marries a woman with moderate myopia none of whose parents, aunts or uncles have myopia would the offspring tend to be myopic and to what extent?

M D, New York

ANSWER—Refractive errors are so common in the human stock that their pattern in the mosaic of heredity is somewhat complicated. As a rule, myopia is inherited as a simple recessive character. This means that the man in the case in question inherits his myopia directly (RR). The mother and her two sisters are affected either because of a large number of siblings or else because of a union of two strains of myopia in her parents. The woman in the case with no known myopic relatives inherits through a mixed transmitter (DA), the myopia remaining latent in the transmitting parent. If all the siblings of her mother and father were known and were numerous, some would be found to be affected. The union of these two persons should result in a large proportion of myopic children. Theoretically all the children should have myopia, but it should be of moderate grade.

#### GALATEST FOR URINE SUGAR

To the Editor—Where can I procure material for the Galat test or Galatest for urinary sugar? An article appeared in the *Trained Nurse and Hospital Review* August 1938. Is it reliable?

O C AUSTUTZ, M.D. Bellefontaine, Ohio

ANSWER—Material for the Galatest for sugar in the urine can be obtained from the manufacturer, the Denver Chemical Manufacturing Company, 163 Varick Street, New York. The test is a modification of the Nylander reaction. It gives a rough idea as to whether the urine contains no sugar, a little sugar or considerable amounts of sugar. In the performance of the test a drop of urine is allowed to fall in the center of a small mound of the test powder. The presence of sugar is indicated by a brownish or blackish discoloration, the amount being roughly shown by the degree of darkening.

The test has the advantage of speed of performance and a minimum of apparatus. However, the test is not believed to be superior to Benedict's test, for the following reasons: 1 The powder is highly caustic and care must be taken to avoid damage to clothing, skin and mucous membranes. 2 It cannot be considered as accurate as Benedict's qualitative test. 3 Benedict's test is simple and requires little apparatus and time. Its use in this country is now so standard that patients and physicians everywhere are familiar with it. To introduce another test,

unless this is decidedly superior, seems unwise. It is only fair to add that in actual practice Benedict's test is not significantly influenced by uric acid, creatinine, cysteine or other substances and impurities as suggested in the article referred to by the inquirer. Rarely will the physician be led astray by a positive Benedict's test.

#### TREATMENT OF OLD X-RAY BURN

*To the Editor*—I am treating an x-ray burn of ten years standing suffered when a roentgen treatment was given for psoriasis. The burn is on the posterior surface of the right thigh. About every six weeks the glands in the right groin swell up and become tender, the entire leg swells up and becomes red and tender and the patient has chills and a temperature of from 102 to 105 F and is bedfast for several days. At these times hot packs are applied to take the swelling and pain out of the leg. Is there anything new in the way of treatment to offer? The patient is a man aged 34 a farmer the burn lvs him up about one sixth of his time.

A A THOMPSON MD Tyner Ind

**ANSWER**—The inquiry would imply that one may be dealing with an indolent ulcer, a thrombophlebitis or a lymphangitis or a combination of them. If the ulcer is extensive, excision followed by a transplant might be desirable. If a second degree dermatitis is present, swabbing the part twice daily with 2 per cent watery solution of gentian violet might help. The application of hot packs is good. There are no new satisfactory methods.

#### DAVIS SIGN IN ORTHOPEDICS

*To the Editor*—What is meant by the Davis sign in orthopedics? The only Davis sign I find in the dictionary relates to a condition of the arteries and is one of the signs of death.

E W MISKALL MD East Liverpool Ohio

**ANSWER**—There are so many so called signs described by almost every writer on any orthopedic subject that the "sign language" has become quite confusing, even to the orthopedic surgeons. The most recent sign described by a Dr Davis concerns an examination of the function and stability of the shoulder (Davis, Arthur G. A Conservative Treatment for Habitual Dislocations of the Shoulder, THE JOURNAL, Sept 26, 1936, p 1012). It supposedly demonstrates overdevelopment of the internal rotators and adductors of the shoulder following recurrent dislocations. It is probable that the sign referred to concerns the attendant change in position from anterolateral to posterolateral of the biceps and bicipital groove in patients who have had repeated dislocations of the shoulder.

#### IRON AND PULMONARY TUBERCULOSIS

*To the Editor*—Is the administration of iron contraindicated in secondary anemia when the patient has pulmonary tuberculosis?

MD Kentucky

**ANSWER**—It is not contraindicated so far as the pulmonary disease is concerned. Naturally heavy doses of iron by mouth will tend to aggravate an ulcerated gastrointestinal tract. In the presence of such a complication it may be better to give iron subcutaneously.

#### QUININE IN LATE PREGNANCY

*To the Editor*—I desire to comment about your answer to a question in the Oct 15 1938 issue of THE JOURNAL regarding antepartum administration of quinine. Since my paper in July 1936 reporting sixty personal cases treated ante partum with quinine I have collected more than 400 additional cases and the results were closely in line with the cases reported as to ease of labor and a decided lessening of time of labor. In my experience quinine is worthless as an oxytocic and is not used by me as such. The only fetal deaths that I have been able to find were caused by quinine used other than in small doses for several weeks preceding labor. All cases of deafness reported were also from larger doses and usually from an effort to induce labor or to strengthen pains both of which are foreign to the use to which I apply quinine. An idiosyncrasy in the mother is evidenced very promptly and the drug is as promptly discontinued which seems to obviate any danger to the fetus.

LINTON SMITH MD Atlanta Ga

#### HEMOPHILIA

*To the Editor*—I have just read on page 1953 of THE JOURNAL of Nov 19 1938 the question of Dr Burrows on hemophilia and the answer you gave to this question. May I take the liberty to correct your answer in that the first researches of Dr Bendien and myself on hemophilia (van Creveld S. *Maandschr v kindergeneesk* 3:351 [June] 1934; Bendien W M and van Creveld S. *Acta brev Neerland* 5:135 [1935]) pointed in the direction of a deficiency of a coagulation globulin in the blood of hemophilic patients. Our researches on the effect in hemophilic patients of human placental extract which pointed in the same direction were published later (Bendien W M and van Creveld S. *Acta brev Neerland* 7:No 6/7 1937 7:No 7 1938).

S VAN CREVELD MD Amsterdam Netherlands

## Medical Examinations and Licensure

### COMING EXAMINATIONS

#### STATE AND TERRITORIAL BOARDS

ALABAMA Montgomery June 20 22 Sec Dr J N Baker 517 Dexter Ave Montgomery  
ALASKA Juneau March 2 Sec Dr W W Council Box 561 Juneau

ARIZONA Medical (Regular) Little Rock June 8 9 Sec State Medical Board of the Arkansas Medical Society Dr L J Kosminsky 317 State Line Texarkana Medical (Electric) Little Rock June 8 9 Sec Dr Clarence H Young 1415 Main St Little Rock

CALIFORNIA Written examinations Los Angeles Feb 6 9 San Francisco July 10 13 and Sacramento Oct 16 19 Oral examinations (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California) Los Angeles Jan 25 San Francisco March 22 Los Angeles August 7 and San Francisco Nov 15 Sec Dr Charles B Pinkham 420 State Office Bldg Sacramento

CONNECTICUT Basic Science New Haven Feb 11 Prerequisite to license examination Address State Board of Healing Arts 1895 Yale Station New Haven Medical (Regular) Hartford March 14 15 Endorsement Hartford March 28 Sec Dr Thomas P Murdock 147 W Main St Meriden Medical (Homeopathic) Derby March 14 Sec Dr Joseph H Evans 1488 Chapel St New Haven

DELAWARE Dover July 11 13 Sec Medical Council of Delaware Dr Joseph S McDaniel 229 S State St Dover

FLORIDA Jacksonville June 19 20 Sec Dr William M Rowlett Box 786 Tampa

GEORGIA Atlanta June Joint Sec State Examining Boards Mr R C Coleman 111 State Capitol Atlanta

IDAHO Boise April 4 7 Dr Bureau of Occupational License Mr D B Crumshank Rm 355 State Capitol Bldg Boise

ILLINOIS Chicago Jan 24 26 Superintendent of Registration Department of Registration and Education Mr Homer J Byrd Springfield

INDIANA Indianapolis June 20 22 Sec Board of Medical Registration and Examination Dr J W Bowers 301 State House Indianapolis

KENTUCKY Louisville June 7 9 Sec State Board of Health Dr A T McCormack 620 S Third St Louisville

MAINE Portland March 14 15 Sec Board of Registration of Medicine Dr Adam P Leighton 192 State St Portland

MASSACHUSETTS Boston March 14 16 Sec Board of Registration in Medicine Dr Stephen Rushmore 413 F State House Boston

MICHIGAN Ann Arbor and Detroit June 14 16 Sec Board of Registration in Medicine Dr J Earl McIntyre 100 W Allegan St Lansing

MONTANA Helena April 4 5 Sec Dr S A Cooney 216 Lower Block Helena

NEVADA Reciprocity and oral examination Carson City Feb 6 Sec Dr John E Worden Capitol Bldg Carson City

NEW HAMPSHIRE Concord March 9 10 Sec Board of Registration in Medicine Dr Fred E Clow State House Concord

NEW JERSEY Trenton June 20 21 Sec Dr Earl S Hallinger 28 W State St Trenton

NEW MEXICO Santa Fe April Sec Dr Le Grand Ward 135 Sena Plaza Santa Fe

NEW YORK Albany Buffalo New York and Syracuse Jan 23 26 Chief Bureau of Professional Examinations Mr Herbert J Hamilton 315 Education Bldg Albany

NORTH CAROLINA Raleigh June 19 Sec Dr William D James The Hamlet Hospital Hamlet

OREGON Basic Science Portland Feb 25 Corvallis July 8 and Portland Oct 28 Sec State Board of Higher Education Mr Charles D Byrne University of Oregon Eugene

Puerto Rico San Juan March 7 Sec Dr O Costa Mandry Department of Health San Juan

SOUTH CAROLINA Columbia June 27 Sec Dr A Earle Booser 505 Saluda Ave Columbia

VERMONT Burlington Feb 7 9 Sec Board of Medical Registration Dr W Scott Nay Underhill

WEST VIRGINIA Charleston March 6 8 Sec Public Health Council Dr Arthur E McClue State Capitol Charleston

WYOMING Cheyenne Feb 6 Sec Dr G M Anderson Capitol Bldg Cheyenne

### NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL January 14 page 173

### New York Endorsement Report

Mr Herbert J Hamilton chief, Bureau of Professional Examinations, reports 167 physicians licensed by endorsement from May 4 through September 19, 1938. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad of
University of Arkansas School of Medicine	(1936) N B M Ex	(1936) N B M Ex
Stanford University School of Medicine	(1932) N B M Ex	(1936)
University of California Medical School	(1937) (1938) California	(1936)
University of Southern California School of Medicine	(1929) (1936 3) (1937 2) N B M Ex	(1937) California
Yale University School of Medicine	(1936 5) (1937 6) N B M Ex	(1931) Connecticut
Georgetown University School of Medicine	(1936 5) (1937 6) N B M Ex	(1935 2)
Emory University School of Medicine	(1937) Tennessee	(1936) N Carolina
Loyola University School of Medicine	(1937) N B M Ex	(1937) N B M Ex
Northwestern University Medical School	(1933) N B M Ex	(1936) California
Rush Medical College	(1936) Indiana	(1937)
Indiana University School of Medicine	(1934) (1936) Iowa	(1933)
State University of Iowa College of Medicine	(1934) (1936) Iowa	(1937)
Johns Hopkins University School of Medicine	(1932) (1936) Maryland (1933) Minnesota	(1917)
University of Maryland School of Medicine	(1932) (1936) Maryland (1933) Minnesota	(1914) Dist Colum



University of Maryland School of Medicine and College of Physicians and Surgeons	(1936), (1937, 2)	(1938, 2)	Maryland
Boston University School of Medicine	(1937)	(1938)	B M I x
Harvard University Medical School	(1927)	(1934)	(1935) A B M I x
Luffs College Medical School	(1929)	Mass	(1931) Maine
(1936) New Jersey			
University of Michigan Medical School	(1937)	(1938)	Michigan
University of Minnesota Medical School	(1937)	(1938)	Minnesota
St. Louis University School of Medicine	(1930)		Illinois
(1936) Indiana	N B M Ex	(1937)	Tennessee
Washington University School of Medicine	(1930)	N B M Ex	
Croighton University School of Medicine	(1936)	N B M I x	
University of Nebraska College of Medicine	(1933)	N B M I x	
New Jersey			
Albany Medical College	(1937, 2)	N B M I x	
Columbia University College of Physicians and Surgeons	(1933, 2)	N B M I x	
Cornell University Medical College	(1932)	(1934, 2)	
(1936, 2)	(1937)	N B M I x	(1938) N Carolina
Long Island College of Medicine	(1935)	(1937, 3)	N B M I x
New York Medical College and Flower Hospital	(1937, 10)	N B M Ex	
New York University College of Medicine	(1937, 2)	N B M Ex	
Syracuse University College of Medicine	(1937)	N B M I x	
University of Buffalo School of Medicine	(1934)	(1935)	N B M I x
Duke University School of Medicine	(1937)		Ohio
Electric Medical College Cincinnati	(1920)	(1937)	Ohio
Ohio State University College of Medicine	(1937)	(1938, 2)	Ohio
University of Cincinnati College of Medicine	(1940)		Ohio
Western Reserve University School of Medicine	(1935)	(1936)	(1937, 3)
Hahnemann Medical College and Hospital of Philadelphia	(1908)	(1921)	Maryland
Jefferson Medical College of Philadelphia	(1925)	New Jersey	(1927)
University of Pennsylvania School of Medicine	(1932)	(1935, 2)	N B M Ex
University of Pittsburgh School of Medicine	(1922)	N B M I x	
Woman's Medical College of Pennsylvania	(1924)	(1936)	Tenn see
Meharry Medical College	(1931)	(1937)	Tenn see
Vanderbilt University School of Medicine	(1931)	(1937)	Tenn see
University of Texas School of Medicine	(1936, 2)	N B M I x	
University of Vermont College of Medicine	(1931)	Puerto Rico	
Medical College of Virginia	(1933)	(1936)	Virginia
University of Virginia Department of Medicine	(1935)		Virginia
Dalhousie University Faculty of Medicine	(1937)		Maryland
University of Toronto Faculty of Medicine	(1931)	N B M Ex	
McGill University Faculty of Medicine	(1931)		Austria
Medizinische Fakultät der Universität Wien	(1908)		Germany
Albert Ludwigs Universität Medizinische Fakultät	(1925)		Germany
Hessische Ludwigs Universität Medizinische Fakultät	(1922)		Germany
Giessen			
Johann Wolfgang Goethe Universität Medizinische Fakultät Frankfurt am Main	(1904)		Germany
Julius Maximilians Universität Medizinische Fakultät Würzburg	(1912)	(1922)	Germany
Ludwig Maximilians Universität Medizinische Fakultät München	(1913)		Germany
Rheinische Friedrich Wilhelms Universität Medizinische Fakultät Bonn	(1904)		Germany
Universität Leipzig Medizinische Fakultät	(1925)		Ma
University of the Royal College of Physicians of Ireland	(1915)		Maryland
Regia Università degli Studi di Bologna Facoltà di Medicina e Chirurgia	(1934)		New Jersey
Regia Università degli Studi di Padova Facoltà di Medicina e Chirurgia	(1911)		Virginia
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia	(1936, 2)		Maryland
Regia Università di Napoli Facoltà di Medicina e Chirurgia	(1925)		Tenn
University of Edinburgh Faculty of Medicine	(1936)	N B M Ex	
Universität Basel Medizinische Fakultät	(1935)		New Jersey

Missouri October Examination

Dr Harry F Parker secretary State Board of Health of Missouri, reports the written examination held at Kansas City, Oct 18-20, 1938. The examination covered fifteen subjects. An average of 75 per cent was required to pass. Twelve candidates were examined, all of whom passed. The following schools were represented

School	Year	Per Cent
Howard University College of Medicine	(1937) 80.5	81.2
Rush Medical College	(1937) 85.8	86.2
School of Medicine of the Division of Biological Sciences	(1937)	79.9
Johns Hopkins University School of Medicine	(1938)	86.6
University of Michigan Medical School	(1933)	84.9
Meharry Medical College	(1937) 75.3	79.1
Universität Zürich Medizinische Fakultät	(1936)	83.9

Twenty eight physicians were licensed by reciprocity from October 3 through November 28. The following schools were represented

School	Year	Reciprocity
University of Arkansas School of Medicine	(1937)	Arkansas
Howard University College of Medicine	(1936)	Tennessee

Northwestern University Medical School	(1938)	Illinois
University of Illinois College of Medicine	(1932)	(1938) Illinois
Indiana University School of Medicine	(1937)	Indiana
State University of Iowa College of Medicine	(1924)	Iowa
Kansas Medical College Medical Department of Washburn College	(1908)	Kansas
University of Kansas School of Medicine	(1934, 3)	(1937, 2) Kansas
University of Louisville School of Medicine	(1930)	(1937) Kentucky
Julian University of Louisiana School of Medicine	(1931)	N Carolina
Harvard University Medical School	(1936)	New York
Electric Medical University Missouri	(1905)	Kansas
Croighton University School of Medicine	(1937, 2)	Kansas
University of Nebraska College of Medicine	(1936)	Nebraska
Ohio State University College of Medicine	(1931)	Ohio
Meharry Medical College	(1937, 5)	Tennessee

Book Notices

**Man and His Body** By Howard W. Haggard Director of the Laboratory of Applied Physiology Yale University New Haven Connecticut. With an introduction by Vandell Henderson. Cloth Price \$4.00. 394 pp. with 49 illustrations including 10 plates. New York & London Harper & Brothers 1938.

The introduction to this book was written by Prof Vandell Henderson. The book is intended especially for three classes of readers: employers and engineers in charge of labor, to whom it aims to give a practical understanding of what the human body is and college students, for whom it aims to afford a general acquaintance with medical science. The material has been used for years for undergraduate students in an elective course in Yale University in the form of lectures and a syllabus for student reading. The aim of the author is to give a general summary of the workings of the human body and to provide a discussion of the chief causes and processes of disease. The book is written in the usual fascinating style of the author. Among the subjects treated are chapters on the human machine and the source of its energy, digestion and its derangements, the lungs and their diseases, the nervous system its service and failures, reproduction and the organs of sex, and the principles of infection, immunity and allergy.

**Herman Boerhaave Commemorative Speech Delivered in the Aula of the Leyden University Hospital on Friday 23rd September 1938** By Dr D. Schoute. Paper 1p 20. Wassenaar Holland The Author 1938.

This is a speech delivered by the author at the Leyden University Hospital in Holland in September 1938 in commemoration of the two hundredth anniversary of the death of Herman Boerhaave. One can read this lecture and yet know little as to why Boerhaave was a great man although the reader will have been told many times that he was great. The author's English is at times awkward and repetitious. Boerhaave prepared for the ministry but in 1691, at the age of 22, turned to the study of medicine. He practiced in Leyden and came to be a professor of medicine, a professor of botany and still later a professor of chemistry. His breadth of knowledge brought him world fame. He was in poor health for many years before his death finding it necessary for associates to hold his classes. He was offered a position on the faculty of Groningen University in 1703 but declined. Boerhaave undertook clinical instruction at the bedside at St. George's Hospital in 1713, and although this type of instruction had been started in 1636 it acquired widespread popularity under Boerhaave's guidance. At the conclusion of the delivery of this address a statue was unveiled in memory of Boerhaave. There is a bibliography of thirty two references.

**The Adolescent** By Ada Hart Armit Ph.D. Professor and Head of the Department of Child Care and Training School of Household Administration and Graduate School of Arts and Sciences University of Cincinnati. Cloth Price \$2.00. 242 pp. New York & London Waltham House McGraw Hill Book Company Inc 1938.

This book was written for parents whose children are between 12 and 21 years of age. The author reviews the recent research on the period of adolescence that is especially valuable to parents in the guidance of their children. The social changes which are responsible for much of the adolescent's behavior are examined. These include the family pattern, which has changed from the patriarchal type of family to the democratic type prevalent today. The author considers that delayed marriage and the change in our educational systems also have caused many difficulties in the adjustment of adolescents. Earlier edu

cational systems were characterized by a minimum amount of reading, writing and arithmetic, with trade training under skilled workers for those who intended to enter the various trades. Until recently, general education for all children other than the three Rs, was not heard of. Now our elementary school system seems to be designed primarily to train children to enter college, with little attempt at training them for life other than to provide a large collection of facts, all of which they lose more or less rapidly. In some of the following chapters the author discusses discipline, training and emotional control growing up emotionally, character training education for home and family life, and planning the day for the older child. With regard to children of low or average intelligence and those with superior intelligence, when it comes to sound character and good citizenship the two appear to have an equal chance if their training has been in line with their capacities. High intelligence gives an adolescent an advantage over his fellows only if, by training and general equipment, he has also developed a sound personality.

**Beitrag zur Physiologie des Hirnstammes** Von Prof. Dr. med. Dr. phil. h. c. W. R. Hess, Direktor des Physiologischen Institutes der Universität Zürich. Teil 2. Das Zwischenhirn und die Regulation von Kreislauf und Atmung. Von Prof. Dr. med. Dr. phil. h. c. W. R. Hess. Paper. Price 26 marks. Pp. 127 with 114 illustrations. Leipzig: Georg Thieme, 1938.

In this monograph Hess presents the results of stimulation of the diencephalon in animals, chiefly cats. The technique employed was described in detail in a monograph published in 1932. In the place of faradic stimulation there was used a direct current interrupted about eight times a second and dampened by the presence of condensers and choke coils in the circuit. Hess believes that this type of current selectively stimulates autonomic paths and centers and makes it possible to activate these without influencing somatic functions. It may be doubted whether this is true in the central nervous system: the selection of the interrupted and dampened direct current as a means of stimulation was unfortunate. Many points in the thalamus, hypothalamus and adjacent structures were stimulated, the effects on blood pressure and respiration were recorded and the location of the stimulated points plotted on a series of photographs through horizontal sections of the cat's brain. The points which yielded rises in blood pressure and those which yielded falls were rather widely distributed through the diencephalon as were also points which yielded changes in the character, amplitude and rate of respiration. The results obtained in this investigation will be of interest chiefly to physiologists and cannot be summarized briefly. The typography is good and the illustrations are excellent. There is an index and a good bibliography.

**Surgical Pathology** By William Boyd M.D. LL.D. MRCP. Professor of Pathology, University of Toronto, Toronto. Fourth edition. Cloth. Price \$10. Pp. 886 with 491 illustrations including 15 colored plates. Philadelphia & London: W. B. Saunders Company, 1938.

This work is well known to every medical graduate. The importance of pathology to the surgeon can never be overestimated, nor will he always have a pathologist at his beck to diagnose for him. Dr. Boyd emphasizes this especially with regard to carcinoma of the breast, demanding ability on the part of the surgeon to make a gross diagnosis, agreeing in this wise with the precept of Lecene. However carcinoma of the breast is not always recognizable grossly nor does it ever call for an emergency operation such that the pathologist cannot be on hand. The continually changing concepts of pathology demand constant revisions in its textbooks even though certain fundamental tenets still remain. Dr. Boyd has in many ways admirably adapted this book to the newer pathology. The relation of endometrial phases to the ductless glands is suggested and a more rational use of endocrine therapy on the basis of the pathologic condition is indicated. Tumor grading, regional ileitis and the tumors of that confused group of ovarian lesions known as the granulosa cell type are new additions. Hypernephroma is properly indicated as a probable renal carcinoma. The method of grading tumors is discussed too briefly since the author utilizes grading as a partial basis for discussing certain carcinomas. The bibliography is recent and sufficient for further reference to almost any subject. The illustrations are clear

and in great number, including some excellent photomicrographs. One can best conclude with the words of W. J. Mayo: "It is a sincere attempt to place pathology before the student and the practitioner from the practical standpoint."

**The Child in Nursing** By Gladys Sellev, Ph.D. B.S. R.N. Instructor in the School of Nursing, Catholic University of America, Washington, D.C. Fourth edition. Cloth. Price \$2.50. Pp. 599 with 57 illustrations. Philadelphia & London: W. B. Saunders Company, 1938.

This comprehensive volume, dealing with the important problems of infant and child care from the nursing standpoint, seems to be excellent for students and a valuable work of reference for graduate nurses. The author has placed particular emphasis on the important points in the nursing care of the infant. Stressed also is the value of knowing the physiology and the anatomy of the well child as a comparative background. The book may aid in providing knowledge in the field of pediatric nursing not provided at present by the entirely too short school curriculum. The book covers the period from the first moment of extra-uterine life throughout infancy in both home and institution. Some of the methods of the treatment of asphyxia neonatorum are not those approved by various authorities. The wisdom of including so much material concerning treatment in a reference book for nurses is debatable. It is felt, however, that this knowledge imparted to the nurse may increase the value of her services to the patient and the physician. Questions and problems appended to each chapter aid in crystallizing in the mind of the reader important facts to be retained.

**A Short Practice of Surgery** By Hamilton Bailey, F.R.C.S. Surgeon, Royal Northern Hospital, London, and R. J. McNeill Love, M.S., F.R.C.S. Surgeon, Royal Northern and Metropolitan Hospitals, London. Fourth edition. Cloth. Price 28s. Pp. 996 with 818 illustrations of which 109 are coloured. London: H. K. Lewis & Co. Ltd., 1938.

This work, long recognized as a masterpiece in the field of surgical compends, underwent a painstaking and thorough revision enabling it to maintain the position of unusual popularity and superiority. Thanks to their erudition, the authors managed to include all that is new in surgery without increasing the number of pages, certainly an enviable and not easily attainable accomplishment. This has been done by omitting everything that is nonessential and by relegating rare conditions and polemic subjects to a smaller type. All important points are dealt with adequately, equal attention being paid to the pathology, etiology, clinical features and treatment of surgical conditions. The language of the text is terse and concise yet not dry; the illustrations are well executed. A perusal of all chapters revealed several minor omissions. For instance on page 67, among gas-forming bacilli, *B. aerogenes capsulatus* and *B. oedematis maligni* have not been mentioned. The post-operative treatment of thyroidectomy described on page 180 should include the use of morphine. In the description of hernia operations the Ferguson method, called the Girard operation in Europe, is not mentioned although it enjoys great popularity in many countries. The chapter on neurosurgery should include a brief description of ganglionectomy or ramisection for relief of pain caused by inoperable cancer of the uterus. Such minor omissions do not detract from the usefulness of this excellent book, which can be highly recommended not only to the students but also to general practitioners, who are given the opportunity to brush up on their knowledge of surgery in an easy and delightful manner.

**Doctor at Timberline** By Charles Fox Gardiner, M.D. Cloth. Price 43s. Pp. 315 with 25 illustrations by R. H. Hall. Caldwell, Idaho: The Caxton Printers Ltd., 1938.

The author was determined to practice medicine awhile in some wild place far from cities. He graduated at Bellevue Medical College, New York, interned at Charity Hospital, was a surgeon at the prison on Blackwell's Island and had a six-months surgical service in New York Hospital, but such places did not appeal to him. He started for the silver mining region of western Colorado in the heart of the Rocky Mountains with little money or experience, intending to try this sort of living for one year but he stayed fifty years. His has been the delight of seeing snow-covered mountains, breathing pure air, having

the sunshine and blue sky and of knowing men in the rough. At first he practiced in the silver camps, high, often above the timberline, with deep snow covering the ground for nine months in the year, then he moved to the cattle country at a lower altitude around 6,000 feet. Here he practiced medicine among cowboys, Indians, hunters, outlaws, gamblers and fugitives men rough in speech and action and yet with a fine regard for honor, honesty and truth. The author was 5 feet 7 inches tall and never weighed more than 110 pounds. He writes of narrow escapes from snow slides, of long horseback rides over dangerous mountain trails, of professional contact with lawless characters, of cutting and shooting affairs, of babies born in snow besieged cabins and of the companionship that a trusted horse and dog bring under such circumstances.

**Pharmacology Materia Medica and Therapeutics.** By Charles Solomon M.D. Associate Attending Physician and Chief of the Medical (Jewish) Hospital of Brooklyn. Collaborator Hazel Houston R.N. Instructor in Materia Medica School of Nursing Bellevue Hospital N.Y. Third edition. Cloth Price \$1.10 799 with 61 illustrations Philadelphia Montreal New York & London J. B. Lippincott Company 1938.

Because it is vitally important for the nurse to have an appreciation of the social problems resulting from the indiscriminate use of drugs an elaborate chapter on 'patent medicines' and self medication has been added. There has also been added a great deal of material at the end of each chapter consisting of a summary clinical correlation and ward practice topics for class discussion, notebook exercises projects for further study and review questions. As one looks over the closely printed material one wonders whether this book is not more suitable for reference than to serve as a textbook for nurses. Graduates in medicine would be well equipped if they knew what is contained in these pages. To require nurses to familiarize themselves thoroughly with the contents is almost inhuman. It is hoped that the teacher who uses the book in classes for nurses will make it clear what portions the nurse needs to memorize and what portions are chiefly included for reference purposes.

**Anus Rectum Sigmoid Colon Diagnosis and Treatment.** By Harry Elliott Bacon B.S. M.D. F.A.C.S. Assistant Professor of Proctology Temple University School of Medicine Philadelphia. Introduction by W. Wayne Babcock M.D. M.D. Professor of Surgery Temple University School of Medicine. Foreword by F. I. Lockhart Munnery M.A. M.B. B.C. Cloth Price \$8.50 Pp. 85, with 147 illustrations Philadelphia Montreal & London J. B. Lippincott Company 1938.

It is necessary only to study the bibliography appended to each chapter of this book to learn the amount of effort which the author has put into his work. He has collected materials from the works of many contemporary authors and has provided an exhaustive display of accepted opinions and procedures. The chapter on proctitis and sigmoiditis, although brief, provides a bibliography which includes 282 articles. The chapter on lymphopathia venereum is well done and almost every article of any importance which has ever been published on this interesting topic is listed at the end of the chapter. The volume is interesting, instructive and well illustrated and will prove of distinct value not only as an index to proctologic literature but also as a work of reference.

**The Special Pathological Anatomy and Pathogenesis of the Circulatory Respiratory Renal and Digestive Systems Including the Liver, Pancreas and Peritoneum.** By Horst Oertel Strathcona Professor of Pathology Director of the Pathological Institute McGill University Montreal Canada. Cloth Price \$8.50 Pp. 640 Montreal Renouf Publishing Company 1938.

This volume is an exceptionally good adjunct to textbooks of pathology for the physician who is interested in the physiologicopathologic processes underlying disease. The book is limited to the consideration of the pathogenesis of diseases of the circulatory, respiratory, renal and digestive systems. Under each system the author briefly reviews the structure and development of each organ with a nice selection of topics significant in pathologic processes. To this he frequently adds a summary of various experimental studies which throw light on the disease process to be discussed. From this point on the descriptions of the various diseases observed in each organ vary from short, concise statements of well established pathologic pictures and their relations to one another to a detailed historical account of the various theories of pathogenesis and the evidence support-

ing them. The purpose of the book, skilfully and logically maintained throughout, is admirably stated in the author's own words: "Any pathogenetic explanation which stops short of tracing the actual tissue changes in their causal connections fails to reach its purpose. We may be unable to accomplish this in many instances, but it is better to admit ignorance where we fail and not resort to pseudoscientific phrases or terms which simply cover ignorance instead of exposing it for further penetration."

**Ophthalmic Nursing.** By D. F. Grand. Foreword by A. C. Hudson M.D. M.A. M.B. Consultant Surgeon Royal London Ophthalmic Hospital London. Cloth Price \$1.75 Pp. 111 with illustrations Baltimore: William Wood & Company 1938.

This short handbook for ophthalmic nurses is divided into three parts: (1) a brief and simple description of the anatomy of the eye, a page devoted to explanation of refractive errors, and a short discourse on general principles of ophthalmic nursing; (2) an alphabetical list of some 100 terms and procedures commonly used with a simple explanatory note about each, and a list of fifty drugs commonly used with the method of use and strength of dilution; (3) a list of surgical procedures and the instruments employed for them. The book is short and all terms are defined with extreme simplicity. There are numerous good illustrations of ophthalmic instruments taken from the blocks of John Weiss and Son. The book might be useful for the instruction of student nurses in the pursuit of their general course but would hardly qualify for any advanced studies.

**A Textbook of Medical Bacteriology.** By David J. Belding M.D. Professor of Bacteriology and Experimental Pathology Boston University School of Medicine Boston Massachusetts and Alice T. Marston Ph.D. Assistant Professor of Bacteriology and Immunology Boston University School of Medicine Boston Massachusetts. In collaboration with the following members of the Department of Bacteriology Public Health and Preventive Medicine of Boston University School of Medicine Boston: Sanford B. Hooker M.D. Professor of Immunology Sidney C. Daley M.D. Dlp. Bact. Associate Professor of Bacteriology José P. Bill M.D. Dr. H. Assistant Professor of Public Health and Preventive Medicine and Matthew A. Derow M.D. Instructor in Bacteriology and Immunology. Cloth Price \$5.10 792 with 13 illustrations New York & London D. Appleton Century Company Incorporated 1938.

This textbook was intended to be intermediate between the voluminous reference books and the simple textbooks too elementary for medical students. The volume covers a mass of details in a sketchy manner. Only one aspect of controversial subjects is presented. In the field of bacteriology where knowledge is rapidly accumulating there are many disillusions awaiting the student who knows only one side of an issue. The illustrations in the book are excellent and the numerous tables which it contains are helpful in correlating information. This book should prove useful to the medical student in bacteriology.

**Text Book of Nutrition.** By J. A. Nixon CMG M.D. FRCP Consulting Physician to the Bristol Royal Infirmary Bristol and Doreen G. C. Nixon M.B. B.S. MRCS Recognized Teacher in Hygiene in the University of Bristol Bristol. Cloth Price \$6.00 Pp. 219 with 9 illustrations New York Toronto & London Oxford University Press 1938.

The authors have compiled a readable discussion of nutrition from the physiologic, clinical and dietetic points of view. The book is intended for the general reader, and detailed discussion of the chemistry of nutrition has been avoided. Numerous tables of food composition, which the authors point out "must not be regarded as possessing the reliability of Bradshaw's Railway Guide," enhance the usefulness of the book for those readers who wish practical information. The general intent of the authors to provide a brief, general discussion of "what the body does with its food" has been achieved.

**Needed Population Research.** By P. K. Whelpton Scripps Foundation for Research in Population Problems. Prepared under the auspices of the Population Association of America. Paper Price, \$1 Pp. 196 New York Milbank Memorial Fund 1938.

Interest in population research has increased greatly in the past few years. It is satisfying to note that this book reflects the true critical scientific spirit in that field, in fact the entire book is devoted to pointing out the faults in basic information and the means of bettering them, and to methodologic pitfalls which should be avoided. Numerous factors in this field of research are difficult to evaluate. Consequently there are many

problems which are faced in population investigations which are common to those of clinical research. As companionate sciences, population research and clinical investigation have much to learn from each other which should prove mutually beneficial.

**A Guide to Human Parasitology for Medical Practitioners** By D B Blacklock M D DPH DTM Professor of Tropical Hygiene Liverpool School of Tropical Medicine the University of Liverpool and T Southwell D Sc PhD A F C Sc Walter Myers Lecturer in Parasitology School of Tropical Medicine The University Liverpool Third edition Cloth Price \$4 Pp 259 with 124 illustrations including 2 colored plates Baltimore William Wood & Company 1938

This practitioners' handbook of human parasitology has proved its acceptability by attaining a third edition in three years. In the latest edition the chapter on malaria has been rearranged and that on leishmaniasis has been rewritten and the book as a whole brought down to date. Its usefulness would be considerably increased if the authors should include therapy and preventive measures in their next edition.

**Cancer Its Diagnosis and Treatment** By Max Cutler M D Associate in Surgery Northwestern University Medical School Chicago and Franz Buschke M D Assistant Roentgenologist Chicago Tumor Institute Chicago Assisted by Simeon T Cantrell M D Director Tumor Institute Swedish Hospital Seattle Cloth Price \$10 Pp 757 with 346 illustrations Philadelphia & London W B Saunders Company 1938

The opening chapter, entitled "Radiation Therapy," reflects the emphasis of this book on the treatment aspects of cancer. Brief discussions of biopsy and the spread of cancer follow. The book then considers the diagnosis and treatment of cancer in the principal anatomic locations. As stated in the preface, cancer of the central nervous system and questions of histogenesis and detailed morphology have been left to other works already available. The book is admirably illustrated. Although doubtless not all sections of the book will be equally accepted by other authorities in the field it may be considered an invaluable aid by all those who diagnose or treat cancer.

**Zur normalen und pathologischen Anatomie des Greisenalters** Von Prof Dr Ludwig Aschoff Sonderdruck aus Medizinische Klinik Paper Price 2.50 marks Pp 116 Berlin & Vienna Urban & Schwarzenberg 1938

This renowned pathologist has presented in a brief monograph the histopathologic changes in organs and tissues encountered in persons between the ages of 60 and 80 exclusive of the pathology of the specific cause of death, such as infections. In more than 400 necropsies on persons from 60 to 80 years of age the author found no case of death due to the aging process itself. There was always a specific disease, arteriosclerosis accounting for one fourth. The monograph is a valuable contribution to the pathologic physiology of aging.

**Doctors I Salute!** By Emilie Conklin Cloth Pp 93 with portrait Winona Lake Indiana Light and Life Press 1938

This is a collection of poems written by the author on numerous subjects related to the life and work of physicians. Some of these poems express beautiful thoughts, some are humorous and some are sad. Their style and meter varies some being in iambic pentameter iambic tetrameter trochaic trimeter and dactylic dimeter. Among the poems are 'A Call to Service,' 'Mountain Doctor,' 'Southland Trail,' 'To a Great Physician,' 'Accident Ward,' 'Court Case,' 'Standing By,' 'Country Doctor,' 'Martyrs of Medicine,' 'Gland Therapy and Lines to a Laboratory Sheep.' These poems constitute a tribute to physicians and their associates which will encourage, inspire and cheer them.

**A Synopsis of Physiology** By A Rendle Short B Sc M D FRCS Professor of Surgery University of Bristol Bristol and C L G Pratt M A M Sc M D Demonstrator in Physiology University of Oxford England Third edition Cloth Price \$3.50 Pp 325 with 25 illustrations Baltimore William Wood & Company 1938

This edition has resulted in the inclusion of more physiologic material than the book had included previously. The book has retained the form of a compendium and consequently there is room for criticism of dogmatic statements which need some qualification to be entirely correct. The statements made are however, digests of the currently accepted opinions and the book should be of great use to physicians who wish to brush up on their information for various qualifying examinations. As a guide for medical students it can be of little value.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Privileged Communications Right of Alleged Criminal to Bar Testimony of Physician Who Treated Victim**—The defendant shot a woman in the back and was convicted in the Queens County court, New York, of assault in the second degree. In support of a motion for a new trial, he contended the court erred in permitting a physician who had treated the victim to testify as to her condition. Section 352 of the Civil Practice Act of New York, he argued, that interdicts the disclosure by a physician of any information he acquires in attending a patient in a professional capacity and which is necessary to enable him to act in that capacity rendered the testimony of the physician inadmissible.

The question before the court was whether a defendant who has shot another person may avail himself of the protection of the privileged communications statute so as to seal the lips of a physician who treated the victim. The court thought that the application of the rule of privilege to the facts here involved was to be determined by the reasoning of the Court of Appeals of New York in *People v Harris*, 136 N Y 423 33 N E 65, as follows:

I should never be willing to assent to a construction or to believe in a legislative intent which would operate to convert a statutory provision protecting a patient from a damaging or objectionable disclosure into a protection for a person on trial for the murder of the patient.

Any other view, said the court in the present case, would permit a gangster, or any other criminal, to seal the lips of physicians who attend the criminal's victim, whenever sufficient pressure is brought on the victim to induce him or her to refuse to waive the privilege. For a court to place such a weapon in the hands of criminals was, the court said, unthinkable in the light of present day conditions. Furthermore, this view, in the opinion of the court was reinforced by the provisions of Section 1915 of the Penal Law of New York which provides, in part: "Every physician attending or treating a case of bullet wound shall report such case at once to the police authorities."

Thus, by express statutory enactment, a physician in New York is compelled to divulge privileged information to police authorities and such disclosure is for the purpose of investigation and prosecution. Hence, the court said, the foregoing section of the Penal Law acts as a waiver of the privilege ordinarily accorded information acquired by a physician in attending a patient.

The court concluded, therefore, that the testimony of the physician was admissible and the motion for a new trial was denied—*People v Lav* (N Y) 3 N Y S (2d) 251.

**Hospitals for Profit Duty of Hospital to Irrational Patient**—The plaintiff was admitted to the defendant hospital in a delirious condition and was placed in a ward on the second floor in which there was no other patient. The wife of the plaintiff, on being informed by a hospital nurse that the plaintiff was in no condition to be left by himself, remained by the patient's bed during the night. The wife, however, fell asleep and her husband got up from the bed and jumped or fell from a window to the ground. For the resulting injuries he sued the hospital but the trial court withdrew the case from the jury and entered a judgment of nonsuit. The plaintiff thereupon appealed to the court of appeals of Georgia division 2.

A private hospital said the court must exercise such reasonable care in looking after and protecting a patient as the patient's known condition may require. In the present case the hospital did not expressly designate the wife as her husband's caretaker for the night when he was injured, but, on being informed that his condition required the presence of some one throughout the night, she volunteered to undertake that supervision. So far as the hospital's duty to the patient was concerned the acceptance by it of the services undertaken by the wife cannot be said as a matter of law to have discharged that obligation. Furthermore the court said the duty of a hospital toward one for whom it undertakes to care cannot by agreement with a third person be reduced below that which the law generally

eracts. Whether or not the hospital, with the wife present in the ward where the husband was a patient, should in the exercise of ordinary care have reasonably apprehended that the patient, in his condition known to the hospital authorities, might have harmed himself, presented in the opinion of the court a question for determination of the jury.

The defendant hospital knew as shown by the chart which it kept and which was admitted in evidence, that the patient was 'mentally off' and that without adequate supervision he might escape from his bed and might harm himself. Should a reasonable consideration of these facts questioned the court, have caused the hospital in the exercise of ordinary care and diligence, to apprehend that the wife might not be able properly to protect him and that in his known condition, he might come to harm? The determination of this question the court thought was within the province of the jury and the trial court should have permitted the jury to make that determination.

For the failure of the trial court to permit the jury to pass on these questions, the court of appeals reversed the judgment of nonsuit.—*Fate v. McCall Hospital (Ga.) 196 S. E. 906*

**Workmen's Compensation Acts Death from Nephritis Following Herniotomy**—Where, said the supreme court of New Jersey, a workman sustains a hernia from an accidental injury arising out of and in the course of his employment necessitating a surgical operation and the shock of that operation 'lights up' a dormant nephritis from which the workman dies a finding that the death was in fact the result of the injury, and was an accident within the meaning of the workmen's compensation act is justified, even though it was not the natural result of the injury.—*Dunn v. Atlantic City (N. J.) 199 1 5*

**Physical Examinations Rights of Defendant When Plaintiff Offers His Injury as Evidence**—The plaintiff claimed that as he was driving his automobile he was struck by a piece of gravel thrown from the wheel of one of the defendant's busses going in the opposite direction. The piece of gravel, he alleged, shattered the left lens of his spectacles, driving four pieces of glass therefrom into his left eye. He claimed that he then drove six or seven miles to a physician, who removed the glass from the eye. He thereafter sued the defendant for damages. The trial court gave judgment for the plaintiff and the defendant appealed to the Supreme Court of Mississippi.

At the trial the plaintiff pointed to his eye in illustration of the testimony he was then giving. On motion of the defendant, the court ordered an examination of the eye by a specialist, who subsequently testified that there had been no traumatic injury to the eye, that an injury such as claimed by the plaintiff would invariably leave scars and that he had found no scars. The plaintiff's condition, in the opinion of this witness was due to congenital astigmatism not trauma. A general practitioner, testifying for the plaintiff contended on the other hand, that it would be possible for injury to have occurred to the eye by traumatism that would cause astigmatism and leave no scar. The trial court did not err, said the Supreme Court, in ordering the examination of the eye by the specialist. Where a plaintiff in a personal injury suit voluntarily exhibits the injured part of his body to the jury for inspection, that part becomes an exhibit in the case, like any other object or thing introduced in evidence, and the opposing party has the right to make such inspection of it as will enable him to explain, criticize or impeach its value as evidence and to that end have it examined by experts. The testimony of the general practitioner, in the opinion of the court, was no answer to the testimony of the specialist. Medical testimony that a certain thing is possible is no substantial testimony at all. Unless such testimony is in terms of probabilities, it is not probative.

The question considered by the court to be vital in the case was whether or not a person with four pieces of shattered glass in his eye, large enough to be taken therefrom and preserved and exhibited in a trial, could have driven an automobile some six or seven miles, immediately following the alleged injury, with the pieces of glass still embedded in the eye. Conceding that it was possible, the court pointed out that evidence which is inherently unbelievable or incredible is not sufficient to sustain a verdict. There is no part of the human anatomy,

said the court, more sensitive to injury than the eye, or where the pain and distress resulting therefrom is more distracting. The eye involuntarily closes even to a gust of dust or sand, and an injury to one eye sets up an involuntary sympathetic response from the other. So the court, it was clearly improbable for the plaintiff to have driven as he testified he did. While, if the court said, the evidence was sufficient to prove that the plaintiff was struck in the eye, it was insufficient to prove that he suffered any such injury as claimed by him. The court accordingly affirmed the judgment as to liability but reversed and remanded it as to the amount of damages.—*Feche Lines, Inc. v. Bount (Miss.) 179 So. 747*

**Malpractice Metal Probe Left in Patient**—The plaintiff aged 11 years, was taken ill with influenza, Feb. 16, 1931. Double pneumonia followed resulting in empyema. About the middle of March 1932 the attending physician made an incision in the patient's left side and inserted a tube for drainage. In treating the patient, the incision was probed from time to time with a metal probe to determine whether there was any pus in the pleural cavity. The process of probing was begun in the summer of 1932 and continued until the early spring of 1933. The attending physician died, Nov. 13, 1933 just after dismissing the plaintiff as well. In August 1934 there was a recurrence of the empyemic condition. In February 1935 another physician performed an operation on the patient and removed two pieces of metal from the patient's side, which it was contended was the probe used by the attending physician in 1932 or 1933. Thereafter the patient by her guardian sued the administratrix of the estate of the deceased attending physician alleging that the physician negligently permitted the metal probe to drop into the patient's pleural cavity. Judgment was given for the plaintiff, and the administratrix appealed to the Supreme Court of North Carolina.

Conceding that the evidence was sufficient to carry the case to the jury the Supreme Court was of the opinion that a new trial must be awarded for error on the part of the trial court in permitting the plaintiff to recover hospital and medical expenses from the time she was taken ill in February 1932. The process of probing the court pointed out, did not begin until the summer of 1932, and it continued through the early spring of 1933. The plaintiff was not entitled to recover for hospital and medical expenses incurred prior to the alleged negligence of which she complained. While the trial court in one instruction said that the plaintiff was entitled to recover for medical and hospital bills 'to the extent that they may or have been incurred as the proximate result of the injuries complained of,' the court immediately added 'She contends they are about fifteen hundred dollars.' This contention was based on the evidence of the plaintiff's mother that the total cost of her illness from and after February 1932 was about \$1,500. Moreover, the Supreme Court continued the two metal pieces were removed from the plaintiff's side in February 1935 and there was no evidence that the recurrence or continuance of her empyemic condition was affected by these pieces after their removal. The trial court instructed the jury, however, to consider the plaintiff's suffering and the condition that prevailed from and after February 1932 through July 4, 1936.

For these errors committed by the trial court, the Supreme Court ordered that a new trial be awarded the defendant.—*Blaine v. Lyle (N. C.) 196 S. E. 833*

## Society Proceedings

### COMING MEETINGS

American Orthopsychiatric Association New York Feb. 23-25 Dr  
Norville C. L. Mar 149 East 73d St New York Secretary  
American Society of Anesthetists New York Feb. 10 Dr Paul M  
Wood 131 Riverside Drive New York Secretary  
Annual Congress on Medical Education and Licensure Chicago Feb. 13-14  
Dr W. D. Cutter 535 North Dearborn St Chicago Secretary  
Mid South Post Graduate Assembly Memphis Feb. 14-17 Dr A. F  
Cooper Goodwyn Institute Bldg Memphis Tenn Secretary  
Society of Surgeons of New Jersey Newark Jan. 28 Dr Walter B  
Mount 21 Plymouth St Montclair Secretary  
Western Section American Laryngological Rhinological and Otolological  
Society Spokane Wash Jan. 29 Dr Frederic G. Sprawl Medical  
Arts Bldg Spokane Wash Chairman

# Current Medical Literature

## AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

## American Journal of Hygiene, Baltimore

28 321 512 (Nov.) 1938 Partial Index

- \*Community Outbreak of Type I Pneumococcus Infection B B Gilman Boston and G W Anderson Minneapolis—p 345
- Active Immunity Against an Intestinal and a Respiratory Infection G Rake Toronto—p 377
- Relation of Mortality from Certain Metabolic Diseases to Climatic and Socio-Economic Factors L P Herrington and I M Moriarty, New Haven Conn—p 396
- Relation of Diseases of Cardiovascular and Renal Systems to Climatic and Socio-Economic Factors I M Moriarty and L P Herrington New Haven Conn—p 423
- \*Control of Sylvatic Plague Vectors M A Stewart Davis Calif and D B Mackie Sacramento Calif—p 469
- Experimental Intestinal Myiasis O R Causey Baltimore—p 481
- Tuberculosis Studies in Tennessee Subsequent Course of Cases Observed in Williamson County Ruth R Puffer H C Stewart and R S Gass Franklin Tenn—p 490

**Outbreak of Type I Pneumococcus Infection**—Gilman and Anderson present evidence that pneumococcal infection may be manifested by pneumonia, by suppurative otitis, by earache and at times by a 'cold' or sore throat. Such an outbreak occurred in February and March 1935 in the adjoining villages of Griswoldville and Shattuckville, Mass. A high incidence of suppurative otitis was associated with this outbreak. There was a much higher incidence of cases in the lower age groups, both in infected families and in the general population. Cultures taken from a cross section of the general population showed that 1 Unless a specific search is made for the pneumococcus, the true etiologic agent might be missed. 2 There was a higher incidence of type I pneumococcus in family contacts of cases than in the general population without such contact. 3 Healthy carriers were confined to the adult age group. 4 Although most of the positive throat cultures had become negative within two weeks after the first positive culture, some might remain positive for three months or more. 5 The prevalence of pneumococci other than type I was about the same in families with probable pneumococcal disease and in families without such disease. The authors suggest that the probable focus of spread was a mill, from which patients and adult healthy carriers spread the organism to the individual homes.

**Control of Sylvatic Plague Vectors**—Stewart and Mackie state that the control of fleas in rodent burrows, as well as control of the rodents themselves, necessary in the effective suppression of sylvatic plague may be accomplished by fumigation with methyl bromide. All stages from the egg to the adult are susceptible to this fumigant, but the adults are more easily killed than are the immature stages. It appears from field tests that the dosage of liquid methyl bromide, approximately 10 cc per burrow opening ordinarily used to kill ground squirrels is also sufficient to kill the fleas in all stages of development. In fumigating warehouses and the like the air and gas should be kept in circulation by means of fans in order to prevent stratification of the gaseous methyl bromide. Thus not only increases the efficiency of the fumigant but also reduces human hazard. Thorough ventilation should be provided on the completion of fumigation of cars, ships, rooms or buildings. It is believed that the spread of bubonic plague occurring through the transportation of plague-flea infested grains, cereals and the like may be effectively checked by fumigating these cargoes with methyl bromide and that the materials so treated will not in any way be rendered unfit for human consumption.

## American Journal of Medical Sciences, Philadelphia

196 761 900 (Dec.) 1938

- Glomerular Dominance in Bright's Disease H A Christian Boston—p 761
- Hemolysis as the Cause of Clinical and Experimental Hemolytic Anemias, with Particular Reference to the Nature of Spherocytosis and Increased Fragility W Dameshek and S O Schwartz with technical assistance of Sonya Gross Boston—p 769
- Paroxysmal Hemoglobinuria Report of Case C P Howard E S Mills and S R Townsend Montreal—p 792
- Thrombosis A Medical Problem M Burke Madison Wis—p 796
- \*Coronary Thrombosis Among Women T W Baker and F A Willis Rochester Minn—p 815
- Studies on Circulation in Pregnancy V Lead 5 of the Electrocardiogram in Pregnancy Including Normal Cardiac and Toxicemic Women K J Thomson Mount McGregor N Y M E Cohen and B E Hamilton Boston—p 819
- Note on Case of Congenital Absence of Left Lung A Jamani and A G Ellis Bangkok Siam—p 824
- \*Study of Oral Typhoid Vaccination as Measured by Blood Serum Agglutinins P D Crimm and D M Short Evansville Ind—p 826
- Acute Infectious Gastro-Enteritis W W Boardman San Francisco—p 833
- Etiology of Effort Syndrome M H Soley and N W Shock San Francisco—p 840
- \*Cigarette Smoking I As Cause of Fatigue II Effect on Electrocardiogram With and Without the Use of Filters H L Segal Rochester N Y—p 851

**Coronary Thrombosis Among Women**—Baker and Willis report the study of 100 cases of coronary thrombosis in women. Previous data disclosed that there was a marked predominance among men, the ratio of men to women was seven to one. It was also shown that coronary thrombosis occurred considerably later (six years) in life among women than it did among men. Only eight of the 100 patients were less than 50 years of age at the time the thrombosis occurred. The average age for the group was 63, clearly demonstrating the tendency for coronary thrombosis to occur later in life among women than among men. Fifty-four patients were dead at the conclusion of this study and in all but nine of these women death was directly attributable to the heart. In thirty-two patients death occurred soon after coronary occlusion and in thirteen later, as a result of ensuing congestive cardiac failure. In four women the cause of death could not be determined in five death resulted from diseases entirely unrelated to the heart. Seven patients suffered from recurrent coronary thrombosis. This incidence is considerably less than that noted in the previous study, which comprised both men and women. In that study the incidence of recurrent episodes was found to be 19 per cent. In seventy-eight women subjective evidence of cardiac disease occurred before the onset of coronary thrombosis. Sixty-six patients were known to have had hypertension before the onset of coronary thrombosis. Data regarding diabetes mellitus were available in twelve women. Sixteen patients had proved disease of the gallbladder. Nine patients lived less than twenty-four hours following the onset of the occlusive episode. Six patients lived less than a week, eight less than a month and nine less than six months. Six patients lived less than a year, four lived less than two years and only three lived more than two years. The average duration of life in the patients who died of cardiac disease was eleven months. Of patients in whom coronary thrombosis did not prove fatal twenty-eight were alive within a period of five years following coronary thrombosis, twelve were alive within a period of from five to ten years and three lived more than ten years. Three patients could not be traced. Eighteen patients reported their state of health as good, five said that they were well with the exception of occasional anginal seizures, fourteen were only in fair health and six were in poor health. The latter include patients who had severe recurrent anginal seizures, severe dyspnea, congestive cardiac failure or a cerebral vascular accident.

**Oral Typhoid Vaccination**—Crimm and Short vaccinated 100 patients subcutaneously with mixed typhoid vaccine and 100 by the oral method. Blood serum agglutinins were determined at various intervals. Of the patients who received the oral typhoid mixed vaccine 33 per cent had mild reactions, none of which were incapacitating. Significant agglutinin titers with oral typhoid vaccine were present within sixty hours. The agglutinin titration of both methods was essentially comparable after an interval of from two to five weeks. Significant titers persisted for six months or longer following oral vaccine. Those



cases failing to show agglutination five weeks following vaccination were 24 per cent for the subcutaneous and 8 per cent for the oral cases. Thus the failures are three times as numerous with the subcutaneous as with the oral method. The authors conclude, from the extensive clinical reports of others and the present laboratory results, that the oral method is as efficacious as the subcutaneous method of mixed typhoid vaccination.

**Cigaret Smoking**—From a study of six patients whose main symptom was a fatigue that was relieved by discontinuing smoking, Segal found that cigarette smoking can be the cause of fatigue in some people and this fatigue can be relieved by stopping cigarette smoking. Cigaret smoking produces definite changes in the electrocardiogram, mainly an increase in the cardiac rate and a lowering of the T wave. Standard and so called demounted brands of cigarettes produce the same effects. Although filter holders decrease the amount of nicotine in cigarette smoke, a sufficient amount of nicotine is still available to produce changes in electrocardiograms. These effects occur mainly in persons less than 50 years of age.

## American J Obstetrics and Gynecology, St Louis

36 727 908 (Nov.) 1938

- Electrical Changes Associated with Human Ovulation J. Rock, Jean Reboul and J. M. Snodgrass Boston—p. 733  
Advances in Our Knowledge of the Early Primate Embryo G. I. Streeter Baltimore—p. 747  
Influence of Long Continued Injections of Estrogen on Mammary Tissue I. A. Imge and K. M. Murphy San Francisco—p. 750  
\*Observations Concerning the Metabolism of Estrogens in Women G. Van S. Smith and O. W. Smith Brookline Mass.—p. 769  
The Place of Vaginal Hysterectomy in Present Day Gynecology W. C. Danforth Evanston Ill.—p. 787  
Hypertension and Pregnancy W. J. Dieckmann and I. Brown Chicago—p. 798  
Study of Lymph Glands in Cancer of Cervix and Cancer of Vagina F. J. Trausig St. Louis—p. 819  
Evaluation of Five Year Criterion in Carcinoma of the Cervix R. A. Kimbrough and P. Tompkins Philadelphia—p. 833  
Miscellaneous Tumors of the Ovary (Arrhenoblastoma, Adrenal Ovarian Tumors) Report of Six Additional Cases of Arrhenoblastoma I. Novak Baltimore—p. 840  
End Results in 400 Cases of Placenta Praevia A. H. Aldridge and T. J. Parks New York—p. 859  
Endometriosis: Clinical and Surgical Review A. S. Counsellor Rochester Minn.—p. 877  
\*Nonirritating Opaque Medium for Uterosalingography P. Titus R. E. Tafel, K. H. McClellan and J. C. Messer Pittsburgh—p. 889  
Complete Vaccination of Perineum and Rectovaginal Fistula: Management and End Results J. I. Phaneuf Boston—p. 899

**Metabolism of Estrogens in Women**—The metabolism of estrogenic hormones by women first engaged the Smiths' attention when they observed that the oral administration of estrogen resulted in increased urinary excretion only during the luteal phase of the cycle. They quantitated theelin and theelol in (1) four specimens of urine from a normally menstruating woman at crucial times in the cycle, (2) ten urines from a patient with dysfunctional menstruation and (3) eighty-eight urines from seven normal, nine toxicemic and two eclamptic late pregnancies. Clinically the determinations indicate that 1 Endometrial bleeding is associated with both increased production and increased destruction of estrogen, which processes accompany a state of progestin deficiency, and this situation is exaggerated in dysfunctional menstruation. 2 The manifestations of preeclampsia coincide with changes in the urinary values for pregnandiol theelol, theelin and estradiol which reflect a progestin-deficient metabolism of the estrogens. It is postulated that the vascular phenomena which are responsible for endometrial flow and preeclampsia may be brought about by a toxic concentration of nonestrogenic breakdown products, resulting from destruction of the estrogens. The treatment of preeclampsia with progesterone and estrogens appears to shift the progestin-estrogen balance in the direction of normal and offers some promise of value, provided injections are started sufficiently early.

**Nonirritating Medium for Uterosalingography**—Titus and his associates find that monoiodomethane sulfonate of sodium (skiodan) (40 per cent) with acacia (20 per cent) is nonirritating in uterosalingography. It does not release free iodine and is rapidly excreted from the body through the urine. The acacia, added for viscosity, does not have a foreign body effect as do poppy seed or sesame oils. The authors have used

the compound in their clinic in a series of patients over a period of nearly two years without clinical evidence of inflammatory or other reactions, either immediate or delayed. Moreover, the roentgenograms appear to be more distinct than with the iodized oil preparations. It is suggested that this preparation may be of distinct use in bronchoscopic work.

## Bulletin New York Academy of Medicine, New York

11 711 764 (Dec.) 1938

- Remarks on Differential Diagnosis and Treatment of Pernicious Anemia C. C. Sturges Ann Arbor Mich.—p. 715  
The Nutritional Diseases R. R. Kracke Emory University Ga.—p. 725  
Recent Advances in Knowledge of Some of the Common Diseases of Childhood S. J. Levine New York—p. 739

## Connecticut State Medical Society Journal, Hartford

2 591 634 (Dec.) 1938

- Public Health Aspects of Syphilis T. Parran Washington D. C.—p. 597  
Virus Proteins S. Hayne Jones New Haven—p. 598  
Vaginitis in Pregnancy N. J. Lastman Baltimore—p. 600  
Experimental Observation on Treatment of Hypertension H. Goldblatt Cleveland—p. 602  
When Should a Person with Syphilis Marry? D. F. Shea Hartford—p. 604  
Hypoglycemic and Metrazol Treatment of Dementia Praecox R. Goldstein New Haven—p. 607  
Survey of Prevalence of Syphilis and Gonorrhea in the State of Connecticut Mary Harkin and J. I. Lunde New Haven—p. 609  
Endocrine Treatment of the Undescended Testicle C. L. Deming New Haven—p. 615  
Treatment of Undulant Fever W. Tilton New Haven—p. 616

**Syphilis and Marriage**—Shea states that every person with syphilis should be considered individually in determining fitness for marriage. Consideration must be given to the duration of the disease and the sex of the infected person. Women are less eligible than men, as primary, secondary and tertiary syphilis is communicable to the offspring. If women do marry, it must be with the assurance that they will take treatment throughout pregnancy regardless of the blood reaction. Also of importance is the amount of treatment received by the infected person at least eighteen months in early syphilis. Of course additional treatment is required for cure. The final consideration should be given to the economic responsibilities of the marrying persons as well as to the social rights of the community. Young and recently infected partners with a prospect of children and an insecure economic future would certainly be less eligible than elderly, noninfectious individuals who are economically comfortable and beyond the child bearing period. There are cases, of course in which because of legal entanglements (illegitimacy and the legalization of common law marriages) the physician may conscientiously disregard any of the usual standards and certify a person for marriage. At no time should the inconvenience of a postponed marriage interfere with the certifying physician's judgment, and just as exacting should be the duty of the judge of probate who has the power to waive the blood test law.

## Journal of Bacteriology, Baltimore

36 455 570 (Nov.) 1938

- Sensitizing Bacterial Spores to Heat by Exposing Them to Ultraviolet Light H. R. Curran and F. R. Evans Washington D. C.—p. 455  
Comparative Metabolism of R and S Variants of *Lactobacillus Plantarum* (Orla Jensen) R. I. Tracy Los Angeles—p. 467  
\*Bactericidal Effect of Sulfanilamide on Beta Hemolytic Streptococci in Vitro H. J. White and J. M. Parker Boston—p. 481  
Synthetic Medium for Cultivation of *Corynebacterium Diphtheriae* J. H. Mueller Boston—p. 499  
Flagella Staining as a Routine Test for Bacteria H. J. Conn and Gladys E. Wolfe Geneva N. Y.—p. 517  
Proteolytic Enzymes of Bacteria II. Peptidases of Some Common Bacteria J. Berger, M. J. Johnson and W. H. Peterson Madison Wis.—p. 521  
New Method for Determination of Disinfection Rates M. L. Isaacs, New York—p. 547  
Hetero Auxin and Growth of *Escherichia Coli* E. Ball Norman Okla.—p. 559

**Bactericidal Effect of Sulfanilamide on Streptococci**—White and Parker studied the bactericidal action of sulfanilamide on beta-hemolytic streptococci *in vitro* at an elevated test temperature. The fact that bactericidal action had been observed with the drug in whole blood at 40 C., when

only inhibition could be demonstrated at 37 C, led them to conclude that the temperature at which bacteria were subjected to the action of the drug determined whether sterilization or inhibition would result. It is difficult to draw definite conclusions from results with a test mixture which contains not only the drug and bacteria but leukocytes and serum as well. In plain PD broth, on the other hand, it seems to them that there can be no question of bactericidal action on the part of any element other than the drug itself. With such a mixture one is obviously dealing only with bacteria multiplying in an environment which includes nutritive elements, metabolites and drug. Under these conditions it appears that temperature is the determining factor. Although the authors have repeatedly verified their bactericidal results at 40 C, they have thus far been unable to obtain data which will explain just why the streptococci are killed by the drug at 40 C when they are merely inhibited at 37 C under conditions otherwise similar. The significance of a bactericidal action with sulfanilamide at 40 C *in vitro* should not be overlooked. Bactericidal action with this drug has been demonstrated by them only at elevated temperatures corresponding to those associated with high fevers. This suggests a correlation with successful clinical treatment of patients with severe hemolytic streptococcus infections involving high temperatures. Hence in rapidly successful sulfanilamide therapeutics it may be that the invading bacteria have been exposed at times to the action of the drug at temperatures similar to those at which bactericidal action has been demonstrated *in vitro*.

### Journal Industrial Hygiene & Toxicology, Baltimore

20 535 592 (Nov.) 1938

- Nature of Mineral Particles in Sputum and Ash of Lungs of Silicotics H E Burke Ray Brook N Y and P F Kerr New York—p 535  
Solubility of Siliceous Dusts and the Inhibitory Action of Added Dusts A G R Whitehouse London England—p 556  
Study of Fatal Case of Uncomplicated Silicosis A R Riddell C M Jephcott and D A Irwin Toronto—p 566  
\*Comparison of Pulmonary Ventilation in Three Methods of Artificial Respiration B G King, with assistance of H F Standerwick W W Schier and J F Steinman New York—p 576  
Rapid Simple Method for Determination of Lead in Small Quantities of Urine D O Shiels Melbourne Australia—p 581  
Note on Practical Method for Rapid Determination of Lead When Found in Atmosphere G C Harrold S T Meek Detroit and T R Holden Pittsburgh—p 589

**Pulmonary Ventilation in Artificial Respiration**—King compared the pulmonary ventilation of twenty-one conscious male subjects during application of the Schafer, the Holger Nielsen and Drinker's "combined" methods of artificial respiration. The Drinker combined method gave the greatest respiratory exchange per respiration. It was administered at the rate of five a minute, it caused no discomfort when applied to a conscious subject. It is concluded that this method has definite value as an alternative method to the Schafer prone pressure technic. It has the advantage, as far as the subject is concerned, of adequate ventilation when applied at a slower rate. By increasing the rate a greatly augmented ventilation could be effected. When used with the inhalator this method would be of value in cases of carbon monoxide poisoning.

### Journal of the Mount Sinai Hospital, New York

5 197 586 (Nov. Dec.) 1938 Partial Index

- Epidural Spinal Infections I Cohen New York—p 219  
Value of Vestibular Test in Neurologic Diagnosis J L Maybaum, New York—p 234  
Ephedrine in Treatment of Autonomic Petit Mal Convulsive Seizures I S Wechsler New York—p 250  
Value of Muscle Training in Treatment of Paralysis and Disturbances of Movement M Grossman New York—p 263  
Cardiac Arrhythmias with Special Reference to Paroxysmal Tachycardia Auricular Fibrillation and Premature Beats in Constitutionally Allergic Individuals J Harkavy New York—p 273  
Detachment of Retina Factors Influencing Prognosis R K Lambert New York—p 311  
Effect of Large Amounts of Lipiodol Injected into Spinal Subarachnoid Space S Selig and S R Rubert New York—p 363  
Toxic Encephalopathy Coal Tar Derivatives as Probable Etiologic Factor Report of Three Cases with Neurohistologic Studies in Two J H Friedman New York—p 463  
Effect of Ergotamine Tartrate on Body Temperatures H Selinsky and W Burman New York—p 545

### Journal of Pediatrics, St Louis

13 805 952 (Dec.) 1938

- \*Treatment of Neurogenic Megacolon with Selective Drugs W O Klingman New York—p 805  
Observations on Congenital Megacolon G de Takats and A D Biggs Chicago—p 819  
\*Treatment of Hypogonadism in the Adolescent Male B Webster New York—p 847  
Histopathology of Convulsive Disorders in Children H M Zimmerman New Haven Conn—p 859  
Nicotinic Acid in Treatment of Acrodynia F F Tisdall T G H Drake and A Brown Toronto—p 891  
Injury of the Child by Roentgen Ray During Pregnancy Report of Case I E Johnson New York—p 894  
Oxygen Therapy by the Open Box Method D J Pachman Chicago—p 902

**Treatment of Neurogenic Megacolon with Drugs**—Klingman believes that, clinically, idiopathic or acquired megacolon falls into one of two groups: rectosigmoidal achalasia, in which one finds a failure of the rectosigmoidal apparatus to relax, and the group in which the motor function of the parasympathetic system fails to act effectively above the rectosigmoidal region. Rectosigmoidal achalasia may arise from two causes: overactivity of the sympathetic system resulting in spasm of the rectosigmoidal apparatus and failure of the parasympathetic system to inhibit properly the rectosigmoidal apparatus. Drugs acting exclusively on the parasympathetics as paralyzers are beneficial in establishing better emptying of the intestine in certain cases of megacolon. The drug of choice to inhibit liberation of acetylcholine should be atropine, but its highly toxic effects contraindicate its administration. Therefore for a less toxic atropine-like compound, syntropan (the ester of 3-dimethylamino 2,2-dimethyl-1-propanol and tropic acid) was selected. It was selected because it controls tonus without interfering with the peristaltic reflex. Clinically the two types of rectosigmoidal achalasia cannot be distinguished except after trial of appropriate drug therapy, but through the use of barium sulfate enemas it is frequently possible to demonstrate whether or not there is rectosigmoidal spasm with or without delayed emptying of the colon. In cases of rectosigmoidal achalasia there is marked delay in emptying, whereas in the cases in which there is deficient motor function on the part of the parasympathetics of the colon above the rectosigmoidal apparatus there is good emptying of the lower colon but retention of the barium sulfate in the upper part of the colon. Based on this classification, the author proposes a selective form of treatment for each of the conditions classified. When an x-ray interpretation makes it possible to establish that the rectosigmoidal apparatus is functioning, prostigmine methyl sulfate should be tried. If the rectosigmoidal apparatus is not functioning, amphetamine sulfate and then syntropan should be tried. If there is no response to either of the latter drugs, lumbar ganglionectomy and presacral resection is proposed until a more satisfactory selective drug can be found.

### Treatment of Hypogonadism in the Adolescent Male

—Webster used replacement therapy in six adolescent males with true hypogonadism as soon as the condition could be definitely detected. Of the six boys, two were typical of the so-called Frohlich's syndrome, one was considered an instance of primary hypogonadism without a history of previous disease or trauma of the testes and without evidence of other endocrine disorder, two were bilateral cryptorchids both of whom had had previous operative procedures, and one was an example of a severe constitutional disease causing retardation of sexual development. Treatment with testosterone propionate brought about increased genital growth and the secondary sexual characteristics usually associated with normal puberty. Whether treatment must be continued for the remainder of the individual patient's life is not known. Although regression of genital growth probably will not take place after the cessation of treatment it is to be expected that small maintenance doses must be given in order to maintain libido, hair growth and the various other functions apparently dependent on a normal level of androgenic hormones in the blood. About 25 mg of testosterone propionate three times a week seemed to be an adequate dosage. In no instance was excessive libido apparent. Smaller doses of 10 mg two or three times a week appear to be adequate to maintain beard growth, libido and the like after they have been established. A careful study of more cases is necessary.

in order to obtain additional data on the subject of clinical dosage. The first change, following the injection of testosterone propionate, was the appearance of pubic and axillary hair. An increase in the size of the penis, development of the scrotum and deepening of the voice soon followed. Growth of beard and an increase in the size of the prostate occurred only after several weeks of treatment. Three patients gained weight. However, these patients looked less obese at the end of the period of treatment than at the beginning. There was a decrease in the size of the mammary region and the abdomen. Growth spurts were noted in every boy during the period of treatment.

### Laryngoscope, St. Louis

19 765-816 (Nov.) 1938

- Observations on Pathology of Impaired Hearing for Low Tone. D. Ochs. Baltimore—p. 765.  
Meningitis (Otitis) Due to Type III Pneumococcus Operation. Sulfanilamide and Intranasal Injection of Patient's Own Serum. Recovery. S. W. Carlin. Boston—p. 793.  
Acute Anterior Polymyelitis with Special Reference to Its Rhinologic Aspect (Anterior Slide Demonstration). I. Felderman. Philadelphia—p. 809.  
Foreign Body in Nose. Report of Case. M. M. Kopp and H. Levy. Brooklyn—p. 819.  
Lingual Eosinophilia. H. Fickett. New York—p. 822.  
Obstructive Laryngeal Dyspnea. S. Weinstein. Brooklyn—p. 836.

### Military Surgeon, Washington, D. C.

91 101-480 (Nov.) 1938

- Peptic Ulcer and the Tartrazine Treatment. Report on Its Use in 132 Cases. M. M. Benedict—p. 401.  
Role of Veterinary Service in Modern Warfare. O. J. McKim—p. 420.  
Medical Aspects of the Cancer Problem. I. K. Sankup—p. 427.  
Treatment of Venereal Lymphogranuloma with Sulfanilamide. G. R. Hamilton—p. 431.  
Medical Preparedness. Every Doctor's Responsibility. A. G. Hulet—p. 439.  
The Pinch Graft. J. J. Voloun—p. 442.  
Rattan Litter for Use in Airplane. K. K. Sampson and I. Potenciano—p. 443.  
The Civilian Conservation Corps as a Youth Reconversion Corp. W. H. Watt—p. 445.  
The Cholera Epidemic During the Black Hawk War. J. M. Phalen—p. 452.

### Nebraska State Medical Journal, Lincoln

27 411-480 (Dec.) 1938

- Some Important Points in the Diagnosis and Treatment of Acute Intestinal Obstruction. I. P. Fugel. Kearney City, Mo.—p. 441.  
Irradiation Therapy of Cancer of Uterine Cervix. I. W. Rowe. Lincoln—p. 445.  
Sulfanilamide Therapy in Gonorrheal Arthritis. F. F. Simmons and J. J. Dunn. Omaha—p. 451.  
\*Obesity. L. W. Hancock. Lincoln—p. 452.  
Treatment of Lymphatic Neck Swelling. W. R. Himes. Omaha—p. 455.  
The Small Hospitals of Nebraska. D. D. Kung. York—p. 461.  
Tumors and Inflammatory Swellings of the Neck. Part V. Diseases of Salivary Glands. A. F. Hicken. H. B. Hunt and A. M. Popper. Omaha—p. 464.  
Sulfanilamide in Gonorrhea. Report of Case Developing Usual and Unusual Complications. W. R. Kovar. Clarkson—p. 467.  
Report on Case of Schizophrenia. R. H. Young. Omaha—p. 470.

**Obesity.**—Hancock states that the obese person, child or adult, is often potentially diabetic. Various orthopedic conditions, ranging from pronated feet to Pott's disease, are associated with overweight which in some instances causes, in others aggravates and in all renders treatment more difficult. Obesity increases the risk in surgical conditions, pneumonia and other medical crises. Obese children are often objects of ridicule by their playmates. This sets up a reaction which differs according to the mental and physical characteristics of the individual. The child who happens to be physically strong in proportion to his weight becomes a bully. The child of normal or reduced strength becomes introverted, has feelings of inadequacy and reacts accordingly. The obese child is judged according to size, not age, too much is expected of him both physically and mentally, wherefore the common but erroneous opinion that fat children are dull. As a matter of fact, most exceptional children are overweight but their mental precocity does not prevent them from forming faulty social adjustments, thus wasting or even perverting their superior mental ability. Most endocrinologists stoutly maintain that obesity is nearly always endogenous and must be treated with endocrine substances, while a majority of pediatricians hold

with the exogenous theory and claim that dietary restriction is the proper treatment. The equally good results reported by the two groups are difficult to reconcile but when their methods are examined it is discovered that most of those who profess to believe in the endocrine theory also include on their treatment a "moderate" reduction in diet and those who consider obesity to be entirely a matter of overconsumption of food often give a "little" thyroid or pituitary extract. The author sums up the evidence by pointing out that the fat child is metabolically different from the thin one. This difference seems to be constitutional and hereditary and may well be on an endocrine basis. The direct relationship of obesity to any endocrine gland has not been proved, nor has any adipogenic hormone been detected. The author proposes a carefully constructed diet, using endocrine substances as an adjuvant, realizing that their use is entirely empiric. The medication has considerable suggestive value and also keeps the child under observation much more closely than when diet alone is used. Exercise is not stressed, since it so increases appetite that the net effect is frequently nil. Fluid restriction and salt free diets affect only the water content of the body and have no effect on the adipose tissue itself.

### New Orleans Medical and Surgical Journal

91 271-334 (Dec.) 1938

- Ameloid Abscess of the Liver. Case Report. E. A. Ficklen. New Orleans—p. 271.  
Malignant Hypertension. G. M. Decherd Jr. and J. R. Schenken. New Orleans—p. 275.  
Star Wounds of the Heart. Case Report with Note on Some Special Problems. A. I. Culpepper. Alexandria, La.—p. 283.  
The Present State of Insulin and Metrazol Shock Treatments of Schizophrenia. F. Wexberg. New Orleans—p. 289.  
Protamine Insulin in Treatment of Diabetes Mellitus. M. Gardberg. New Orleans—p. 293.  
\*Treatment of Tularemia. J. N. Elson. New Orleans—p. 296.  
Review of Roentgen Pelvimetry with Special Reference to Pelvicograms. W. I. Guerriero and W. J. Smith. Monroe, La.—p. 299.  
The Diagnosis of Rabies. J. H. Connell. New Orleans—p. 307.  
Deuteroprotease in Treatment of Pneumonias. C. Brooks. New Orleans—p. 306.

**Treatment of Tularemia.**—Elson stresses the fact that there are three classes of tularemic inflammations of subcutaneous lymphatic nodes which are diagnosed and pass as other diseases. These inflammations are (1) cases that pass as glandular fevers, (2) inguinal adenitis (buboes) which remains undurated or only partially suppurating for a long time with out undergoing resolution and with marked constitutional symptoms and (3) the type of furunculosis that arises in the subcutaneous lymph nodes with or without subsequent suppuration. The fact that so many patients have no typical initial lesions does not exclude tularemic origin, as the mere contact with infected animals through handling, especially when the mucous membranes come in contact (well exemplified by tularemic conjunctivitis), suffices to cause localized or even in rare cases generalized tularemic infection. The author began to use syrup of ferrous iodide in the treatment of tularemia in 1932 and states that ferrous iodide is a specific.

### New York State Journal of Medicine, New York

38 1485-1530 (Dec. 1) 1938

- The Prevention of Pneumonia. W. G. Smilie. New York—p. 1485.  
Alcoholism as a Psychiatric Medical Problem. E. B. Allen. White Plains—p. 1492.  
Application of Convulsive Therapy in Schizophrenia. L. L. Orenstein. I. I. Rosenbaum and P. Schilder. New York—p. 1506.  
The Progression of Deformities with Special Reference to Chronic Arthritis. J. P. Stamp. New York—p. 1509.

### Review of Gastroenterology, New York

5 306-403 (Dec.) 1938

- Bacteriology of Intestinal Tract in Certain Chronic Diseases. III. Possible Role of Upper Respiratory Infection. C. W. Lieb and G. H. Chapman. New York—p. 306.  
Imitiss Plastica. Report of Case. H. J. Vier. White Plains, N. Y.—p. 319.  
Gastric Syphilis. Report of Three Cases of Gastric Syphilis in Syphilitic Individuals and One Case of Benign Gastric Ulcer in a Syphilitic. Survey of Literature. M. Golub. New York—p. 322.  
Food Allergy of the Digestive System. J. S. Smul. New York—p. 331.  
Physical Therapy in Gastro-Enterology. S. W. Johnson. Passaic, N. J.—p. 350.

## Radiology Syracuse, N Y

31 521 650 (Nov) 1938

- Roentgen Diagnosis of Destructive Lesions of the Knee Joint and Its Limitations—Experimental Study E Fichmann Oklahoma City—p 521
- Remarks on Chondro Tube Therapy J F Bromley Birmingham England—p 547
- New Device for Radium Application in Esophageal Malignancy S Rubenfeld and T Schneider New York—p 554
- Pancreatic Lithiasis Case Report and Autopsy Findings W A Marshall Chicago—p 562
- Foreign Body Localization in Military Roentgenology E K Reid and L F Black Washington D C—p 567
- Roentgen Pelvimeter Simplifying Thomas's Method R Torpin L P Holmes and W F Hamilton Augusta Ga—p 564
- Excretory Urography by Intramuscular Injection of Diodrast H B Hunt and A M Popma Omaha—p 587
- Pseudogastrointestinal Fistula Report of One Case C H Frank Batavia N Y—p 595
- \*Postmortem Findings and Radioactivity Determinations Five Years After Injection of Thorotrast Lillian E Jacobson and D Rosenbaum New York—p 601
- \*The Practical and Experimental Aspects of Roentgen Treatment of Brucillus Welchii (Gas Gangrene) and Other Gas Forming Infections J F Kelly D A Dowell B C Russum and F E Colien Omaha—p 608

**Radioactivity Five Years After Injection of Thorotrast**—Jacobson and Rosenbaum discuss the postmortem observations in a case in which 75 cc of thorotrast was injected intravenously five years before death. The ash of the liver preserved in 10 per cent neutral formaldehyde for six months showed that the liver still retained 27 per cent of the gamma ray activity of the thorotrast injected five years previous to death. Ninety cc of the formaldehyde in a sealed bottle did not show any radioactivity. The approximate gamma-ray activity of the liver ash was 0.3 microgram of radium. It is considered that the changes observed at necropsy were due to the longstanding presence of thorium or its disintegration products and that the amount of radioactive substance present was sufficient to induce the fibrotic changes seen in the liver, spleen and lymph nodes.

**Roentgen Treatment of Gas-Forming Infections**—Since August 1928, Kelly and his collaborators have collected data in 143 cases of gas gangrene infection treated with x-rays. A definite amount of x-rays to cover all cases can never be stated, as each case is a distinct clinical problem. Any one with a working knowledge of radiation therapy should be able to treat a case if he is not compelled to start too late. The thicker the part the higher the voltage and the more filtration is indicated, but since it is necessary to treat over a period of only three days or at the longest five days, making the number of treatments vary from six to ten, no complications should arise from the use of 100 roentgens per port at one treatment if the correct voltage and filtration are used. If treatment extends beyond the third day, unless new areas are being treated 50 roentgens per port might be sufficient. An increase in filter would also add to the protection of the patient. Since 1931 no patient who has been thus treated has died of gas gangrene. The lowered mortality and the number of recoveries in the non-amputation group and in the no-serum group proved beyond question that the use of x-rays in treating gas gangrene approaches the action of a specific. There are no contraindications to their use by a qualified radiologist. Severe debridement measures are no longer justifiable. In addition to lowering mortality the authors are certain that many arms and legs have been saved. A low mortality rate is no longer the sole standard of successful treatment of gas gangrene if it has been obtained at the sacrifice of amputation. Some patients treated early in the disease recovered following two or three roentgen treatments. If patients are treated early, during the first twenty-four hours of the disease, there should be a 100 per cent recovery. By use of the roentgenogram a diagnosis of gas gangrene can be made early, with the first accumulation of gas in the deep tissues. This method of examination is essential in all cases of suspected gas gangrene. Prophylactic use of x-rays is advised in all suspected cases, in fact, in all types of injuries such as those in which gas gangrene infections commonly develop. Patients complaining of an unusual amount of pain following a hypodermic injection might well be roentgenographed for gas in the deeper tissues as this infection following

hypodermic injection has been reported in the literature. X-rays have also been of benefit in treating arteriosclerotic and diabetic patients in whom gas gangrene has developed. The use of serum is not absolutely essential to recovery and its use should be conservative with avoidance of serum sickness, which only adds to the patient's illness. Tetanus serum must be given. Some filter and adequate kilovoltage to penetrate the involved part must be used. Up to this time no patient has died of gas gangrene who has received a treatment in the morning and a treatment in the evening for three days over all the involved area.

## Rocky Mountain Medical Journal, Denver

35 937 1016 (Dec) 1938

- What Is Expected of the Physician and Surgeon in Compensation Cases H C Thompson Denver—p 954
- Medical Care from the American Medical Association Standpoint J D Lutz Chicago—p 963
- Indigent Medical Care Largely a Problem of National Economics W R Carey Sheridan Wyo—p 969
- Uncle Sam Practices Medicine A L Miller Kimball Neb—p 972
- Treatment of Hemorr by the Injection Method A S Jackson Madison Wis—p 980
- One or Two Shifts for the Hospital Chef? Eldora Harfeld Denver—p 983

## Surgery, St Louis

4 809 980 (Dec) 1938

- Treatment of Rectal Lymphogranuloma by Excision Report of Six Cases Operated on by the Lockhart Mummery Procedure M Edwards and F B Kindell Baltimore—p 809
- Peroral Intubation and Drainage of the Small Intestine Technique and Indications S H Klein New York—p 827
- Operative Incidence of Pancreatic Reflux in Cholelithiasis R Colp and H Doublet New York—p 837
- Pathologic Changes in Chronic Cholecystitis and the Production of Symptoms N A Womack St Louis—p 847
- Surgical Procedure for Hydrocephalus Associated with Spina Bifida A D Errico Dallas Texas—p 856
- \*Dextrose Utilization in Surgical Patients S B Winslow Ann Arbor Mich—p 867
- Blood Concentration Influenced by Ether and Amytal Anesthesia J L Bollman J L Svirbely and F C Mann Rochester Minn—p 881
- Operative Technique of Carotid Jugular Anastomosis Experimental Study W C Corwin Rochester Minn—p 887
- Unilateral Hypertrophy of Mandibular Condyle Associated with Chondroma F F Kanthak and H N Harkins Chicago—p 898
- Hematogenic Pyarthrosis Due to Brucillus Hemophilus Influenzae and Corynebacterium Xerosis J B Weaver and Loraine Sherwood Kansas City Mo—p 908
- Simple Operation for the Discharging Nipple W W Babcock Philadelphia—p 914
- Cystic Disease of Lung R G Weaver and E von Hram Columbus Ohio—p 917
- \*New Method for Detection of Hidden Abscesses S F Straus F Neuwelt L Rovner and H Necheles Chicago—p 930

**Dextrose Utilization in Surgical Patients**—Twenty six male patients who had undergone surgical procedures and one patient undergoing preparation for surgery were followed over a period of from two to ten days, during which time Winslow carefully checked the amount and rate at which fluids were administered intravenously. He recommends the routine use of 5 per cent dextrose in distilled water for patients who require water and some carbohydrate parenterally, either in preparation for or following an operation. The solution is isotonic with blood. Its dextrose content is sufficient to prevent ketosis and to provide ideal fuel for energy. It protects the liver and avoids the edema which may result from the promiscuous use of physiologic solution of sodium chloride. No serious complications such as dehydration, diuresis, unusual loss or retention of fluids which might be ascribed to the dextrose solution were observed when 3 liters was administered daily at rates of from 300 to 500 cc an hour. This is an inadequate daily caloric intake but this is not an important objection in patients with fair general nutrition or in those who will be taking food orally in a few days. About 98 per cent of the dextrose is utilized when administered at the rate of from 300 to 500 cc an hour, averaging 0.35 Gm of dextrose hourly per kilogram of body weight. A 10 per cent dextrose solution in distilled water is hypertonic with blood is mildly diuretic and can be given at the same rates of administration as 5 per cent dextrose without harmful effects supplying the patient with 93 per cent more carbohydrate than an equal volume of 5 per cent dextrose solution. In this study 95 per cent of the administered dextrose (10 per cent solution) was utilized, making this solution the

author's choice in the presence of hepatic damage, thyroid crisis, inanition and cachexia. Although no measurable damage was observed when 500 cc an hour of the solution was administered, from 200 to 300 cc of the 10 per cent solution hourly is preferred to larger amounts.

**Detection of Hidden Abscesses**—Strauss and his colleagues report a method for the detection of hidden abscesses in patients who are going through a septic course. They detect such abscesses by the use of substances emitting gamma rays which, when injected intravenously, are accumulated in the abscessed area and, as the result of this radioactivity, are observed with a sensitive electron counter. The counter tube which is generally referred to as a Geiger-Muller tube is essentially a gas-filled diode consisting of a hollow cylindrical conductor (the cathode) mounted axially about a central conducting filament (the anode). Under the influence of an external source of penetrating radiation the counter tube mechanism initiates a process of "collision ionization" that produces a discharge through the gas between the cathode and the anode. The counter tube is so surrounded with lead metal that it is shielded for all practical purposes against gamma rays except for those entering through a small opening over which different regions of the dog were placed and counts taken. Thorium dioxide was injected either intravenously or intra-arterially on the affected side (following the technique used by Sedgwick and Solotuchin) in dogs having abscesses of the thigh created by the subcutaneous injection of a suspension of staphylococcus, streptococcus or *Bacillus coli* in intrascapular earth. The procedure was as follows. In the late afternoon the abscess was produced. The next morning the animal was injected intra-arterially on the affected side with 5 cc of colloidal thorium dioxide. During the afternoon the animal was anesthetized and the dog was passed over the tube of the counter. Determinations of five minutes duration were made over various regions of the body. Frequent basal counts were done and the head, the upper and lower parts of the chest, the abdomen and the thigh were examined. At least three determinations were made over each of the foregoing regions and the results were averaged. In five of seven experiments the count over the abscessed area was from one to four impulses a minute higher than the basal count. In three of these experiments this count was higher than in any other region of the body. In the other two dogs the count over the chest was higher than over the abscess itself. In these instances the thorium in the liver or in a large arterial trunk was perhaps sending gamma rays into the receiving tube. The authors conclude that the localization of an abscess often may be a life saving procedure and that their results seem encouraging and that the use of compounds with artificially induced radioactivity, much more potent than thorium dioxide, should increase the number of gamma rays from even a small focus and a low concentration of the radioactive material in it.

### Virginia Medical Monthly, Richmond

67 723-740 (Dec.) 1938

- The Diagnostic Value of the Clinical Aspects of Digestive Diseases  
W. J. Mallory, Washington D. C.—p. 723
- Graphic Evidence of Response with Sulfanilamide in Pneumonia and Pneumococcal Infections  
R. B. Williams and G. B. Irwin, Roanoke—p. 727
- Some Problems in Fracture Treatment  
R. A. Funsten and P. Kinser, Jr., Charlottesville—p. 733
- Hysteria  
T. N. Spessard, Norfolk—p. 736
- Report on Tuberculosis Survey of 480 Teachers and Cafeteria Workers in Roanoke City Public Schools  
K. D. Graves, Roanoke—p. 738
- Some Brief Extemporaneous Remarks Relative to the Organization of the Piedmont Medical Society and Its Founders  
M. J. Payne, Staunton—p. 739
- Endoscopy: Its Role in a General Hospital  
F. D. Woodward and G. S. Fitz, Hugh, Charlottesville—p. 742
- Injection Method for Treatment of Hernia: Preliminary Report  
J. T. N. McCristor and Mary C. McCristor, New York—p. 744
- Management of Trichomonas Infection in the Female  
R. H. Grubbs, Christiansburg—p. 747
- Meningitis (Streptococcus Hemolyticus) Secondary to Otitic Infection  
J. E. Diehl, Norfolk—p. 750
- The Prevention of Hearing Difficulties in Children—The Role of the Family Physician  
H. B. Stone, Jr., Roanoke—p. 753
- Determination of Prolactin Excretion During the Menstrual Cycle  
B. B. Bigby, Jr. and R. J. Mann, Richmond—p. 756
- Report of a Case of Type III Pneumococcus Meningitis with Recovery, in Which Sulfanilamide Was Used  
R. G. Magruder and D. O. Nichols, Charlottesville—p. 759
- Hemiplegia Complicating Labor  
M. Hines, Abingdon—p. 761

### Western J Surg, Obst & Gynecology, Portland, O

16 619-672 (Dec.) 1938

- \*Recurrent and Persistent Thyrotoxicosis Following Thyroidectomy  
M. A. Fulton, M. A. Schmitzer and E. C. Cutler, Poston—p. 619
- \*The Value of Splenectomy  
D. C. Collins, Los Angeles—p. 678
- Sympathetic of the Head  
O. Larsell, Portland Ore—p. 633
- Problems of Psychoses Associated with Reproduction  
R. H. Fay, Los Angeles—p. 639
- The Surgical Approach to Hypertension: Division II  
F. M. Find, San Diego, Calif—p. 642
- Studies on Aqueous Testicular Hormone: I. Changes in Male Sexual Organs: Preliminary Report  
P. Vidgoff, H. Vehr and R. E. Portland Ore—p. 648

### Thyrotoxicosis Following Thyroidectomy—Fulton:

his associates reviewed the histories of thirty-nine patients with persistent or recurrent symptoms of thyrotoxicosis after a total thyroidectomy. Since 1923 when the preoperative use of iodine began these thirty-nine patients have continued to be thyrotoxic or it has redeveloped following thyroidectomy. Fourteen of these thirty-nine patients were free from symptoms for a period of less than six months following their first operation; persistent thyrotoxicosis. In contrast to them in twenty-five cases the duration of freedom from symptoms following operation was more than six months, the average being 1.5 years; recurrent thyrotoxicosis. As a basis for comparison twenty-five patients who had been followed in the endocrine clinic for an average period of seven years and had not had a recurrence of thyrotoxicosis during this interval are used. There were no striking differences between the three groups. Two points of difference are that the patients in whom recurrent developed or thyrotoxicosis persisted were on the average somewhat younger and had somewhat larger goiters than the control group. Their initial symptoms, however, were not so long standing; their average basal metabolism was not impressively high and their response to rest in bed and iodine as measured by the drop in cardiac rate and metabolism compared favorably with that seen in the control series. The author's observations at second operations indicate that continuance of recurrence of symptoms is associated in most instances, though not in all, with an appreciable amount of regeneration of thyroid tissue. What causes this active regrowth of gland is at present unknown. The clinical as well as the laboratory signs of thyrotoxicosis were as a rule less marked during the recurrent and persistent phases of the disease than when the patients were first seen. The return of symptoms was frequently associated with an increase in the degree of exophthalmos. In contrast to this are those patients in whom other features of hyperthyroidism have been relieved following operation, while exophthalmos has actually progressed to a marked degree. This may occur even with the development of postoperative myxedema. These facts emphasize the dissociation that may exist between exophthalmos and many of the other features of toxic goiter. The author's treatment of choice for both the recurrent and the persistent cases has been a second thyroidectomy. The majority of patients have been relieved of symptoms by this procedure and have remained well over an average period of six years. In a few instances roentgen therapy or prolonged iodine administration has satisfactorily controlled symptoms either in place of a second operation or subsequent to it. In three patients a third operation and in two others a fourth operation has been necessary.

**Value of Splenectomy**—In evaluating the efficacy of splenectomy, Collins studied the outcome of the eighty-one splenectomies performed between July 1928 and October 1938 at the Los Angeles County General Hospital. He finds that splenectomy is the only proper treatment for traumatic rupture of the spleen, as soon as the patient's condition permits. Elective splenectomy has its greatest usefulness in instances of essential chronic thrombopenic purpura and congenital hemolytic icterus. Its value in early Banti's syndrome is less clearly defined and the postoperative morbidity in this disease is a formidable factor. Elective splenectomy in certain other diseases such as sickle cell anemia, Gaucher's disease, malaria and early portal cirrhosis with splenomegaly, is not usually advisable. Each individual case must be carefully evaluated. Splenectomy is usually contraindicated in polycythemia vera, syphilis, Hodgkin's disease, tuberculosis, the leukemias or radiosensitive splenomegalies.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Medical Journal, London

2 1029 1070 (Nov. 19) 1938

Aspects of the History of Anesthetics A J Clark—p 1029

\*Radiotherapy in Nonmalignant Uterine Hemorrhage B Windeyer—p 1034

Treatment of Nonmalignant Uterine Hemorrhage Beatrice M Willmott—p 1037

Danger of Primary Abdominal Tuberculosis in Children S Engel Ruby O Stern and G H News—p 1038

\*Aplastic Anemia with Complete Recovery T H Boon—p 1041

Triphenyl Ethylene Tested on Capons A M Hain—p 1043

**Radiotherapy in Nonmalignant Uterine Hemorrhage**—Windeyer believes that roentgen or radium therapy is the treatment of choice in nonmalignant irregular hemorrhage at or near the menopause. Of the sixty-one consecutive cases of menopausal menorrhagia that he has treated success was obtained in fifty-seven, partial success in one, one was unsuccessful and two were untraced. Radium has been used almost exclusively and complications (discharge, nausea and vomiting) have all been due to radium insertion. Such complications have not been reported after the use of x-rays alone, and the production of amenorrhea has been just as certain. Therefore when both methods are available x-rays are to be preferred. In bleeding associated with fibroids occurring in women about or more than 40 years of age, x-rays seem to be more definitely indicated to radium because the distortion due to the tumor may cause the ovaries to lie at an increased distance from the endometrium, with consequent diminution of the dose received from the intra-uterine radium. Radiotherapy should not be used in the treatment of fibroids in young women unless there is some factor, such as cardiac disease, which makes the risk of surgery too great. In menorrhagia in young women, if one accepts the action of radium as being mainly on the ovary and it appears that this is the only way that the greater difficulty in sterilizing young women can be explained, it would seem advisable to use x-rays rather than radium. The dose to the ovaries can be assessed with greater accuracy and there is less damage to the endometrium, with consequently a greater chance that an impregnated ovum can be retained.

**Aplastic Anemia with Recovery**—Boon reports a case showing diminution in all the cellular elements of the blood following arsphenamine therapy. Fortunately the anemia due to aplasia in this case was not increased by hemorrhage from the mucous membranes, as occurred in a recent case of aplastic anemia due to gold therapy for rheumatoid arthritis in which a fatal hematemeses followed. Despite a fall to 18 per cent hemoglobin and 750,000 red cells recovery has occurred, and the patient is apparently well more than two years after the last transfusion. During the period that the blood level was kept up by transfusions there was no evidence of spontaneous recovery, the hemoglobin always being about 40 per cent immediately before and 50 per cent immediately after a transfusion. Within a few weeks of ceasing transfusions there was an increase of reticulocytes and a gradual rise of red cells. The color index remained high until a normal level was reached, and granulocytes lagged behind in their recovery. There seems no doubt that without repeated transfusions the case reported would have proved fatal. In all 12,540 cc of blood was given as twenty-five transfusions.

## Edinburgh Medical Journal

45 829 900 (Dec.) 1938

\*Therapeutic Use of Barbiturates A J Clark—p 829

Bronchiectasis A Fatal Disease H A Cookson and G A Mason—p 844

Debatable Tumors in Human and Animal Pathology VI Meningioma J R M Innes W F Harvey and L K Dawson—p 855

Incidence of Fetus in Scotland R Aitken—p 867

**Therapeutic Use of Barbiturates**—Clark summarizes the chief clinical uses of the barbiturates as follows: (1) cerebral sedatives (in epilepsy, seasickness and the like), (2) hypnotics, (3) narcotics (to lessen the pain of childbirth), (4) basal nar-

cotics and (5) anesthetics. Many of the distinctions drawn between the actions of barbiturates and the actions of other hypnotics depend on the fact that barbiturates such as barbital and phenobarbital produce a more prolonged effect than do most other hypnotics. The potency of barbiturates varies within a relatively small range. The duration of action of the hypnotics depends chiefly on the rate at which they are broken down in the body. Barbital is an exceptional compound in the general class of barbiturates, because the body is unable to break it down and it is excreted unchanged in the urine. Consequently it is removed from the body extremely slowly. The more complex and less stable barbiturates are broken down by the body, probably by the liver, and only small quantities are excreted in the urine. The duration of the action of barbiturates other than barbital depends therefore not on their rate of excretion but on the rate of their destruction in the body, and this varies greatly in different cases. Half destruction of phenobarbital occurs in from six to twelve hours. The safety of barbiturates depends on the therapeutic range, i.e. the ratio between the dose likely to produce the required action and the maximal dose that is unlikely to produce toxic effects, the change of unusual undesirable effects and the chance of cumulation. The estimation of the therapeutic range is rendered difficult by the fact that extensive individual variation occurs in the response to barbiturates, as indeed it does in the response to all other drugs. As a general rule the quick-acting barbiturates are safer than the long-acting ones, because with the former cumulation is less likely and, moreover, any toxic effects, if produced, are of shorter duration. The long-acting barbiturates find their chief employment in the use of phenobarbital in epilepsy and of barbital and phenobarbital as hypnotics. It seems probable that the shorter-acting barbiturates such as pentobarbital sodium are preferable to barbital as hypnotics. Barbiturates with a shorter action than phenobarbital might be found equally efficacious in epilepsy and would be less liable to produce undesirable side actions such as rashes. Barbiturates appear to be satisfactory agents for the production of preoperative narcosis provided only a slight degree of narcosis is produced. The production of narcosis deep enough to relieve severe pain appears to be unsatisfactory because of the incidence of delirium. The chief danger of full anesthesia by barbiturates is paralysis of the respiratory center. This paralysis is difficult to overcome. The permanence of this undesirable effect is surprising in view of the rapid rate of destruction of the drugs in the body.

## J Royal Inst Public Health and Hygiene, London

1 823 886 (Nov.) 1938

New Maternity Services from the Point of View of the Medical Officer of Health A J Shinnie—p 833

Prevention or Palliation of Deafness I A Tumarkin—p 838

The Place of Surgery in Treatment of Pulmonary Tuberculosis J E H Roberts—p 857

Id W Anderson—p 864

Recent Advances in Infant Feeding Ann Mower White—p 872

Physical Education from the Point of View of the School Medical Officer W C V Brothwood—p 879

## Journal of Tropical Medicine and Hygiene, London

41 341 356 (Nov. 1) 1938

\*Sternal Puncture with Special Reference to Its Application in Tropical Diseases in South China A Schretzenmayr and R L Lancaster—p 341

Comparison of Treatments of Kala Azar and Schistosomiasis F G Cawston—p 343

Classification of Certain Groups of Intestinal Bacteria Belonging to the Family Bacillaceae Tribe Ebertheae and Tribe Encapsulatae A Castellani—p 344

41 357 376 (Nov. 15) 1938

Treatment of Pellagra by Amino Acids Report of Six Cases from Postgraduate Section Faculty of Medicine Egyptian University S A Pasha—p 357

Classification of Certain Groups of Intestinal Bacteria Belonging to the Family Bacillaceae Tribe Ebertheae and Tribe Encapsulatae A Castellani—p 362

**Sternal Puncture in Tropical Diseases**—Schretzenmayr and Lancaster state that in chronic cases of malaria with anemia, splenomegaly and sometimes cirrhosis of the liver a bone marrow picture may be found which is similar to that of pernicious anemia. There are, therefore, grounds for the



liver treatment in cases of chronic malarial anemia. If malarial parasites are found in the blood they can always be found in the bone marrow in tertian, quartan and subtertian malaria. They may, however, be discoverable in the marrow when absent from the blood and therefore sternal puncture should always be tried before spleen or liver puncture is attempted. Chronic myelostomatitis can produce an aplastic change of the bone marrow suggestive of toxemia. Sternal marrow examination is of value in arriving at a prognosis. In smallpox the typical changes in the bone marrow consist of a myelotic reaction combined with an increase of the reticulum and plasma cells. The differential diagnostic value of these observations is stressed in atypical cases of smallpox. In kala-azar the Leishman Donovan bodies appear to be always found in the bone marrow. Filariae and spirochetes can also be found in the sternal fluid. Autogenous and heterogenous sternal fluid injections in cases of secondary anemia have been found useful, especially when blood transfusion was impracticable.

### Lancet, London

2 1213 1271 (Nov. 26) 1938

- \*Treatment of Meningococcic Meningitis with 2 Sulfamyl Anilopyridine (M & B 693). J. G. Hobson and D. H. C. MacQuarrie—p. 1213
- Primary Thrombocythemia. R. A. Rowlands and J. M. Vaisey—p. 1217
- \*Gastroscopic Observation of Effect of Aspirin and Certain Other Substances on the Stomach. A. H. Douthwaite and G. A. M. Lintott—p. 1222
- Bilateral Bronchiectasis with Cardiospasm. T. Schrire—p. 1225
- True Oxycephaly. Case Report. J. Hawkins and D. Jefferies with pathologic note by R. S. Hamilton—p. 1226
- Osteitis Condensans Illi. J. Shafir—p. 1229
- Indovesical Color Photography. I. Schirz—p. 1232

**Treatment of Meningococcic Meningitis with Sulfapyridine.**—Hobson and MacQuarrie tried to find a bacteriostatic agent of lower toxicity than sulfanilamide, with equal or even greater bacteriostatic powers in such concentrations as can be easily given orally or parenterally and with a chemical constitution which makes possible the accurate determination of its fate and its distribution in the body fluids. The drug selected was sulfapyridine. Six cases of meningococcic meningitis have been treated with no deaths. In all six cases the infection was subdued without the use of serum. The clinical evidence suggests that a concentration of 3 mg. or less per hundred cubic centimeters of cerebrospinal fluid will be effective. Absorption from the intestinal tract into the blood stream is rapid and within four hours the drug has always been found in fair concentration, while with continued medication the concentration rises in from twelve to twenty-four hours to much higher figures. In the trial administration of the drug over a period of no longer than eight hours the concentration in the blood reached 10 mg. per hundred cubic centimeters of cerebrospinal fluid or more in some cases. A similar concentration was found in three normal persons. There are, however, striking individual variations in the capacity to absorb the drug and a given individual absorbed the drug more rapidly in health than in disease. The state of the gastrointestinal tract therefore introduces an important though incalculable factor into medication. The drug passes rapidly from the blood stream into the cerebrospinal fluid and there is some evidence that the rate of passage is increased by inflammation of the choroid. Toxic symptoms were unimportant, although in all probability an unnecessarily large dosage was used.

**Effect of Acetylsalicylic Acid on the Stomach.**—Douthwaite and Lintott studied gastroscopically the stomach's response to certain drugs. They found that acetylsalicylic acid (in the form of certain proprietary preparations) is a gastric irritant and may thus cause acute indigestion and hemorrhage or, if taken repeatedly, chronic gastritis. If taken after food or with milk it probably has no deleterious effect. Calcium acetylsalicylate is less irritating.

### Tubercle, London

20 148 (Oct.) 1938

- Prognosis in Pulmonary Tuberculosis. H. Wessler—p. 1
- The Management of Threatened Thoracogenic Spinal Curvature. J. D. Bisgard—p. 13
- Detection of Pulmonary Tuberculosis by Means of Serial and Environmental Investigations. J. E. Krzyser Peteren—p. 24

### Presse Medicale, Paris

16 1745 1760 (Nov. 26) 1938

- Studies on Latent Insufficiency of Ascorbic Acid. E. Codville II, Simonnet and J. Mornard—p. 1745
- Present Status of Treatment of Postoperative Pulmonary Embolism. J. Patel—p. 1748

**Latent Insufficiency of Ascorbic Acid.**—Codville and his associates say that besides scurvy, the extreme form of ascorbic acid insufficiency, there are abortive forms, such as hemorrhagic diatheses and certain forms of rheumatism. These latent forms of avitaminosis constitute also an essential element in some infectious diseases. In their studies on latent ascorbic acid insufficiency they stress first the necessity of utilizing for the determination of the urinary elimination of ascorbic acid, a procedure which permits complete conservation of this acid in the urine. They solved this problem by using hydrochloric acid instead of trichloroacetic acid. Their studies were made on persons between the ages of 20 and 23 years. They emphasize that the daily administration of 100 mg. of ascorbic acid even if continued for more than a month, is not accompanied by a noticeable urinary elimination. The arrest of ingestion leads immediately to the arrest of elimination even in 'saturated' subjects. These observations indicate a real need of the organism and it may be concluded that daily doses of 30 mg. of ascorbic acid, which are recommended by some authors, are far below the real requirements. Moreover it was found that even the administration of large doses (500 mg.) do not result in signs of intolerance. The organism seems to require about 100 mg. of vitamin C daily, but many persons do not receive this quantity in their daily diet. In this connection the authors discuss the ascorbic acid content of certain foods particularly fruits. They show that a lemon contains only about 18 mg. of ascorbic acid and that, if the 100 mg. of vitamin C is to be supplied by the consumption of oranges, four would have to be eaten each day. In view of the importance of ascorbic acid not only in the prevention of scurvy but also in the defense against infectious diseases, the insufficient quantities of vitamin C in the diets, particularly of large groups (boarding schools, military organizations and so on) should be supplemented by the administration of ascorbic acid.

### Revue de Chirurgie, Paris

57 633 717 (Nov.) 1938

- \*Late Results of Treatment of Tetany and Spasmophilia in Adults by Subcutaneous Implantation of Piece of Bone According to Method of W. A. Oppel. W. M. Wokressenski—p. 633
- Disturbances in Circulation of Blood and in Respiratory Volume in Course of Operations on Lungs and Problem of Nervous Mechanism of Operative Shock. W. Bross and B. Lueken—p. 648
- Perirectal Strictures of Utero-Adnexal Origin. F. Ferrari and R. Aubanc—p. 659
- Röntgenologic Study of Hunter's Canal in Relation to Arteriographies. E. Forster—p. 707
- Thrombo Angitis Obliterans and Mesenteric Infarcts. M. Constantinesco—p. 713

**Implantation of Bone in Tetany and Spasmophilia.**—Following remarks about the pathogenesis of tetany and spasmophilia, particularly about the insufficiency of the parathyroids, Wokressenski gives his attention to the treatment, pointing out that parathyroid extract prepared according to the method of Collip was not produced in Russia until 1937 and that he is as yet unable to judge its efficacy. The therapeutic method introduced by W. A. Oppel in 1926 consists in the subcutaneous implantation of a piece of bone and results in an increase in the calcium content of the blood. After discussing the technique of this implantation the author points out that Leriche, without knowing of Oppel's ideas, has suggested an analogous treatment. Further the author reviews the 113 cases of tetany and spasmophilia that were treated by means of Oppel's bone grafts at the second surgical clinic of the Kirov institute in Leningrad. He divides the 113 cases into four groups. To the first group belong eighteen patients in whom the spasmophilia and tetany constituted the primary disorder and who had the typical symptoms of the disease. This was the only group in which Oppel's bone implantation was really indicated. In the second group, twenty-seven patients, the spasmophilia and tetany only accompanied some other disorder. In these cases there existed only a relative indication

for the osseous graft. The third group, sixty-two cases, includes those patients in whom the pathognomonic signs of spasmophilia and tetany were not present and in whom the diagnosis was based only on secondary signs which are symptomatic also of other disorders. In this group the indications for the bone implantation were insufficient. In the fourth group, six cases, the osseous transplantation was a prophylactic measure, for it was resorted to in order to prevent possible postoperative tetany after strumectomy. Discussing the results obtained in these different groups, the author cites illustrative case reports. The late results, that is, those observable after from two to eleven years subsequent to the treatment, could be traced in forty-two of the patients. On the basis of the observations made on the material analyzed here the author concludes that hypocalcemia in the presence of tetany and spasmophilia is the chief indication for the subcutaneous implantation of a piece of bone. To be sure the osseous graft is utilisable only within certain limits. Its effects cure in most of the moderately severe cases of spasmophilia and tetany, but in the severe cases it can effect only improvement.

### Schweizerische medizinische Wochenschrift, Basel

68 1221 1244 (Nov. 5) 1938 Partial Index

- Heredity and Orthopedics M R Francillon—p 1221  
\*Progressive Muscular Dystrophy R Stahl—p 1226  
Dehydration by Means of Salt-Free Milk N Markoff—p 1228  
Case of Acute Poliomyelitis During Pregnancy Birth of a Healthy Child P Klein and O Sittig—p 1228  
New Modification of Takata's Functional Test of Liver P Bots—p 1230  
Results in Treatment of Hay Fever H U Hartmann—p 1233

**Progressive Muscular Dystrophy**—Stahl states that occasionally there are cases of muscular dystrophy with absolutely normal creatine and creatinine values in serum and urine. A case of this type was observed by the author. The patient was a man who, at the age of 51, sustained a trauma of the vertebral column and who later developed atrophic and hypertrophic processes in the muscles. In its external aspects the case corresponded to the type to which Griesinger applied the term pseudohypertrophic myopathy, which occurs not only during childhood and in familial groups but also in later life and without demonstrable hereditary tendency. The relation between myopathy and trauma is probably of a different nature in the reported case than in the cases described by Ken Kure and others. The creatine and creatinine metabolism was found to be within normal limits, but it cannot be doubted that this man has a severe, progressive myopathy. This case and a description by Curschmann indicate that anomalies in the creatine metabolism present a frequent but only a facultative symptom of myopathy. Recently it has been pointed out again by Netolitzky and Pichler that disturbances in the creatine metabolism and the clinical behavior of muscular dystrophy do not go parallel. These authors observed clinical improvements after malaria therapy and in case of unchanged creatinuria. On the other hand, they report about the retrogression of creatinuria under the influence of aminoacetic acid without simultaneous increase in muscular strength.

### Giornale di Clinica Medica, Parma

19 1335 1444 (Oct. 30) 1938 Partial Index

- Behavior of O H and Vi Agglutinins in Relation to Clinical Forms of Typhoid G Battistini—p 1335  
\*Clinical and Roentgen Aspects of Tuberculous Sacrocoxitis V Sechi—p 1355  
Pathogenesis and Roentgen Therapy of Spleen in Metrorrhagia at Age of Puberty S T Armando Biasini—p 1377

**Tuberculous Sacrocoxitis**—Sechi made clinical and x-ray observations on twelve patients, children and adults of both sexes who had tuberculous sacrocoxitis. The condition was on the right side in eight cases and on the left side in four. The author found that the main symptoms are pain of a sciatic type and unilateral antalgic lameness. Pain can be provoked by bimanual pressure at the two iliac crests or else at the two trochanters. Lameness with a forward inclination of the trunk is typical of the condition. There may be hypertrophy of the muscles of the buttocks, edema of the limb, scoliosis and abscess formation at the iliac or gluteal regions. The seat of the lesion or the presence of an abscess cannot

be decided by the results of performing rectal palpation. The x-ray examination of the joint is made when the intestine is empty. Early lesions may be seen in the roentgenograms as light shadows of small erosions or as irregular contours of the articular cleft. The x-ray shadows which show alterations of the sacro-iliac joint are dark and precise in the phases of evolution and involution of the disease. The roentgenograms show irregular contours and notches of the bones at the joint, and the presence of one or various zones of rarefaction of the bone around centers of thickened bone (sequestrums already formed or in the process of formation) or sclerosis of the bones. An x-ray sign of importance is the uneven aspect of the pubic bone which appears in the roentgenogram as though it were at a higher plane on the diseased than on the normal side. In the majority of the cases seen by the author sacrocoxitis was secondary to tuberculosis of the respiratory tract. In two cases the condition originated in propagation of tuberculous lumbar spondylitis. According to the author the x-ray study of tuberculous sacrocoxitis is of diagnostic importance as the iconography of the condition is typical.

### Giornale di Psichiat e di Neuropat, Ferrara

66 1 315 (Nos. 1 2 3) 1938 Partial Index

- Clinical Diagnosis of Intracranial Tumors L Bini—p 1  
\*Hematoporphyrin in Depressive Psychosis U Maloberti—p 175  
Insulin Pyretotherapy L Telatin—p 183

**Hematoporphyrin in Depressive Psychosis**—Maloberti administered hematoporphyrin hydrochloride to nine patients suffering from depressive psychosis and to two patients with depressive forms of schizophrenia and paranoid psychosis, respectively. The patients were given, for ten consecutive days, an injection of 1 cc of hematoporphyrin solution which contained 2 mg of the drug. The injections were followed by an interval of three days and then by another series of ten injections on consecutive days in doses of 4 mg each. The patients who derive some benefit from the treatment showed it early in the course of the treatment. When the improvement was obvious but slow the second series of injections was administered in daily doses of 4 mg each for fifteen or twenty days. The treatment proved to be harmless and well tolerated in all cases. The amount of hemoglobin, the crisis of the blood and the general condition of the patients improved in all cases. In the group of nine patients with depressive psychosis the treatment gave satisfactory results to the mental condition in seven and failed in two. It failed also to improve the mental condition of the patients with schizophrenia and paranoid psychosis. According to the author, hematoporphyrin has a depressive action on the vagus. It has, however, a stimulative action on hemoglobin, erythrocytes and leukocytes by which action the sympathetic disturbance is compensated.

### Arch. Urug. de Med., Cir. y Especialid., Montevideo

13 401 536 (Oct.) 1938 Partial Index

- Differentiation of Syndromes of Total and Subtotal Obstruction of Gall Ducts B Varela Fuentes and R Canzani—p 401  
Stenosis of Isthmus of Aorta J C Barsantini and J J Bazzano—p 448  
Familial Friedreich Disease Two Cases R J Barú—p 457  
\*Puerperal Mastitis from Fissures of Nipple Treatment by Filiform Drainage C Stajano and A Achard—p 517

**Puerperal Mastitis**—According to Stajano and Achard, puerperal mastitis is the result of a syndrome of primary infection of a fissure in the nipple which is immediately followed by painful neuritis, spasm of the muscles of the areola and the nipple and retention of milk in one or more lobes of the breast. Puerperal mastitis develops in two different main phases, namely simple and suppurative mastitis. The treatment of early simple mastitis consists principally in application of wet hot compresses on the breast. In the majority of cases, especially if the treatment is administered early in the development of the infection it suffices to control the infection. If the treatment fails or if the patients are seen late when one or more abscesses are already formed, the authors advise filiform drainage. Local anesthesia is applied to the two lower extreme points of the lobe the acini are transfixed with a curved needle (of Reverdin or Hagedorn type) and a bunch of four strands of silkworm gut is left in the acini as a drain.

Gentle manual expression is done on the lobe and the drain left in place for from four to seven days. As a rule the retained milk (or pus) is spontaneously eliminated through the drain and the condition and function of the breast become normal in about one week. In the presence of infection of acini other than those which were drained the treatment can be applied independently to the newly infected acini. The treatment is indicated also in chronic suppuration of fistulas of the breast in lactation. In these cases the tubes and drains which are commonly used are removed and the filiform drainage is applied. As a rule, even in grave cases, complete cure of the breast is obtained in from seven to twelve days. The authors say that they had obtained satisfactory results in a large number of patients who attended one of several clinics or maternity hospitals of Uruguay. The number of cases is not specified.

### Revista de la Facultad de Medicina, Bogotá

7 4596 (Aug.) 1938 Partial Index

\*Roentgen Study of Amebiasis G. Esquerri Gomez—p. 45

**Roentgen Study of Amebiasis**—Esquerri Gomez carried on a roentgen study of the digestive tract in ten patients suffering from chronic amebiasis with symptoms of the digestive tract and without dysentery and also in twenty-five patients who had either acute or chronic amebiasis with acute or repeated dysentery. The examinations were made after administration of the opaque substance by mouth and in some cases also after administration of an enema of the opaque substance. The author found that frequently there is a retarded elimination of the barium sulfate by the stomach, a rapid passage of the substance through the cecum and colon and retarded elimination of the substance by the colon. The duodenum and ileum are normal. The cecum and colon, especially the transverse segment, show an increased number of segmental divisions of different sizes at some segments, whereas other segments are normal. The number of lobules of the cecum and colon may be diminished or lobules may not be present at all in cases of ptosis and dilatation of the colon with diminished tonicity of the walls of the structure. The caliber of the colon is diminished. Barium sulfate is not evenly distributed in the colon. The lack of repletion appears at the same location if the x-ray examination is repeated. The cecum, the sigmoid flexure and the transverse and descending segments of the colon are the most frequently involved. The normal x-ray aspect of large segments of the intestine, including the duodenum and ileum, in the presence of deformities of the cecum and colon by notches and the general aspect of ulcerous colitis are all characteristic x-ray aspects of amebiasis, both chronic without dysentery and acute or chronic with dysentery. Therefore the author regards the x-ray examination of the digestive tract of diagnostic value in amebiasis, especially in the forms which do not give clinical symptoms of the condition.

### Archiv fur Gewerbepathologie, Berlin

9 1178 (Nov. 12) 1938 Partial Index

- \*Pneumonia Caused by Gaseous Nitric Oxide Compounds G. Cramer—p. 1  
 Danger of Lead Poisoning from Soldering and Grinding in Workers on Automobile Bodies K. Humperdinck—p. 13  
 Do Workers with Pneumatic Tools Develop Endangitis Obliterans? Annemarie Tikentscher—p. 65  
 Relations of Lead Poisoning to Parathyroids K. Reinhart—p. 80  
 Dust Masks and Dust Filters Their Mode of Action and Their Respiratory Resistance Limitations of Their Applicability in Occupations Involving Contacts with Stones and Earths G. Hass—p. 97  
 Disturbances of Hepatic and Thyroid Function as Manifestation of Welders' Disease H. Winiak—p. 113  
 Influence of Dust Produced in Grinding of Precious Stones on Teeth of Grinders H. Schmittner—p. 123

### Pneumonia from Gaseous Nitric Oxide Compounds—

Cramer describes the pathologic anatomic changes that develop after inhalation of gaseous nitric oxide compounds. He demonstrates with case reports that the inhalation of such gases leads to inflammatory pulmonary processes, which in severe cases take the form of inflammatory edema and terminate in death. In other cases miliary bronchopneumonia develops which on microscopic examination discloses quantities of fibrin erythrocytes and leukocytes in the alveoli, moreover, there are large

syncytial cells which represent regenerating forms of alveolar epithelium. This miliary bronchopneumonia, which in every stage can be diagnosed by roentgenoscopy, may terminate in death, but in many cases recovery results. Occasionally miliary carnification foci develop from it. The author maintains that lobular pneumonia is possible also after inhalation of the nitric oxide gases. In one case he observed within the hepatized portions the same syncytial regenerative forms of alveolar epithelium as are found in miliary bronchopneumonia. He is of the opinion that the forms of pneumonia that develop after inhalation of nitric oxide gases are essentially a result of the inhalation of nitrogen dioxide. Formation of methemoglobin has been observed only occasionally in the fatal intoxications.

### Beitrage zur Klinik der Tuberkulose, Berlin

92 275 394 (Nov. 22) 1938

- \*Tuberculosis in Twins Investigations on Forty Six Pairs E. Uehlinger and M. Künsch—p. 275  
 Disinfection of Wood and Linoleum Surfaces That Have Been Contaminated with Sputum F. Haider—p. 371  
 Experimental Investigations on Influence of Gaseous Substances from Tubercle Bacilli Cultures on Tuberculous Changes D. Sakaki—p. 391

**Tuberculosis in Twins**—Convinced that investigations on twins, as recommended by Diehl and von Verschuer, are the method of choice in determining the role of heredity in tuberculosis, Uehlinger and Künsch made studies on forty six sets of twins, twelve of whom were uniovular, twenty six binovular and eight paired twins. Tuberculous changes were present in one or both of each set of twins. During 1936-1937 the authors visited nearly all the living twins, a roentgenogram of the thorax was made and the environmental and social conditions were investigated. These observations were complemented by earlier case histories and roentgenograms, so that in many instances it was possible to obtain a survey over a number of years. First the authors describe and discuss their observations on the twins with differing heredity, that is, on the binovular twins and the paired twins (twenty six and eight sets, that is, thirty-four sets). In nineteen of these sets tuberculous changes were present in only one of the sets whereas in the other fifteen sets tuberculous changes were present in both. Summarizing the observations on these thirty-four sets the authors say that in thirty-two the behavior as regards tuberculosis was different, in two sets it was identical. In the twelve sets of uniovular twins, however, the behavior as regards tuberculosis was different in five sets and identical in seven sets. In this connection the authors cite the figures obtained by Diehl and von Verschuer. Although these investigators studied a larger material, the ratios between concordance and discordance as regards tuberculosis in enzygotic and dizygotic twins were approximately the same as in the material investigated by Uehlinger and Künsch. From the great similarity in the tuberculosis histories of the uniovular twins and the great differences in these histories in dizygotic twins, it must be concluded that there is a hereditary specific predisposition for the development of tuberculosis. In enzygotic twins the presence of exposure and of an otherwise identical environment always leads to the infection of both twins whereas in dizygotic twins this is not the case in that in many instances only one of a set develops tuberculosis. The authors admit that the problem of genotypically conditioned differences in the susceptibility to tuberculosis requires further investigations.

### Deutsche Zeitschrift fur Chirurgie, Berlin

251 125 280 (Nov. 14) 1938 Partial Index

- \*Raynaud's Disease P. Sunder-Plassmann—p. 125  
 Protrusion of the Acetabulum C. H. Ingerfeld—p. 195  
 \*Intrathoracic Lipoma E. Fulde—p. 207  
 Results of Operation on Cryptorchids E. Wessel—p. 235  
 Pancreatic Diastase Content in Experimental Pancreatic Damage O. Schurch and O. Iseli—p. 245  
 Errors in Diagnosis of Scheuermann's Disease and Hydronephrosis B. Bibus—p. 258  
 Dangers of Electric Resection of Prostate A. Stumpf—p. 267

**Raynaud's Disease**—According to Sunder-Plassmann, the characteristic feature of Raynaud's disease as opposed to most organic blood vessel diseases, such as endarteritis obliterans, diabetic gangrene and senile gangrene, is to be seen principally

in vasomotor disturbances. The disease is characterized by the occurrence of attacks during which the pulse remains unaltered. It never begins with gangrene, and endocrine disturbances are frequently present. Essential to the understanding of Raynaud's disease is the most minute knowledge of innervation of the blood vessels, particularly the arterioles and capillaries. The investigations of Stohr, Boeke, Reiser, Sunder-Plassmann, Seto, Yoshitoshi and Hayasi have clearly established that every cell of the blood vessel apparatus, including the capillaries, is under the control of the nervous system. The transmission of the nervous impulses to the cells of the blood vessel wall is accomplished through the nervous terminal reticulum. This consists of a finest network of vegetative neurofibrils partly located in the plasma of the peripheral cells of Schwann and partly in the plasma of the cells of the blood vessel wall. Because of a particular structure, the nervous terminal reticulum possesses considerable peripheral autonomy. The author feels that it would be impossible to denervate a vessel or even a portion of a vessel by an operative procedure. In contrast to endarteritis obliterans there are found no organic alterations in the blood vessel wall in the early stages of Raynaud's disease, which may remain stationary for a number of years. No pathologic changes were reported in the literature in sympathetic ganglions removed at operation. It would therefore appear that Raynaud's disease is a purely functional disturbance of the blood vessel apparatus. It is, however, possible, in the opinion of the author, that if this material was subjected to a particular histologic treatment the results would be different. As long as they are compelled to make observations on fixed material, the demonstration of the finest alterations in the structure of the vegetative nervous substance is possible only through the application of the Bielschowsky method. The author describes severe pathologic alterations in the sympathetic ganglions removed from patients with Raynaud's disease and studied by the Bielschowsky method. He demonstrated definite pathologic alterations in the rami communicantes of the stellate ganglion expressed in pronounced edema of Schwann's sheaths and in pronounced swelling of the axis cylinders. Pathologic changes were likewise found in the finest blood vessel nerve plexuses. On the basis of the observed clinical cases and of the histologic observations and experimental studies the author conceives Raynaud's disease as an entity characterized by localized toxic damage, result of alteration in the vegetative nervous substance central as well as peripheral. At a certain stage of the disease this alteration becomes morphologically demonstrable with the use of a special histologic technique. As a result of these alterations there arises a certain hyperergic transformation of the nervous system supplying the blood vessels. Localizing factors such as cold or psychic emotions bring about attacks of evident circulatory disturbances particularly in parts of the body readily seen and exposed to chilling influences. This circumstance justifies the further supposition that the hyperergic vegetative nervous substance undergoes structural alteration in Raynaud's disease, which becomes morphologically demonstrable with our rather coarse methods only at a later stage. The author feels, however, that with improved histologic technique the negative observations will become more and more rare. Sympathectomy accomplishes no more than the removal of an intermediary station and brings about an improvement in the disease picture through the dilatation of the blood vessels, which in its turn neutralizes and removes metabolic products within the damaged tissues. The author found it useful to administer after sympathectomy, in order to prevent recurrence, dried thyroid tissue and thiamin chloride.

**Intrathoracic Lipoma**—Fulde collected and analyzed thirty-six cases of intrathoracic lipoma reported in the literature since Cruveilhier in 1856 made the first diagnosis of the condition in the living. To these he added four cases from Sauerbruch's clinic. Three of these were cured by operative intervention. According to their localization the tumors may be divided into two groups, a completely intrathoracic and one in which the growth is both intrathoracic and extrathoracic. The physical characteristics of the growth permit of its surgical removal. The earlier mortality of surgical intervention has been markedly lowered in the last few years.

## Klinische Wochenschrift, Berlin

17 1673 1712 (Nov 26) 1938 Partial Index

- Blood Diastase F Chrometzka and F Erlemann—p 1673  
Distribution of Ions Between Blood Cells and Plasma W von Moraczewski and T Sadowski—p 1678  
Diagnosis of Gallstone Ileus B Kommerell and R Engel—p 1680  
Diagnosis of Filariid Diseases H Lippelt and W Mohr—p 1684  
\*Scarlatiniform Exanthems in Infections with *Staphylococcus Aureus* Haemolyticus A Dohmen—p 1689  
\*Sjogren's Syndrome, an A Hypovitaminosis W Stahel—p 1692

**Scarlatiniform Exanthems in Staphylococcal Infections**—Dohmen calls attention to a report by von Bormann about the discovery of a toxin resembling Dick toxin in bouillon cultures of various bacteria. Von Bormann observed that the filtrates of thirty-eight cultures of *Staphylococcus aureus* haemolyticus produced a cutaneous erythema similar to the Dick reactions. Previous admixture of therapeutic scarlet fever serum, that is, of streptococcus serum, prevented this reaction in seventeen of the staphylococcus filtrates, moreover, antitoxic staphylococcus serum weakened the erythema producing factor of the staphylococcus filtrates as well as of the Dick toxin. However, one erythema producing component of the staphylococcus filtrates could be counteracted by neither of the two serums. Such toxins, which resemble the Dick toxin, could be detected also in a number of other bacteria (pneumococci, *Staphylococcus albus* anhaemolyticus and non-hemolyzing streptococci). It was concluded that all these bacteria are capable of forming a toxin which resembles that of the scarlet fever streptococci. The author reviews reports on staphylococcal infections that produced symptoms similar to or identical with those of scarlet fever. He cites three cases described by F A Stevens and one case reported by Glanzmann and then describes the clinical histories of three cases observed at his clinic. Two patients were men aged 25 and 46 and one was a woman aged 35. All three presented the clinical aspects of typical scarlet fever. Two of the patients had earlier passed through scarlet fever, one during childhood and another one only a year before the present illness. The present attack of scarlatiniform exanthem could be traced in all three patients to a wound infection with *Staphylococcus aureus* haemolyticus. No hemolytic streptococci could be detected and the exanthem could be counteracted only by antitoxic staphylococcus serum but not by streptococcus serum. These two factors indicate an etiologic connection between the staphylococcal infection and the scarlatiniform exanthem. The author concludes that these observations militate not against but for the streptococcal etiology of true scarlet fever.

**Sjogren's Syndrome, an A Hypovitaminosis**—Stahel says that the syndrome described by Sjogren is a little known systemic disease of which will show a greater frequency than heretofore assumed. The syndrome is characterized by great dryness of all mucous membranes, resulting from deficient secretion of the glands, particularly the lacrimal and the salivary glands, those of the upper respiratory tract, the sweat glands and the glandular apparatus of the stomach. As sequels of these deficient secretions there develop lack of tear secretion, keratoconjunctivitis sicca or keratitis filiformis, xerostomia, rhinopharyngotracheobronchitis sicca with impairment of the act of swallowing and of the olfactory and gustatory senses, deficient sweating, achylia gastrica, impairment of the tolerance for carbohydrates, general weakness, lack of appetite, muscular atrophy, fever and anemia. The disorder occurs almost exclusively in women of the postmenopausal age, and a chronic polyarthritis exists in 80 per cent of the cases. After citing several investigators who have published reports about this disorder, the author says that some cases have been erroneously diagnosed as Sjogren's syndrome. Xerostomia and keratomalacia were known before as isolated symptoms and as such cannot be identified with Sjogren's syndrome. If this is done erroneous conclusions might be drawn, such as that the disease is equally frequent in the two sexes. The author gives a detailed description of a case showing a complete range of symptoms, which has been under his observation for some time. A woman aged 64 in whom the disorder developed in two phases, had a slowly progressing polyarthritis deformans from the age of 30 to the time of the menopause. After the

characteristic the other symptoms developed. In the discussion of this case the author cites factors which convinced him that Sjogren's syndrome is a systemic disorder with functional disturbances in the ectodermal and endodermal tissues, the cause of which is a vitamin A deficiency and in the manifestation of which disturbances in the mineral content and in the endocrine apparatus play a part. The vitamin A content of the average diet is insufficient in these cases, but the administration of large doses of vitamin A is effective. The woman whose history is reported was given daily 10,000 biologic units of vitamin A for a period of several months. Under the influence of this treatment the inflammatory manifestations on all mucous membranes subsided, the olfactory and gustatory functions became normal, swallowing became easier, sweating returned, the conjunctivitis and photophobia disappeared and the general condition was greatly improved.

### Zeitschrift fur Tuberkulose, Leipzig

51 129 209 (Nov.) 1938

Demonstration and Effects of Tuberculosis Immunity in Guinea Pigs. H. Selter and A. Nagel—p. 129

\*Fatalities from Extrapulmonary Tuberculosis. Their Part in Total Fatalities from Tuberculosis. R. Ingelmann—p. 145

Tubercle Bacilli of Reduced Acid Fastness and Virulence. Marie Maxim—p. 155

**Fatalities from Tuberculosis.**—Ingelmann discusses the statistics on the fatalities from tuberculosis in Germany during the years 1914-1934 pointing out that the fatalities from this disease were reduced by nearly one half during the period although there was a considerable increase during the war years 1916 to 1918. He also compares the fatality rates from tuberculosis in the different sections of Germany and then analyzes the statistics from certain sections of the country, giving especial attention to the fatalities from extrapulmonary tuberculosis. He emphasizes that the fatalities from tuberculosis should always be differentiated into those from pulmonary tuberculosis and those from tuberculosis of other organs for whereas the figures for the fatalities from tuberculosis in general and from pulmonary tuberculosis show a declining tendency, those for the fatalities from extrapulmonary tuberculosis, including military tuberculosis do not do this. He does not consider it advisable to separate military tuberculosis from the extrapulmonary tuberculosis and classifies it with the pulmonary form. The group of extrapulmonary tuberculosis is not uniform. It is of essential importance for the statistics whether certain forms are regarded as secondary or as primary forms. Necropsies are of great value in determining to what extent such forms as intestinal tuberculosis, tuberculous meningitis or military tuberculosis may be considered as basic disease or as a secondary cause of death. The exactness and arbitrariness of some diagnoses cause considerable deviations in the percental portion of the tuberculosis of extrapulmonary organs in relation to the fatalities from all forms of tuberculosis. The author analyzes fatalities from the various forms of extrapulmonary tuberculosis, discussing in turn abdominal, peritoneal, cutaneous, pleural, renal, glandular, military, meningeal, intestinal and osseous tuberculosis. He shows that the separation of military tuberculosis and of tuberculous meningitis is important, since both groups indicate infectious tuberculosis. Records of cases of military tuberculosis indicate that military dissemination may take place during all stages of tuberculosis. Tuberculous meningitis takes the first place as regards incidence. Tuberculous pleurisy is extremely rare as a primary cause of death. Renal tuberculosis may develop as an ascending tuberculosis and is not necessarily combined with pulmonary tuberculosis. Glandular tuberculosis is rarely the cause of death. Intestinal tuberculosis is regarded by the author as usually of the secondary type. Osseous tuberculosis is especially noteworthy, because of the comparatively frequent involvement of the vertebral column and of the fact that it occurs chiefly in women (twenty of twenty-nine cases). In the last part of his report the author takes up the frequency with which tuberculosis concurs in several members of one family. He shows that, in the material analyzed by him, 8 per cent of the fatalities from tuberculosis were of this group.

### Wiener klinische Wochenschrift, Vienna

51 1301 1324 (Dec. 9) 1938 Partial Index

Angina Pectoris. Pathogenesis. Differential Diagnosis and Therapy. O. von Zimmermann Weinzingen—p. 1301

Fluctuations in Cholesterol Content in Multiple Sclerosis. E. Fichtler and H. Reissner—p. 1304

Chief Points in Medical Supervision of Pregnant Women. E. Navratil—p. 1309

Technic of Mammary Plastics. H. Neuffer—p. 1312

Psychopathic Children. H. Asperger—p. 1314

**Cholesterol Content in Multiple Sclerosis.**—According to Fichtler and Reissner, the relations between the lipid metabolism and multiple sclerosis have been investigated repeatedly, ever since Warburg expressed the opinion that a lipolytic ferment is the cause of the destruction of the myelin sheaths. Some investigators searched for the chemical constituents of the myelin sheaths and for the products of decomposition and detected an increase in the cholesterol content of the blood serum and of the cerebrospinal fluid. However, since an excessive cholesterol content is absent in diseases that are accompanied by great destruction of nervous substance, it is improbable that the elevation of the cholesterol content is simply the result of the destruction of the myelin sheaths. The authors, who for different reasons made studies on the serum cholesterol content of patients with multiple sclerosis, found that the cholesterol values are not constant but undergo fluctuations. Since many aspects of the cholesterol metabolism are still obscure, they studied the cholesterol content of the serum in a large number of cases of multiple sclerosis. In tables they indicate the cholesterol values (total, esterized and free cholesterol) in the different forms of multiple sclerosis: (1) in new cases or in new exacerbations, (2) in stationary and slowly progressive cases and (3) in controls who had various neural disorders. They also show diagrams indicating the cholesterol fluctuations in the various types of cases and finally show tabular reports of the changes taking place under the influence of various types of treatment. Summarizing their results, they state that a noticeable increase in the serum cholesterol content is detected only in the new cases of multiple sclerosis. In the course of clinical improvements this hypercholesteremia decreases to normal values. If in the course of stationary and slowly progressive cases improvement in the condition of the patient is brought about by means of treatment this improvement is usually found to be accompanied by a temporary increase in the cholesterol content. This hypercholesteremia which is observed in the course of new exacerbations or of clinical improvements of chronic cases of multiple sclerosis is regarded as an accompanying symptom or as a part of the defense measures of the organism.

### Hospitalstidende, Copenhagen

51 1081 1094 (Nov. 8) 1938

\*Agglutination of Sheep Blood Corpuscles in Patients' Serums in Illumination of Serodiagnosis of Infectious Mononucleosis. M. Kristensen and H. Meyer—p. 1081

**Sheep Corpuscle Agglutination in Infectious Mononucleosis.**—Kristensen and Meyer examined the serums of 862 persons, including sixty-four tuberculous persons treated with vaccine against colds. In 449 (52 per cent) there was no agglutination, 387 (45 per cent) gave agglutination in the dilution of 8 to 32 and twenty-six serums (3.2 per cent) agglutinated in the dilution of 64 and over. The agglutination of sheep blood corpuscles was not more frequent or more marked in the serums from the vaccinated tuberculous patients and patients with positive sero-reaction to typhoid, paratyphoid B and Brucella infection than in the serums from other patients with infectious diseases, and in general no certain changes of the agglutinating ability of the blood toward sheep blood corpuscles was observed following vaccine injection against colds. Absorption tests of the serums with most pronounced agglutination in the main confirmed the value of the absorption test in the serodiagnosis of infectious mononucleosis. Examination of eighteen serums for agglutination of sheep blood corpuscles at 37° C. and 4° C., hemolysis of sheep blood corpuscles and agglutination of rabbit blood corpuscles did not afford any diagnostic information beyond that which is obtained from the agglutination and absorption tests that are usually made.

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## THE PROBLEM OF THE THYMUS IN CHILDREN

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AND  
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The thymus gland has for a long time been a subject for study by physiologists<sup>1</sup>. It appears to many clinicians, however, that this organ is cited only when convenient to account for an otherwise inexplicable symptom, or even death. Thus the critical physician frequently wishes there were no such thing as the thymus and denies that it has any clinical implications. The thymus exists, however, and it cannot be entirely disregarded as a potential source of disturbance in early life, even though it has been too often incriminated by uncritical diagnosticians and too frequently treated by enthusiastic therapeutists. There will be considered in this presentation three ways in which the pediatrician meets the problem of the thymus, the type of encounter varying at the different stages of the child's development.

### THYMIC HYPERPLASIA

The pediatrician may be called to see a young infant suffering from such symptoms as respiratory stridor, dyspnea, cyanosis and dysphagia. Before he considers the differential diagnosis and treatment of these symptoms, two essential questions should, if possible, be answered. First, "Can thymic hyperplasia cause symptoms of compression?" The answer appears to be "Yes." Second, "Is thymic hyperplasia a frequent cause of the syndrome?" The answer is "No"—or, to paraphrase in the idiom of Chevalier Jackson,<sup>2</sup> "All is not thymus that chokes." In other words, the truth is probably to be found between the two extremes of "thymic negation" and "thymic obsession."<sup>3</sup> That some greatly respected clinicians have stated that they never encountered a stridor which could not be explained by other causes than thymic hyperplasia or that the diagnosis of enlarged thymus cannot be made during life does not prove that such an occurrence is impossible. It is a demonstrable fact at necropsy that the thymus can cause compression of the trachea, blood vessels and perhaps the recurrent laryngeal and other

nerves,<sup>4</sup> and tracheal compression has been demonstrated during life by tracheoscopic examination.<sup>5</sup>

The symptoms of stridor, dyspnea, cyanosis and dysphagia are, of course, not characteristic of thymic hyperplasia. They can be observed also in other conditions and the differential diagnosis is by no means easy.

Thymic stridor should be noticeable in inspiration as well as expiration. It should be continuous, diminishing only moderately during rest and sleep. These qualities may be of help in distinguishing it from other forms of noisy respiration. A purely inspiratory stridor may be caused by a number of more or less common conditions, such as a congenital laryngeal stridor due to softness and smallness of the infantile larynx, and may be intermittent and disappear during sleep. A loud and snoring inspiration is heard in a variety of conditions, such as retropharyngeal abscess, cysts at the base of the tongue, glossoposis and congenital macroglossia or the macroglossia of hypothyroidism. Stridor may be due also to congenital deformities or benign tumors of the larynx. In older children adenoids frequently cause noisy respiration, and deep-seated goiter is a possibility to be considered in differential diagnosis. In stenosis of the bronchioli an expiratory stridor is to be expected.

Cyanosis in thymic hyperplasia may be due to the imperfect aeration caused by tracheal stenosis or to compression of the large vessels which are situated near or, in the newborn period, even in the thymic tissue. It is hardly necessary to point out that cyanosis of the newborn may be due to a number of other causes, such as congenital heart disease, cerebral abnormalities or injuries and atelectasis, which are all much more frequent than thymic pressure.

Inspiratory retractions are not typical of thymic hyperplasia. They are found also in all other forms of obstruction of the upper and lower air passages.

Dysphagia could be caused by pressure of an enlarged thymus on the esophagus, but this type is not to be confounded with the difficulty in swallowing due to esophageal malformation or to that seen in persons with hypothyroidism or in idiotic infants.

To confirm the diagnosis of enlarged thymus, some clinicians—who, we freely acknowledge, must be more skilful than most of us—claim to be able by percussion to outline this organ. It is said to be sometimes possible to palpate the enlarged thymus in the suprasternal notch during expiration—a pleasure which has been denied to most practitioners. Lymphocytosis is of doubtful if any value in the diagnosis. It must be admitted, then, that none of the differential points men-

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Read before the joint meeting of the Section on Pediatrics and the Section on Radiology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 16, 1938.

1 Mitchell A G and Rittershofer, C R. The Thymus Gland in Brennemann Joseph. Practice of Pediatrics Hagerstown Md W F Prior Company 1937, vol 3, chapter 22.

2 Jackson Chevalier. Wheezing Respiration in Children. Bronchoscopic Observations on Stridorous and Asthmatic Breathing. Am J Dis Child, 41: 153-157 (Jan) 1931.

3 Morse J L. Thymus Obsession. Boston M & S J 197: 1547-1552 (Feb 16) 1928.

4 Feer Emil. Diagnosis of Children's Diseases. Philadelphia J B Lippincott Company 1928, p 261. Noback G J. Contribution to Topographic Anatomy of the Thymus Gland. Am J Dis Child 22: 120 (Aug) 1921.

5 Jackson Chevalier. Thymic Tracheostenosis. Tracheoscopy. Thymectomy. Cure. J A M A 48: 1753-1756 (May 25) 1907.



tioned are typical of thymic hyperplasia. Elsewhere Brown and one of us<sup>6</sup> have particularly emphasized the fact that an infant or child who has some cause for dyspnea, cough and cyanosis (as infection of the respiratory tract, congenital heart disease or the like) and who also has an enlarged thymus is more liable to these compression symptoms. Probably an enlarged thymus may aid in their production, even when in itself it would be insufficient to cause symptoms.

Roentgenograms can be helpful in the diagnosis of thymic hyperplasia. The fact that misinterpretation of these occurs all too frequently does not in itself discredit their use. Like other diagnostic tools, roentgenograms are of value only in the hands of experts who know how to use and interpret them. The discussion of this phase of the subject is better left to others in this symposium.

It follows logically from what has been stated that such symptoms as stridor, dyspnea, cyanosis and dysphagia in newborn or young infants may occasionally be caused by thymic hyperplasia. The treatment at the present time is roentgen irradiation, as first suggested by Friedlander.<sup>8</sup> Before the diagnosis is made and such treatment instituted a number of more frequent conditions must be ruled out.

Time does not permit more than the dogmatic statement that radiologic treatment is not indicated simply because the thymus appears on the roentgenogram to be enlarged. Certainly too there is nothing to support the practice of routine radiologic treatment of the thymus in every newborn infant. Furthermore, it may be stated categorically that no harm should result from one to three radiologic treatments properly given.

#### STATUS THYMICOLYMPHATICUS

Status thymicolymphaticus has nothing to do with thymic stridor. The title of Paltauf's<sup>9</sup> original paper on this subject was "On the Relation of the Thymus Gland to Sudden Death." It dealt with children and adults who had died suddenly, without preceding stridor or any other symptoms of disease. In some of these patients Paltauf saw at necropsy the following uncharacteristic symptoms: pallor, well developed deposits of subcutaneous fat, an enlarged spleen, signs of rickets and enlargement of the lymph nodes and of the thymus. There were transitional forms described by him in which rickets was not present, but otherwise the picture was similar to that in the first group. The somatic makeup of these children was termed "lymphatic constitution" and Paltauf expressed the belief that this, rather than any abnormality of the thymus itself, was the cause of death. That is to say, enlargement of the thymus was not of primary importance in this conception. Granting that there is such a condition as the lymphatic diathesis, any enlargement of the thymus would be only an indication of the abnormal constitution, and no improvement could be expected by treatment of this organ. To reduce the size of the thymus by radiologic treatment or to remove it would not be of any more value than to irradiate the spleen or some of the lymph nodes or to remove them. The situation would be similar to treating hypothyroidism by clipping the patient's dry and coarse hair, which would remove a symptom but which could hardly be considered causal treatment.

Discussion concerning status lymphaticus could be limited to these few statements. However, since the conception of "lymphatic constitution" will celebrate its fiftieth birthday next year, it might be of interest to review briefly the present attitude toward that diagnosis and its role as a cause of sudden death. Sudden death still occurs in children in whom necropsy shows enlargement of the thymus gland and spleen and numerous large lymph nodes and follicles. What should be the attitude concerning the cause of death in such cases? The studies of Hammar,<sup>10</sup> Boyd,<sup>11</sup> Greenwood and Woods,<sup>12</sup> and Young and Turnbull<sup>13</sup> have helped greatly to clarify the conception of status thymicolymphaticus. These have made it evident that the involuted thymus of the chronically sick and undernourished child had been incorrectly considered normal whereas the prominent thymic and lymphatic tissue of the healthy, well developed infant had also incorrectly been considered abnormal. In the majority of instances of sudden death in infants, well developed thymus glands and lymphoid tissues were declared abnormal because they were compared with the same tissues in children who had died after a wasting disease. In many instances of sudden death due to obvious causes such as fracture of the skull, supposedly large but obviously normal thymus glands are found. Even the mere fact that a thymus gland may weigh 20 or 30 or more grams above the average for a given age only demonstrates the wide limits of normal and is no proof that the condition of this organ was in any way related to death.

It is obvious that if status thymicolymphaticus exists not only does it comprise a great number of pathologic syndromes but it is present in many apparently healthy children.

#### THE THYMUS GLAND AS AN ENDOCRINE ORGAN

It is, of course, not possible to do justice to the problem of the thymus as an endocrine organ in a few moments. Here again are encountered the same reactions of negation and of obsession which have previously been mentioned. Thus the thymus gland was at one time supposed to have so many different secretory functions that various investigators who could not verify these assumptions experimentally came to the conclusion that it was not an endocrine gland at all. Yet some experimentally proved facts show a distinct participation of the thymus in glandular interplay—facts which cannot be overlooked by the clinician. For example, gonadectomy as well as adrenalectomy leads to delayed involution or even to hyperplasia of the thymus. This does not necessarily mean that the thymus is an endocrine organ, since many types of tissue, glandular or otherwise, can be affected by such an interference with the normal function of the organism. Removal of the thymus and administration of thymus extracts have led to contradictory results. The experiments of

6 Mitchell A G, and Brown Estelle W. Clinical Implications of Thymus and Status Thymico-Lymphaticus. *Ann Int Med* 8: 669-677 (Dec.) 1934.

7 Hasley C K. Radiology's Responsibility in the Diagnosis and Treatment of Thymic Hyperplasia this issue, p. 285.

8 Friedlander, Alfred. Diagnosis and Treatment of Enlarged Thymus. *Am J Dis Child* 6: 38-56 (July) 1913.

9 Paltauf A. Ueber die Beziehungen der Thymus zum plötzlichen Tod. *Wien klin Wchnschr* 2: 877-1889 3: 172-1890.

10 Hammar J A. New Views as to Morphology of Thymus Gland and Their Bearing on the Problem of Function of the Thymus. *Endocrinology* 5: 543-573 (Sept.), 731-760 (Nov.) 1921. *Die Lehre von Status thymicus im Lichte der normalen Thymusverhältnisse Klin. Wchnschr* 8: 1385-1391 (July 23) 1929. *Mikroskopische Analyse der Thymus in 14 Fällen sogenannten Thymustodes Ztschr f Kinderh* 13: 153-217 1916. *Zur ferneren Beleuchtung der Thymusstruktur beim sogenannten Thymustod. Mikroskopische Analyse der Thymus in 24 Fällen meistens plötzlichen Todes aus inneren Gründen* *ibid* 15: 274-312 1917.

11 Boyd Edith. Growth of the Thymus. Its Relation to Status Thymicolymphaticus and Thymic Symptoms. *Am J Dis Child* 33: 867-879 (June) 1927. *Weight of the Thymus Gland in Health and Disease* *ibid* 43: 1162-1214 (May) 1932.

12 Greenwood M and Woods H M. 'Status Thymicolymphaticus' Considered in Light of Recent Work on the Thymus. *J Hyg* 26: 305-376 (Aug.) 1927.

13 Young M and Turnbull H M. Analysis of the Data Collected by the Status Lymphaticus Investigation Committee. *J Path & Bact* 34: 213-258 (March) 1931.

Rowntree and Einhorn<sup>14</sup> will be referred to in this symposium. Briefly, these have shown that in the offspring of thymectomized rats a definite retardation of growth occurs, as reflected in body weight and in body length. Furthermore, after continuous intraperitoneal injections into rats of a thymus extract prepared by Hanson, successive generations of their offspring showed acceleration of growth and development.

When the application of these experimental studies to clinical problems is attempted, it must be recognized that we are only at the beginning of an understanding of pathologic syndromes. Suppose, for example, the clinician sees a patient who is sexually hypoplastic and who has an enlargement of the thymus. The question immediately arises whether the thymus, the gonads or the adrenal glands are primarily at fault. Some of the experiments cited previously indicate that enlargement of the thymus is secondary. Obviously, therefore, such patients would not be benefited by radiologic treatment or removal of the thymus gland or by the administration of thymic products, since these procedures would not influence the primary defect. There may be found too an apparently hyperplastic thymus in patients with pluriglandular syndromes involving the gonads, the thyroid and the adrenal and pituitary glands. According to the case and the preference of the author, any one of these glands may be placed in the center of the disease picture, the thymus usually being credited with only a secondary role. Instances<sup>15</sup> have been known, however, in which primary cancer of the thymus has apparently led to a pluriglandular syndrome and in which it might be justifiable to assume a primary role for the thymus in the symptoms caused by the endocrine imbalance. The observations of Rowntree and his co-workers could also be brought into discussion here in relation to glandular disturbances which appear in successive generations. It is to be stated that present knowledge of the possible endocrine functions of the thymus offers nothing of practical help in treatment.

#### SUMMARY

Anatomic and clinical observations support the view that an enlarged thymus gland may occasionally cause such symptoms of compression as stridor, dyspnea, cyanosis and dysphagia. These occur in many other abnormal conditions, which are more frequently operative in their causation than is disorder of the thymus. Radiologic treatment, carefully given in proper dosage, is a justifiable procedure when the thymus gland is suspected as the cause of such symptoms and when no other cause can be found. If the thymus is responsible or partly responsible for them, they should be relieved by from one to three such irradiations.

If such a condition as status thymicolymphaticus exists, and if it is in any way related to sudden death, there is no justification for the belief that radiologic treatment or extirpation of the thymus or administration of thymus extracts would have prevented such death. Abnormalities of the thymus could only be part of such a syndrome.

Present knowledge of the functions of the thymus has not led to any clinical implications which are helpful in the treatment of endocrine syndromes presumably associated with thymic abnormality. Any such abnormality would be only part of a pluriglandular syndrome.

## RADIOLOGY'S RESPONSIBILITY IN THE DIAGNOSIS AND TREATMENT OF THYMIC HYPERPLASIA

CLYDE K. HASLEY, M.D.

DETROIT

Is the present lay concept of thymic hyperplasia based on medical facts or on medical fabrications? No one can deny the statement that the general public is thymus conscious. Mothers with infants turn pale when told that cyanosis and difficulty in breathing may indicate a very slight enlargement of the thymus, and others whose infants have been treated for thymic enlargement praise and glorify Dr. Doe for his mystical and miraculous ability to detect and cure thymic disease. The public is thymus conscious, in fact, overly thymus conscious. A few legislative-minded lawyers have asked if the thymic syndrome is over or under emphasized. State supreme courts in certain instances have made and make decisions after reviewing medical facts and medical fabrications. Who is responsible for this unwarranted concern?

The unusual interest in thymic disease can be traced back to the physician, more particularly the radiologist, the pediatrician and the pathologist. In the highly specialized medical groups on radiology and pediatrics various and conflicting ideas have been expressed. One of the present debatable contentions reverts back to the time of Kopp,<sup>1</sup> in 1830, who drew attention to the fact that an enlarged thymus was present in some infants in whom sudden death had occurred during an attack of stridor and difficulty in breathing. Kopp was perhaps the first author to advance the theory that death was due to the mechanical pressure of an enlarged thymus on the trachea and the other mediastinal structures. In spite of the subsequent experimental work to the contrary, this concept of mechanical obstructive respiratory death is still accepted by a few physicians, although the majority believe that death in cases of enlarged thymus and of status lymphaticus is due to cardiac failure, and many physicians, after years of careful study, observation and research, are convinced that mechanical death never results from enlargement of the thymus. Their conclusions are based on the fact that the consistency of the largest thymus ever demonstrated was not such as to produce sufficient pressure on the cartilaginous tracheal rings to result in tracheal collapse. In spite of this evidence, however, the size of the thymus is still a controversial issue and explains, in part at least, why the lay attitude is so highly colored with medical fabrications. Before this regrettable misconception can be eliminated it will be necessary for physicians to come to some common and nonconflicting opinions regarding the part played by the thymus in sudden death.

From an anatomic standpoint the thymus is intimately associated with other structures of the mediastinum, such as the aortic arch and the superior vena cava. If one were asked to distinguish on a roentgenogram the outline of the thymus gland from that of a blood vessel, the degree of accuracy would in many cases be minimal.

Borderline thymic hyperplasia offers many pitfalls, while the much enlarged thymus is perhaps less difficult to diagnose. Too many radiologic diagnoses are made

14 Rowntree L. G. and Einhorn N. H. Experimental Phases of the Thymus Problem read before the Section on Pediatrics at the Eighty-Ninth Annual Session of the American Medical Association San Francisco June 16 1938

15 Leyton Otto Turnbull H. M. and Bratton A. B. Primary Cancer of the Thymus with Pluriglandular Disturbance J. Path. & Bact. 34 635 660 (Sept.) 1931

Read before the joint meeting of the Section on Pediatrics and the Section on Radiology at the Eighty-Ninth Annual Session of the American Medical Association San Francisco June 16 1938

1 Kopp cited by Riesman David and Harris S. F. in Christian H. A. and Mackenzie J. Oxford Medicine New York, Oxford University Press 1928 vol 4 p 52

from a single film of the chest by physicians who are not well trained in the rudiments of pulmonary radiology. No study of the chest for thymic hyperplasia is complete without a fluoroscopic study and without films made with the patient in three or four different positions and different phases of respiration and of the cardiac cycle. In the past many erroneous diagnoses of thymic

TABLE 1—Weight of the Thymus at Autopsy

Cases	Size
5	6 to 10 Gm
17	11 to 15 Gm
33	16 to 20 Gm
26	21 to 30 Gm
13	31 to 40 Gm
6	41 to 60 Gm
12	1 listed as large
2	1 listed as small
116	

hypertrophy have been made simply because the mechanics of respiration and cardiac movement were not studied sufficiently.

Donaldson<sup>2</sup> has offered a standard in centimeters for the study of thymus in newborn children. The shadow of the supracardiac mediastinum is used as a standard (normal if the shadow is two and one half times the width of the third dorsal vertebra). Measurements are made in both phases of respiration, one at the height of inspiration and the other at the height of expiration. The thymic shadow of a 5 pound (2.3 Kg.) infant, according to Donaldson's standard, can be as wide as that of a 10 or 12 pound (4.5 to 5.4 Kg.) baby.

Obviously, such a standard is open to criticism. Moreover, the thymic borders, if they can be distinguished on a roentgenogram, are not those of a fixed rigid structure with a definitely defined margin. It would seem, then, that the size of the thymus, which varies with the mediastinal shadow in the different phases of the cardiac cycle and of respiration, cannot be accepted as the actual measurement of the thymus when an incomplete roentgenographic study is made.

TABLE 2—Classification of Cases According to Age

Cases	Age	Cases	Age
14	1 day or less	11	12 months
1	2 days	1	14 months
2	1 month	1	15 months
4	1½ months	1	16 months
9	2 months	5	18 months
8	3 months	1	20 months
8	4 months	4	24 months
6	6 months	5	30 months
7	6 months	8	36 months
2	7 months	2	48 months
6	8 months	3	60 months
1	9 months	2	108 months
2	10 months	2	Not listed
		116	

Hasley and DeTomas<sup>3</sup> have shown that the superior cardiac-mediastinal shadow varies as much as 3 to 4 cm within ten to fifteen seconds, as recorded on serial roentgenograms made with the Jarre Cinex camera.

In the light of present knowledge regarding the mechanical movement of the mediastinum in respiration and the various phases of the cardiac cycle, a satisfactory x-ray standard for the thymic size may never be established, as so many variable mechanical factors

enter into the establishment of such a standard, such as the questions: Should the outline of the supracardiac mediastinal shadow in diastole or systole be accepted? Should it be in inspiration or in expiration? or Should it be in some intermediate phase? The inspiratory phase has been suggested by many observers.

Even though it were possible to establish a satisfactory normal standard for the size of the thymus in relation to the age, such a standard would be of but little actual value, as it overlooks the physiologic fact that the parenchyma of the gland has a secretory function which cannot be measured by size or weight. It does not hold that all thymic glands have proportionate secretory functions any more than it would hold that the thyroid glands function directly and proportionately to their size and weight. The bulk of the thymus changes too with various constitutional diseases.

It has been demonstrated in postmortem material that many of the largest thymuses have not actually been a factor in death.

Therefore the radiologic examination should not be accepted and sold to the public as the "supreme court of thymic disease."

The radiologist, of course, is interested in all phases of the physiology of the thymus which have to do with metabolism, growth, sexual development or calcium

TABLE 3—Classification of Cases According to Weight of Thymus

Weight (Gm.)	Age	Symptoms
20	6 months	Dyspnea and cyanosis 1 day
23	2½ years	Operative death
24	Unknown	
26	7 months	Pneumonia
36	4 years	Sudden collapse
30	6 weeks	Cyanosis for few hours
31	7 months	No symptoms
40	3 years	Pneumonia
40	3 years	Hearings 3 days
50	7 months	Attack of cyanosis 1 month

metabolism, but he is more concerned in that phase which may be in some way associated with the factors implicated in the shock mechanism of the body.

This constitutes radiology's responsibility in the diagnosis of thymic hyperplasia.

An x-ray report of thymic enlargement should not be interpreted by the pediatrician as indicating the necessity of immediate roentgen treatment. In the past many physicians have insisted that in every case in which the x-ray examination is doubtful or positive a series of roentgen treatments should be given. Such a vicious practice has discredited x-ray diagnosis and roentgen therapy. As a matter of fact, in only a small percentage of cases is roentgen therapy actually needed. Would it not be better to advise roentgen therapy when other stigmas of a lymphatic constitution are present? For it is in such cases, because of the constitutional defect, that susceptibility to shock exists.

The shock mechanism has something to do with the reaction of the smooth muscles and the response of the autonomic nervous system. The secretory function of the thymus gland may be in some way associated with this mechanism. Hammar<sup>4</sup> expressed the opinion that the functional unit of the thymus is Hassall's corpuscle while a few other authors have stated the belief that it may be the thymocyte or even the lymphocyte. Experimental work has been done with various kinds of extracts from the thymus gland some of which have

2 Donaldson S. W. A Study of the Relation Between Birth Weight and Size of the Thymus Shadow in 2,000 Newborn. Ohio State M. J. 34 5 (May) 1938.  
3 Hasley C. K. and DeTomas R. Q. Cinex Camera Studies of the Thymus in Infants and Children. J. Michigan M. Soc. 29 25 28 (Jan.) 1930.

4 Hammar cited by Riesman David and Harris S. F. in Christian H. A. and Mackenzie James. Oxford Medicine. New York. Oxford University Press 1928. vol 4 p 51.

been like or similar to extracts from other lymphoid structures. It is interesting to note that in Asher's<sup>5</sup> laboratory a preparation of thymic extract was made which gave a peptide reaction. Symmers<sup>6</sup> had advanced the view that sudden death in cases of status lymphaticus is due to anaphylaxis resulting from sensitization and shock of the nucleoproteins from the necrotic germinal centers. These observations can be offered as evidence to support the theory of anaphylactic death in cases of status lymphaticus. Recently many allergists have turned to the theory of anaphylaxis expressed by Waldbott.<sup>7</sup> In fact, the late Dr. Warthin<sup>8</sup> stated that death in cases of thymus lymphaticus was due to a constitutional defect or anomaly and intimated that thymic enlargement, which was usually found in a moderate degree, was only a small part of the pathologic picture and not actually the cause of death. In this respect Warthin supported the theory which was expressed by Paltauf as early as 1890.

To further the contention that the size of the thymus gland is a somewhat incidental finding in relation to the

cause of death, the tabulated autopsy material from the Children's Hospital of Michigan<sup>9</sup> is offered. Records of 116 autopsies are included in this survey—seventy-two of males, forty-two of females and two of persons unclassified as to sex. No attempt was made to select the cases, and the study extends back over approximately eight years. In some of the cases roentgen treatment was used, but in

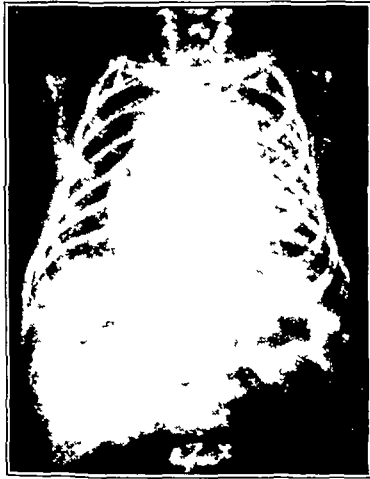


Fig 1—Postmortem appearance in case 1

none were diagnostic roentgenograms made just before death. Consequently it was impossible to trace the outline of the superior cardiac mediastinal shadow with the results of autopsy, but it was noted that in subsequent cases in which roentgenograms were made the x-ray appearances and the size of the supracardiac mediastinal region did not closely coincide with the conditions at autopsy. Two such cases will be discussed in detail later.

The weight of the thymus at autopsy, regardless of the age, is shown in table 1. The classification of cases according to age is given in table 2.

Among patients of 1 day or less, five deaths occurred within a few hours after birth. In only one of these was there an enlarged thymus, this weighed 36 Gm and was found in a monstrosity. All of these deaths were due to congenital heart disease and atelectasis. In the remaining nine patients listed as 1 day old cyanosis was given as the chief symptom. In two of these cases the thymus was slightly enlarged, and in all of the cases cyanosis apparently was due to a cardiac condition. In ten, or 8 per cent, of the 116 cases, the diagnosis on the basis of postmortem observations was

status lymphaticus. These cases deserve particular study. In table 3 they are classified according to thymic weight, and it should be noted that the symptoms of cyanosis and dyspnea were totally lacking or present only a relatively short time before death. In every case except one the thymus was slightly enlarged, in this it was excessively enlarged, weighing 50 Gm. Attacks of cyanosis and dyspnea had been present for a month.

The observations of this autopsy material support those of Symmers, who in 4,000 autopsies found 249 cases of status lymphaticus, of which 118 were instances of status lymphaticus proper.

Two cases observed post mortem and not included in table 3 deserve special attention. In one the thymus gland weighed 135 Gm and the right lobe was the size of an egg. There were no symptoms referable to thymic enlargement. There was leukemic infiltration of the thymus. In the second case the thymus gland was greatly enlarged, and again there were no symptoms referable to thymic enlargement. A tumor mass the size of a baseball was demonstrated. The thymus proved to be malignant, and distant metastases to the retroperitoneal lymph nodes, pancreas and kidneys were demonstrated.

To further my studies a few of the infants' chests were roentgenographed in the postero-anterior and the lateral position just before the autopsy.

The anterior wall of the chest was then removed to expose the thymus, and the thymus was measured, removed, weighed and re-measured. The corresponding roentgenograms were then traced, the heart, the superior mediastinum, the diaphragm, the lateral walls of the chest and the bony landmarks being outlined. It was found that the width of the supracardiac mediastinal shadow on the roentgenograms actually measured more than that of the dissected thymus even after generous allowance for a correcting factor, as the x-ray exposure was made at a distance of 30 inches (76 cm).

The postmortem x-ray observations in two cases are illustrated by both actual roentgenograms and animated drawings which are actual tracings of them.

Figure 1 is the postmortem roentgenogram in case 1.

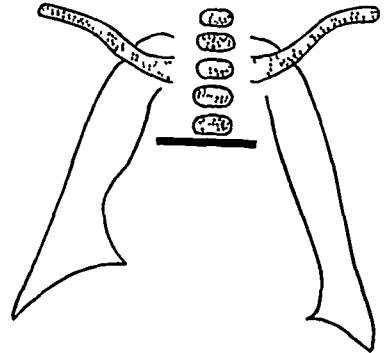


Fig 2—Animated drawing made from the roentgenogram in case 1. The superimposed heavy black line represents the actual width of the thymus as found on the dissecting table.

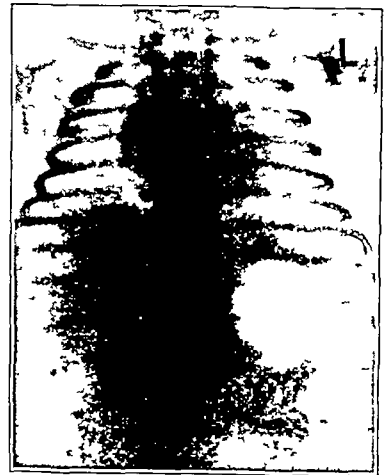


Fig 3—Postmortem appearance in case 2

5 Asher Doris *Biochem Ztschr* 257: 209 (Jan) 1933  
6 Symmers Douglas *Am J Surg* 26: 7 (Oct) 1934  
7 Waldbott G L So-Called Thymic Death *Pathologic Process*  
in Thirty Four Cases *Am J Dis Child* 41: 60 (Jan) 1934  
8 Warthin A S Editorial *Ann Int Med* 4: 1472 (May) 1931  
9 Dr Martha Effie Madsen pathologist Children's Hospital of Michigan gave me permission to use the autopsy material

Figure 2 is the animated drawing for case 1. Superimposed on this is a heavy black line which represents the actual width of the thymus gland as found on the dissecting table. It will be noted that the outline of the supracardiac mediastinal shadow was approximately 9 mm wider than the black line which represents the width of the thymus. The actual weight of this thymus gland was 41 Gm, and it measured 3 cm long, 2.4 cm wide and 2 cm thick. With 12 to 15 Gm as the normal thymic weight at birth, a figure used by various anatomists, the weight of the thymic gland in this particular instance was only one third of normal, yet, with the standard that the superior mediastinal shadow should be two and one-half times the width of the third dorsal vertebra, this case would be diagnosed as showing evidence of enlargement.

Figure 3 is the postmortem roentgenogram in case 2.

Figure 4 is the animated drawing for case 2. In this case the thymus weighed 77 Gm—approximately two thirds of the normal birth weight, and again with the standard that the superior mediastinal shadow should be two and one-half times the width of the third dorsal vertebra, this case would be diagnosed as showing evidence of enlargement.

Figure 5 is the superimposition of the two animated drawings, figures 2 and 4. It is to be noted that the superior mediastinal shadow at the level of the third dorsal vertebra measures approximately the same on the two roentgenograms in spite of the fact that the one gland weighed 41 Gm and the other 77 Gm. From the x-ray examination there appears to be nothing but a slight difference in the size of the thoracic cage, which is not sufficient to indicate that one thymus gland is almost twice as heavy as the other, yet, if one should be asked to give an opinion from this single examination, as is so often done, the diagnosis of thymic hyperplasia would undoubtedly be made, whereas in reality there was marked hypoplasia in both cases.

From my studies of cases referred to in this paper roentgen therapy was indicated in only a few cases. Status lymphaticus was demonstrated in only 8 per cent and in those cases autopsy did not support the contention that the thymus actually was the cause of death. In the cases in which the thymus was largest, there were no symptoms of respiratory embarrassment. Consequently the discovery—accidental or intentional—of

thymic hypertrophy does not necessarily indicate that roentgen therapy is imperative.

During the past five years in only a few cases on which the diagnosis of thymic hypertrophy was made on x-ray examination has treatment been given, and

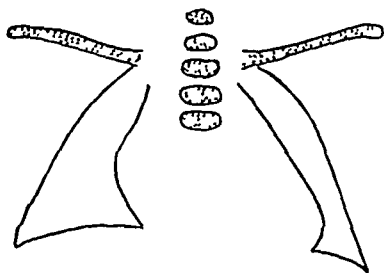


Fig. 4—Animated drawing made from the roentgenogram in case 2.

in spite of the decrease in treatment, as far as can be determined, so-called thymic deaths have not increased. Hence the opinion regarding the need of roentgen therapy in thymic hyperplasia is changing. It is my opinion that in only a few cases is roentgen therapy indicated and, if it is deemed advisable to try a therapeutic exposure, treatments should be given cautiously in order that there may be no delayed x-ray effects. In my experience a technic which corresponds much to that used for ordinary infection has produced the desired

result. My technic has consisted of administration in one sitting of from 40 to 80 roentgens filtered through 4 mm of aluminum, with the thyroid gland protected. This technic has been used for many years, and some cases in which treatment was given from ten to twelve years ago have been recently observed and no mental or physical retardation has been discovered. The delayed x-ray effects which have recently been reported in the literature are apparently due to overdosing. The responsibility of radiology then in the treatment of thymic hypertrophy consists of giving small, fractional, well filtered doses only in cases of extreme involvement. It is much better to err on the side of undertreatment than on the side of over treatment.

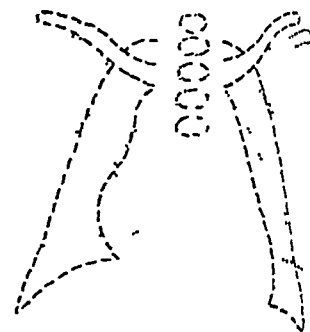


Fig. 5—Superimposition of the two animated drawings (figs 2 and 4).

#### CONCLUSIONS

1 Isn't status lymphaticus a constitutional disease in which thymic hypertrophy is of little consequence in the cause of death?

2 Isn't respiratory thymic death a myth?

3 Physicians must come to some common and non conflicting opinion regarding the standard for the diagnosis of thymic hyperplasia.

4 Physicians must come to some common and non conflicting opinion regarding the indications and contra indications for radiotherapy in thymic hypertrophy.

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#### ABSTRACT OF DISCUSSION

ON PAPERS OF DRs MITCHELL AND WARKENT  
AND DR HASLEY

DR W EDWARD CHAMBERLAIN, Philadelphia. Dr Edith Boyd and I worked together and argued about the thymus back in 1922 at Stanford University Hospital, and I find her recent work and her ideas on this subject helpful. When the American Medical Association meets in San Francisco and the Sections on Radiology and on Pediatrics meet together, I find myself talking to a great many men who know what I think about thymic enlargement and its roentgen therapy. What might be the indications for roentgen therapy to the thymus? Shall it be said that x-ray evidence of a certain size of the organ is an indication for roentgen treatment? I do not feel so. In 1919 I discovered accidentally a greatly enlarged thymus. It was a little bit larger than the heart of the patient, a 1 year old infant. The accidental discovery occurred because Dr Langley Porter of San Francisco asked me to find for him a perfectly normal child at the age of 1 year with a thorax that appeared normal enough on x-ray examination to be used in his book on the young child. This child had never had a cold, had never been ill in any way and was selected for this study on her first birthday, and this tremendous enlargement of the thymus was discovered. I did not treat that thymus. However, the enlargement gradually disappeared, as was seen in subsequent films. A strange thing happened when she was 5 years old. One of the ear, nose and throat specialists of Oakland, Calif., tried to put a finger into her nasopharynx to see whether she had adenoids, and she bit his finger and he sent her to the hospital and gave an anesthetic. As soon as she had the first whiff or so of the anesthetic she became cyanotic and stopped breathing. She began to breathe again however

and is today 19 years old and in perfect health, with normal mediastinal and pulmonary shadows. Who does not know of instances in which anesthesia has resulted in such an episode and at the time x-ray study showed perhaps the slightest degree of shadow in that region? I am convinced now that there is no additional evidence to indicate that I should have treated that thymus just because the roentgenogram showed it to be enlarged. If x-ray evidence of thymic enlargement is not an indication for roentgen therapy—that is, when it exists in a symptomless child—is stertor an indication? Again I say no, because the kind of stertor that has been present in the children referred to me for roentgen therapy has not been, in my opinion, due to thymic enlargement. I have a case in which the thymus did produce stertor, and the type of stertor which was produced in this instance of definite tremendous thymic enlargement was this kind of stertor. The trachea was definitely compressed, and the ingress as well as the egress of air was interfered with. The child was kept busy trying to get air in and out past this tremendous enlargement. The cause turned out to be thymoma.

DR. EDITH BOYD, Minneapolis. As medical students, most of the members saw only a microscopic section of the thymus and learned to distinguish it from a lymph node by those queer things, Hassall's corpuscles. When I started doing autopsies of children, I discovered the thymus of the child was quite different from that of the adult. In the newborn infant the free margins of the lungs overlap two structures of equal prominence, the heart and the thymus. The thymus is attached to the pericardium and fitted closely round the innominate vein. The expanding lungs gradually mold the broad soft fetal thymus into the elongated organ of the newborn. At the same time the weight of the thymus, like that of the body, has a temporary neonatal loss. The thymus and body both double their weight by the age of 6 months. The body triples its weight by one year. The thymus does not do so before five years. Obviously, after six months the thymus will begin to be a relatively insignificant structure. A weight of 20 Gm., ordinarily considered an indication of status thymicolymphaticus, is below the average weight in the period in which thymic enlargement is supposed to occur frequently and not above the probable zone of normal variation for any age. All parenchymatous structures of the thymus increase in size after birth but are markedly reduced by maturity, while the supporting connective tissue and fat are increasing steadily in amount and variability. The cortex, which is chiefly lymphoid tissue, increases more rapidly than the medulla during early childhood, but both decrease in weight after puberty. These standards of normal age change and variation in the thymus were based on deaths, within twenty-four hours, from gross trauma and poisons. I think that the organs observed in such cases may be considered normal. In infections lasting from one to seven days, fortuitous involution reduces the thymus to such an extent that in 69 per cent of cases it is below the 25 percentile line, where it is expected in only 25 per cent, and when illness has lasted one week or more the incidence of such shrinkage reaches 94 per cent. The concept of status thymicolymphaticus arose because thymuses from persons dying of such wasting diseases as tuberculosis and gastroenteritis were considered normal while the normal prominent thymus was called pathologic.

DR. RANDOLPH G. FLOOD, San Francisco. During the last three years I have been gathering statistical data on the size of the superior mediastinum during the first twelve months of life. The data were obtained from anteroposterior orthodiagrammatic tracings, with a fluoroscope, and the superior mediastinal area as well as the total thoracic area were obtained from these tracings with a planometer. I found that I could obtain consistent measurements in this manner, provided the infant was not crying. Further, I was able to show that the fluctuations of the superior mediastinum were negligible during quiet breathing. With regard to the effect of the thymus on body build in my series of 1,124 tracings, I was under the impression that the infants who had the largest thymic area at 1 month were larger and heavier at 1 year than those with small superior mediastinal areas. To verify this I subjected 100 infants whose superior mediastinal area had been obtained at 1 month and whose weight and measurements were again taken when they reached 1 year to statistical analysis. I found that the corre-

lation between the area of the superior mediastinum at 1 month and the weight at 1 year demonstrated a correlation coefficient of 0.2815. This demonstrates a distinct tendency for those children with the relatively larger thymic areas to weigh more at 1 year.

DR. HERBERT E. COE, Seattle. In an experience covering some 2,500 operations on infants under 18 months it has been my misfortune to see six or eight of these thymic deaths. They are not anesthetic deaths and they are not due to obstruction of the respiratory tract. The outstanding characteristic is the complete absence of respiratory effort, as if there might be inhibition or paralysis of the respiratory center. I have tried all the ordinary methods of resuscitation without success. The heart beat does not vary perceptibly either in rate or in character until near the end. When artificial respiration is stopped, the color fades and the skin becomes cyanotic. The pink color may be restored for some time by renewing the artificial respiration, but there is no respiratory effort in spite of the fact that these children are in good physical condition and not infected or weak. In my groping about for an explanation of this phenomenon it has occurred to me that the involution of the thymus early in life may be significant. When an organ is no longer necessary for preservation of the individual or the species, it undergoes involution. Is it possible that one of the functions of the thymus is to inhibit respiration before birth? Is there perhaps a thymic hormone which is activated when amniotic fluid touches the pharynx? Is this the reason for the immediate cessation of respiration occasionally noted when a retropharyngeal abscess is incised? Dr. Boyd has shown that the portion of the thymus containing Hassall's corpuscles is the first to undergo involution. Are they perhaps concerned with the production of the hormone in question?

DR. HENRY F. HELMHOLZ, Rochester, Minn. It is evidently not known to what sudden death in childhood is due. However, I think that two things have been definitely decided, namely that thymic stridor must be an inspiratory and expiratory stridor and that sudden death cannot be prevented by roentgen treatment of the thymus. I think these are two important points on which to have agreed. To assume, from the medicolegal point of view, that death during or shortly after anesthesia was due to an enlarged thymus and could have been prevented by roentgen treatment of the thymus is absolutely unwarranted.

DR. CLYDE K. HASLEY, Detroit. There wasn't time to go into the responsibility of the radiologist for treatment, which is, briefly, this. If roentgen treatment is insisted on—and I think it is usually insisted on when the radiologist would believe it was not indicated—it should be given as though an infection were being treated, with from 40 to 80 roentgens, well filtered, as an average dose. It is perfectly safe to give as much as 100 roentgens if one or two treatments are given. I thank Dr. Helmholtz particularly for his conclusions, because I believe thymic death cannot be prevented by roentgen treatment.

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**Sources of Phosphorus.**—Phosphorus is to calcium as thunder is to lightning, the two together are required to make our bones and teeth. We must have our phosphorus and plenty of it, twice as much as calcium (about 14 grams per day) for we turn over our body's total supply in less than three years. The greater need comes from the fact that phosphorus is required by some of the body proteins, phospholipins and phosphatases. Fortunately most foods are more plentiful in phosphorus than in calcium, the notable exception being milk. Meat and egg-yolk are high in phosphorus, 9 to 10 ounces of egg-yolk or 13 ounces of round steak would be sufficient for the daily supply. If you wouldn't care for 7 ounces of cocoa powder per day you could satisfy your phosphorus needs with a little less than 7 ounces of American cheese or a little more than that of dried navy beans. Infant feedings should be supplemented with egg-yolks for there are about equal amounts of calcium and phosphorus in milk and the body demands about twice as much of the latter for satisfactory growth. With this exception, however, it is generally true that if the calcium requirement is met on a mixed diet the phosphorus quota has been filled as well.—Furnas, C. C., and Furnas, S. M. *Man, Bread and Destiny*. New York: Reynal & Hitchcock, 1937.



## THE THYMUS

STUDIES OF SOME CHANGES IN THE GONADS  
AND PITUITARY FOLLOWING ITS DESTRUCTION  
BY ROENTGEN IRRADIATION

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Nearly a century has elapsed since the first experimental investigation of the physiology of the thymus was reported by Restelli,<sup>1</sup> and numerous investigators have since added many data, yet the function of the thymus is still to be defined accurately. We outlined in a previous publication<sup>2</sup> the factors which we believe are responsible for the diverse opinions regarding the activity of this gland.

About two years ago we undertook to study in rats the effect of deprivation of the thymus on gastric function following roentgen therapy. We quickly recognized that striking changes occurred in the testes of the treated animals. These observations led us to a more detailed study of these effects, which constitute the chief feature of our present report.

In previous publications<sup>3</sup> we explained why we selected the rat for study and described the method and dose of roentgen therapy used; we will give here only a brief summary of our earlier results.

The exposures were made anteriorly through the superior mediastinum. Treatments were given daily and were begun when the rats were 48 hours old. The average dose was 550 roentgens and was administered on four successive days. The animals were immobilized on a board with adhesive tape. The center of the portal was determined by roentgenoscopic examination and indicated by an ink mark on the skin. The portal was from 8 to 10 mm in diameter. The rest of the animal was properly protected by a lead sheet. With this amount of radiation, atrophy of the thymus occurred rapidly and in most instances was so complete that no thymic tissue could be recognized at autopsy. We found that this could occur within ten days of treatment.

In some cases, perhaps through movement of the animal during treatment, the rays did not remain perfectly centered and incomplete atrophy of the thymus occurred. Where the residue was small, the effects on the animal were no different from those produced in other animals by complete anatomic destruction of the thymus. When more than a fourth of the gland remained, the effects of deprivation of thymus were diminished. These lessened effects seemed to occur in direct proportion to the size of the remaining thymus. These observations are of interest, especially in relation to our method of destruction of the thymus. We

previously pointed out that in the past the study of the effects of deprivation of thymus generally took place after surgical removal of the gland. We also indicated that incomplete thymectomy was followed by hypertrophy of the remaining tissue and was probably one of the most important factors in conflicting results which have been reported. Furthermore, our results indicated that complete anatomic removal of the gland was not necessary to produce the striking changes we noted. The quantitative difference found when larger portions of the gland remained was an indication that, as with all the established organs of internal secretion, the remaining portion of the gland must be below a certain minimum to cause recognizable changes. Our data also called for an opinion contrary to that expressed by Einhorn and Rowntree<sup>4</sup> that surgical thymectomy is a more satisfactory method for complete removal of the thymus than roentgen irradiation. As a matter of fact, we believe that permanent functional destruction of the thymus is easier and much more certain with the x-rays than by surgical removal.

In our previous reports we detailed changes noted in animals for the most part up to 100 days old and in a few instances up to 150 days. In treated male animals observed up to 100 days of age we saw striking changes. All observations were made on litter mates. During this period complete or nearly complete destruction of the thymus was followed by almost complete arrest of development of the testes. This was confirmed microscopically. In most instances the seminiferous tubules were represented by a single layer of marginal cells. Under these conditions it was not surprising that the animals when mated with normal females failed to procreate. We also found striking changes in the anterior pituitary in these males. At 20 days of age some difference in appearance of the anterior pituitary was noticeable when compared with that of the litter mate used as a control. This increased progressively until the rat was 100 days of age. There developed, as the animal grew older, a picture of the typical castrate pituitary, with its increase, enlargement and vacuolation of the basophils. In view of what appears to be a temporary physiologic castration, we considered the pituitary changes as secondary manifestations not directly related to the deprivation of thymus.

In the female deprivation of thymus early in life does not have any appreciable effect on the sexual apparatus. Although the thymus was destroyed just as effectively as in the male, no anatomic or functional impairment of the ovaries resulted. Microscopically no difference could be detected in a comparison with the ovaries of litter mates used as controls. The estrous cycle was not interfered with and reproduction equaled that of the controls after mating with fertile males. No microscopic changes appeared in the anterior pituitary.

Since these results were reported, we have been able to study a larger group of animals beyond the 100 day period as well as carry out numerous control experiments.

In many treated male animals by the time the 150 day period was reached, and in nearly all beyond the 200 day period, there were marked reparative changes. The testes were regenerated to a point at which it was impossible to distinguish them from those of the control animals, at mating the males were fertile. In order to establish

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<sup>1</sup> Restelli, Antonio. *De thymo. Observationes anatomico-physiologicae pathologicae. Ticini. Regu ex typog. Fusi et socii. 1845. p. 46.*

<sup>2</sup> Gershon-Cohen, Jacob; Shay, Harry; Fels, Samuel S.; Meranze, Theodore; and Meranze, David R. *The Thymus. The Effect of Atrophy of the Thymus Following Roentgen Irradiation.* *Am. J. Roentgenol.* 30: 263 (Feb.) 1938.

<sup>3</sup> Gershon-Cohen, Jacob; Shay, Harry; Fels, Samuel S.; Meranze, Theodore; and Meranze, David R. *Studies in the Physiology of the Thymus.* *Science* 87: 20 (Jan. 7) 1938, footnote 2.

<sup>4</sup> Einhorn, N. H. and Rowntree, L. G. *The Biological Effects of Thymectomy.* *Endocrinology* 21: 659 (Sept.) 1937.

that regeneration really took place, we removed one testicle at 50 days from control and treated males and killed the animals at from 150 to 200 days. The testes removed at 50 days showed the striking differences between the control and the treated animal previously recorded. However, when the animals were killed at the later periods and the remaining testes examined, these differences had disappeared. The pituitaries of these animals at the time they were killed showed no appreciable differences microscopically.

These results, we believe, permit interesting speculation. The thymus in the rat reaches the peak of its growth between 85 and 100 days. Since the regeneration in the testes begins only after 100 days—a time when thymic development has normally passed its zenith—our results confirm the usual concept that its effective function is limited to the prepubertal period. During this period it appears that adequate thymic activity is necessary for the proper development of the testes. The corollary that during the prepubertal period the pituitary and adrenal glands are themselves unable to supply the necessary stimulus for proper testicular growth also seems justified. The fact that the removal of the pituitary in young animals is followed by testicular atrophy indicates that the thymic agent operates through the pituitary. We have some further indirect evidence in favor of such a mechanism. Although we were unable to show any striking anatomic or functional change in the ovary of rats whose thymus had been destroyed, recent experiences with injections of thymus extract have produced in our female animals almost continuous estrus. This too would suggest that action of the thymus on the gonads is probably by way of the pituitary.

Control experiments were performed because we realized that our experimental method—the use of x-rays to destroy the thymus—was open to criticism on the ground that our results might be due to an x-ray effect on the body generally, since we were using a fairly large dose, to an effect on the sympathetic trunks which must come in the field of treatment, or to stray radiation acting on the testes.

We were certain from the care which was taken to shield the body that stray radiation had no effect. Nevertheless, since a number of roentgenologists were still in doubt, we undertook to rule out such a possibility as well. Control experiments were done in which a similar amount of x-ray radiation was delivered over similar portals in an area below the thymus. These experiments, in which the animals were studied during the first hundred days of life, showed no difference in the testes between the treated and the control animals. Since this exposure was even closer to the testes than that delivered to the thymus, one can be certain that our previous observations were not the result of stray radiation to the testes. It is certain also that they were not purely a general x-ray effect. As the sympathetic trunks were equally exposed, damage to those trunks as an explanation of our previous results is also eliminated. The resultant data remove all doubts. In some animals we tried to give the exposures above the area of the thymus. This was found generally impossible, because in order to avoid the region of the thyroid the upper part of the thymus was usually involved, so that varying degrees of destruction of the thymus resulted in this group.

Previous experimental results concerning the role of thymic function in gonadal activity are just as conflicting as they are in the other phases of the problem.

With the discovery by Calzolari<sup>5</sup> in 1898 that the thymus continues uninvolved in animals castrated before maturity, a definite relation between the thymus and the gonads was established. This was confirmed by Henderson<sup>6</sup> and others. Paton<sup>7</sup> in 1905 concluded from studies of extirpation of the thymus in the guinea pig that the thymus inhibits the growth of the testes in immature but not in mature animals. His results coupled with those of Calzolari led him to the view that before the period of sexual maturity the thymus and sex glands act antagonistically, each exerting an inhibitory influence on the other. Adler<sup>8</sup> from studies on tadpoles and frogs came to a similar conclusion. However, in 1908 Soli<sup>9</sup> reported effects of thymectomy in rabbits, fowls and guinea pigs at variance with those reported by Paton and by Adler. He found that the removal of the thymus causes a delay in development of the testes in all three species, most marked in the cock, less in the rabbit and least in the guinea pig. He also reported analogous effects of thymectomy on the ovaries of rabbits and guinea pigs. In the testes of thymectomized puppies Hart and Nordmann<sup>10</sup> found an increase in the interstitial cells and atrophy of the sperm cells, with an absence of signs of spermatogenesis. In contrast to these conflicting positive results of thymectomy, Klose and Vogt,<sup>11</sup> Lucien and Parisot,<sup>12</sup> Pappenheimer<sup>13</sup> and Park and McClure<sup>14</sup> failed to see any changes in the testes after thymectomy.

While in our previous publication<sup>2</sup> we indicated what we believed to be the causes for the variable results regarding thymic function reported in the literature, we believe our present observations indicate another important explanation of such discrepancies. If, as our results indicate, the effect of deprivation of thymus on the testes is operative only during the prepubertal period and regeneration of such damage may occur later in life, it is not unlikely that the age of the animal at the time of observation, as well as at the time of removal or destruction of the thymus, will determine whether the results of deprivation will be positive or negative.

#### SUMMARY

Our results indicate (1) that the complete or nearly complete destruction of the thymus early in the life of the rat results in an arrest of development of the spermatogenic portion of the testes, (2) that this physiologic castration is accompanied by the development of a typical castrate pituitary picture, (3) that these changes are progressive to approximately the age of 100 days, the time when the thymus in the

5 Calzolari A. Recherches experimentales sur un rapport probable entre la fonction du thymus et celle des testicules. Arch ital de biol 30 71 1898

6 Henderson J. On the Relationship of the Thymus to the Sexual Organs. I. The Influence of Castration on the Thymus. J Physiol 31 222 1904

7 Paton D N. The Relationship of the Thymus to the Sexual Organs. J Physiol 32 28 1905

8 Adler L. Metamorphosestudien an Batrachierlarven. I. Exstirpation endokriner Drüsen. B. Exstirpation des Thymus. Arch f Entwicklungsmech d Organ 40 1 1914

9 Soli Ugo. Contributo alla funzione del timo nel pollo ed in alcuni mammiferi. Path Riv quindicim 1 149 1908 1909

10 Hart C and Nordmann O. Experimentelle Studien über die Bedeutung der Thymus für den tierischen Organismus. Berl Klin Wchnschr 47 814 1910

11 Klose H and Vogt H. Klinik und Biologie der Thymusdrüse mit besonderer Berücksichtigung ihrer Beziehungen zu Knochen und Nervensystem. Beitr z klin Chir 69 1 1910

12 Lucien M and Parisot J. Contribution à l'étude des fonctions du thymus son influence sur la croissance le développement du squelette et l'évolution des organes. Arch de med exper et anat path 22 98 1910

13 Pappenheimer A M. The Effects of Early Extirpation of the Thymus in Albino Rats. J Exper Med 19 319 1914

14 Park E. A. and McClure R D. The Results of Thymus Extirpation in the Dog. Am J Dis Child 18 317 (Nov) 1919

rat has reached the peak of its growth, (4) that during this period all males with destruction of the thymus remain sterile, (5) that after this period reparative processes set in so that in fifty to a hundred days more the testes have completely regenerated, the pituitary has returned to its normal state and the animals are able to reproduce, (6) that similar destruction of the thymus in the female produces no recognizable functional or anatomic changes in the ovary or pituitary, (7) that control experiments prove that none of the effects seen on the testes were a pure x-ray effect, an effect of stray radiation acting directly on the testes or a result of damage to the sympathetic plexus, (8) that the thymic effect operates through the pituitary, (9) that the fact that the reparative processes are possible indicates another important explanation for the differing experimental results reported in the literature.

These regenerative results in older animals will doubtless explain too why so little damage has resulted from roentgen treatment to the thymus. Although roentgenologists in recent years have employed an x-ray dose to the thymus which certainly does not cause any secondary changes in the testes, it is possible that the exposures during the earlier days of roentgen therapy were excessive. Even in such cases roentgenologists and pediatricians need not fear that any permanent harm was done.

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#### ABSTRACT OF DISCUSSION

DR EDWARD L. JENKINSON, Chicago. This work is conclusive as it applies to rats. For many years radiologists have been treating children with large thymus glands, and from my experience and from reading the literature there is apparently a marked difference in the response to irradiation by rats and by human beings. Successful and adequate treatment of enlarged thymus glands by irradiation does not call for large doses. Usually not over 100 roentgens is given to one area. It has been my practice for years to give the patient 100 roentgens over the anterior portion of the thymus and one week later give 100 roentgens over the posterior portion. Usually this amount causes a marked reduction in the size of the gland and improvement in the symptoms. If after these two treatments there has not been a definite decrease in the size of the thymus and improvement in the symptoms, the shadow is probably not due to an enlarged thymus. The treatment may be repeated in one month. Over twenty-three years I have treated a great many patients with enlarged thymus glands. I have not seen any bad effects from the irradiation. I do not recall any patient who later in life married who was not able to have children. I do not believe that the percentage of sterility in the treated patients is any higher than in the average run of men and women who have not been irradiated. I should like to ask the authors whether in the irradiation of the rats the treated area was confined to the thymus. I realize that rats are small and that it is difficult to direct the rays directly to the thymus. We all know that a good many of the tissues of infants are radiosensitive and that it is important to try to confine the treatment to the area of the thymus. I should like to inquire also as to the sensitivity of the skin of rats as compared to that of human beings. Certainly it would not be advisable to treat a child for an enlarged thymus with one erythema dose every four days, such as I understand the authors have been giving the rats. I do not believe it is necessary to treat every child who has an enlarged thymus. A great many children with an enlarged thymus present no symptoms, and in the absence of symptoms, unless the patient is to be subjected to an operation, I should hesitate to give irradiation. I am a little leery about comparing results in rats and in human beings.

The marked discrepancy in dosage must certainly be considered. I am not familiar with how well rats tolerate irradiation.

DR HENRY ULLMANN, Santa Barbara, Calif. I want to emphasize what Dr Jenkinson just said, for when the report is published plenty of internists and pediatricians will say one should not irradiate a thymus. The points to use in arguing against that are, first, that the dose is infinitely less and, second, that anything within the therapeutic range will reduce hypertrophic tonsils but will not carry them below a normal size. Now, my doses on these, as Dr Jenkinson said, are probably less, because my dose of 100 roentgens is measured on the skin. That means around 75 or 80 roentgens in the air. The other point is that the radiologist sometimes gets children sent to him by the pediatrician because they present a certain type of feeding problem. At least three pediatricians in Santa Barbara have found that that particular type, with no enlarged thymic shadow, will be definitely benefited by a few small doses over the mediastinum. Then the enlarged mediastinal shadow appears and will not go down with a few moderate doses, probably because of enlarged tracheobronchial glands. The children are benefited by longer courses such as would be used for tuberculous glands. In spite of this work, which I think is enormously valuable from the standpoint of the function of the thymus, I do not think it contains any basis for alarm in treating children for enlarged thymus or enlarged tracheobronchial glands.

DR C. K. HASLEY, Detroit. I want to discuss this paper from the angle of treatment. Dr Ullmann has already brought out the fact that the dose used for children is different from the dose used in the experimental work. At the Children's Hospital in Detroit my associates and I have made a concerted effort to follow the patients treated during the last fifteen years, we have been fortunate in following up some of them and have found that, on their return, those who have been treated with moderate doses have shown no signs of delayed mental or physical development. In the literature there have been a few cases in which it was thought there had been delayed mental and physical development because of the roentgen treatment given. Now, if that is the case, the only argument that I have to advance is that the dose was probably too large. It is not necessary to use a dose any larger than 100 roentgens. If the treatments are spaced a week apart, with the maximum number of treatments four—to get a clearing of the symptoms of difficulty in breathing and cyanosis—and if the shadow of the gland does not disappear, I think something else besides an enlarged thymus is causing it. As you know, fifteen or twenty different conditions can produce difficulty in breathing and cyanosis.

DR HARRY SHAY, Philadelphia. I think that we ought to put ourselves straight on this problem. We did not attack this problem with any idea of discrediting roentgen therapy of the thymus, we merely used it as a means of physiologically destroying the thymus. We realize that the dose employed is far in excess of that used therapeutically, and we have stressed this point in the body of our paper. The striking observation to us was that even from serious damage produced early in life we were able to see recovery. This was particularly important in the light of what happened in the presentation of some of our earlier work at the International Congress of Radiology in Chicago. At that time most of the men were perturbed by our results. We were glad to be able to show that even if in the earlier days of roentgen therapy to the thymus some temporary damage had been done, such damage was not permanent and therefore not of real moment. We realize that present day roentgen therapy of the thymus certainly cannot produce any of the damage that we have shown in our earlier pictures, but nevertheless it was essential to show that if damage did occur it was not permanent. Dr Jenkinson's question as to whether the thymus can be visualized in the small rat at 2 days of age can, I think, be answered in the affirmative. Dr Cohen, who is the roentgenologist in our group, I am sure has effectively done that, because in the animals that we show at the exhibit the area of the thymus has been pretty effectively covered by the treatment.

ESTIMATION OF DISABILITY AFTER  
INJURIES TO BONES  
AND JOINTS

WALTER G STERN, MD

CLEVELAND

With "social security" as a fixed cadastral point on the ever widening sociologic horizon, the ways and means of attaining our goal in safety are becoming of tantamount importance. Good or bad, right or wrong, such policies are here to stay and must be made actuarial, i e financial, successes if the present social system is to endure. Industrial as well as all other forms of health and accident insurance, as for instance compulsory state insurance against automobile accidents, are now considered an integral part of the social security setup, and it is here that the medical profession and particularly the orthopedists, who in recent years have been paying particular attention to injuries of bones and joints, can be of greatest service in the proper estimation of the disabilities incumbent on injury and, by that token, of the proper compensation therefor. The great importance of this subject can be best illustrated by the fact that in 1936 over 1 per cent of the entire population were seriously injured by automobile accidents alone and that the financial damage from automobile accidents in that year was estimated by the National Safety Council as over 3½ billion dollars.

After the temporary period of convalescence and rehabilitation is over—after orthopedic surgery and vocational rehabilitation have finished their work of restoring the injured person to useful industry when possible—comes the indefinite period of permanent disability, either partial or total.

Disability has been defined as "the inability to work with the same degree of ease and comfort as before the injury was sustained." Partial disability needs no further definition here, but, to be easily understood and uniform, its rating should be expressed not merely by the extent of the anatomic or functional loss but rather in percentages of permanent total disability, which was once defined by the International Association of Industrial Accident Boards and Commissions as "100 per cent unfitness for future industrial usefulness." But total disability cannot be so easily dismissed today. The "literal" rigid definition, once universal, has been modified by law and judicial interpretations until today it has come to represent something quite different. In war risk insurance, which the United States Supreme Court defined as an "unqualified insurance against total disability," in the case of *Lumbia v United States*, 290 U S 551 at 558, the court declared that total disability means "any impairment of mind or body which renders it impossible for the disabled person to continuously follow his usual work or work of like character, for remuneration commensurable with that which was paid to him in his former occupation." The Supreme Court of Texas held that "total disability" does not imply an absolute impossibility to perform any work. A person is totally disabled when his physical condition is such that he is unable to perform or direct any work without injury to his health and when common prudence would require him to desist from the performance of his duties." Arkansas and California held

"when injuries received prevent him from performing all the substantial and material acts of his business or occupation in the usual and customary way", Kentucky, "the disability is total if the insured is unable to follow his usual occupation, although he might be able to do something else", Pennsylvania, "one so far disabled as to be unfit for continuous gainful occupation and to be reduced to the status of an occasional laborer." The majority of states, however, have taken a "middle ground" somewhere between the two previous extreme positions. Their courts, however, have failed to give a clearcut definition, for the reason that their position depends more or less on the rejection of the extreme verdicts last defined. One writer has defined the limits of this position to be as follows:

(A) That the mere inability of an assured to pursue his usual, prior or customary vocation is insufficient

(B) That mere fanciful ability to engage in some occupation wholly beyond the assured's normal capabilities will not preclude recovery for total disability

(C) That the entire range of gainful pursuits is to be considered but only in the light of the assured's age, training, experience, education, as well as his physical and mental qualifications

The federal and all state governments (except of Arkansas and Mississippi) are now charged by law with the payment of compensation to injured employees, and practically all have adopted fixed schedules of percentage of loss for certain fixed disabilities, such as amputations. For instance, the complete loss of the arm at the shoulder is used as a basis for estimating such schedules, such 100 per cent loss of the arm has been variously estimated at ratings from 29 per cent of permanent total disability (New Mexico) to 56 per cent (Iowa), but the committee of the international association, already cited, recommended that a fair rating for the loss of the major arm at the shoulder by a common laborer 36 years of age would be 50 per cent of permanent total disability. This and the complete loss of the leg at the hip, also 50 per cent permanent total disability, are then the yardsticks and the schedules of percentages for other amputations and deformities have been developed from these values.

Henry<sup>1</sup> has given me permission to print the accompanying table of fixed values for partial disability (table 1).

The International Association of Industrial Accident Boards and Commissions has studied these problems for years, and its conclusions have been the guide for the revision of such schedules and have resulted in more uniform procedures. Some of its methods and conclusions are so valuable that the medical profession at large should be made familiar with them before attempting to estimate the percentage of loss resulting from disability. I shall cite a few of the most important conclusions (not verbatim, as time and space do not permit) and enter into a short discussion relative thereto.

1 Compensation paid for permanent disability is that paid after temporary disability ceases—that is, for the loss of earning power after healing has taken place.

2 Compensation for such permanent disability should be based on disability for a lifetime. (Only thirteen states allow this, others have a time or a money limitation.)

TABLE 1—Fixed Values for Partial Disability

UPPER EXTREMITY	
The upper extremity includes the shoulder girdle. Total loss of the upper extremity is usually defined by local state law. The average is 50 per cent permanent total disability.	
I Sternoclavicular joint	
(a) Ankylosis	{ rate according to resulting loss of active motion of shoulder
(b) Chronic dislocation	
II Clavicle	
(a) Complete loss	{ rate according to resulting loss of active motion of shoulder
(b) Nonunion	
(c) Malunion	
III Acromioclavicular joint	
(a) Ankylosis—as in I and II	
(b) Dislocation	
1 Incomplete (conoid and trapezoid ligaments intact)	5 per cent permanent total disability
2 Complete (conoid and trapezoid ligaments torn)	rate according to resulting loss of active motion of shoulder
IV Scapula	
(a) Malunion	{ rate according to resulting loss of motion of shoulder
(b) Loss of blade or body	
V Shoulder	
(a) Flail—40 per cent loss of extremity—which equals 20 per cent permanent total disability (unless rating for loss of motion exceeds this in which case that rating should be used)	
(b) Ankylosis—in Jones position (20 degrees in front of coronal plane 50 degrees abduction) 30 per cent permanent total disability	
(c) Ankylosis in bad position if operable 37.5 per cent permanent total disability (may be total loss of extremity if inoperable and patient is a poor operative risk)	
(d) Loss of motion	
1 Loss of elevation (useful arc normally 90 degrees from shoulder level to vertical) 17.5 per cent permanent total disability	
2 Loss of abduction (useful arc normally 90 degrees from side to shoulder level) 40 per cent arc refers to any plane and rotation is necessarily limited in proportion and covered in rating of arc loss	
VI Arm	
(a) Amputation at or above the elbow equals loss of extremity 50 per cent permanent total disability	
(b) Amputation 4 inches or more below the elbow (permitting use of elbow in prosthesis) 35 per cent permanent total disability	
(c) Shortening nil unless actually disabling or seriously disfiguring	
VII Elbow	
(a) Flail same as ankylosis in good position plus rating for loss of motion	
(b) Ankylosis in Jones position (at an angle of 110 degrees) 20 per cent permanent total disability	
(c) Ankylosis in bad position	
1 Acute angle—if inoperable total of arm if operable 60 per cent of loss of use of arm or 30 per cent permanent total disability	
2 Obtuse angle of 110 to 155 degrees 25 per cent permanent total disability	
3 Obtuse angle of 155 to 180 degrees 37.5 per cent permanent total disability	
(d) Distortion of carrying angle of elbow (15 degree valgus) 10 per cent	
(e) Loss of motion	
1 Loss of flexion beyond acute angle of 80 degrees not compensable	
2 Loss of motion (useful arc normally 80 to 175 degrees) rated on percentage loss of this range up to 37.5 per cent	
(f) 1 Loss of pronation and supination alone (in Jones position i. e. midway between pronation and supination) 10 per cent	
2 Loss of pronation and supination alone in bad position 15 per cent	
3 Loss of pronation and supination alone in Jones position when combined with disabilities of wrist or elbow an additional 10 per cent disability	
4 Loss of pronation and supination in bad position when combined with disabilities of wrist or elbow an additional 20 per cent disability	
VIII Wrist	
(a) Flail same as ankylosis in good position plus rating for loss of motion up to 37.5 per cent maximum	
(b) Ankylosis (in Jones position i. e. at an angle of 135 degrees) 12.5 per cent	
(c) Ankylosis in bad position (i. e. straight or in volar flexion) if operable 15 to 25 per cent (may be loss of hand if inoperable)	
(d) Loss of motion percentage loss of arc total loss equals 12.5 per cent permanent total disability	
1 Flexion extension disability (75 per cent of motion of wrist) 18.5 per cent loss of extremity or 9.5 per cent permanent total disability (useful arc normally is 165 degrees)	
2 Radial and ulnar abduction (25 per cent of motion of wrist) 5 per cent (useful arc is normally 30 degrees each way)	
IX Hand	
(a) Total loss 70 per cent of extremity (includes loss of arm to 4 inches [10 cm] below the elbow) or 35 per cent permanent total disability	
(b) Partial loss rated on loss of function of fingers	
1 Thumb	
(a) Total loss 20 per cent of extremity or 10 per cent permanent total disability	
(b) Ankylosis in good position (extended in apposition) 7.5 per cent permanent total disability	
(c) Ankylosis in bad position same as total loss if inoperable if operable 10 per cent	
(d) Loss of terminal phalanx 5 per cent permanent total disability	
(e) Loss of motion of metacarpophalangeal joint 7.5 per cent	
(f) Loss of motion of interphalangeal joint proportion of loss of arc of motion (normal range 90 degrees), 5 per cent	
2 Index finger	
(a) Total loss 10 per cent of extremity or 5 per cent permanent total disability	
(b) Loss of one and a half or more phalanges 5 per cent permanent total disability	
(c) Loss of terminal phalanx 2.5 per cent permanent total disability	
(d) Loss of motion or ankylosis of the interphalangeal joint	
(1) Distal joint proportion of loss of arc of motion based on 2.5 per cent	
(2) Proximal joint proportion of loss of arc of motion based on 5 per cent	
3 Middle finger (second finger)	
(a) Total loss 5 per cent permanent total disability	
(b) Other ratings same proportion of 5 per cent as in index finger	
4 Ring finger (third finger)	
(a) Total loss 5 per cent	
(b) Other ratings same proportion of 5 per cent as in index finger	
5 Little finger (fourth finger)	
(a) Total loss 2.5 per cent	
(b) Other ratings same proportion of 2.5 per cent as in index finger	
The accrued rating for loss of the use of more than one finger should not exceed the total loss of a hand as provided previously.	
Since most state laws give no definite ratings for disabilities of the spine no attempt has been made to rate the spine or the spinal portion of the pelvis. Ratings on the pelvis are covered in this schedule only and the disability limits motion of the hip shortening of the extremities or both.	
LOWER EXTREMITY	
I Thigh	
(a) Amputation	
1 Stump of less than 6 inches 100 per cent loss of leg equal to 50 per cent permanent total disability	
2 Useful stump 6 inches below hip 42.5 per cent	
3 Amputation 3 inches or more below knee (useful stump) 33 per cent	
4 Amputation in foot without loss of motion of ankle 25 per cent	
(b) Shortening*	
1 One inch no disability	
2 One to 2 inches 5 to 10 per cent permanent total disability	
3 Two to 3 inches 10 to 20 per cent permanent total disability	
4 More than 3 inches 25 to 30 per cent permanent total disability	
Just as the shoulder is considered with relation to adjoining structures in the hip motions are considered with reference to the pelvic girdle as a whole whereas scapular motion completes the upper extremity to some extent a similar relation does not play so great a part in the lower extremity, except in some fractures of the pelvis especially of the acetabulum. However the mobility of the hip is so great that the authors deemed it wise to classify these motions with specific values for each so that the total disability could be readily ascertained.	
II Hip	
(a) Ankylosis in optimum position (15 degrees flexion 10 degrees abduction and slight external rotation or a proportionate increase in abduction dependent on shortening) 50 per cent loss of extremity or 25 per cent permanent total disability	
(b) Ankylosis in bad position 30 to 50 per cent permanent total disability if inoperable	
(c) Loss of motion	
1 Flexion extension disability proportionate to loss of motion (useful arc normally 120 degrees of which flexion is 105 degrees and extension 15 degrees) total loss of motion with flexion ankylosis equals 100 per cent loss of function of limb or 50 per cent permanent total disability	
2 Abduction adduction disability (useful arc normally 90 degrees of which abduction is 45 degrees and adduction 45 degrees) total loss of abduction and adduction equals 25 per cent loss of function of limb or 12.5 per cent permanent total disability	
* The optimum position depends on the amount of shortening (Jones-Robert and Lovett R. W. Orthopedic Surgery, New York William Wood & Co 1923 table of abductions p 138)	

TABLE 1—Fixed Values for Partial Disability—Continued

LOWER EXTREMITY—Continued	
3	Internal and external rotation (useful arc normally 90 degrees of which internal rotation is 45 degrees and external rotation 45 degrees) total loss of rotation equals 10 per cent loss of function of limb or 5 per cent permanent total disability Formula The proportionate loss of flexion (25 per cent) plus the proportionate loss of abduction (12.5 per cent) plus the proportionate loss of rotation (5 per cent) equals the disability
III	Knee
(a)	Flail 40 per cent permanent total disability
(b)	Ankylosis in good position (at an angle of 170 to 150 degrees) 30 per cent
(c)	Ankylosis in bad position (at an angle of less than 140 degrees) if inoperable 40 per cent
(d)	Loss of motion
1	Flexion-extension disability (useful arc normally 180 to 75 degrees) Formula The proportionate loss of the arc (valued at 31.8 per cent permanent total disability) equals the disability
2	Extension limited to less than 160 degrees same as ankylosis in bad position
3	Abnormal lateral mobility 10 to 30 per cent depending on function
4	Relaxation of either or both crucial ligaments and other internal derangements 10 to 40 per cent permanent total disability
IV	Ankle
(a)	Flail 25 per cent permanent total disability
(b)	Ankylosis in good position 12.5 per cent
(c)	Ankylosis in bad position (equineus or over 20 degrees plantar flexion) if inoperable 25 per cent
(d)	Subastragalar ankylosis in good position 7.5 per cent
(e)	Partial ankylosis of subastragalar joints (always painful) 17 to 25 per cent if inoperable
(f)	Loss of motion
1	Dorsiflexion (valued at 12 per cent permanent total disability useful arc 90 to 70 degrees)
2	Plantar flexion (valued at 8 per cent permanent total disability useful arc 90 to 125 degrees) Formula The proportionate part of dorsiflexion (12 per cent) plus the proportionate part of plantar flexion (8 per cent) equals the disability in motion of the ankle (the proportionate loss of dorsiflexion is considered as that proportion of 12 per cent and added to the proportionate loss of plantar flexion which is represented by a total value of 8 per cent)
V	Foot
(a)	Loss of foot with loss of motion of ankle 25 per cent permanent total disability
(b)	Amputation proximal to the heads of the metatarsals (loss of weight bearing) 25 per cent In the authors experience such amputations usually require rating as for amputations above the ankle or loss of motion of the ankle
(c)	Loss of metatarsals rated as the proportionate loss of weight bearing (which if total is specified in paragraph two as 25 per cent)
(d)	Great toe
1	Amputation at metatarsophalangeal joint 5 per cent
2	Amputation at interphalangeal joint 2 per cent
3	Loss of motion (hallux rigidus) 4 per cent
(e)	Other toes
1	Total loss 1 per cent
2	Partial loss 0.5 per cent
(f)	Ankylosis between tarsal bones 5 per cent
(g)	Ankylosis of subastragaloid joint (astragalus and os calcis) 8 per cent
(h)	The frozen foot i. e. atrophied ankylosed in practically all the joints with lowered circulation a tendency to trophic changes and usually pain should be allowed the same disability as the total loss of the member i. e. 25 per cent

3 Permanent partial disability shall be valued as a percentage of permanent total disability

4 Permanent disability should be based on a table of fixed ratings, modified by important variable factors The most important of these are

(a) *Age*—A man of 60 is much more disabled by the loss of an arm than a man of 35 There are five distinct breaks in the line representing age

1 From 15 to 25 years is the experimental age, when the average boy is learning his trade

2 From 25 to 30 years shows a decided change, usually the man has learned a trade, his social status has been changed by marriage

3 From 30 to 50 years is the greatest productive age At 40 usually he starts on a decline His trade is fixed, and he is hard to adapt to a new one, accentuating any disability

4 From 50 to 60 years the aforementioned factors are even more accentuated

5 At 60 years and above age is less important The man is at the end of industrial activity

(b) *Type of Occupation*—There is a distinct and unique relation between the claimant's occupation and the amount of disability arising from a given injury The United States Veterans' Bureau uses a most comprehensive and detailed table of occupations, with a variant ratio ranging from 1 to 9, the lightest occupation usually rating the lowest The type of work must always be borne in mind For instance, a seamstress working with thin silk must be able to grasp her materials firmly with the left hand A musician with a disabled left hand can still play the cornet Disabled persons are often able to do much heavier types of work while working for themselves—and, from the nature of things, resting whenever a painful spasm arises—than they could for an unsympathetic foreman who might drive them beyond the limit of their endurance The type of light work that any individual can do is unfortunately not usually specified This leaves such partially disabled persons at the mercy of the foreman who wishes to relieve his department of the burden of keep-

ing crippled employees, and thus, in one of the cases I have in mind, light work for a partially disabled man with a crippled ankle consisted in carrying two pails full of cutting liquid at a time all day long up three flights of stairs, a task which nobody except one in the pink of health and strength could do

(c) *Presence of Pain*—Be it ever so slight, the presence of pain is a most disturbing factor and one extremely difficult to evaluate In some regions, as the shoulder and the spine, the presence of pain can be estimated by the muscular spasm which accompanies painful motion, but pain in a neighboring joint absolutely destroys any values given to the fixed disability ratings of existing deformities In partial ankylosis or fracture into or near a joint it is my belief that a stiff and painless joint is far preferable to a movable joint which produces pain Tender scars or amputation stumps add 5 per cent to the fixed disability rating

(d) *The Will to Work (morale) and Other Psychic Factors*—The mental attitude of the patient greatly influences his ability to carry out the work which his disability, age and occupation should warrant his performing Malingering and deliberate exaggeration must always be summarily condemned, but genuine psychoneurosis must at least be viewed in a sympathetic manner Some states, the latest being Iowa and Nebraska, actually pay compensation for such conditions<sup>2</sup> An examining physician must at all times be on his guard against the obvious fallacy of calling every hidden and unexplained condition a neurosis or exaggeration, and it is my opinion and constant practice never to make a diagnosis of neurosis until repeated examinations have fully demonstrated the lack of objective corroborative evidence of the actual existence of disability Often actual disability of a minor grade and psychoneurosis coexist The compensating board seeing only the cold, formal report cannot be expected to evaluate these conditions as can the observing examining physician

<sup>2</sup> Workmen's Compensation Acts Compensation for Nervous and Mental Sequelae J. A. M. A 98 1216 (April 2) 1932



(c) *Preexisting Disease or Disease Set Up as a Consequence of Injury*—Preexisting disease which has been rendered active, painful or disabling by the injury, or disease which has resulted from the trauma, must always be given due consideration and is compensable in all state and federal jurisdictions except where specifically enjoined by legislative enactment. In this regard the United States Court of Appeals has decided as follows (*General Ins. Co. v. Daffern*, 81 F. [2d] 179) "Claimant was entitled not only to compensation for disability directly caused by the accident but also for the total disability resulting from the aggravation of his preexisting ailments which prior to the operation had no disabling effects." For instance rheumatic arthropathy—Charcot joint—is sometimes seen after fractures, the first roentgenograms of which were entirely negative except for the fracture. Osteoarthritis which had hitherto been painless and symptomless can be rendered painful and disabling. I, however, do not agree with the commonly expressed opinions of Coley and Geschickter that sarcoma of bone can arise from a single injury. Neither of these authors offers any proof of

atrophy) and to pain and stiffness in the neighboring joints are not properly evaluated in the United States. The German insurance and compensating boards lay great stress on the presence of what is called in this country "traumatic tropho-edema," meaning "chronic swelling due to circulatory changes," and it has been my experience, which is well corroborated in the German literature, that this tropho-edema with swelling and stiffness of the joints may travel upward, so that an injury to the wrist, say Colles's fracture, finally results in a painful and stiff elbow and shoulder. This disability is usually recovered from and, as in atrophy of bone, physiologic use aided by the application of modern pressure-suction apparatus is the best method of cure.

(h) *Injuries to Nerves and Tendons*—Injuries to tendons are estimated according to resultant loss of function of the neighboring joints. Injuries to nerve give a combination of disabilities. These are estimated according to the loss of function in the joints involved, plus an estimated percentage for atrophy, trophic changes and pain.

TABLE 2—Percentages of Permanent Partial Disability at Various Ages

Loss of	Nature of Injury	Age Years											
		1 and Under	20	25	30	35	40	45	50	55	60	65	Over
Major arm at shoulder		40.0	47.5	44.0	50.0	52.5	55.0	60.0	65.0	72.5	80.0	87.5	90.0
Minor arm at shoulder		4.0	40.75	42.7	47.5	49.75	52.25	57.0	61.75	68.5	76.0	83.25	85.25
Major arm at or above elbow		31.0	36.12	38.25	42.5	44.75	47.75	51.0	55.25	61.25	68.0	75.25	77.25
Minor arm at or above elbow		23.0	31.75	36.75	40.75	42.4	44.4	48.4	52.49	58.4	64.6	66.61	68.61
Major hand at or above wrist		26.67	28.33	30.0	32.5	35.0	37.4	40.0	43.3	48.3	53.33	58.33	60.0
Minor hand at or above wrist		23.3	26.9	28.5	31.67	33.25	35.8	38.0	41.2	46.9	50.67	55.67	57.33
Thumb		4.0	8.0	9.0	10.0	0.7	11.0	12.0	13.0	14.0	15.0	16.0	17.0
Index finger		4.0	4.2	4.5	5.0	5.2	5.5	6.0	6.5	7.25	8.0	8.6	8.6
Middle finger		3.2	3.4	3.6	4.0	4.2	4.4	4.8	5.2	5.8	6.4	6.8	6.8
Ring finger		2.4	2.5	2.7	3.0	3.15	3.3	3.6	3.9	4.3	4.8	5.1	5.1
Little finger		2.4	2.5	2.7	3.0	3.15	3.3	3.6	3.9	4.3	4.8	5.1	5.1
Leg at hip		40.0	42.5	44.0	50.0	52.5	55.0	60.0	65.0	72.5	80.0	87.5	90.0
Leg at or above knee		11.0	36.12	38.25	42.5	44.75	47.75	51.0	55.25	61.25	68.0	75.25	77.25
Leg at or above ankle		20.0	21.25	22.5	25.0	26.25	28.0	30.0	32.5	36.25	40.0	43.25	45.0
Great toe		1.2	3.4	3.6	4.0	4.2	4.4	4.8	5.2	5.8	6.4	6.8	6.8
Other toes		0.8	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.6	1.6	1.7
Eye		16.0	17.0	18.0	20.0	21.0	22.0	24.0	26.0	29.0	32.0	35.0	36.0
Hearing one ear		4.0	4.2	4.5	5.0	5.2	5.5	6.0	6.5	7.25	8.0	8.6	8.6
Hearing both ears		26.67	28.33	30.0	32.5	35.0	37.4	40.0	43.3	48.3	53.33	58.33	60.0

this claim beyond the history of an injury. One could readily understand how an infection such as tuberculosis might crop out of a locus minoris resistencie from trauma, but how, for instance, a giant cell tumor deep in the interior of a condyle of a femur should rise from a single bruise which does not even break the tissues of the soft parts or disarrange the lamellae of the cortex is beyond my conception. My own experience contains several positive refutations of this theory, in that the tumors under suspicion were invariably secondary metastases from preexisting carcinoma, and autopsy showed widespread dissemination.

In the latest publication on this subject Ewing<sup>3</sup> of New York reviewed everything that has been published along these lines, and he came to the Scotch verdict of not proven. Leila Knox<sup>4</sup> also denied the possibility or probability of this.

(f) *Injury or Atrophy of Soft Parts*—Permanent injury or atrophy of the soft parts, when due to direct injury or circulatory change, adds from 5 to 15 per cent to the loss of function.

(g) *Circulatory Changes and Swelling*—Circulatory changes with chronic swellings which lead in great part to atrophy of bone (Sudeck's atrophy, acute transverse

(i) *Nonunion of Fractures*—Ununited fractures rate as three fourths of an amputation at the site of non union, except at the patella and the hip, where they rate as 100 per cent. Flail joints rate as three fourths loss of the joint.

(j) *Multiple Injuries*—Multiple injuries must be divided into two kinds. 1 Diverse disabilities occurring from the same trauma. These are to be computed in the same manner as are commercial discounts and not by merely adding the resulting disability values together. 2 Injuries occurring at different times. In this connection the lump sum and gross settlement plans of most states create an injustice for the insurer and unless the terminology is carefully watched, many ludicrous situations will develop. For instance, a man receives compensation for the loss of one eye and then while at work loses the sight of his second eye, receiving by the same token compensation for the loss of two eyes. In other words, a two-eyed man is compensated for the loss of three eyes. However, if the plan recommended in this paper should be followed, this person would in the first instance have received compensation for the percentage of disability arising from the loss of the sight of one eye and finally compensation for the total disability resulting from the complete loss of vision.

3 Ewing James. *Modern Attitude Toward Traumatic Cancer*. Bull. New York Acad. Med. 11, 281 (May) 1935.  
4 Knox Leila. In *Brady Leopold and Kahn Samuel*. Trauma and Disease. ed. 1 Philadelphia Lea & Febiger 1937.

## ABSTRACT OF DISCUSSION

DR R W HARBAUGH, San Francisco The California Supreme Court has not defined what constitutes total and permanent disability in compensation cases. The California Industrial Accident Commission has the final duty of determining what is total and permanent disability, since the act says that the commission's decision shall be final on questions of fact. In California the standard rating for loss of the major arm at the shoulder is 60 per cent, and for loss of one leg at or above the knee, 50 per cent. California makes a distinction between major and minor in all disabilities of the upper extremities and takes into consideration the age and occupation of the injured workman. In the rating a laborer 40 years old is considered standard. If a man is less than 40 his rate of compensation decreases, if he is more than 40 it increases. If he is not a laborer but a carpenter, a structural iron worker a musician or any other type of worker, then he gets more than the common laborer, who is the lowest in the scale. The ratings are made by a specially trained expert, who has the assistance and guidance of the commission's medical examiners and medical directors, and are based on a schedule for rating permanent disabilities adopted by the commission. Neurosis is recognized as a disability in California, but the measurement of the disability in terms of its permanent effects is still an unsolved problem. No hard and fast rule can be made for compensating swelling and edema. The ratings for atrophy and neural injury are not made solely on the anatomic disabilities but on the results of the anatomic changes. The California act provides that, "in case of aggravation of any disease existing prior to such injury, compensation shall be allowed only for such proportion of the disability due to the aggravation of such prior disease as may reasonably be attributed to the injury."

DR EARL D MCBRIDE, Oklahoma City Physicians must stay with their fundamental training. They should not be biased or prejudiced or swayed by the monetary contentions of the claimant and respondent. They must stay within their own field if they are going to be on entirely safe ground. How then can a formula for evaluating permanent disability be phrased for physicians' use? I have studied this problem thoroughly, and it seems to me that the only sound scientific basis of evaluating disability is extent of function. The patient should be studied—his anatomic characteristics and the extent of ankylosis and of whatever else may have happened to him clinically. Then the physician should say to himself: "Now what can the man do with that part which is disabled?" not just "How does it differ from that same part when it was normal?" The amount of function and not the extent of anatomic change is the answer to the question of disability. Now what does function mean? If one stops to think a moment one can break that word down into a number of factors. One important factor would be quickness of action (how fast can this man work with this stiff arm?). Others would be endurance (how long can he work?), strength (how strong is he with the arm?) and security (how much confidence has he in his arm?). Also will his risk be increased or decreased as far as work is concerned? Can he pass an examination for employment? All these belong to the one word "function." Each one of those factors can be given a percentage value within 100 per cent, and if the case is analyzed according to how much each factor has depreciated the answer will be a percentage of disability based entirely on the physician's scientific analysis, clinical sense and good judgment. All the rest can be left to the jury and the courts and industrial commissions for final decision.

DR LIONEL D PRINCE, San Francisco Before one can arrive at estimates of disability after injury for the purpose of standardization throughout the United States it will be necessary to have uniform compensation laws governing the proceedings in each state. As one reviews compensation in different states there will be found great variance in the waiting period, the amount of weekly indemnity and the sums awarded for permanent total disability and partial temporary disability. In considering the estimates of disability after injuries to bones and joints one must show equal fairness to the injured and to the insurance company. A procedure that will have to be

standardized before uniform laws can be established is that of measuring joints. Frequently one examines reports by other physicians and is unable to understand their measurements of restricted motion. Some physicians in measuring angles use the ascending row of figures on the protractor, others use the descending row. Some start from different neutral points. A method of measurement should certainly be standardized. I agree with Dr Stern that the presence of pain is most disturbing and extremely difficult to evaluate. Pain is one of the greatest single disabling factors and, as stated by Dr Stern, destroys any values given to a fixed disability rating of existing deformity. A shoulder, wrist, hip, knee or ankle in which there is normal motion with pain is far more disabling than a painless stiff or partially stiff joint. Neurosis is compensable in this state. This, I think, will always be a more or less unsolved problem. Experience again counts for much in sifting the wheat from the chaff, but the problem is a real one especially when definite disability is associated with neurosis, hysteria, purposeful exaggeration and malingering. The question of preexisting injury is extremely important. No one would want to deny a man compensation if some type of preexisting disease has been aggravated by an injury. The point is: How many of these preexisting diseases are actually aggravated by injury? Frequently persons come in with arthritic backs after some trivial injury, and they attribute the disability to the injury. In private practice a large percentage of persons consult the physician because of painful backs without history of injury. From a working man one seldom, if ever, gets a history of a disability of the back which he does not attribute to his employment. The point of differentiation is a fine one and, I think, largely depends on the physician's interpretation.

DR WALTER G STERN, Cleveland This subject is a much broader one than the estimation of injury for industrial compensation alone. I told the members that the new social security schemes are here to stay and cannot be taken away from the workman even for his own good. When the money for direct relief ran out in Cleveland last fall and the city was able to beg a little more money from government agencies who wanted the families to go off relief and the men to go to work on WPA projects, over 325 men previously unknown to the Federated Charities or the Dispensary Clearing House applied in two weeks to one of the larger dispensaries alone for certification that they could not go back to work because of diverse disabilities (chiefly backache). If the funds of the various social security agencies and the various insuring bodies are to be made a "grab bag" for any claimant, the organizations are not going to be financial successes. This will cut down the amount of compensation that the injured are able to receive and will increase the premium that the employee and the employer must pay, and thus the same final conditions will appear in this country that have appeared in other countries, notably Germany, owing to the failure of the social security schemes. The plan followed by Dr McBride in his book, which I advise all interested in this subject to read, and outlined in his discussion does not really differ from mine in its final appraisal except that more of his factors are subjective and depend on uncontrollable attributes of employment which the general medical fraternity will hardly be able to evaluate. The conditions are now bad enough without having to throw in the factors of "security," "endurance," "prestige of normal physique" and the like, which are serious matters and which men of experience like Dr McBride could accurately evaluate but the rank and file of practitioners could not. It is necessary to stick strictly to the medical facts of the case, just as in noncompensable disease. A man with a stiff elbow that he cannot move more than 30 degrees is just as badly disabled in California as he would be in Ohio. The courts must be ignored because they have confused this subject so badly that from day to day one hardly knows what new medical disease will be officially declared a traumatic surgical disability. Then too they have given different interpretations of what constitutes total disability for different ends: for civil suits, for war veterans' compensation, for industrial accident compensation, for ordinary liability insurance and even in criminal cases and those involving railroad employees' pensions.

SURGERY OF GENITO-URINARY  
MALIGNANT TUMORS

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Success in the surgical management of malignant tumors in any part of the body depends on early recognition and complete removal, furthermore this is the only absolute cure for malignant conditions that is known at the present time. The application of this principle to malignant disease of the urinary tract has been especially difficult, owing to the commonly insidious onset of the disease and the impossibility of its discovery while sufficiently localized to permit of its entire elimination.

This is particularly true regarding malignant disease of the kidney. Here the earliest signs and symptoms may be long delayed in their onset, the cardinal symptoms (pain, tumor and hematuria) not being noticeable or recognized as serious until the growth is no longer confined to the kidney. The emphasis placed by urologists on the significance of painless hematuria is, however, beginning to bear fruit, and unquestionably a larger number of renal tumors are now being seen at an earlier stage of growth than was formerly the case, a second factor contributing to this result is the common employment of excretory urography.

Even with all the methods of diagnosis now available, the recognition of the presence of a renal tumor is often extremely difficult and may necessitate repeated investigations carried out at frequent intervals. The causes of filling defects to be noted in urograms, as well as distortions in the outline of the calices and renal pelvis, are many and varied and cannot always be differentiated with certainty. A blood clot in the kidney pelvis, a calculus of low density, spasm of the pelvis and calices, distortions incident to infection, tuberculosis and polycystic disease, renal torsion, displacement of the kidney, congenital anomalies and single cysts, abscess of the parenchyma or perinephric abscess, also extra-renal retroperitoneal tumors are all possibilities to be borne in mind when one is rendering an interpretation of films.

Much time and effort have been expended in attempts to classify renal tumors. From the standpoint of prognosis and possible reaction to irradiation, such a classification may be of interest and value. Scarcely any two authorities, however, agree on any one pathologic classification. The most important phase of the subject is the making of a diagnosis which will be sufficiently complete to lead to an exploration of the kidney, the one hope of cure resting on an early nephrectomy, a principle which applies to benign tumors as well.

With a diagnosis of renal tumor established there are two possible factors that may justify delay in exploring the kidney. The first is the question of employing irradiation to reduce the size of a large growth or possibly render an inoperable tumor operable (the preliminary employment of irradiation being routine in so-called Wilms tumors), the second factor is the presence of metastases. That irradiation has a field of usefulness in the treatment of renal tumors has been proved. Its preoperative use in reducing the size

of renal tumors (through apparent destruction of thin walled blood vessels with the production of hemorrhagic infarcts which may in turn destroy areas of tumor tissue) has the effect of partial removal of the tumor. Tumor cells, however, have always been found adjacent to such areas of tissue destruction.

Areas of malignancy have been found in all kidneys removed for Wilms tumors subsequent to irradiation, it would seem to be the best judgment for all such kidneys to be removed after a thorough course of irradiation. Irradiation alone must be considered as a palliative method for the treatment of renal tumors. Its employment as a routine procedure preliminary to nephrectomy is hardly justifiable in the light of our present knowledge. By so doing valuable time may be lost, during which metastasis may take place. The value of irradiation after nephrectomy seems to be still in doubt.

While it may be said that nephrectomy is seldom justified in the presence of metastases, the question of a mistake in diagnosis might well arise. This is particularly true of metastases to the lungs, which cannot always be detected with certainty. Furthermore, in certain instances metastases to the lungs have been reported to have disappeared under irradiation, so that one should not proceed according to an arbitrary rule but consider each case individually. By refusing operation in all cases showing metastases, an occasional patient might be deprived of the only possible cure.

Tumors of the renal pelvis and ureter cannot be differentiated pathologically before operation. When examinations indicate the presence of such a tumor, nephro-ureterectomy should be carried out and the mucous membrane of the bladder about the ureteral orifice should be resected or destroyed by means of diathermy.

Preliminary to nephrectomy, it is often desirable to give a blood transfusion, a pronounced anemia frequently being present sometimes caused by the presence of metastases which have not been diagnosed. In carrying out the operation it is most important to have as free an exposure of the kidney as possible. This may best be obtained by means of the transperitoneal route, the kidney pedicle being clearly exposed and ligated before the tumor is removed. With the retraction of the peritoneum however, dilated, thin walled vessels on the surface of the kidney are easily torn and the resultant hemorrhage may be difficult to control. In employing this route, lumbar drainage should be supplied by a puncture wound placed in the back. As a rule the lumbar route, especially when augmented by resection of the last rib or employment of a transverse incision with a prolongation upward in the midline anteriorly, will give sufficient exposure. If it is thought necessary to remove the ureter, the lumbar route is to be preferred, furthermore, in the instance of tumors of the renal pelvis the kidney seldom reaches large size. Injuries to the bowel, vena cava and pleura are possible during nephrectomy for renal tumor and are best avoided by employing a free exposure. Extension of the growth into the renal vein or vena cava has been noted.

There have been fifty-four renal malignant growths under treatment at St. Luke's Hospital during the past ten years. Of this number twenty-nine were diagnosed as hypernephroma, one being bilateral. In eighteen metastases were present. Of eleven patients without metastases who were operated on, four are alive ten

five, three and two years after operation. There were fourteen patients with carcinoma of the kidney (seven showing metastasis). Of this group two are alive six and three years after operation. Of five patients with carcinoma of the renal pelvis, one involving the ureter, two patients are alive three and two years after operation. I have a third patient in the latter group alive twelve years after operation. Three patients with sarcoma of the kidney all died within two months. There were also two patients with adenoma, both alive, and one with epithelioma.

This brief summary of cases indicates (1) that the large majority of cases of malignant disease of the kidney are seen late in the disease, when metastases are present, (2) that, in the cases seen before metastases are present, nephrectomy offers a distinct hope for a cure. In one case in which nephrectomy was attempted and found impossible, irradiation reduced the growth to one-third the original size and I was able subsequently to remove the entire tumor. The pathologic diagnosis in this case was carcinoma of the kidney.

A greater difference of opinion exists regarding the treatment of bladder tumors than of any other type of malignant condition of the urinary tract. Before the advent of fulguration and irradiation, no treatment other than surgery was known. The end results from surgery were so poor that any new method of procedure was welcomed.

The common types of tumors of the bladder are papilloma, papillary carcinoma and infiltrating carcinoma, other types of malignant growths are so rare that they will not be considered in this brief discussion. While pathologists are not in entire agreement as regards the classification and gradation of malignant tumors of the bladder, Broder's gradation (based on the percentage of cells fully differentiated into adult forms) seems to be the most satisfactory one yet given. The question always arises as to whether the biopsy specimen represents the character of the entire tumor, with the tendency of so-called benign papillomas to recur, the recurrences often showing definite malignancy, it is a question whether apparently benign papillomas of the bladder should not be considered as grade 1 malignant growths.

That all tumors of the bladder should be thrown into definite classes, depending on the gradation of malignancy, and each class be treated as a routine, does not seem to be good judgment. The appearance of the growth, its position and size, mean much to the eye of the trained cystoscopist. The age and general condition of the patient and the question of metastases must also enter into the decision as to the line of procedure to be adopted in individual cases. All will agree that so-called benign papillomas or papillomas of a low grade of malignancy should be thoroughly and completely destroyed by fulguration. The resectoscope is often of great assistance in carrying out this procedure, especially when large and multiple papillomas are present. Equally important is a follow-up, cystoscopic examinations should be made at regular intervals for an indefinite length of time, the intervals becoming less frequent with the lapse of time should no recurrences appear. Recurrences should be recognized promptly and immediately destroyed.

Papillary carcinoma presents a different problem. Surgical resection has given good results in certain cases, while in others recurrences have occurred promptly. A definite pedicle seemingly surrounded by

an area of healthy bladder wall, when removed has often shown, on microscopic section, chains of cancer cells extending along the muscle bundles, even to the cut edge of the bladder mucosa. In other instances a supposedly pedunculated growth has proved to be the apex of a tumor, the broad base being situated in the outer layer of the bladder wall or in an extravescical mass of large size. Tumors are often multiple and are frequently situated in close proximity to a ureteral orifice, necessitating ureteral transplantation if the bladder wall is to be resected, a procedure which may result in a functionless kidney. With the advent of radium, the implantation of seeds into these growths or into the base of the pedicle after destroying the papilloma became a common practice. The difficulty of an even distribution of radiation following the introduction of seeds containing radium element or emanation, the destruction of intervening normal tissue, local irritation and burns resulting from its use, as well as the general toxemia that was produced, have resulted of late in its less frequent employment. Diathermy has been employed through an open bladder with seemingly satisfactory results in certain cases, and more recently transurethral resection has often proved to be a satisfactory method of removal of this type of growth. Within the past six years transurethral resection has been employed in eighteen cases of papillary carcinoma, and the results in these cases to date have been more satisfactory than those obtained by any other single method of treatment. The pedicle must be thoroughly destroyed, irradiation may be employed in conjunction with resection, and follow-ups are essential. Recurrences frequently present a lower degree of malignancy and often are more easily destroyed than was the original growth.

Infiltrating carcinoma of the bladder has been subjected to the same variety of procedures as has papillary carcinoma. In this type of tumor, especially when located in the trigon, the question of the advisability of a total cystectomy with deviation of the urinary stream will arise in an occasional case. This operation, while radical, must nevertheless be undertaken before the growth has extended beyond the bladder or metastasis has taken place. It will necessarily have a limited field of application.

Tumors of the bladder show such variations in structure, rapidity of growth and vulnerability that it is difficult to compare the efficacy of different methods of treatment. Irradiation in the form of radium or high voltage roentgen therapy may have a definite effect on certain papillomas, but such growths may also be readily destroyed by fulguration or removed with the resectoscope. Irradiation is frequently employed in cases considered hopeless in the light of other methods of treatment, yet infiltrating carcinomas are more or less definitely radioresistant. Certain tumors increase in size slowly, even if no treatment is applied, and such growths are undoubtedly those which seemingly respond well to various methods of treatment.

In reviewing 139 cases (thirty-one of which were reported pathologically as papillary carcinoma and 108 as carcinoma of the bladder) treated in St. Luke's Hospital during the past ten years, I found that one patient was alive five years after high voltage roentgen therapy only, five were alive after radium implantation two, three, four, six and in one instance seven years after treatment, four patients were alive five, four and three years after surgical resection, one patient was alive fifteen years after surgical resection and radium,

four were alive after fulguration (one of twenty, one of ten and two of eight years' standing) while patients are living the following number of years after transurethral resection of the growth: one six years, three five years, four four years, seven three years, four two years and three one year.

Twenty-two patients of the entire series presented extensive metastasis when first observed. Thirty-four patients are known to be alive three years or more since they were first seen. Excluding the twenty-two patients with metastases and inoperable conditions, 31.4 per cent are alive and well three years or more after onset.

There has been no question that the results obtained in cases of papillary carcinoma over a period of five years during which transurethral resection has been frequently employed have been better than those obtained by irradiation or surgical resection only. This has not precluded, however, the employment of any type of procedure or combination of therapy that seemed advisable in individual cases. More time must elapse before it will be possible to determine the number of actual cures as well as the lengthening of life that may be expected following such treatment. Obviously one cannot hope to remove entirely an infiltrating carcinoma involving the entire thickness of the bladder wall by transurethral resection, nor can one derive much encouragement from efforts to eliminate such growths by open operation or irradiation. A modified technic for applying irradiation, such as roentgen therapy to the open bladder, may in itself or in combination with surgery or resection prove to be a step forward. Many patients with malignant tumor of the bladder still come to us in the late stages of the disease, when all treatment must be palliative in nature, yet a diagnosis of tumor of the bladder is seldom difficult to make.

Rarely is the diagnosis of carcinoma of the prostate made at a stage of the disease sufficiently early to permit of removing the entire growth. Only by the removal of the entire prostate and its capsule can one effect a cure for prostatic cancer. Cancer may originate in association with hypertrophy, it may arise in the posterior lobe or in the perineurethral glands. It is present in approximately 20 per cent of all cases of prostatism and is discovered on microscopic section in approximately 3 per cent of prostates removed for hypertrophy. Arising commonly in the posterior lobe, cancer of the prostate frequently invades the seminal vesicles by direct extension, often involving the neck of the bladder and becoming a sizable growth before retention or hematuria occurs. In other words, a sudden attack of retention or the appearance of blood at the end of urination may be the first indication of what on examination will prove to be a growth that has already involved the prostatic capsule and seminal vesicles, the gland then being hard, nodular and firmly fixed.

Cancer of the prostate is often slow in growing. Patients have been observed over long periods (in one instance twelve years) during which little change has taken place in the size of the growth and there has been no appreciable interference with urinary function. It is undoubtedly in this type of case that various methods of treatment have given encouragement as to the results obtained, from either surgery, irradiation or transurethral resection, or combinations of any or all of these procedures.

In 1936 I reviewed cases of carcinoma of the prostate observed over a period of twenty-five years and

in which prostatectomy, cystostomy, irradiation and transurethral resection were the treatments used. At that time a series of sixty-three resections carried out on fifty-two patients during the previous four years were cited and the technic employed in transurethral resection was described. During the past two years, twenty-four additional patients have undergone this procedure for cancer of the prostate, in four instances carcinoma of the bladder was also found to be present and was completely removed by resection at the same time.

The results have continued to be such that except in the occasional rare case in which an entirely encapsulated growth may be completely removed or it may seem wise to employ irradiation transurethral resection by restoring bladder function even in the presence of metastases has given more relief and for a longer period than has any other method of procedure employed up to the present time. High voltage roentgen therapy may be beneficial in relieving pain incident to metastases.

Two patients treated with radium only have survived seventeen and fifteen years after prostatectomy, two patients are alive fourteen and eleven years after operation while of seventy-six who have had transurethral resections with no operative mortality thirty-nine are known to be alive and comparatively comfortable over a period of from one month to six years after operation.

#### SUMMARY

A malignant condition of the urinary tract whether located in the kidney, ureter, bladder or prostate, can be cured only by its complete removal while still localized. This can be effected only through an early diagnosis which may be difficult because of the late appearance of physical signs and symptoms suggesting its presence.

Irradiation in the instance of kidney tumors may be a valuable adjunct but does not take the place of surgery.

Nephrectomy carried out under satisfactory exposure and with as little traumatism as possible will result in a certain number of cures. Cancer of the kidney pelvis and ureter (the latter to be suspected in all instances of filling defects in the ureterogram) should be diagnosed early and a nephro-ureterectomy carried out.

Tumors of the bladder, while easily diagnosed, are often allowed to become extensive before being discovered. Fulguration and transurethral resection give excellent results in low grade papillomas and in certain cases of papillary carcinoma, while infiltrating carcinoma is often radioresistant, and the only surgery applicable may be a total cystectomy following a deviation of the urinary stream.

Cancer of the prostate is essentially a fatal disease. Rarely is its complete removal possible. As a rule when the diagnosis is made the disease has extended beyond the capsule, and one's efforts may best be expended in restoring urinary function, which may be accomplished with a minimum of risk to the patient by means of transurethral resection, it being borne in mind that most cancers of the prostate are slow in growing.

A certain amount of encouragement should be derived from the occasional cures obtained from radical surgery in all types of malignant conditions of the urinary tract, also from complete eradication of tumors of the bladder, in some instances by fulguration and by means of the resectoscope. Transurethral resection has proved to be a decided addition to our methods for treating

cancer of the prostate—at least to the extent of giving functional relief without mutilation

The watchword should be “early diagnosis,” with constant emphasis on the necessity of ascertaining the origin of red blood cells in the urine, for only through such means will one be able, in the light of our present knowledge, to substitute methods of cure for palliative treatment in the management of genito-urinary malignant tumors

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#### ABSTRACT OF DISCUSSION

DR GEORGE C PRATHER, Boston Regarding malignant tumors of the testis, less importance should be attached today to the hormonal diagnostic tests than was believed warranted three or four years ago, unless a quantitative report can be obtained from a dependable laboratory. It is to be hoped that further observations resulting in a more definite yardstick for measurement of the follicular changes which the hormone causes will eventually be a definite aid in diagnosis and prognosis. In the treatment of a testicular tumor I prefer preoperative fractional irradiation of the affected part and bony pelvis followed by orchiectomy, by the technic of ligating and bisecting the spermatic cord before delivering and removing the testicle. There are times, however, when all diagnostic methods may leave one uncertain as to whether the patient has a testicular tumor or other scrotal abnormality. In such an instance I hesitate to use radiation, even as a therapeutic test, preferring to inspect the testis through a gently made but generous incision in the cavity of the tunica vaginalis, which allows adequate exposure with a minimum of handling of the testicle, should the trouble be tumor. One has, of course, another choice when the preoperative diagnosis of testicular tumor is uncertain—that of performing orchidectomy after ligation of the cord. This, however, may lead occasionally to an unnecessary sacrifice of a valuable structure. It is agreed I believe, that testicular biopsy should never be done except by orchidectomy. My lack of experience with Hinman's courageous operation precludes any remark. No doubt the greatest improvement in the percentage of five year cures in persons with malignant tumors of the renal cortex will, during the next few years, occur in children having the Wilms type of tumor. This success will be due in a great part to the miraculous recession in size caused by the fractional or Coutard type of irradiation preliminary to nephrectomy, a procedure now generally accepted. The death of many, if not all, tumor cells as the result of radiation in the kidney with Wilms tumor makes nephrectomy relatively safe, from the standpoint both of immediate mortality and of spread of malignancy during operation. Unfortunately the response of malignant tumors of the renal cortex in adults to preoperative roentgen treatment produces only moderate, if any, appreciable recession in size of the tumor, so that one is often faced with nephrectomy for a patient showing a large renal tumor with no demonstrable metastases. If my logic is correct in the technic of orchiectomy for malignant testis, one should do transperitoneal nephrectomy, ligating the renal pedicle before attempting to deliver the kidney. There are times, however, when a tumor originating on the anterior surface of the kidney close to the hilus causes delay or difficulty in exposing the pedicle. Exploration of a kidney where there is only a question of tumor should, I believe, be done through an extraperitoneal incision of the flank.

DR CLARK M JOHNSON, San Francisco Dr Bugbee has reviewed a subject to which a lifetime could be devoted. He has outlined the treatment of cancer of the kidney bladder and prostate and indicated his preference. He has stressed the key to the only cure known for cancer—early diagnosis. He has not attempted to regale the members with cures due alone to irradiation or to radical surgical measures. I wish to emphasize the importance of the subject he has presented. In ten years at the University of California Hospital there were 4,592 admissions in the urologic service. A definite diagnosis of cancer of the genito-urinary system was made in 274 cases. Of this number many were reentries, I was unable to separate the

reentries from new cases. The number of cases of cancer included only those in which the diagnosis was proved by a pathologic examination. However, the 6 per cent or more of cancer in a urologic service gives it importance. When I find that of the 274 patients with malignant growth only a small number are still alive, the number assumes added importance. The patients had the advantage of as good high voltage roentgen therapy with or without radical or palliative surgical measures as there is available, to my knowledge. The poor results, therefore, were due to late diagnosis, and results will be the same in a similar group of patients until there is available a real cure for cancer in all its stages or a more concerted effort is made by the whole profession and the public which will lead to earlier diagnosis. This is particularly true of cancer of the bladder, hence I have singled out seventy-six cases of that condition. These represent the worst possible results because only hospitalized patients are in this group. About 150 cases of papilloma of the bladder were observed, and a fair number of these were labeled by the pathologist as instances of papillary carcinoma or malignant papilloma from the biopsies. It was in this group of precancerous lesions or early cancer without deep infiltration that cure was obtained. With carcinoma of the bladder advanced enough to require hospitalization there was a history of hematuria and urinary symptoms of months or years before examination. Sixteen patients were lost track of. Of the other sixty, only four are known to be alive. All four underwent cystectomy and diversion of the urinary stream. Many of the others died of urosepsis, without definite evidence of recurrence of carcinoma. Too often the justifiable energetic treatment of carcinoma of the bladder is undertaken without enough regard for the upper part of the urinary tract, with resultant ureteral stenosis and death from uremia.

#### FACIAL DISFIGUREMENT AND PERSONALITY

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With the rapid advance of reconstruction surgery during the past decade in technic, in availability to the public and in the types of disfigurement that have been treated, new interest has developed in this field. The experience of surgeons has been, however, that the benefit derived is not always in keeping with the results. They have found patients who have benefited both in body and in mind but also patients who, although they have experienced very creditable surgical results, have remained unsatisfied and have shown that they are sick and maladjusted persons.

A study was undertaken of the personality of patients coming to the Graduate Hospital of the University of Pennsylvania for plastic repair of facial disfigurement under the direction of Dr Robert H Ivy and his associates. There has been a total of 312 such patients. In this study, patients with disfigurements of recent traumatic origin were not included, for the reason that the immediate reaction to an accident is determined by the existing personality. Only after from two to five years should one take as permanent the effect of facial change, because this time is necessary for the personality to accept and incorporate the new factor.

Twelve cases were taken as examples for detailed study. The study was carried out in the Graduate Hospital, usually during the postoperative period, when operation was performed and at the Institute of the Pennsylvania Hospital when the disfigurement was not suitable for surgical intervention or there was special psychiatric interest.



The patients were interviewed informally on from two to six occasions, each interview lasting from two to eight hours. They were not conscious of the reason for these interviews. After a general history had been obtained, the personality material was elicited in an informal manner, the latter was later incorporated into workable form, the outlines of Strecker and Appel being followed.

A brief summary of the twelve cases gives some indication of the contrasts on which their separation into three groups is justified.

**CASE 1 (group 1)**—A boy aged 13 had burns of the neck and face, with contracture, of ten years' duration. He was an athletic, intelligent, artistic boy in the tenth grade. His health had always been good, and he had a cheerful, happy, optimistic personality, was socially inclined and outgoing, possessed no inferiority complex and no self-consciousness and was rather phlegmatic. He came from a demonstrative family, was rather close to his parents in affection and had no jealousies of his siblings. He accepted his handicap rather well and was objective about it.

**CASE 2 (group 1)**—A rather phlegmatic, psychic girl aged 16 appeared at the clinic for repair of contractures of the neck and shoulder occasioned by a burn which she suffered at the age of 6 years. Her reason for wanting an operation was that she wanted to get married and be better looking. There was no sense of inferiority, she stood pain well and her energy was quick and steady. She was rather cheerful, friendly and sociable, having no especial drives or ambitions. She was close to her mother and spoiled because of her burns. However, there was no jealousy of her siblings. Her amusements were outgoing. She admired her sister. Her interests were marriage and family. One suspected a low intellectual capacity. This girl had not been affected by her handicap, did not expect too much from operation and was expected to make a satisfactory adjustment after repair.

**CASE 3 (group 1)**—A man aged 29, an Assyrion, came to the clinic to have a long, redundant tip removed from his nose, saying "It keeps me from advancement in my work, my boss has told me so." He had a trade school education, had been in excellent health, lived with his family and had made a good social adjustment in spite of his congenital facial appearance. He had advanced in his trade and was friendly, outgoing, tactful, neat and efficient. He was affectionate and took close care of his mother and siblings. He was an artistic, social type, his ambitions were well within the realm of possibility and he dealt objectively with his handicap. He did not expect too much from operation.

**CASE 4 (group 1)**—A man aged 27 came to the clinic with hemiatrophy of the face and progressive ankylosis of the jaw, which began at the age of 7, after an infection. He wanted the operation so that he could eat. He was a cabinet maker, provided for a large family and had made a good social adjustment. There was no inferiority despite marked deformity. He was emotional, cheerful, optimistic and objective, he adapted well and had no more than average anxiety. He was decisive and neat and expected little from operation that could not be given. He had a healthy concept of his condition, and after operation the results were good.

**CASE 5 (group 2)**—A white woman aged 23 had had post-infective hemiatrophy of the face and skull with ankylosis of the jaw for seventeen years. She wanted an operation so that she "could become more acceptable to people and get a job." She had a tenth grade education, her health was poor as a child and she had been dependent on her family throughout her life. For the past ten years she had withdrawn into her home, keeping away from all social contacts. She was moody, explosive, childish and resentful, with marked likes and dislikes. Her ambition was to become a nurse in a home for the blind or with crippled children or to be a beauty operator. She expected operation to make her an average, acceptable face and was vindictive and depressed when she found that this could not be done. After operation she became quite a problem for a while because of her attempts to compensate.

**CASE 6 (group 2)**—A woman aged 24 came to the clinic for repair of a cleft palate and a harelip, on which there had been an unsuccessful attempt at repair ten years before. She came because of her "facial appearance." She had a business college education, although she refused to graduate because of a slighting remark made by a professor. Her health was good, although she was dependent, complained of pain and was easily hurt physically and emotionally. She fatigued easily and was irritable, tense and excitable, cynical and self-conscious. She desired attention and was subborn and childish, with an ego-centric, vindictive trend. Her family relationships were completely demanding and egocentric. She hated her mother and sisters because, she said "They are so beautiful and don't realize what I go through." After repair of her harelip was successful, a hysterical paralysis of one leg and alleged phlebitis developed, and it was only with difficulty that she was discharged from the hospital. She very evidently was hiding behind her deficiency and other psychoneurotic symptoms quickly developed to replace her harelip when it was repaired.

**CASE 7 (group 2)**—A psychic German youth aged 23 came to the clinic for repair of a post-traumatic scar on the right side of the face with a contraction deformity of the nose and eyelid of five years' duration. He wanted the repair because he wished to get married. He had a tenth grade education, stood pain well and was self-conscious, seclusive, irritable, embarrassed, reticent and somewhat suspicious. He projected much of his social trouble onto the accident and had no close emotional ties either at home or with friends. He felt that he had not received adequate restitution for his accident and was vindictive. He was prone to lay much of his financial and social difficulty to the deformity and was expected to react only moderately well to operation.

**CASE 8 (group 2)**—A man aged 41, who came to the clinic with a congenital saddle nose, desired repair so that he would "be a success in business and marital life." He was a photographer, his health had been good, he had marked feelings of inferiority concerning his facial appearance and on this placed the blame for his inability to make a good living in his chosen field and also for the marital infidelities of his wife. He was tense, envious, moody, irritable and unstable. Socially he was apologetic and withdrawing, undecisive and easily hurt. He was dominated by his wife and felt inferior to all about him. He felt definitely that his facial appearance was the cause of his business failure and expected repair of his nose to alleviate all his difficulties. He was not objective in his attitude toward operation.

**CASE 9 (group 2)**—A man aged 35, a Jew, asked for remodeling of his racial nose because his nose kept him "from getting a job or joining social clubs." He had had two years of college education and his health had been good, although he complained continually and felt markedly inferior to those about him. He fatigued easily and was indecisive, fearful and slow thinking. He came from a family background of strife, parental separation and parental domination. He was childish and immature in his attitude toward his family and his own importance. He had never had a job, had no ambitions or goals and was completely bound up in the problems of the moment. His was a completely inadequate personality. He blamed his racial heritage for his inability to find happiness. No operation was performed because of this quite evident rationalization.

**CASE 10 (group 3)**—A man aged 30, a German, with a post-traumatic asymmetry of the mandible, asked for repair so that he could "go out of the house in the daytime and not be laughed at." In reality, the examiner had to ask what the deformity was before it was noticeable. The patient had quit many jobs and had been unable to continue work until he got a job in a mine where he would not come in contact with other people. He was seclusive, antagonistic and resentful, blaming others for his misfortunes. He was dependent on his wife and jealous of his friends and relations. He was hypochondriacal and prone to blame his environment for his troubles. After operation there developed a transitory amaurosis, which responded to suggestion. He became demanding and antagonistic in the ward, although the surgical results were excellent. This man will probably remain a chore to the surgeon or to the medical staff.

CASE 11 (group 3)—A fair-skinned, retiring, reticent, Irish youth aged 19 came to the clinic for removal of a small, soft, postoperative scar at the hairline of the left brow. It had been present for four years. He said "It keeps me from making friends, people look at it and laugh and I am embarrassed." The deformity had to be pointed out to the examiner. The patient's father had been an alcohol addict, and his mother, who was tuberculous, had died when he was 10 years of age. He grew up in an atmosphere of constant strife and uncertainty and was adopted at the age of 13. He went into the navy "to become a man," was disappointed in his advancement and in the past year had become seclusive, unhappy and suspicious. He blamed the small scar for his inability to find social success. His was an introverted personality rationalized on the basis of a small scar. No operation was performed.

CASE 12 (group 3)—A girl aged 17 was operated on at the age of 13 for "lop ears," as she felt that they prevented her from entering social activities and making friends. Since the operation there had been a recurrence of physical and emotional upsets. She was withdrawing, asocial, egocentric, suspicious and immature. She hated her sisters and mother and had tried to kill them. She had no capacity for ideals or ambitions and was completely self indulgent and egocentric. A diagnosis of schizophrenia was made, and she was committed.

From a study of these cases we feel that persons with facial disfigurements can be divided into three main groups. Group 1, the superior group, consists of well adjusted persons (cases 1, 2, 3, 4). Group 2 consists of persons with recessive or inadequate personalities, who retreat behind the "handicap" and unconsciously use it as a defense (cases 5, 6, 7, 8). Group 3 consists of prepsychotic and psychotic persons, with whom the facial abnormality is the material, the factual point of focus, of a schizophrenic process (cases 9, 10, 11, 12).

In the first of these groups one finds moderately successful, well adjusted persons who have marked disfigurements and who wish repair purely for cosmetic reasons or for comfort and not as an answer to all their problems, financial, emotional and social. They do not expect too much of their improvement and have a logical concept of the outcome. They offer ideal material for obtaining successful results, both plastic and emotional.

A report in greater detail of case 4 illustrates well this type of patient.

An Italian cabinet maker had infantile paralysis at the age of 7 and an abscess at the age of 14 which produced hemiatrophy of the face and progressive ankylosis of the jaw. At the age of 20 he was able to open his mouth only half way. When he came to the clinic he could open it only 2 cm. He had felt no especial handicap from his facial appearance, was a leader in social activities, had succeeded in his trade, was happily married and was supporting a family of four. His only worry was the loss of time occasioned by the operation. He had accepted his facial deformity and adjusted himself well. He was excellent personality material and characteristic of the group in which one would expect the best plastic results.

The recessive, or inadequate, personality group is composed of those patients who, feeling a marked handicap because of their condition, have secluded themselves and altered all their desires, emotions and activities because of their facial appearance. They have become limited in their social scope, general knowledge and social experience. They tend to develop a jealous, hateful personality indicated by sarcasm, a cynical attitude, marked aggressive hates or loves, dislike of siblings or parents and active hate and envy more or less repressed, for "normal people." These feelings may be repressed to below the conscious level. An exposing of them is a greater surprise to the patient than to the

people in his environment. The ultimate result may be expressed as marked antisocial activity or sadistic desires. Because of or as part of the typical seclusive life these people lead, their emotional development remains at an egocentric, immature and childish level, making them selfish, self indulgent, self deifying, thoughtless of others, obstinate, and illogical in matters pertaining to their own comfort or activities. Their attitude is usually quite easily controlled by suggestion and tactful persuasion. Their immaturity makes them fearful, prone to panic states, suspicious and deceitful. It is the basis for their self consciousness, ideas of reference, easily hurt feelings and projection of their difficulties onto the environment.

The result of this immaturity and fear, which produce a vicious cycle, is often laid at the door of the facial disfigurement by the patient.

What is the result of the removal of this answer to his personality inadequacy, is the surgical repair of the facial anomaly?

For years the scar, harelip or misshapen nose has been looked on as a handicap, and its importance in the social and emotional adjustment is unconsciously all embracing. It is the "hook" on which the patient has hung all inadequacies, all dissatisfactions, all procrastinations and all unpleasant duties of social life, and he has come to depend on it not only as a reasonable escape from competition but as a protection from social responsibility.

When one removes this factor by surgical repair, the patient is cast adrift from the more or less acceptable emotional protection it has offered and soon he finds, to his surprise and discomfort, that life is not all smooth sailing even for those with unblemished, "ordinary" faces. He is unprepared to cope with this situation without the support of a "handicap," and he may turn to the less simple, but similar, protection of the behavior patterns of neurasthenia, hysterical conversion, hypochondriasis or the acute anxiety states.

It is this group which forms the exasperating, disturbing chore for the surgeon who has obtained an excellent technical result. Such patients make the surgeon realize that his responsibility includes "the person" as well as the operative field. Because of this, psychiatric aspects must be considered by the surgeon in working for complete and satisfactory results. It is the duty of the psychiatric service to aid the surgeon in helping to spot such potential reactions.

Case 5, here presented in greater detail, is an example of this group.

An unmarried young woman had hemiatrophy of the face and skull to the left with resulting ankylosis of the jaw. This was occasioned by recurrent osteomyelitis at the age of 7 to 12. She went to the tenth grade in school and then quit and withdrew into her home because her facial appearance "made people laugh." She had had no social contact for the past ten years and her admission to the hospital was the first time she had been away from home during her entire life. She said "I thought I would come to the hospital and go out with a beautiful face like every one else." After the first operation she realized that this would not happen, became depressed and threatened suicide in a childish fashion. She was stubborn, obstinate, sensitive and suspicious. She had quick swings of mood and anger and responded quickly to suggestion. Her ambitions were out of keeping with her possibilities as she wished to be a doctor, a nurse or a beauty operator. She refused to admit that her facial deformity as well as her educational limitations would keep her from these occupations. She had met her difficulties by hiding behind her facial disfigurement which she used as

a rationalization of her inability to make a social adjustment. We felt that with an intelligent and sympathetic program and facial reconstruction a fairly good result could be obtained.

A logical question arises at this point. Do all these persons with inadequate personalities fall into a psychopathologic state and become problems after the surgical experience? We think that "no" is the answer. There is the retiring, passive, apologetic person who finds his psychic adjustment through humility and forbearance and is everlastingly thankful for any interest or aid given or offered by his environment. He does not cause the surgeon trouble even if the surgical results are unsatisfactory.

The third group is composed of those persons who have a primary, or basic, personality inadequacy. They are unable to assimilate and digest the demands and restrictions of their environment or to measure up to their opportunities and in casting about for a plausible basis for rationalization come, by chance perhaps, on a minor defect, such as a mole, acne scar, freckles, a long lip or an unequal nostril. From this they build an all-inclusive rationalization of their difficulties, out of all proportion to the reality values of the deformity. Furthermore, there are conscious and unconscious meanings to those deformities or defects.

Any plastic or reconstruction procedure only serves to interrupt the rationalization process, and soon the resulting scar or some other trivial defect is seized on for continuation of the delusional and illusional construction, which is often frankly schizoid.

When such patients appear for surgical aid one is wise to proceed with greatest caution, and it is suggested that physiologic function alone be used as the criterion for operative intervention. This criterion is offered because the emotional importance of the disfigurement is secondary to a basic prepsychotic personality and regardless of the technical success the procedure will serve only to diversify instead of to remove the expression of an incipient psychosis. Case 11 is a classic example of this group.

A youth had a small white scar on his forehead which was undetectable without close observation. He was tall, slender and asthenic, with many facial mannerisms, was reticent and emotionally unstable and seemed perplexed at times. He felt that this small scar was responsible for his inability to make a satisfactory social and occupational adjustment, and it had been the reason for his seclusiveness for the past two years. His mother, who was tuberculous, died when he was 10, after many years of strife with an alcoholic father, who deserted the children soon after her death. He was raised in a tuberculosis hospital and an orphanage and by foster parents. In the second year of high school he became seclusive and disinterested in social activities, his lessons became difficult and he had some change in personality, which he attributed to a small mole, which was removed by electrolysis. After about one year he transferred his rationalization from the mole to the resulting scar, where it remained to this time. He had joined the navy about two years before and was dissatisfied with his advancement. He was prone to blame the aforementioned scar for his difficulty in adjustment and was unable to accept any other explanation despite logic or reason. It is obvious that he was definitely in the early stages of schizophrenia and that operative procedure would only serve to precipitate a more active phase of his psychosis. No improvement of the basic condition could be attained by treatment of the presenting symptoms.

It is here logical to consider whether all the prepsychotic reactions are of the schizophrenic type. Other reactions were conspicuous by their absence in this study, perhaps they may be found later. The schizophrenic reaction is definitely the common and characteristic one.

In the cases available, the extroverted, affective personality types were absent, and practically all the members of the well adjusted group could be classed as outgoing types. This fact leads one to feel that either the extroverted, affective person adjusts to his facial deformities without surgical aid or that when he has an operation he offers the most adequate subject for aid from an emotional standpoint.

No attempt is made at this time to discuss the underlying psychobiology of the reactions observed, as prolonged study and contact are necessary for an understanding of them. This we hope to report in future communications.

It is our hope that the direction of attention to this fertile field will be productive of more satisfactory results for all concerned in this growing branch of surgery. The proper selection and preparation of the patient may at times be as helpful as the proper surgical technique and skill.

The question arises regarding how these types can be recognized by a busy surgeon. Experience must be the guide. In general, however, one must look at the patient as an integrated organism, in which the personality needs study as well as the somatic factors involved. We list herewith certain questions that might be kept in mind: 1. What was the personality prior to the disfigurement? 2. What was the patient's emotional status when he was first conscious of his disfigurement? 3. What part has the disfigurement played in formation of the present personality? 4. What will probably be the emotional effect of plastic removal of the facial defect?

These questions require only a general working concept of basic personality factors and mental mechanisms plus the judgment and common sense of the investigator. The cardinal requirement is an interest in the patient's makeup and from one to three hours of time, depending on the physician's ability and the patient's complexity. In this period if the patient is encouraged to talk of factors other than his illness, the aforementioned personality outline is used only as a guide (not as a rigid questionnaire) and the physician considers the effect, judgment, security, and relative value in the patient's productions as well as their superficial content, as a rule an excellent estimation can be gained in a relatively short time.

If time or circumstance renders it impossible to make the necessary effort, an opinion of a psychiatrically trained consultant will not be amiss and will usually be welcomed by the patient. Such a consultation will often forestall an unpleasant, prolonged and thankless effort on the part of the surgeon.

#### SUMMARY

A consideration of the personality and emotional status of the patient seeking a facial operation is recommended in an attempt to diminish the number of emotional defects which hound the surgeon after good technical results have been obtained. This can be achieved by a better understanding of mental and personal mechanisms on the part of the plastic surgeon and can be further facilitated by a closer association of the plastic surgeon and the psychiatrist. An estimation of the personality by one trained in that field as well as in the field of general medicine is recommended at least until the surgeon has acquired an insight and a workable concept of what personality factors influence the total result from the patient's standpoint.

## WHOOPIING COUGH

## NEW PHASES OF THE WORK ON IMMUNIZATION AND PROPHYLAXIS

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The coccobacillus of Bordet and Gengou (*Haemophilus pertussis*) has now been accepted quite universally as the sole causative factor of whooping cough, a filtrable virus plays no role. This pathogen, first isolated with difficulty from the coughed up, glistening pearls of mucus, can now be recovered with relative ease on cough plates exposed during the catarrhal stage. With the proper technique it has been recovered post mortem from alveoli and bronchi. It is not found in any other respiratory disease, intimately exposed immune subjects rarely harbor it.

## EXPERIMENTAL WHOOPIING COUGH

Various groups of investigators have produced clinical whooping cough in young monkeys (ringtails, rhesus chimpanzees) by nasal or intratracheal inoculation of recently isolated cultures. Furthermore, the paroxysmal cough, lymphocytosis and pathologic lesions were produced in monkeys inoculated with bacilli recovered from the finer bronchi of experimentally infected monkeys. To exclude any virus factor, Shibley<sup>1</sup> inoculated chimpanzees with a culture of *H. pertussis* that had been transplanted on suitable culture medium more than sixty times. Clinical whooping cough developed in the animals. In chick embryos inoculated with recently isolated cultures by Gallavan and Goodpasture,<sup>2</sup> pulmonary lesions developed microscopically similar to those found in human infection with whooping cough.

The human transmission experiment by the MacDonalds<sup>3</sup> brings strong evidence that a filtrable virus plays no etiologic role. Their four sons—two of them twins—aged 6, 8 and 9 years, all in good health, had not had whooping cough. Two of them had been vaccinated five months previously with a total dosage of 8 cc of *H. pertussis* vaccine (1 cc = 10,000 million organisms). The Chamberland L<sub>3</sub> candle filtrate of a recently isolated culture (half of the growth of the well seeded Petri dish, suspended in physiologic solution of sodium chloride, maintained at 37°C) was instilled into the nose and throat of each of the four boys. Symptoms did not develop in any of the boys in eighteen days. A colony from the intact half of the refrigerated plate was suspended in physiologic solution of sodium chloride. Approximately 140 bacilli were instilled into the nose and throat of each. The two vaccinated volunteers remained free from symptoms. Their cough plates were repeatedly negative and their blood counts remained normal. The two boys who had received no vaccine began to cough in a week, in the course of several weeks they showed all the clinical signs and symptoms of whooping cough. Their cough plates were repeatedly positive (+++), the blood counts rose to 29,200 and 29,100 respectively, lymphocytosis was marked. The paroxysms and vomiting persisted for weeks. Complement fixations on the four boys were four plus posi-

tive. The vaccinated boys remained well, although in the closest contact with the patients throughout the course of the disease.

The diagnosis of whooping cough without adequate proof is often misleading. Typical whooping cough in a sibling, intimate contact with a child in the catarrhal stage, a typical paroxysm or whoop, a positive cough plate early in the disease, typical lymphocytosis or a positive complement fixation test later substantiates the diagnosis. The typical whoop may be absent in infants and adults. Persons who had the disease months or years previously may again cough in paroxysms, whoop and vomit during subsequent respiratory infections without expelling the bacillus. Occasionally the disease is contracted by children a second time, more frequently by intimately exposed adult attendants, especially mothers and grandmothers. Without adequate tests it may be difficult to differentiate atypical whooping cough from other coughs. A protracted, paroxysmal contagious cough (without lymphocytosis or whoop) due to catarrhal tracheobronchitis may simulate clinical whooping cough. The paroxysmal cough of distemper (snuffle infection) in young children (contracted from pet rabbits, puppies, cats or infected children) can be differentiated from whooping cough by early cough plates or subsequent complement fixation and agglutination tests.

While using the cough plate in the diagnosis of whooping cough, Eldering and Kendrick<sup>4</sup> repeatedly isolated from children with paroxysmal coughs a new bacillus (*B. parapertussis*) which resembled *H. pertussis* in some respects, was like *B. bronchisepticus* in other respects but had some characteristics common to neither. The colonies resembled those of *H. pertussis* so closely that the children were quarantined as whooping cough patients. Only on subculture and further study were the differences found. It is not yet known whether children vaccinated with potent whooping cough vaccine would be protected against infection with this bacillus.<sup>5</sup>

Bradford and Slavin<sup>6</sup> reported the isolation of ten atypical strains, by the cough plate method, from children with pertussis-like coughs. Eight had been regarded as *H. pertussis* until further study showed clearly that they constituted an atypical group. The atypical strain was isolated from two infants in a contagious disease hospital, they presented all the clinical features of moderately severe whooping cough. The white blood cell counts were 17,500 and 36,600 respectively. Six of the strains were isolated from patients with what seemed to be "typical" cases of whooping cough treated at home. At that time there was a decided increase in the incidence of whooping cough in the city (Rochester, N. Y.). Eight atypical strains were isolated in a series of 160 consecutive "positive" cough plates—about 5 per cent of the "positive" plates. The atypical strains darkened the medium and showed early pleomorphism. They too resembled *B. bronchisepticus* in some respects but not in others. Each atypical strain was strongly antigenic when injected into rabbits. They suggest that all whooping cough vaccine for immunization should include an atypical strain. (This would weaken the vaccine and would probably not be strong enough to protect against atypical strains.)

Read before the Detroit Pediatric Society, Oct. 5, 1938.  
From the Evanston Hospital of Northwestern University Medical School.

1 Shibley G. S. Proc. Soc. Exper. Biol. & Med. **31**: 576 (Feb.) 1934.  
2 Callaway M. and Goodpasture F. W. Am. J. Path. **13**: 927 (Nov.) 1937.  
3 MacDonald Hugh and MacDonald E. J. J. Infect. Dis. **53**: 328 (Nov. Dec.) 1933.

4 Eldering Grace and Kendrick Pearl. J. Bact. **35**: 561 (June) 1938.

5 Since August 1935 Mrs. Eva Markley, my technician, isolated on five occasions only an atypical strain of *H. pertussis* on cough plates exposed to children reported as having whooping cough. One of these had had authorized *H. pertussis* vaccine.

6 Bradford W. L. and Slavin Betty. Am. J. Pub. Health **27**: 1277 (Dec.) 1937.

VACCINATION AGAINST WHOOPING COUGH

The efficacy of an antigen is usually interpreted in two ways (a) by serologic tests—complement fixation and agglutination (antibody responses similar to those produced by the disease), (b) by the severity of the disease, if infection occurs. Because both possess sources of error, views on the efficacy of vaccine differ. Complement fixation and agglutination tests do not actually prove the presence of immunity, without the injection of any antigen an appreciable number (more than 20 per cent, according to some epidemiologists) of exposed children who have not had whooping cough do not contract it when exposed, those who contract it show wide natural variations in severity.

The ultimate test of vaccine-conferred immunity is a comparison of results in similar groups of intimately exposed unvaccinated (control) and vaccinated susceptible persons in the same age range—preferably between 8 months and 3 years—the age period when the incidence of the disease is highest.

MUNICIPAL CONTROL OF WHOOPING COUGH

At the Evanston Health Department Whooping Cough Control Clinic conducted semiannually since 1934,<sup>8</sup> a total of 1,377 infants and young children (average age about 9 months) have been vaccinated. To date, a total of ten of the vaccinated children con-

quired, the three weekly injections are given just under the skin in alternate arms. The total dosage for children under 2 years of age is 5 cc (1, 2 and 2 cc at weekly intervals). The total dosage for children over 2 years is 6 cc (1, 2 and 3 cc at weekly intervals). If desired, the injections may be given at intervals of two or three weeks. The first two injections are given in the deltoid regions, the third is given in the left triceps region.

FAILURE OF ANTIGEN TO CONFER PROTECTION

An antigen fails to elicit specific antibodies in sufficient amount for prolonged immunity if it does not contain a sufficient concentration of the essential immunizing substance, if the injected dosage is inadequate or if the time interval between injection and exposure is not sufficiently long. Children over 2 years of age require a somewhat larger total dosage. Failure may result from impotent vaccine (old cultures, denaturing effect of preservatives, inadequate refrigeration), insufficient dosage for age, error in administration (deep injection in place of just under the skin), inability to develop antibodies from the injected antigen (premature exposure, too young) or premature loss of immunity (improper spacing, intercurrent diseases).

REACTIONS<sup>9</sup>

Parents are forewarned that a transient local reaction (redness and tenderness) and a rise in temperature may follow an injection. Reactions usually subside within thirty-six hours. A local induration or subcutaneous nodule may persist for a week or more. Nothing should be applied locally. Injections are not given in the area of a previous diphtheria toxoid injection or smallpox vaccination.

COMPLEMENT FIXATION AND AGGLUTINATION TESTS

Complement fixation and agglutination tests, performed with recently isolated cultures, maintained on a suitable culture medium, are usually positive with serums collected after the height of the disease or after adequate vaccination with potent vaccine. Gundel, Keller and Schluter<sup>10</sup> found that the complement fixation test remains negative in a very small proportion of patients with whooping cough—mostly infants who failed to produce antibodies and in whom the disease was often fatal. They found the antibody response after vaccination better when freshly isolated cultures rather than old laboratory strains were used. They proved the futility of the injection of vaccine during the paroxysmal stage.

Since 1934, Daughtry-Denmark<sup>11</sup> has used the test as a routine a month or more after the third injection of authorized vaccine. If fixation was not complete (four plus), an additional 3 cc of authorized (or 1.5 cc of "double strength") vaccine was given. Later on, if the retest did not show complete fixation, a final 3 cc (or 1.5 cc "double strength") vaccine was given. The Webb<sup>12</sup> modification of the complement fixation technic

Controlled Vaccinations with Authorized Haemophilus Pertussis Vaccine \* (Jan 1, 1933, to Oct 1, 1936), Age Range 6 Months to 4 Years

Groups		Number	Contracted Whooping Cough
Private, from 1933	Unvaccinated (controls)	540	10
	Vaccinated	1,001	16
Evanston Department of Health from 1934	Unvaccinated (controls)	1,100	129
	Vaccinated	1,377	10
St. Vincent's (1935 epidemic)	Unvaccinated (controls)	70	52
	Vaccinated	70	6
Totals	Unvaccinated (controls)	1,730	286
	Vaccinated	2,453	2

\* Since March 1 1938 only double strength vaccine (1 cc = 20,000 million organisms) has been used total dosage from 80,000 to 100,000 million.

tracted whooping cough more than three months after injection. For the decade ending in 1933 the average yearly city total of reported cases of whooping cough was 334. In 1936 the city total was ninety-one, the lowest yearly total in the history of the department of health. In one clinic child the disease developed shortly after vaccination, none of the remaining ninety patients in the city had received vaccine. In 1937 the city total was 131 cases, chiefly among the Negro children, whose parents had remained rather reluctant about whooping cough vaccination. Of twenty-seven vaccinated Negro children subsequently exposed to whooping cough in their unvaccinated siblings, mild pertussis developed in three whereas in twenty-four the disease did not develop.

Since March 1938 both laboratories licensed by Northwestern University Medical School to make authorized H. pertussis vaccine for immunization have supplied us with so-called double strength vaccine (1 cc = 20,000 million organisms). It will be available in the near future. Owing to the smaller volume

7 This difference of opinion on the immunizing virtue of vaccine is augmented by the various ways in which vaccines have been made—from old stock strains or recently isolated cultures some mediums contain blood others do not some vaccines are washed others are not washed.

8 Sauer L. W. Inoculations Against Whooping Cough J. A. M. A. 109: 487 (Aug. 14) 1937.

9 When the heat sterilized syringe is reused without resterilization as is customary more than one child is injected the used needle should be cautiously replaced with a sterile one without the tip of the syringe being touched. To avoid contamination of vaccine with resultant local infection only the very end of the plunger should be touched as the syringe is being filled and discharged.

10 Gundel M. Keller W. and Schluter Willy. Ztschr. f. Kinderh. 57: 89 1933. Schluter Willy. Ergeb. d. Hyg. Bakt. Immunitätsforsch. u. exper. Therap. 18: 1 1936.

11 Daughtry-Denmark Leila. Studies in Whooping Cough. Am. J. Dis. Child. 52: 587 (Sept.) 1936. Am. Acad. Pediatr. Reg. 2: New Orleans 1937.

12 Sauer L. W. in Brennemann Joseph. Practice of Pediatrics 1939 (revision). Hagerstown Md. W. B. Saunders Company vol. 2 chapter 34.

can be performed in any laboratory equipped to make Wassermann tests. At the Atlanta Whooping Cough Control Clinic a total of 600 children were tested after vaccination. Twenty-eight were subsequently directly exposed to whooping cough, none contracted it. During the same five years, 174 of 192 nonvaccinated (control) children of the same social group contracted whooping cough. If a complement fixation test is not performed, Daughtry-Denmark recommends a total of 7 cc of "double strength" vaccine. She concludes "If complement fixation is indicative of antibody response, a four-plus fixation test has definite significance."

Miller found that washing *H. pertussis* (phase I) vaccine with distilled water or with 0.85 per cent solution of sodium chloride removed a specific substance which could be flocculated by hyperimmune rabbit serum. He concluded that this constitutes grounds for the omission of washing in the preparation of vaccine.

#### TESTS FOR VACCINE POTENCY

Burnet and Timmins<sup>13</sup> produced a fatal pulmonary infection in anesthetized mice by nasal inoculation of living *H. pertussis*, mice previously vaccinated with potent vaccine withstood the lethal dose. They suggest the use of this test in the evaluation of vaccine used in immunization.

Powell and Jameson<sup>14</sup> found that mice injected with three weekly doses of 0.1 cc of authorized vaccine withstood, one month later, the lethal dose of starch-treated living bacilli. They were the first to establish quantitative differences in the immunizing effectiveness of pertussis antigen. Silverthorne and Frazer, and Silverthorne<sup>14a</sup> injected mice with the authorized pertussis vaccines, other fresh strain vaccine, stock strain vaccines and "antigens." Only mice vaccinated with the authorized and other fresh strain vaccines withstood subsequent intraperitoneal injections of lethal doses of mucin-treated living cultures. They suggested that vaccine for immunization should be so tested before release.

Park and Mishulow,<sup>15</sup> Shorr<sup>16</sup> and Blatt, Levin and Schapiro<sup>17</sup> gave whooping cough vaccine intradermally. Park and Mishulow believe that a better response occurs with a smaller volume of vaccine. Shorr abandoned the intracutaneous technique because "of the marked local reactions and the large number of injections necessary to give a total anywhere approaching the proposed dosage. The largest single injection given intracutaneously was 0.2 cc and the total amount did not exceed 1 cc in any child."

#### CUTANEOUS TEST

Gundel, Keller and Schluter tested dilutions of *H. pertussis* endotoxin as a cutaneous test. It showed no specificity, nor was its necrotizing action neutralized by the addition of convalescent serum. Mishulow, Mowry and Scott obtained a toxic filtrate by growing the bacillus on horse blood-chocolate agar with 1 per cent horse serum-beef heart broth. The Shwartzman phenomenon was produced with the filtrate. Koplik neutralized the toxin with convalescent serum. Truschina,

Pechlotzkaja and Murawjowa<sup>18</sup> prepared a toxin which seemed to possess immunizing properties. Addition of 0.2 per cent solution of formaldehyde rendered it less toxic, when injected into animals, the toxin produced antibodies. Intradermal injection of diluted toxin in nonimmune children produced lesions resembling the Dick test. Their work has not yet been confirmed. Cruickshank and Freeman<sup>19</sup> isolated an antigenically active fraction from phase I bacilli. Tested in mice, it appeared to possess an immunizing potency equal to that of phase I vaccine. Miss Leonora Hambrecht and I produced whooping cough bacteriophage by growing young cultures of old strains in a concentrated fresh sewage bouillon filtrate which contained a small amount of defibrinated human blood. Lysis was transmitted in series, and platings made from such lysed tubes produced typical plaques.

Thompson<sup>20</sup> reviewed the work of others on a cutaneous test for whooping cough and tabulated his own observations on immune and nonimmune subjects with 0.1 cc of authorized vaccine (undiluted and diluted 1:10) and an endotoxin (diluted 1:5 and 1:10). Bacterial hypersensitiveness (positive cutaneous test) appeared about the tenth day of illness, reached a peak during the course of the disease and then usually receded. In some it did not completely disappear. The test seemed to be valuable in determining the immune state of a person, also as a diagnostic aid in atypical or missed cases when the cough plate was negative. He did not determine whether the positive cutaneous reaction indicated sensitization or immunity.<sup>21</sup>

#### PROPHYLAXIS

Bordet discontinued the use of whooping cough antitoxin as a prophylactic or curative agent because its questionable value did not warrant the hazards of anaphylactic reactions, serum sickness and sensitization to horse serum. Although the organic damage caused by endotoxin produced by the invading bacilli during the disease is not counteracted by whooping cough antitoxin, Schluter recently reported on the early use of a concentrated, more potent antitoxin prepared by the injection of larger doses of toxic cultures. Toomey reported that the injection of whooping cough antiserum aggravated clinical symptoms.

#### CONVALESCENT SERUM

Degkwitz was probably the first to report favorable results with convalescent serum in infants and young children when injected in the incubation and early catarrhal stage. Bradford<sup>22</sup> recently reviewed the literature on convalescent serum and whole blood in whooping cough. He recommended 10 cc of human convalescent serum or 20 cc of immune adult blood before catarrhal symptoms appear. Meader<sup>23</sup> recom-

18 Truschina N, Pechlotzkaja W and Murawjowa O. *Ztschr f Immunitätsforsch* 83: 124 (1934). Cutaneous tests with their toxin kindly sent to us failed to differentiate immune from nonimmune children. Deterioration while in transit is probably the cause of our negative results.

19 Cruickshank J C and Freeman G G. *Lancet* 2: 567 (Sept 4) 1937.

20 Thompson A R. *J Hyg* 38: 104 (Jan) 1938.

21 Dilution of authorized vaccine also of the clear supernatant liquid after prolonged centrifugation often gave cutaneous reactions like those described by Thompson. When 0.1 cc of authorized vaccine or its clear supernatant liquid after prolonged centrifugation diluted (1:8) with 0.5 per cent phenol in 0.85 per cent saline solution was injected intracutaneously into the skin of the forearm after whooping cough or several months after completion of vaccination against whooping cough, a local reaction that measured more than 10 mm in diameter was frequently observed twenty-four hours later. Nonimmune persons usually showed a smaller or negative reaction.

22 Bradford W I. *J Clin Child* 50: 918 (Oct) 1935.

23 Meader F M. *Prophylaxis of Whooping Cough* *Am J Dis Child* 53: 760 (March) 1937.

13 Burnet F M and Timmins Cecily. *Brit J Exper Path* 18: 83 (April) 1937.

14 Powell H M and Jameson W A. *J Immunol* 32: 153 (Feb) 1937.

14a Silverthorne Nelles and Frazer D T. *Canad M A J* 38: 556 (June) 1938. Silverthorne Nelles. *Canad Pub Health J* 29: 233 (May) 1938.

15 Mishulow Lucy cited by Park W H. *J Pediat* 7: 691 (Nov) 1935.

16 Shorr E Y. *J Pediat* 9: 49 (July) 1836.

17 Blatt M L, Levin I M and Schapiro I E. *J Pediat* 12: 619 (May) 1938.



mended the prompt injection of from 10 to 15 cc of pooled convalescent serum within the first week after exposure. In 72 per cent of the exposed infants so treated whooping cough did not develop, whereas in 30 per cent of the exposed but not injected (control) infants in the same age group the disease did not develop. Bessau observed no advantage in convalescent serum even when large amounts were injected early. Bordet holds that young infants are less susceptible to whooping cough because many possess, for the first few months, antibodies transmitted through the placenta from the immune mother.

Jundell injected parents preferably those who had had whooping cough in childhood, with three doses of vaccine at intervals of three days. He reported good results with such 'hyperimmune' convalescent serum when given in the incubation or early catarrhal stage. Because valuable time was lost by waiting, Kendrick<sup>24</sup> prepared hyperimmune serum by the injection of the Michigan whooping cough vaccine into donors. Such hyperimmune serum was injected into infants soon after exposure with apparent benefit.

#### LYOPHILE SERUM

McGuinness, Stokes and Mudd<sup>25</sup> pointed out that improved technical procedures for preservation, pooling and concentration of human serum facilitated the use of serum in the passive immunization of exposed infants. Pooled serums are preserved by drying in vacuo. The dry, yellow, porous material ('lyophile' serum) was redissolved in sterile distilled water just before use. It was usually injected in doubly concentrated form.

Twelve infants between 1 and 7 months of age, exposed for two weeks in a ward to an early case of whooping cough with a fatal outcome, were injected with lyophile serum on the twelfth day following the initial exposure. Eight received 10 cc and four received 20 cc. Whooping cough did not develop in any of the twelve. For two days a child of 10 years was exposed to a sister with whooping cough, 20 cc of the pooled adult serum was injected and whooping cough did not develop. Healthy adult donors who gave a history of whooping cough were injected with the routine course of authorized whooping cough vaccine, one full course of vaccine was given every four months. After four months the donors were repeatedly bled at varying intervals. Diluted lyophile whooping cough serum was injected into twelve children intimately and continuously exposed to siblings with whooping cough. Previous attacks of whooping cough could be definitely excluded. In six the disease did not develop, in three a cough developed which lasted for from ten days to two weeks but was not associated with a characteristic whoop, in the remaining three children typical but mild whooping cough developed. Fifteen patients with clinical whooping cough were treated. Five appeared improved and the other ten were not benefited. They concluded that lyophile serum was of prophylactic value for passive protection,<sup>26</sup> after the disease was active, its value was uncertain.

#### CONCLUSIONS

Whooping cough is caused by *Haemophilus pertussis* (coccobacillus of Bordet and Gengou), a filtrable virus plays no role

*Bacillus pirapertussis* (Eldering and Kendrick) causes a pertussis-like cough.

The newly recommended concentration of authorized *H. pertussis* vaccine (1 cc = 20,000 million organisms) requires a smaller volume of vaccine for active immunization.

It is not yet known whether the frequently observed positive cutaneous test (after the disease and after active immunization) is an allergic phenomenon or actual proof of immunity.

The present strongest laboratory evidence of vaccine conferred immunity is a four-plus complement fixation test.

Passive immunity, according to various investigators, occurs when intimately exposed infants are promptly injected with convalescent or hyperimmune serum before the paroxysmal stage.

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## Clinical Notes, Suggestions and New Instruments

### KALA-AZAR

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This case of kala-azar is reported because of the infrequent occurrence of this disease in the United States.

C. Y., a Chinese student aged 29, entered the United States from China Sept. 3, 1935. Prior to that time he had been engaged as a teacher and research worker in parasitology and entomology. He came to this country for graduate study at the University of Minnesota. His general health had always been good with the exception of several attacks of malaria.



Fig. 1.—Smear showing Leishman-Donovan bodies

On admission to the Students' Health Service the patient stated that about Dec. 15, 1935, he began to notice increased fatigue on moderate exertion, loss of appetite and slight dizziness. These symptoms increased in severity until December 21, when he was confined to bed, where he remained until the date of admission, Jan. 7, 1936. During this interval "chills" sensations and fever, nosebleeds, bleeding gums and loss of hair were noted.

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Dr. Watson is physician, Students' Health Service, and assistant professor of preventive medicine, University of Minnesota Medical School.

<sup>24</sup> Kendrick, Pearl. *J. Pediat.* 9: 117 (July) 1936.  
<sup>25</sup> McGuinness, A. C., Stokes, Joseph Jr. and Mudd, Stuart. *J. Clin. Investigation* 16: 185 (March) 1937.  
<sup>26</sup> Since the benefit of passive immunization is temporary, children so injected should also be given the three customary injections of authorized vaccine for prolonged protection.

On physical examination at the time of admission it was noted that the patient was fairly well developed but slightly emaciated. He appeared weak and fatigued but not acutely ill. The temperature was 100.6 F, the pulse rate 100 and the respiratory rate 20. The hair was dull and dry. The skin was clear. The eyes, ears, nose and throat were normal. The breath was foul. The tongue was clean and moist. The gums of the maxilla were bluish purple. There was dried and caked blood on the alveolar margins of the upper incisor teeth. There was no cervical adenopathy. The thyroid was not palpable. The lung fields were clear. No rales or other abnormal sounds were made out. The heart appeared to be normal in size, shape and position. A soft systolic murmur was heard in the second left interspace. The blood pressure was 110 systolic, 54 diastolic. The abdomen was protuberant. The spleen was enlarged extending below the umbilicus. It was firm and had a smooth edge. The liver was enlarged and palpable to about 3 cm below the costal margin to the right of the midclavicular line. Neurologic examination gave negative results. The white blood cell count was 2,700, the red blood cell count 3,000,000 and the hemoglobin content 60 Sahli units. The differential blood count showed 60 per cent polymorphonuclears and 40 per cent lymphocytes. Culture of material from the nose and throat was negative.

An admission diagnosis was not made. The patient remained for observation and further study. A Mantoux test (1:100 dilution) was negative. A roentgenogram of the chest showed nothing abnormal. Because of the patient's history of recurrent attacks of malaria and the splenomegaly, numerous blood

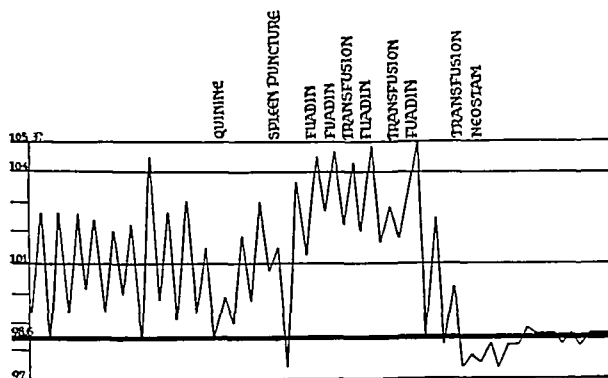


Fig 2—Response of the temperature to treatment

smears were made and examined for malarial parasites. Though none were found, a course of quinine was administered definitely to rule out malaria. A total of 75 grains (4.8 Gm) was given over a three day period. With the onset of toxic symptoms administration of the drug was discontinued. It had in no way altered the course of the illness. Because the patient had been doing experimental work with pathogenic filaria worms a night specimen of blood was obtained and examined for filaria worms. None were found. Agglutination tests with the patient's serum and antigens of tularemia and undulant fever were negative. The possibility of kala azar was suggested. A formal-gel test<sup>1</sup> was carried out. The result was strongly positive. Test of a control serum gave negative results. The patient had become weak and listless. Afternoon temperatures were becoming higher. Marked anemia (29 Sahli units of hemoglobin) had developed, and marked leukopenia, with a count of 1,800, was present. At this time (fifteen days after admission) a splenic puncture<sup>2</sup> was done. Smears were made which showed the presence of Leishman Donovan bodies (fig 1). Cultures were made on N N N medium. The patient at this stage was acutely ill and hope for recovery was slight.

A course of treatment with antimony was immediately started. This consisted of intramuscular injections of fuadin<sup>3</sup> on alternate days. The patient was given a transfusion of 300 cc of citrated blood every other day. After six days treatment his

condition became critical. His temperature was 105 F, his pulse rate 134 and his respiratory rate 28. There were petechiae over the abdomen, in the axilla, in the folds of the elbow, and on the right leg. There was also at this time a considerable accumulation of fluid in the peritoneal cavity. The platelet count was 20,430 per cubic millimeter. Up to this time a total of 125 mg of trivalent antimony compound had been given. The day following the last injection the temperature dramatically dropped to normal and the patient's general appearance was surprisingly improved. After two days' interval treatment was resumed, with the use of stibamine glucoside (neostam)<sup>4</sup> in place of fuadin. A total of 2.06 Gm was given in forty-three days. The only toxic manifestations noted were slight headache, urticaria and dry, nonproductive cough at the time of injection. These were well controlled by codeine and epinephrine. Figure 2 shows the response of the patient's temperature to various types of therapy.

At the time of discharge from the hospital the patient had made an apparently complete recovery. His blood picture was normal. The spleen had decreased in size and the liver was no longer palpable. The patient was able to resume his studies and in August 1937 was granted a Ph D degree in parasitology.

#### THE PROTHROMBIN TIME OF BANK BLOOD

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The institution of "blood banks" in many of the larger hospitals throughout the country has often made the clinician entirely dependent on stored blood for transfusion. That such blood is not equivalent to freshly drawn blood in all respects is becoming increasingly apparent.

For several years it has been a routine procedure at the Hospital of the University of Pennsylvania, in the service of Dr. I. S. Ravdin, to transfuse jaundiced patients in the surgical wards both before and after operation and to combat any manifest hemorrhagic tendency with repeated transfusions. The work of Quick,<sup>1</sup> as well as that of Brinkhous, Smith and Warner<sup>2</sup> and that of Dam and Glavind,<sup>3</sup> has provided a rational basis for the belief that transfusion may diminish the hemorrhagic tendency in jaundice. They have shown that the hemorrhagic tendency of jaundice is associated with a prothrombin deficiency and that normal blood contains a great excess of prothrombin beyond the amount necessary for clotting. Because of this work it seemed important to determine the prothrombin content of blood stored in the blood bank, of the Hospital of the University of Pennsylvania at various intervals.

A modification of Quick's method<sup>4</sup> was employed. The technique recommended for taking samples could not be followed because the blood in question had already been citrated.

Two cubic centimeters of each flask of blood was transferred to a sterile test tube the morning after it was drawn. Half of this amount was removed, the plasma was separated by centrifugation and immediately tested for prothrombin time. The other half remained in the blood bank with the flask from which it was taken. The temperature was regulated to 4 C. In forty-two instances this sample was tested on the third day, in sixty-six instances on the seventh day and in twenty-six instances on the tenth day. The average prolongation of the prothrombin time was computed in percentage and the results are shown in the accompanying chart.

Using serial dilutions with plasma in which the prothrombin has been inactivated with aluminum hydroxide as described by Quick,<sup>4</sup> we have found that a 40 per cent prolongation in

4. Napier, L. E. The Pentavalent Antimony Compounds in the Treatment of Kala Azar. Stibamine Glucoside (Neostam), an Analysis of the Treatment of Fifty Seven Consecutive Cases. *Indian J. M. Research* 16: 911-919 (April) 1929.

From the Department of Surgical Research, University of Pennsylvania School of Medicine and the William Pepper Laboratory of the Hospital of the University of Pennsylvania.

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2. Brinkhous, K. M., Smith, H. P. and Warner, E. D. *Am. J. M. Sc.* 196: 50 (July) 1938.

3. Dam, Henrik and Glavind, Johannes. *Lancet* 1: 720 (March 26) 1938.

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1. Napier, L. E. and Muir, Ernest. Kala Azar. A Handbook for Students and Practitioners. New York: Oxford University Press, 1925.

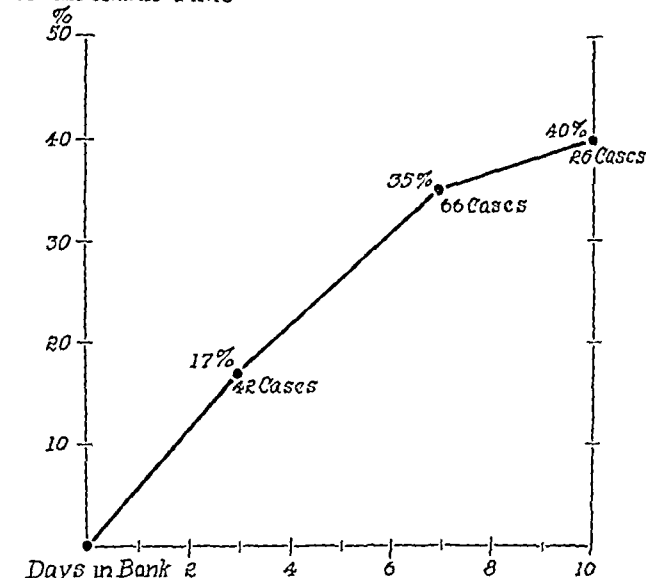
2. Napier, L. E. Technique of Splenic Puncture. *Lancet* 2: 126 (July 18) 1936.

3. Sodium antimony III bisacatechol-disulfonate of sodium.

prothrombin time indicates a decline to about 20 per cent of the original prothrombin concentration and that a 35 per cent prolongation in the time corresponds to a concentration of less than 25 per cent of the original prothrombin. The 17 per cent prolongation falls in a part of the curve in which small differences in the time represent large differences in the prothrombin concentration and represents a loss of over half of the prothrombin.

We conclude, on the basis of the Quick method, that blood that has been in the bank a week or more would be practically

#### *Prolongation of Prothrombin Time*



Average percentage increase in prothrombin time in specimens of bank blood

useless in the treatment of the acute prothrombin deficiency encountered in jaundiced patients not adequately treated with vitamin K and bile salts. Blood that has been in the bank three days would probably be of some slight value but it would be so inferior to freshly drawn blood that we recommend that only the latter be used when the transfusion is intended to combat the hemorrhagic tendency in jaundice.

#### METRAZOL THERAPY IN SCHIZOPHRENIA

REPORT OF A FATAL CASE WITH AUTOPSY

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SILFESSVILLE, MD.

There has been much enthusiasm recently for metrazol therapy of the functional psychoses. This is based on the dramatic remissions, on its ease of administration and on its adaptability to the treatment of large groups of patients. The literature, however, is still too meager to acquaint one with all the potential dangers attendant on the treatment. Meduna has treated more than 400 patients without a single death, in all, upward of 1,500 patients must have received metrazol therapy.<sup>1</sup> Severe headache, nausea and vomiting, fractures and dislocations, and many minor complications are common, but to date only three fatal cases have been reported. We record in detail, with autopsy, a case under metrazol therapy which terminated fatally.

#### REPORT OF CASE

**History**—D. G., a white man aged 24, since June 1936 had complained of nervousness, weakness, trembling, pains in the head, back and abdomen and a subjective sensation of high blood pressure. The latter symptom was associated with a feeling of hot fluid running up his spine. Following two previous periods of hospitalization he was committed to the Springfield State Hospital, Dec. 8, 1937. Here he was seclusive, preoccupied and retarded, he believed that people pursued him

and that voices cursed him and called him obscene names. He held fixed positions and was often mute. Other than measles and mumps and a tonsillectomy in childhood he had had no significant illnesses. One sister died of "meningitis of the brain" at the age of 8, but otherwise the family history was noncontributory.

**Examination**—**Physical Status**. The patient was tall and of athletic build. The heart showed no clinical enlargement, rhythm was regular and there were no adventitious sounds. The blood pressure was 120 systolic, 84 diastolic. The lungs were normal. Neurologic and eye-ground examinations were negative. Other than poor dental hygiene and a relaxed right inguinal ring, no physical abnormalities were noted.

**Laboratory Studies**. On admission the red blood cell count was 4,220,000, hemoglobin content 86 per cent and white blood cell count 8,200 with a normal differential. Repeated urinalyses were negative. Blood chemistry, including dextrose, nonprotein nitrogen and uric acid, was within normal limits. Examination of the spinal fluid was negative as were Wassermann reactions of the blood and spinal fluid. These studies and physical examinations repeated immediately before institution of metrazol therapy, showed no essential change.

The clinical diagnosis was schizophrenia of the catatonic type.

**Treatment**—Metrazol therapy was instituted Feb. 22, 1938. Three cc. of a 10 per cent solution of metrazol was given intravenously. Thirty seconds after the injection the patient gasped and there were blinking of the eyelids, dilatation of the pupils, flushing of the face and an increase in the pulse rate. Other than a few irregular movements no convulsion occurred. The following day he was preoccupied and retarded, there was some twitching of the facial muscles and he spoke of the treatment being "blurry, like electricity."

February 26, 4 cc. of metrazol was given. The patient became tense but showed no other reaction. Again he had the sensation of electricity and was slightly nauseated in the afternoon.

March 1, 5 cc. of metrazol was given. Ten seconds after the injection there was a sudden contraction of the body with the legs and shoulders raised stiffly from the bed. Without preliminary clonic movements an immediate tonic spasm set in which was followed by clonic movements becoming progressively slower and of greater amplitude. Immediately after the convulsion the patient became restless and appeared fearful of the examiner. He showed flexibilitas cerea for five minutes after the convulsion. In ten minutes he recognized the physician.

March 5, with 5 cc. of metrazol the patient reacted with the usual clonic-tonic-clonic metrazol convulsion. Again he seemed anxious and frightened afterward. The following day he complained of headache and nausea which persisted at intervals for three days; treatment was omitted March 8.

March 15, with 5 cc. of metrazol the patient reacted again with the usual convulsion, with a prolonged tonic and terminal clonic phase. A short series of clonic movements occurred a few seconds after the cessation of the convulsive seizure. The pupils were fixed and dilated, and there was conjugate deviation of the eyes to the left. He again showed flexibilitas cerea. In fifteen minutes he was able to respond and expressed hallucinations.

March 19, 5 cc. of metrazol was given. An atypical convulsion followed. Immediately after the injection a few irregular clonic convulsive movements occurred, most marked on the right side. Intense motor activity was present for a very short while and the patient tossed about on the bed. The pupils were dilated and remained fixed. The face, showing alternate pallor and flushing finally remained pallid. The irregular convulsive movements were present for two minutes and became rapidly weaker and finally the body relaxed. The pulse became weaker, was imperceptible at the wrist, and finally heart sounds became inaudible. Irregular respirations ceased. There was no cyanosis. Caffeine with sodium benzoate was administered intravenously, and artificial respiration was immediately instituted. Within three minutes 1 cc. of epinephrine was injected intracardially but heart sounds did not reappear, the patient could not be revived.

**Pathologic Examination**—Autopsy was performed five hours after death. All the organs of the body were intensely congested. The heart weighed 315 Gm., it was large and flabby.

<sup>1</sup> Cook, L. C. Cardiazol Convulsion Therapy in Schizophrenia. *Proc. Roy. Soc. Med.* 31:4 (April) 1938.

and filled with large quantities of blood. There were numerous, slightly raised fibrous nodules scattered through each of the cusps of the mitral valve, which was moderately thickened but not fixed. There was very slight ventricular hypertrophy. The brain was enlarged, edematous and remarkably congested but showed no other gross abnormalities.

The nodules in the mitral valve consisted of fibrous tissue with hyalinization and some scattered deposits of calcium. Similar scarring and deposits extended inward into and about the muscle bundles, replacing small areas of the latter with fibrous tissue. Small deposits of cholesterol were evident in parts of the valve. None of the other valves were involved.

The pleurae evidenced markedly congested blood vessels, as did the medium sized and small blood vessels of the lungs. The alveolar capillaries, however, were devoid of blood. Many small sections of the lung showed collapsed alveoli; other sections showed edema or extravasation of red blood cells into the alveoli.

The sinuses of the spleen were enormously distended with blood. The liver cells were swollen and the sinuses contained considerable blood. Here also the vessels were markedly congested. Moderate round cell infiltration was present in the periportal area, with lymphocytes, fibroblasts and occasional plasma cells. The kidneys and adrenals showed the same congestion but no other abnormalities.

The microscopic sections of the brain were prepared in the Neurological Laboratory of the Henry Phipps Psychiatric Clinic and the slides were studied by Dr Ellis Margolin. The leptomeninges showed no thickening and appeared normal. There was no distortion of the normal architecture of the brain. No gross or petechial hemorrhages were evident and there were no scars or areas of softening. The blood vessels showed no pathologic changes but were markedly congested with blood. The individual nerve cells showed no abnormalities.

The diagnosis was chronic endocarditis, pulmonary edema and acute cardiac dilatation. The probable cause of death was the toxic effect of a pharmacologic agent on a pathologically impaired heart.

#### COMMENT

On the sixth treatment with metrazol a man aged 24, whose physical and laboratory examinations were negative, suddenly died. The morbid anatomy showed marked congestion of all the organs and a pre-existent endocarditis. Except for the latter, the changes were essentially the same as those described by de Morsier and his associates<sup>2</sup> in their studies of a rabbit dying during a metrazol convulsion. No specific lesion was found at autopsy and the animal was apparently pushed beyond its physiologic limit of endurance.

The literature to date, as far as we can ascertain reports three deaths in association with metrazol therapy. In all three cases a pre-existing pathologic condition was present: aortic disease in one,<sup>3</sup> bilateral hypernephroma and goiter in the second, and pulmonary embolism and pelvic thrombophlebitis in the third.<sup>4</sup> In our own case a clinically asymptomatic and unsuspected chronic endocarditis was the underlying pathologic lesion. Other than the two fatalities presenting cardiac disease (Angyal and Gyrfas and our own), Goldstein and his associates<sup>5</sup> mention the occurrence of cardiovascular collapse in one of their patients. From our experience with metrazol in a case with a minimal heart lesion we feel that it is not as innocuous as is generally supposed. To keep the mortality rate at a minimum thorough physical examination and routine laboratory studies must be supplemented, as Low and his associates<sup>6</sup> suggest, by basal metabolic tests, x-ray examination of the chest and electrocardiograms.

Springfield State Hospital

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4 Briner O. Ergebnisse der Konvulsionstherapie an der Psychiatrischen Klinik in Bern. *Schweiz Arch f Neurol u Psychiat (supp)* 39: 118 (1937).

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6 Low A, A. Sonenthal I, R. Blurock M, F. Kaplan Maurice and Sherman Irene. Metrazol Shock. Treatment of the Functional Psychoses. *Arch Neurol & Psychiat* 39: 717 (April) 1938.

## Special Clinical Article

### THE PROGNOSIS OF SYPHILIS

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In one of a series of lectures in therapeutics delivered in this country in 1933 Dr Francis Fraser<sup>1</sup> of Saint Bartholomew Hospital, London, said:

So long as there is no anxiety medical advice is not sought, and when fears arise they may not be expressed, and are often scarcely realized, but it is well that the physician should appreciate that fear is present and that it is no less real because it is not confessed. What the patient is really saying is "What does this symptom or this loss of efficiency mean to me, to my future?" and "Can you make me well?" The duty of the physician is then clear, he must endeavor to answer these questions, and the answer to the first is dependent on the answer to the second. The answer to the first question, or the prognosis, cannot be given unless the disease process present is known and the stage in the process that has already been reached, and the value of any curative treatment available must be weighed.

It is the purpose of this paper to bring together certain data concerning the prognosis of the disease syphilis in its natural, untreated state and to assess in the light of these data the value to the patient of modern treatment. My consideration of the problem then is restricted in the main to the disease from the point of view of the individual and not of the public health.

#### ASYMPTOMATIC INFECTION

Although one is accustomed to think that the establishment of syphilitic infection is heralded by the development of chancre at the site of inoculation, it is evident that this does not always occur. Indeed it seems probable that a considerable number of persons acquire syphilis without ever exhibiting signs or experiencing symptoms of the acute stage of the infection. What mechanism operates to bring about the suppression of visible reactivity to infection is entirely unknown. Certain facts, however, are of interest in this connection and may be of importance.

*The Inoculum*—The quantity of the inoculum may play a part. Asymptomatic infection may be induced in the rabbit by decreasing the amount of the inoculum to a point where demonstrable lesions do not occur. In 1934 it was demonstrated that in order to induce experimental infection more than a few organisms are required.<sup>2</sup> In recent unreported experiments Vryonis and I have been unable to produce lesions in rabbits with inoculums containing less than 30,000 spirochetes.<sup>3</sup> Nevertheless, under such circumstances infection can be proved to have become established. In the human disease there is evidence in the form of asymptomatic infection that an analogous state of affairs may exist.<sup>4</sup>

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Read in the Medical Division of the General Scientific Meetings at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 14, 1938.

1 Fraser, Francis R. *The Principles of Therapeutics*. Baltimore: Williams & Wilkins Company, 1934.

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**Age**—Fournier<sup>5</sup> pointed out in 1899 that acquired syphilitic infection is prone to be more violent or florid in its manifestations in either prepubescent or elderly patients than in young adults or middle-aged persons. Although in agreement, I have no evidence to support this contention other than clinical impressions. Certainly congenital syphilitic infection in infants is commonly fatal,<sup>6</sup> and the incidence of asymptomatic congenital syphilis is much lower than that of asymptomatic

festations of acute syphilis, but apparently it also helps to protect the woman against the serious late sequelae of syphilitic infection.

The importance of detecting asymptomatic infection is great. Since its presence is not suggested by either clinical signs or symptoms, it tends to remain unrecognized, and indeed can be recognized only by serologic tests. Thus there exists in the population a large unrecognized reservoir of syphilis, potentially capable of spreading infection by the development of mucocutaneous lesions and in the case of women by the transmission of the infection to offspring. Furthermore, the threat of subsequent development of cardiovascular syphilis or neurosyphilis would seem to be great in asymptomatic syphilis. At least half of the patients who acquire these serious, often lethal, sequelae have had asymptomatic infection.<sup>8</sup>

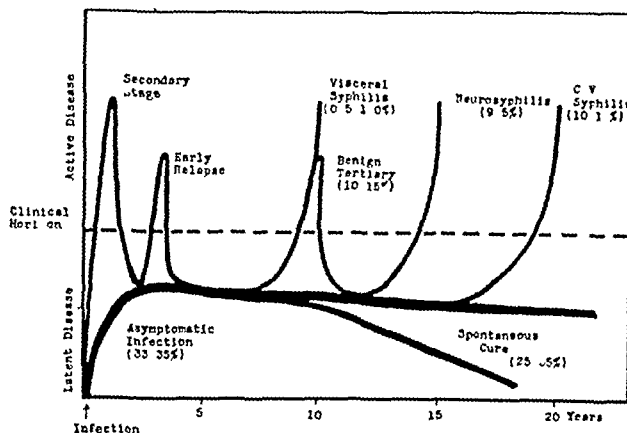


Fig. 1—Possible course of syphilis

matic acquired syphilis. Moore<sup>7</sup> emphasized that the chief difference between the manifestations of early congenital syphilis and those of early acquired syphilis in the adult is quantitative and not qualitative. The visible manifestations in both instances are of the type designated secondary. The infant exhibits, besides, impressive clinical evidence of visceral involvement and toxemia. It seems probable then that the very young have not developed, and the very old may lose, the capacity to suppress acute manifestations of infection.

**Sex**—There seems little doubt that women experience asymptomatic infection quite frequently, indeed twice as frequently as men.<sup>8</sup> Certainly not more than one half of women with late syphilis can give a history at all suggestive of acute syphilis. This difference in the incidence or recognition of acute manifestations of syphilis in men and in women is also impressively reflected in clinic attendance. Men with acute syphilis greatly outnumber women. At the Vanderbilt University Hospital<sup>9</sup> 73.6 per cent of 497 patients with chancre were men and 26.4 per cent were women. Of 1,319 patients with mixed primary and secondary syphilis 62.4 per cent were men and 37.6 per cent women. This difference between the two sexes as to the clinical manifestations of acute syphilis is even more impressive when it is pointed out that among patients with latent and chronic, active syphilis females are slightly in the ascendancy in our clinic (53 per cent of 3,242 patients).

**Pregnancy**—Moore<sup>10</sup> has shown that the production of asymptomatic infection is favored by pregnancy. Not only does pregnancy tend to suppress the usual mani-

#### SYMPTOMATIC INFECTION

Figure 1 illustrates the course of symptomatic syphilis. After the virus has penetrated the skin or mucous membrane generalized infection rapidly develops. In rabbits it has been demonstrated that it requires only a few days for the organisms to traverse the barrier interposed by the lymphatic system and gain access to the blood stream.<sup>11</sup> Thus in animals it is established that generalized infection occurs before the chancre develops at the site of inoculation. This is known to be the case also in the human disease, since blood obtained from a transfusion donor in the prechancre (incubation) stage of syphilis has induced syphilis d'emblee in the transfusion recipient.<sup>12</sup> In acquired syphilis there is an interval of approximately three weeks before the local lesion develops at the site of inoculation and nine weeks before the mucocutaneous, ocular or meningeal manifestations of generalized infection become apparent. All these lesions represent tissue reactions to *Spirochaeta pallida*, which at this period in the disease is disseminated throughout the body. The chancre heals before, during or after the appear-

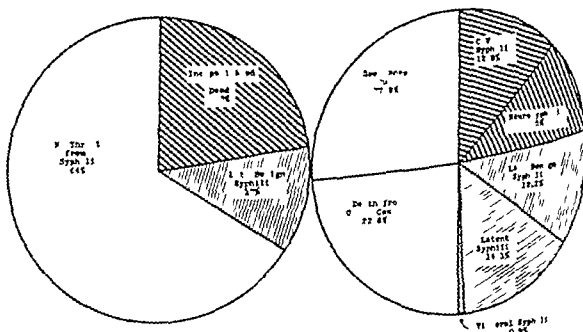


Fig. 2—Outcome of untreated acute syphilis

ance of the secondary lesions, and in the course of a few days, weeks or months there occurs spontaneous resolution of the latter. As healing occurs, dark field examinations of surface lesions indicate that widespread destruction of spirochetes is taking place. Massive generalized infection no longer exists. The disease thus becomes converted from a general infection to a focal one. Latent syphilis without signs or symptoms becomes established.

5 Fournier A. Traite de la syphilis. Paris J. Rueff 1899.  
6 Jeans, P. C. and Cooke J. V. Prepubescent Syphilis. New York D. Appleton & Co. 1930.  
7 Moore J. E. The Modern Treatment of Syphilis. Baltimore Charles C. Thomas Publisher 1933.  
8 Moore J. E. Cole H. N. O'Leary P. A. Stokes J. H. Wise U. J. Clark Taliaferro Parran, Thomas and Usilton Lida J. Cooperative Clinical Studies in the Treatment of Syphilis. Latent Syphilis. Ven. Dis. Inform. 13: 317 (Aug. 20) 1932.  
9 Keller, Alvin. Unpublished data.  
10 Moore J. E. The Course of Syphilitic Infection in Pregnant Women. Bull. Johns Hopkins Hosp. 34: 89 (March) 1923.

11 Brown W. H. and Pearce Louise. On the Generalization of *Treponema pallidum* in the Rabbit Following Local Inoculation. Proc. Soc. Exper. Biol. & Med. 17: 164 1919.  
12 Post C. D. and Cooney G. C. Accidental Transmission of Syphilis by Blood Transfusion. J. A. M. A. 100: 258 (Jan. 28) 1933.

In this process the infected person has acquired the capacity for converting an active, generalized spirochetal infection with bacteremia into an inactive, focal infection, and this through the operation of factors of resistance native to the body. The mechanism of this immunity is not known. It develops during the stage of the early lesions of the skin and mucous membrane, and one is therefore inclined to emphasize the possible role played by these structures. This is known. While the immunity is effective and prevents death from an overwhelming spirochetal infection, such as occurs commonly in intra-uterine life, it cannot be proved to be totally effective in the sense of producing biologic cure. Spontaneous biologic cure of syphilis, with eradication of the last spirochete from the body, does not occur so far as is known. Nevertheless it would seem that the experience of a brisk reaction to acute infection with lesions of the skin and mucous membrane conveys a certain degree of protection against the late manifestations of the disease. It has been pointed out that the incidence of the late sequelae of syphilis is greater in persons whose histories indicate asymptomatic acute syphilis than in those who had as a result of the infection a chancre and rash. Moreover, the optimal time for treating seropositive acute syphilis, from the point of view of therapeutic results in individual patients, seems to be after the development and at least partial resolution of the frank secondary stage of the disease.<sup>13</sup> However this may be, in acute syphilis there is a limiting process which results in inactive infection, and this is brought about by natural immune forces. If these forces are potent, latency is permanent and reversals into the acute phase of the infection do not occur. If they are not potent, latency is not permanent and recurrences of the acute mucocutaneous lesions take place for months and even years. The highly infectious stage of the disease is thus prolonged.

Latent syphilis is an inactive, focal infection. The evolution of the disease now occurs in terms of years and decades, not of weeks or months, as in the acute period of the infection. The reactivity of the tissues of the body has become changed. When lesions develop they are no longer acute and actively inflammatory, as in the early phase of the infection, but are slowly proliferative and destructive. After a decade or more of symptomatic quiescence, progression of the disease from the latent state to active chronic infection may take place, manifestations of progressive changes in the vascular and central nervous systems begin to make their appearance, and the disabling, lethal phase of the infection appears. "Benign" lesions of skin and of bone may and often do occur, but the chief threat from the development of chronic inflammatory and degenerative tissue changes resides in the cardiovascular and central nervous systems. Equally grave, though much less commonly encountered, are the late syphilitic lesions of liver, rectum, lung and other organs.

#### PROGNOSIS OF UNTREATED SYPHILIS

Acute syphilis in adults is rarely lethal and is only occasionally disabling. Nevertheless, it constitutes the first phase of a chronic disease which ultimately results in great morbidity and mortality. When acute syphilis is untreated about 25 per cent of patients will eventually attain a state in which no clinical or serologic evidence of the disease is manifest ("spontaneous cure"), about

25 per cent will die of other causes than syphilis, about 15 per cent will have serologic (blood serum) evidence of syphilis but will remain otherwise free of sign or symptom, about 12 per cent will experience syphilis of skin, mucous membrane or bone, approximately the same percentage will have cardiovascular syphilis, and a slightly smaller percentage will have neurosyphilis (fig 2). In summary, somewhat less than 25 per cent will eventually die or become incapacitated by syphilis, about 12 per cent will have relatively benign active syphilis and the remainder will experience no personal menace to health from the disease.<sup>14</sup>

Latent syphilis, by definition, indicates infection without clinical signs or symptoms of disease in patients with normal spinal fluid. At the outset it should be stated that, so far as the future of the individual patient is concerned, untreated latent syphilis will by no means invariably terminate in crippling or devastating disease. It will be seen that the chief difference between the ultimate prognosis of untreated latent syphilis and that of untreated acute syphilis is due to the fact that a considerable number of patients with acute syphilis never attain latency according to the foregoing defini-

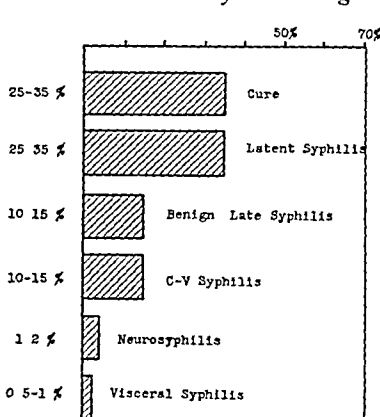


Fig. 3—Outcome of untreated latent syphilis

tion of this term. This is due to the presence of neurosyphilis. When true latency becomes established, neurosyphilis will rarely evolve. The Cooperative Clinical Group,<sup>15</sup> prognosticating on the basis of its own and Bruusgaard's experience, surmised that approximately 25 to 35 per cent of patients with untreated latent syphilis ultimately attain clinical cure and that an additional 25 or 35 per cent will have no evidence of their infection except a positive Wassermann reaction of the blood. The remaining patients with latent syphilis will experience relapses of the acute infection or progression into visceral or cardiovascular disease or disease of the central nervous system (fig 3).<sup>16</sup> Thus approximately two out of three patients will experience no serious results from syphilitic infection. How does this alter the life expectancy of a person with latent syphilis, a person who has neither signs nor symptoms of the disease, whose cerebrospinal fluid is normal and who has only a positive reaction of the blood to indicate the presence of infection? Life expectancy is shortened from that for the general population between the age of 30 and 60 by 17 per cent if the patient is a white male and by 30 per cent if he is a Negro male.<sup>17</sup> A study of 100,000 applicants for life insurance subjected to medical selection and considered favorable except for

14 Bruusgaard E. Ueber das Schicksal der nicht spezifisch behandelten Luetiker. Arch f Dermat u Syph 157 309 1929. Moore.<sup>1</sup>

15 Moore J E and Others. Cooperative Clinical Studies in the Treatment of Syphilis. Latent Syphilis. Ven Dis Inform 13 351 (Sept 20) 1932.

16 It should be stated that untreated latent congenital syphilis is more prone to clinical relapse than untreated latent acquired syphilis (Smith F R. Jr Bull Johns Hopkins Hosp 53 231 (Nov 1 1933).

17 Usilton Lida J and Miner J R. A Tentative Death Curve for Acquired Syphilis in White and Colored Males in the United States. Ven Dis Inform 18 231 (July) 1937.

13 While a statement of fact this point has no place in clinical therapeutics. The importance of the prompt treatment of all acute syphilis is obvious in the light of its great infectiousness.



a history of syphilis indicated that actual mortality is about 1.4 times the predicted mortality.<sup>18</sup> If the patient is a woman it is probable that her life expectancy will be greater, since the incidence of serious lesions of the central nervous system and cardiovascular involvement is distinctly less in females than in males.<sup>19</sup>

While a relatively small number of untreated patients in Bruusgaard's series acquired neurosyphilis (4 per cent), it should be emphasized that routine studies of the cerebrospinal fluid were not made, and the material thus loses much of its value. Kemp and Menninger<sup>20</sup> pointed out that over 50 per cent of 680 patients who had received no treatment gave clinical or laboratory evidence of neurosyphilis. They noted but little difference in incidence between the sexes, males showing only a slight increase over females. While this observation indicates that signs and symptoms referable to the central nervous system commonly develop in the course of syphilitic disease it is reassuring to point out that less than 10 per cent of all patients with acute syphilis (including both white patients and Negroes of both sexes) actually acquire clinical neurosyphilis and that only 1 or 2 per cent who complete the acute phase of the infection with normal cerebrospinal fluid (i. e., attain latency) face this threat

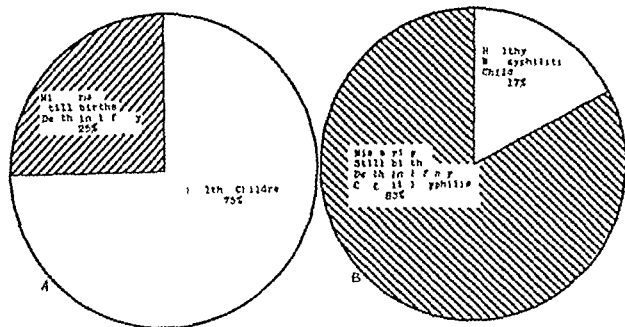


Fig. 4—Effect of syphilis on pregnancy. A outcome in absence of maternal syphilis. B outcome in presence of maternal syphilis.

An analysis of data dealing with the probable outcome of latent syphilis in relation to cardiovascular disease<sup>16</sup> indicated that from 10 to 15 per cent of patients will experience this complication. Unquestionably the incidence of cardiovascular syphilis is greater for males than for females. This is true both in the Negro and in the white race. I do not feel certain that the Negro male is more susceptible than the white male to the development of cardiovascular syphilis. It may well be that the high incidence of cardiovascular disease in Negro men is due to the great frequency with which syphilis occurs in this group and not to increased individual susceptibility to syphilitic cardiovascular involvement.

The latent state is terminated and "benign" lesions of skin, mucous membrane and bone eventually develop in from 10 to 15 per cent of untreated patients with chronic syphilis.<sup>16</sup> While these constitute an important cause of morbidity they rarely result, if uncomplicated, in mortality.

Syphilitic disease of the liver, esophagus, stomach, rectum, mediastinal structures, lung, kidney or hematopoietic apparatus occasionally terminates the latent state

(0.5 to 1 per cent) but these conditions develop infrequently to be of importance in a general consideration of the prognosis of the disease.

In a discussion of the prognosis of latent syphilis Moore<sup>7</sup> summarized the matter as follows. Assuming that the disease has existed for four years and in latency has been attained, with negative results of physical examination and tests of the cerebrospinal fluid if the patient receives no treatment:

At best it is probable that he has only two chances out of ten of developing serious trouble, at worst not more than the chances out of ten. If lesions do occur, there is probably a worse than an even chance that they will be incapacitating and cardiovascular involvement is the chief serious risk which must be feared. The danger of the development of neurosyphilis (probably excepting only a more or less pure vascular involvement) is largely past by the time true latency in the sense in which I have used the word, is achieved.

#### THE PROGNOSIS OF UNTREATED SYPHILIS IN PREGNANCY

Since approximately 10 per cent of all syphilis is thought to be congenitally acquired, it is a matter of no small importance to consider syphilis as a factor in pregnancy and to determine what the outlook for the product of conception is when syphilis exists.

Experience indicates that, when infection is acquired at approximately the same time at which conception occurs, fetal syphilis will almost invariably result. It is difficult to see how fetal infection could fail to develop in the presence of generalized maternal infection, since the inciting agent of the disease is distributed throughout the body (spirochetemia). It is likewise difficult to see how with the same circumstances prevailing a pregnant woman infected in the seventh or eighth month of gestation could fail to infect the placenta or fetus, although apparently normal infants are born under such circumstances. Although evidence of infection may develop in these infants after birth, it has been attributed to infection during passage through the birth canal and nursing rather than to intra-uterine contamination with the virus. One wonders whether this paradox may not in many instances be explained by the existence of an intra-uterine lag or prolonged incubation period in the maturing fetus rather than by postnatal infection.

The observations of Jeans<sup>6</sup> and of the Cooperative Clinical Group<sup>8</sup> give accurate data relative to the incidence of syphilis in children born of women who have passed through the acute stage of the disease and are considered to have latent infection. Moore<sup>7</sup> presented this material in an impressive way (fig. 4). It is seen that when women with syphilis become pregnant the products of conception face an extremely hazardous future. From 30 to 50 per cent of such pregnancies terminate in miscarriages or stillbirths. From 18 to 30 per cent of the pregnancies result in viable offspring who do not survive infancy, and from 11 to 24 per cent result in infants with syphilis. Only 17 per cent of pregnancies in syphilitic women will result in healthy nonsyphilitic offspring who survive infancy. When these figures are compared with those for the outcome of pregnancy in nonsyphilitic women, the enormous importance of syphilis as a cause of fetal and infant mortality is apparent, and this in spite of what seem to be high figures for miscarriages, stillbirths and infant mortality for the "normal" group. Moore tersely made the contrast: "A syphilitic woman, untreated, has only

18 Williams, E. S. The Social Significance of Syphilis. Virginia M. Monthly 63: 360 (Sept.) 1936.

19 Stokes, J. H. Modern Clinical Syphilology. Philadelphia: W. B. Saunders Company, 1934. Moore<sup>7</sup>.

20 Kemp, J. E. and Menninger, W. C. Influence of Inadequate Treatment of Early Syphilis on the Incidence and Incubation Period of Neurosyphilis. Bull. Johns Hopkins Hosp. 58: 24 (Jan.) 1936.

one chance in six of bearing a live, healthy infant as compared with the normal woman's three chances in four."

#### THE PROGNOSIS OF TREATED SYPHILIS

It has already been stated in this discussion that acute syphilis acquired in adult life rarely kills. It is, nevertheless, highly infectious. Persons with acute syphilis, while in no immediate danger of their lives, are passing through an experience which renders them dangerous to their intimate personal contacts. They make up the group which keeps the epidemic of syphilis raging. In the final analysis they are responsible for the 500,000

TABLE 1—Results of the Best Present Day Treatment of Early Syphilis (Moore)

Stage of Syphilis	Chance for Cure Percentage
Seronegative primary syphilis	100
Seropositive primary syphilis	95
Early secondary syphilis	99.95

new cases which appear annually in the United States,<sup>21</sup> for the man or woman with acute syphilis constitutes the medium by which the spirochete passes to its next victim. The importance of this from the point of view of the public health can hardly be overemphasized. Furthermore, the patient with acute syphilis is in an extremely critical position with regard to his own future. This is true because it is during the acute stage of the infection that the chances are best for absolute "cure." It is apparent then that the patient with acute syphilis should not be reassured regarding his situation by the statement that he will survive the acute infection. On the contrary, he should be sensitized to the fact that he is a grave menace to his intimate associates and that the best chance for completely ridding himself of his infection exists only during its acute phase. His situation is indeed critical from the point of view both of his fellow man and of his own future. What does treatment offer him? Stokes and his associates<sup>22</sup> have considered this question in the light of data obtained from several large syphilis clinics.

The figures in table 1 are Moore's<sup>7</sup> and represent the results obtainable only if patients cooperate fully, are treated expertly and bear treatment well. Under these circumstances "cure" may be obtained in from 90 to 100 per cent of cases. Granting that such ideal conditions frequently do not obtain, it is nevertheless clear (table 2) that, if the patient remains under medical observation, regardless of the amount and type of treatment administered the chances for good results are most encouraging.

It is obvious that the best treatment of late syphilis is the prevention of its development by curing early syphilis. This cure may be accomplished in 90 per cent of cases which come under observation during the acute stage of the infection. The all important fact to the patient that acute syphilis is "curable," together with the fact, equally important to the public health, that it is rendered noninfectious by treatment, places early syphilis directly in the spotlight of medical attention and effort.

It has been stated that it is difficult to obtain that degree of cooperation from patients with syphilis which insures proper, adequate treatment. What of those who

receive inadequate treatment? It has been clearly demonstrated that inadequate treatment often reacts unfavorably on the course of the disease. The data supplied by the Cooperative Clinical Group indicate that 13 per cent of patients inadequately treated (less than twenty injections of arsphenamine) have recurrences of acute infectious lesions, whereas only 2.7 per cent of patients who receive twenty or more injections experience such recurrence. The reappearance of infectious lesions of the mucous membrane and skin after cessation of treatment represents concrete evidence (1) that the virus is not wholly eradicated (inadequacy of chemotherapy) and (2) that the patient is unable to suppress or control those organisms which survive chemotherapy (inadequacy of immunity). If no treatment at all is given the patient with acute syphilis, immune forces will in time convert the generalized infection into a focal one. When this occurs, immunity is usually effective or "solid" enough to prevent the recurrence of the acute infectious lesions. If the natural development of this resistance to infection is interfered with by chemotherapy, it is a matter of the greatest importance that treatment be continued until the infection is entirely eradicated. If it is withdrawn short of this, the patient may be deprived of the benefit of naturally acquired resistance to infection without attaining eradication of the infection. Recurrences of acute manifestations of syphilitic infection under such circumstances are by no means confined to the skin and mucous membranes. The mucocutaneous lesions are serious, for they spread disease, but they are not the source of physical incapacity or death of the patient. More serious are the acute exacerbations of syphilitic infection which occur in the nervous system (meningitis, involvement of cranial nerves).<sup>23</sup>

While it seems probable that so far as the individual patient is concerned no treatment is better than inadequate treatment for acute syphilis, this point of view certainly cannot be given consideration in practical ther-

TABLE 2—Results of Treatment, Without Relation to Amount and Type of Early Syphilis (Moore and Cooperative Clinical Group)

Stage of Syphilis	No of Patients Treated	Satisfactory Clinical Outcome Percentage
Seronegative I	140	71.4
Seropositive I	274	53.3
Early II	912	49.8

apeutics. The spread of syphilis is dependent on the existence of untreated acute syphilis. Therefore every patient with acute syphilis should be treated promptly regardless of the number of injections it may be possible ultimately to administer. A few treatments render acute syphilis at least temporarily noninfectious, and the majority of patients who have been thus rendered noninfectious will remain so even though they discontinue therapy long before obtaining the best ultimate result.

The prognosis of acute syphilis adequately treated, untreated and inadequately treated has been studied by Moore, and table 3, from his monograph, illustrates the points which have been emphasized in this discussion.

<sup>21</sup> New Cases of Syphilis and Gonorrhea. *Ven Dis Inform* 17 38 (Jan) 1936.

<sup>22</sup> Stokes J. H. and Others. What Treatment in Early Syphilis Accomplishes. *Ven Dis Inform* 15 341 (Nov) 1934.

<sup>23</sup> Morgan Hugh J. Induced Syphilitic Meningitis (Meningorecurrence). *M Clin North America* 12 1369 (March) 1929. Morgan Hugh J. and Dedman W. M. Neurosyphilis. An Analysis of Vanderbilt University Hospital Material Over a Period of Seven Years. *South M J* 26 809 (Sept) 1933. Moore<sup>7</sup>.

What has treatment to offer in the case of latent syphilis? The person with latent syphilis is free of symptoms and signs of disease and has only a positive Wassermann or flocculation reaction of blood to show for his infection. In the large number of cases of latent syphilis studied by the Cooperative Clinical Group the effect of treatment is most impressive when evaluated

have symptoms or signs of the infection. Thus the treatment reduces the morbidity, as it does for early latent infection, from 25 to 35 per cent to less than 5 per cent.

What is the outlook for established cardiovascular syphilis and syphilis of the central nervous system? The matter involves individual factors which all but defy statistical approach. These factors render the prognosis of chronic active syphilis a highly individualized problem. That modern treatment has resulted in an improved prognosis for patients with established cardiovascular syphilis, syphilis of the central nervous system and visceral disease is clear, but the subject cannot be dealt with in this discussion. My concern has been to determine the probability of the development of serious manifestations of infection and what can be done to prevent them.

TABLE 3—Estimate of the Probable Outcome of Early Syphilis (Moore)

Type of Syphilis		Probable Outcome, Expressed in Approximate Percentage		
Original Diagnosis	Ultimate Outcome	Untreated	Inadequately Treated	Thoroughly Treated
Early syphilis	Serious late syphilis	25	35-40	5-10
	Benign late syphilis	15	15	5
	Latent syphilis	30	30	5
	"Cure"	30	15-20	50-55

in the light of the probable outcome of untreated latent infection. The figures in table 4 were obtained from Moore's monograph, from a recent publication by him<sup>24</sup> and from the reports of the Cooperative Clinical Group. It is apparent that from 70 to 80 per cent of early latent syphilis is curable in the clinical sense of that word, that less than 5 per cent of properly treated patients with latent syphilis acquire active lesions of chronic syphilis and that these are rarely incapacitating. The excellent prognosis of the treated patient must be attributed to a combination of effective immune forces present in him and the protection obtained by the specific treatment administered. It is therefore apparent that, while the patient who has progressed from the acute into the latent stage of syphilitic infection has forfeited his best chance for biologic "cure" in the strict sense, he has, if he chooses a good physician and if he presents himself within three or four years of the onset of his infection, an excellent chance for symptomatic

TABLE 4—Estimate of the Probable Outcome of Latent Syphilis (Moore, Brunsgaard and Cooperative Clinical Group)

	'Cure %	Latent Infection %	Late Syphilis (Cutaneous Mucous Osseous) %	Cardiovascular Syphilis %	Neurosyphilis %	Other Visceral Syphilis %
Untreated	25-35	25-35	10-15	10-15	12-20	0.5-1
Adequately treated early latent syphilis	70-80	20-20	2-5	2-5	12-20	0.5-1
Adequately treated late latent syphilis	60-70	25-35*	1-6†	1-6†	1-6†	

\* Wassermann fast  
† Lesions rarely incapacitating

and serologic cure. Even if he delays action until he is in the late latent stage he can be given an excellent clinical prognosis. True it is that the Wassermann reaction of the blood may be irreversible (25 per cent), but it has been shown that this need not be seriously considered if the disease has been accurately classified as latent syphilis, i. e., if infection in the central nervous system or cardiovascular apparatus does not exist. If the disease is correctly classified and actually latent, less than 5 per cent of patients properly treated will later

THE PROGNOSIS OF TREATED SYPHILIS IN PREGNANCY

It has been seen that the presence of syphilis in the female creates an extremely hazardous future for the product of conception and that with syphilis the chance for a normal healthy child decreases from approximately 75 per cent to the appallingly low figure of 17

TABLE 5—Syphilis and Pregnancy (Cooperative Clinical Group)

	Living Nonsyphilitic Children Percentage	Syphilitic Children Percentage
Treatment before fifth month	75.4*	91†
Treatment after fifth month	60.6*	23.4*

\* Amount of treatment is not considered only duration  
† At least ten injections of arsphenamine and appropriate heavy metal  
‡ At least ten injections of arsphenamine but less than ten injections of heavy metal

per cent. What does proper treatment of the syphilitic mother do with respect to prenatal and infant mortality? It is difficult to answer the question directly and in a way which allows for comparison with the statistics on untreated syphilitic mothers. The Cooperative Clinical Group<sup>25</sup> furnished impressive figures on the results of treatment of 603 women who had 922 pregnancies after the establishment of their syphilitic infections. These figures, which indicate the results of varying amounts of treatment given for varying periods, are shown in table 5.

Adequate treatment started before the fifth month was followed by the birth of a living nonsyphilitic child in 91 per cent of the cases. Similar results were reported by Ingraham<sup>26</sup> and others. This observation indicates that congenital syphilis is from a practical point of view a preventable disease. Recognition of syphilis early in pregnancy and the administration of adequate standardized treatment will for practical purposes eradicate congenital syphilis. "Prevention is dependent upon the routine, early and repeated use of the serologic blood test on every pregnant woman and upon adequate early treatment once the diagnosis of syphilis has been made." Furthermore, when the presence of syphilis in the pregnant woman is not recognized until late in pregnancy, many more living

24 Moore, J. E. The Question of the Cure of Syphilis. editorial Am. J. Syph. & Ven. Dis. 22: 648 (Sept.) 1938.  
25 Cole, H. N. and Others. Cooperative Clinical Studies in the Treatment of Syphilis. Syphilis in Pregnancy, Ven. Dis. Inform. 17: 39 (Feb.) 1936.  
26 Ingraham, N. R. The Importance of Treatment in the Control of Congenital Syphilis. Ven. Dis. Inform. 19: 124 (May) 1938.

nonsyphilitic children will be born if vigorous treatment is instituted than if inadequate therapy or no treatment is employed.<sup>27</sup> If early syphilis appears late in pregnancy and no treatment is instituted, the loss of fetal life may be as great as 46 per cent. This figure, according to the observations of the Cooperative Clinical Group, is reduced to 7.6 per cent when treatment is employed. These considerations make it apparent that no clinical aspect of syphilis offers a more challenging and at the same time promising problem to the clinician than syphilis in pregnancy.

## SUMMARY

It commonly occurs that syphilitic infection becomes established without manifestations of the acute stage of the disease. The recognition of its presence is then dependent on either serologic tests or the ultimate evolution of serious sequelae. The incidence of cardiovascular syphilis and serious involvement of the central nervous system appears to be greater in patients who fail to react at the time infection occurs with acute lesions of the skin and mucous membrane than in those who experience these lesions. Thus asymptomatic infection seems particularly disposed to the ultimate development of serious sequelae. The frequency of asymptomatic infection in the female renders the general recognition of its presence and the prevention of congenital syphilis impossible without the employment of serologic tests of all pregnant women.

The threat of untreated syphilitic infection to the individual is great. It constitutes a menace to personal contacts, the earlier the infection in terms of elapsed time from the initial lesion, the greater the menace. The pregnant woman with untreated syphilis has only one chance in six for a healthy living infant as compared with the normal woman's three chances in four. There is some evidence that age, race and sex are factors in determining the morbidity and mortality of syphilis. Syphilis in infancy is commonly fatal. In adult life the Negro male seems to be in a particularly vulnerable position with regard to cardiovascular syphilis and the white male with regard to neurosyphilis. The infection is less likely to result in serious disability in women, yet syphilis in pregnancy constitutes an extremely serious problem.

With treatment acute syphilis can be rendered non-infectious and "cured," and with the best treatment "cure" is possible in from 90 to 100 per cent of patients. From 70 to 80 per cent of patients with early latent syphilis can be "cured" in the practical sense of that word. The treatment of late latent syphilis is of the greatest importance, since it greatly reduces subsequent morbidity and mortality from cardiovascular and benign tertiary syphilis. The early recognition and proper treatment of syphilis in pregnant women will greatly reduce prenatal and infant mortality and almost completely eradicate the tragic problem of congenital syphilis.

The outlook for the patient with syphilis is dependent in no small way on the physician who first discovers the disease. With the foregoing considerations in mind the physician may approach the therapeutic problem with confidence and optimism—qualities sorely needed by both patient and physician during the long months necessary if treatment is to be adequate.

27 McKelvey, J. L. and Turner, T. B. Syphilis and Pregnancy. Analysis of the Outcome of Pregnancy in Relation to Treatment in 943 Cases. J. A. M. A. 102: 503 (Feb. 17) 1934.

## Special Articles

## THE PHARMACOPEIA AND THE PHYSICIAN

## THE TREATMENT OF INFANTILE ECZEMA

FROM THE POINT OF VIEW OF  
THE ALLERGIST

BEN Z. RAPPAPOORT, M.D.

AND

RUDOLPH HECHT, M.D.

CHICAGO

*This is the last of a series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee on Revision and The Journal of the American Medical Association.—Ed*

Although attempts at differentiation and classification of disease processes are of value, in infantile eczema these are difficult and, in fact, almost impossible because one type merges into another and because several conditions may be present at the same time. One is tempted to agree with Moro that "Ekzem ist was, aussieht wie ein Ekzem" (Eczema is what looks like eczema). The longer one deals with infantile eczemas, the more one concludes that classifications have restricted values and that differentiation is possible only after prolonged observation of the course of the eruption and its response to therapy.

The great impetus given to the study of eczema came with the introduction of the concept of allergy and the subsequent demonstration that some of these conditions depended on a specific sensitization mechanism. It has been in the infantile eczemas that the best results have been attained by the cooperation of the pediatrician, the dermatologist and the allergist.

The important conditions considered under the head of infantile eczema are (1) seborrheic dermatitis, (2) fungous infections, (3) contact dermatitis and (4) atopic dermatitis. The clinical appearance and course of these conditions have been discussed in detail by Sulzberger.<sup>1</sup> The discussion here will be limited to the contact type and atopic dermatitis.

## HISTORY AS AN AID IN DIAGNOSIS

If we were limited in our practice to only one diagnostic medium, of all those available we would choose the history. A carefully taken history usually gives leads that point to the proper avenue of investigation, doing the indicated tests makes the diagnosis possible. The allotted space permits brief mention of only a few of the pertinent details to be elicited. These are as follows: Onset, course and duration of present complaint, age at onset, its first site, its appearance at onset, dry? wet? vesicular? erythematous? scaling? the degree of itching? (itching in atopic dermatitis is intense), sites and mode of spread, diet at onset (detailed and as exact as possible, was a new food added at onset?), present diet, foods that cause erup-

This is the last of three articles on this particular subject. From the Department of Medicine, University of Illinois College of Medicine and the Mandel Clinic, Michael Reese Hospital.  
<sup>1</sup> Sulzberger, M. B. The Treatment of Infantile Eczema from the Point of View of the Dermatologist. J. A. M. A. 112: 38 (Jan. 7) 1939.

tion to flare up, diet manipulation in detail (if certain foods were supposed to have been eliminated, it should be ascertained whether this was done completely), internal medications, topical medications (did eruption get worse after any of these?), environmental conditions, details of room furnishings, clothing, toys, insecticides, pets, cosmetics of attendants (does the rash get worse when the child is handled by some member of the family?), effect of removal from home, results of previous tests, occupations and hobbies of members of the family, atopic family history (suggesting that the condition is atopic)

This is by no means complete but indicates the method of questioning that must be adapted to the particular case. The more accurate and painstaking the history, the more likely that certain 'leads' will be obtained to guide one in the diagnostic procedures to be described.

It is due mainly to the work of Sulzberger,<sup>2</sup> Bloch<sup>3</sup> and Jadassohn<sup>4</sup> that a clear understanding has been obtained of some of the underlying processes and their correlation with the observed clinical phenomena. It is well to recall that the upper layers of the epidermis are relatively impermeable and that the epidermis has no blood vessels while the upper cutis is richly supplied with them. These facts may be correlated with clinical, experimental and histologic studies as follows:

**Contact Dermatitis**—The "shock tissue," i.e. the site of reaction, in contact dermatitis is primarily the epidermis. Histologically it is known that the primary lesion of the epidermis is edema, which can be interstitial and/or parenchymatous and eventuate in vesicle formation. Clinically contact type dermatitis is characterized by vesiculation. According to Sulzberger, the substances that are likely to call forth this condition are:

1 Substances that are soluble having small molecular weight and rapidly moving ions which are capable of penetrating the horny layer. Examples are metallic salts such as nickel and mercury.

2 Substances soluble in the fat of the skin, such as the fatty substances of plants, e.g. ivy and ragweed oils.

3 Substances that have an affinity for horny material and firmly bind themselves to the horny layer of the skin, e.g. dyes.

4 Anesthetics that have an affinity for ectodermal tissue and fat, e.g. procaine hydrochloride and ethyl aminobenzoate.

5 Primary irritants, such as fat solvents, soaps, alkalis and acids.

The reactions given by the substances of the first four groups are of an allergic nature, i.e. specifically acquired reactions, in which no antibodies have as yet been demonstrated. The materials in group 5 usually act by means of a primary irritant effect on the epidermis, although typical allergic sensitization can here occur.

Having made the diagnosis of contact type dermatitis by history and clinical characteristics, one makes test by applying the substance directly to the epidermis by means of the patch test.

To do a patch test a small square of adhesive is used on the center of which has been placed a small square of cellophane. The material to be tested is placed on a still smaller piece of linen. The patch is removed in forty-eight hours, unless the itching becomes intense before this time has elapsed, in which case the patch is removed sooner. A positive reaction is characterized by an erythematous, papular, vesicular or lous eruption corresponding to the area occupied by the square of linen. Sometimes the reaction is delayed and may appear later. It is well, therefore, to examine sensitive sites for several days after removal of the patch. One must ascertain that the material in the concentration used is not a primary irritant. A positive reaction, however, is not proof that this is the substance causing the clinical symptoms unless removal of the material from the patient's environment results in improvement and its subsequent presence causes an exacerbation.

Positive reactions to patch tests with substances of high molecular weight such as proteins are practically unknown in adults, perhaps owing to the fact that they are unable to penetrate the epidermis. In infants one does occasionally obtain positive reactions to patch tests with wool, feathers, silk and even food proteins, especially egg white. Whether this is from the great permeability of the infant's skin or some other peculiarity of infants is not known. Moreover, it is unknown whether these reactions are the exact equivalents of the contact type, typical, eczematous reactions produced by patch tests. It is well known that woolen garments frequently cause an exacerbation of the eruption even in infants suffering from a dermatitis not based on specific sensitization. Mechanical factors of a non-specific nature are probably just as important as are specific sensitizations in the case of irritations apparently resulting from wool (the Koebner phenomenon which is discussed especially in relation to infantile eczema by Kreibich<sup>5</sup>). To rule out possible contact type dermatitis caused by protein substances, it is well to make patch tests on infants with suspected foods and inhalants. The diagnosis in many of these cases is largely made in an inferential fashion. If the family history is negative for atopy, if scratch or intracutaneous tests give negative results, if reactions to patch tests are positive, if eosinophilia is absent and if exposed surfaces are involved, the diagnosis of contact dermatitis may be tentatively made.

**Atopic Dermatitis**<sup>6</sup>—This is by far the most common form of infantile eczema. A family history of asthma, hay fever and other atopies is common. These patients usually have intense itching, eosinophilia and immediate wheal reactions to scratch or intracutaneous tests with the usual protein allergens, frequently have passive transference antibodies (reagins) and typically fail to give classic reactions to patch tests with contact substances. In a classic case the condition comes on in the third month and subsides usually by the end of the second year. A large number of these infants become free from atopic stigmas after the second year of life. However, some do not clear up and gradually

2 These works include:  
Sulzberger M. B. and Wise Fred. The Contact or Patch Test in Dermatology. Arch. Dermat. & Syph. 23: 519 (March) 1931.  
Hill L. W. and Sulzberger M. B. Evaluation of Atopic Dermatitis. ibid. 32: 451 (Sept.) 1935.  
Sulzberger M. B. Spain Sammis and Shahon.  
Sulzberger M. B. Wise Fred and Wolf Jack. A Tentative Classification of Allergic Dermatoses. J. A. M. A. 104: 1489 (April 27) 1935.

Sulzberger, M. B. and Goodman Joseph. The Relative Importance of Specific Skin Hypersensitivity in Adult Atopic Dermatitis. ibid. 106: 1000 (March 21) 1936.  
Sulzberger M. B. J. Michigan M. Soc. 34: 78 (Feb.) 1935.  
Sulzberger M. B. and Goodman Joseph. Journal Lancet. 56: 134 (March) 1936. M. Rec. 143: 17 (Jan.) 1936.

Sulzberger M. B. New England J. Med. 215: 330 (Aug. 20) 1936.

3 Bloch Bruno. The Role of Idiosyncrasy and Allergy in Dermatology. Arch. Dermat. & Syph. 19: 175 (Feb.) 1929.

4 Jadassohn Josef. Handbuch der Haut und Geschlechtskrankheiten. Berlin Julius Springer. Vol. 2 p. 353-492.

5 Quoted by Moro Ernst. Eczema Infantum und Dermatitis seborrhoidea. Berlin Julius Springer 1932.

6 Sulzberger M. B. Spring W. C. Sammis F. and Shahon H. J. Allergy 3: 423 (July) 1932. Sulzberger M. B. and Vaughan W. T. ibid. 5: 554 (Sept.) 1934.

are transformed into the adult type of atopic dermatitis (disseminated neurodermatitis). Associated with this there may be hay fever, asthma and other atopies in various combinations. It is difficult to follow these patients for the time necessary to gain a complete picture. While most of them recover completely by the end of the second year and have no subsequent atopic diseases, in some these disturbances develop later, and in others cutaneous disorders last without interruption from infancy to middle life. It is noteworthy that many young persons with hay fever or asthma who present themselves for treatment give a history of infantile eczema.

The atopen to which these patients are sensitive acts on the vessels of the upper cutis. To test these vessels (the shock tissue) the substance must be brought to them. This is accomplished by means of the scratch or intracutaneous test. The test substances are usually proteins.

#### CUTANEOUS TESTS

The child should be tested with those foods which he is eating or has eaten. The common foods included in such tests are wheat, corn, rice, barley, oats, egg, milk, potato, tomato, carrots, peas, string beans, spinach, asparagus, banana, apple, orange, prunes (plums), apricots, raisins (grapes), beef, chicken, lamb, pork (bacon) and cod fish. If the child is breast fed or partially breast fed, tests may sometimes be necessary with those foods frequently eaten by the mother in addition to those in the child's diet.

Environmental substances, however, present a different problem, since most American homes have a variety of possible inhalant and contact materials. We test with a rather large list of environmental materials: feathers, wool, silk, dog dander, cat dander, rabbit dander, goat dander, cattle dander, hog dander, horse dander, house dust, cottonseed, linseed, krapok, orris root, pyrethrum and pollens (in older children, especially if worse in summer).

Many of the materials listed are not easily identified in their commercial use. Rabbit hair does not necessarily signify a live, hopping rabbit but more frequently an angora trimmed garment or a fur covered toy. Cattle hair may be woven in the Chinese rug on which the baby plays or in the pads under the carpets. Because of the obscure uses of many of these substances it is wise to resist the temptation of omitting tests in the absence of a history of exposure to these common inhalants. If a positive reaction to a substance is found, one must search diligently for the presence of the material. While in infants (up to 1 year of age) inhalants are seldom the causes of atopic dermatitis, there are a few for whom such atopens as feathers are important factors and whose condition is improved on their elimination. Peck and Salomon<sup>7</sup> found reactions to feathers in infantile eczema, and when positive reactions to patch tests were present they obtained definite improvement on removal of the feathers. Rostenberg and Sulzberger<sup>8</sup> have published some interesting tables on the results of patch tests with foods and inhalants in infantile eczema. In atopic dermatitis, patch tests with foods and inhalants are done only in infants up to 1 year of age. These are of no value in older children with typical atopic dermatitis.

**Technic of Tests**—For scratch tests commercially prepared dried extracts may be used. After the site has been washed with alcohol an instrument is used which makes six superficial scratches painlessly at one time. A circular borelike instrument described by Hill is simple, safe and relatively painless for this purpose. All scratch tests may usually be done at one visit with safety. These are done wherever clear skin is available, usually on the anterior aspect of the thigh in infants. A drop of twentieth-normal sodium hydroxide solution is placed on each scratch. Into this the allergen is gently rubbed with a toothpick. As a control, a drop of twentieth-normal sodium hydroxide solution is rubbed over one of the scratches and the other tests are compared with this. The sites should be observed frequently for the next thirty minutes. First there is usually a traumatic area of redness around the scratch. This subsides shortly and is followed in the area of a positive reaction by a slowly increasing redness which, in strong reactions, surrounds a wheal. This may develop any time from a few minutes to half an hour.

Intracutaneous tests are done only with those substances which give negative results on a scratch test. If a scratch test with a substance is definitely positive, it need not and it must not be used intracutaneously. When the intracutaneous technic is used an entire botanically related group should not be injected at one visit, e.g., the cabbage group (broccoli, cauliflower, turnips, brussels sprouts, cabbage and so on). Members from different groups should be selected to avoid constitutional reactions. For this reason further tests are discontinued for that day if several large reactions develop. Epinephrine solution (1:1,000) and a sterile syringe and needles must be at hand to combat a reaction. The intracutaneous wheal raised by the material injected (0.02 cc.) should not be more than 2 mm. in diameter. Twelve tests are usually done at one visit. The ordinary method of performing these is by means of a 26 or 27 gage needle on a tuberculin syringe. By observing all these precautions, one should be able to avoid untoward effects with the intracutaneous method.

Experience is necessary for the interpretation of the tests. What may be etiologically a clinically significant reaction in one person may be without clinical significance in another. In infants the reactions are often very slight and controls are essential. Here a scratch test with a definite erythema without redness at the control site should be considered positive. The formation of wheals with erythema is more significant. Positive intracutaneous reactions are larger than positive reactions to the scratch test. Positive reactions in infants, if correctly "read," are of more clinical value than in adults. The exception to this, which will be discussed later, is the reaction to egg white. Scratch tests, when positive, are more significant than intracutaneous ones because a higher degree of sensitivity is indicated and the errors are more easily avoided from insufficient experience in interpretation, improper technic, irritating materials and the occasionally highly reactive skin. No positive reaction can be considered significant, however, unless clinical trial proves its relationship to the dermatitis. Cutaneous tests are important aids and not the final means for diagnosis.

**Trichophyton or Tuberculin Type of Reaction**—The shock tissue is the upper cutis and the cutis. The test is elicited by injecting intracutaneously 0.1 cc. of properly diluted micro organisms or their products.

<sup>7</sup> Peck, S. M. and Salomon, Gustav. Eczema of Infancy and Childhood. *Am. J. Dis. Child.* 46: 1308 (Dec.) 1933.  
<sup>8</sup> Rostenberg, Adolph, Jr. and Sulzberger, M. B. Some Results of Patch Tests. *Arch. Dermat. & Syph.* 35: 433 (March) 1937.



The resultant response is of the delayed type and comes on after from twenty-four to forty-eight hours. Characteristically the positive reaction is a papule with an area of surrounding edema and erythema, although immediate reactions of the wheal type have been reported.<sup>9</sup> When fungous or yeast infection is suspected it is well to test with trichophylin and oidiumycin extracts.

#### THE IMPORTANT ALLERGENS IN INFANCY

**Foods**—Egg occupies a peculiar position in infantile eczema. As a result of the reactions to egg many perplexing questions have arisen. On the other hand, many important fundamental facts have been uncovered. Most infants with atopic dermatitis when tested with egg white give immediate wheal reactions even though the child has never ingested egg. This is a true immunologic reaction as demonstrated by the presence of reagins in the patient's blood. Sensitization to egg probably occurs in utero by way of the placenta. It has been shown that unaltered egg antigen is capable of entrance into the circulation<sup>10</sup> and into mother's milk and thus may be transmitted to the infant. These infants may therefore have had previous contact with egg, and the reaction can be looked on as a typical allergic reaction. It is significant, however, that some infants without eczema give positive cutaneous reactions with egg white antigen. This finding is of great importance and has prompted the formulation of the theory that many infants on their first contact with a food may become sensitive to it, i. e. develop antibodies (precipitins, cutaneous tests). The subsequent ingestion of the food renders the normal infant immune and the antibodies disappear. Instead of achieving the normal state of immunity, the atopic child remains sensitive to this food. Since most infants who have atopic dermatitis and who give a positive cutaneous reaction for egg have never eaten egg, this finding is of little practical but of great theoretical importance. In older children egg may be a specific factor. For some time we have been testing these with five purified egg white protein fractions, furnished us by Dr. A. G. Cole. Varying reactions were found to the different fractions as well as to fowl meat in some cases. Because of this, when an infant is sensitive to egg we eliminate fowl from the diet while symptoms are present. When the skin clears a clinical test with fowl meat is done, and if no exacerbation occurs it is permitted in the diet.

In infancy milk is the most important article in the diet and the most frequent cause of atopic dermatitis. Cow's milk contains casein, lactalbumin, lactoglobulin and an alcohol soluble protein. These are all immunologically distinct. Casein has been shown to be the common antigen in milks from various species, while the other milk proteins are probably species specific. Casein is not coagulated by boiling and retains its antigenic activity after such treatment. It is a poor antigen according to most investigators, although Wells<sup>11</sup> states that "casein is far more active than some authors have maintained." Hill has come to the same conclusions from clinical observations.

It is known that many ingested substances find their way into milk. As has already been mentioned, milk offers a route whereby a mother can transmit various proteins to her child. The passage of wheat proteins

into cow's milk causing symptoms in a wheat sensitive infant has been suggested.<sup>12</sup> In the breast-fed infant a thorough history of the foods which the mother eats is essential. In the case of the infant fed on cow's milk one must consider the fodder used in the particular locality as a possible additional factor in the etiology of obscure cases. Cattle fodder may contain large amounts of cottonseed, flaxseed, wheat and soy beans. Whether any or all of these are present in the milk in sufficient amounts to cause trouble is an unsettled question.

It is probable that the infant is most often sensitive to the lactalbumin or globulin, although Hill maintains that casein sensitization is not altogether uncommon. Thus an infant on a formula of cow's milk will frequently be improved by milk that has undergone prolonged boiling. This coagulates most of the albumin and globulin. Positive reactions to scratch tests with milk are infrequent, although intracutaneous tests with milk proteins are not uncommon.

Wheat is the most frequently ingested cereal and among the cereals gives the most frequent cutaneous reactions. Here too the role of common antigens is important, i. e. a patient sensitive to wheat may also be sensitive to a common antigen found in rye. Chemically and immunologically it has been shown that there are apparently two rather distinct groups of cereals—the wheat group (wheat, rye, barley, durum and the like) and the corn group (maize, sorghum and so on). There are probably common protein constituents within each group, although the two groups are apparently quite distinct. When there is evidence of sensitization to cereals or when cereals are eliminated from the infant's diet, one must, in the breast-fed infant, take into account the possibility that the mother's and cow's milk contain the cereal antigens also.

Orange rarely gives a positive reaction in the scratch test and only occasionally in the intracutaneous test, although one frequently obtains a history of an increase in the severity of symptoms on its addition to the diet. If orange is omitted, other fruits or ascorbic acid should be used to avoid vitamin C deficiency. Fish sensitization, especially cod fish, has been reported.

**Environmental Substances**—The evidence on hand would seem to indicate that in infants these materials can occasionally cause eczema by three or possibly four routes: (1) by inhalation and entrance into the circulation by way of the lungs, (2) by contact, a contact type eczema being produced, although on an excoriated skin the inhalant allergen may enter and be effective through the circulation, (3) by transepidermal penetration through the intact skin, (4) possibly by inhalation and swallowing of allergen with sensitization by way of the gastrointestinal tract.

#### SPECIAL DIAGNOSTIC PROCEDURES

**Passive Transfer**—When the infant has such a generalized eruption that no clear skin is available for tests, and if a careful history and elimination diets have not resulted in clinical improvement, passive transfer tests are used for diagnosis. The child's serum is injected into numerous sites on a normal skin, and these are tested with the various allergens after forty-eight hours. Matthew Walzer uses this method of testing many of his atopic dermatitis patients, because he believes that their skin is altered to such a degree as

<sup>9</sup> Sulzberger, M. B. and Kerr, P. S. *J. Allergy* 2: 11 (Nov.) 1930.  
<sup>10</sup> Walzer, Matthew. *J. Immunol.* 11: 249 (April) 1926.  
<sup>11</sup> Wells, H. G. *The Chemical Aspects of Immunity*. New York: Chemical Catalog Company, 1929.

<sup>12</sup> Balyeat, R. M. and Bowen, Ralph. *Allergic Diseases*. Philadelphia: F. A. Davis Company, 1936.

not to give valuable reactions. He has been successful in clearing up many obstinate cases by using this method.

*Special Extracts*—In a few patients in whom the studies mentioned here have failed to elicit the cause of the trouble, we have been successful with a method suggested by Bret Ratner. This applies only to environmental substances. The mother is questioned carefully for all possible suspected causes, no matter how remote they may appear. A sample of each of these is soaked overnight in twentieth-normal sodium hydroxide solution and scratch tests are done with the supernatant fluid.

#### DIAGNOSIS BY MEANS OF ENVIRONMENTAL AND FOOD STUDIES

The management of infantile eczema can be accomplished in most cases without the use of cutaneous tests. Environmental change sometimes produces results which amaze both the physician and the parents. Removal of the patient to a hospital room furnished with a horsehair or rubber encased mattress can by one simple procedure eliminate a complicated environment of overstuffed furniture, toys, cotton mattress, rugs, cosmetics, animal emanations, dyes and a variety of other substances too numerous to mention. If improvement occurs it is likely that one or more of these environmental substances is the cause. The effect of bringing suspected materials in the presence of the infant can then be studied. One must keep in mind, however, that exposure to suspected substances must be sufficiently long to reproduce the conditions in the home. This may not be practical. From a clinical point of view this type of study, while more difficult and tedious, is much more significant than cutaneous tests. The reason for frequent rapid improvement on hospitalization is not established, but it seems probable that one or more of the environmental home allergens has been the cause in such cases.

Similarly, an organized study, preferably in an "allergen free" environment, can be carried out by means of "elimination diets." Since milk and wheat are the commonest causes of atopic dermatitis, they should be eliminated first. It is necessary at this point to emphasize that multiple rather than single food sensitivity is usually present. Thus while such foods as fish oils, orange, tomato, the various cereals, fruits and vegetables in a large group of cases may be less important than milk and wheat, any or several of these may be the all important foods in the particular patient studied. All foods eaten must therefore be known. All must be suspected.

In most cases, because of the possibility of multiple sensitivity, wheat, milk and eggs should be removed at one time. In the infant this should not lead to any difficulties. Milk can be eliminated or, in the presence of malnutrition, replaced by evaporated cow's milk, milk boiled for two hours and skimmed or evaporated goat's milk. Sensitivity is in most cases to the whey proteins, and these are sufficiently altered by treatment with heat to make them nonallergic for any but the most sensitive patient. Since casein is not altered by heat, such a substitution will not improve the unusual patient who is sensitive to casein. One of the milk substitutes, such as soy bean products or almond-lac, may then be tried. Eggs need no substitution, while wheat may be replaced by corn, oatmeal, sago or tapioca prepared

with water and sugar. Such substitution should result in improvement if the foods permitted are not among the causative factors.

*Food Diaries*—An intelligent mother is in many cases the most important factor in a successful diagnosis. During the study it is desirable to have the mother understand the rationale for the various procedures. She should be taught to keep a carefully itemized diary of each meal and to record any flare-up of the eruption. If the condition becomes worse after certain meals, one or several foods may be found to be the common factors in these meals. They may then be eliminated or replaced and the effect noted.

*Prophylactic Management*—Prophylactic care should not be considered either far fetched or fanciful in atopic families. It is common in our practice for the mother who is under allergic management to inquire what may be done to prevent the occurrence of allergic symptoms in an infant. The difficulty of determining the effectiveness of the measures does not diminish their importance. Certain environmental and dietary precautions can readily be taken in those infants with a family history of atopy. Regarding the environment, if a new mattress is needed it should be made of horsehair. This material, as prepared for such purpose, will not cause symptoms even in those sensitive to horse dander. If a cotton mattress is already in use, it should be sealed with a rubberized cover. If pillows are used, they should be completely encased in rubberized cloth. Old blankets that have had frequent washings are preferable to new ones. They should be covered with sheets so that no wool comes in contact with the child's skin. Contact of wool with the skin should otherwise be avoided. "Snow suits" are not uncommonly the cause of dermatitis in infants. The clothing next to the skin should be smooth, of linen or cotton. Irritation of the skin from other sources should be avoided. Upholstered furniture, dust gathering draperies and, if possible, carpets should not be used in the child's room. Animal pets should not be permitted.

Prophylactic food measures are not only more important but also more readily accomplished. From an immunologic point of view the rationale of the measures recommended depends on two facts: first that the gastrointestinal tract of the newborn infant is highly permeable, and second that denatured proteins are in general nonantigenic and more readily digested than are native proteins. That the gastrointestinal tract of the infant in its first weeks of life is highly permeable is indicated by the appearance in the urine of the proteins of colostrum if the infant nurses while this is secreted. In infants fed on cow's milk during the first weeks of life lactalbumin is found in the blood together with antibodies for this protein.<sup>13</sup>

With these facts in mind, the following precautions should be observed, especially in infants with an atopic background. During the colostrum period if a milk formula is used it should be prepared from evaporated milk. The heating of coagulable protein makes it insoluble so that it loses its antigenicity. Absorption therefore does not occur until it is digested by the gastrointestinal enzymes. While only the whey proteins are coagulable, these are the commonest causes of sensitivity to milk. It seems advisable to use evapo-

13 Lippard V. W., Schlosser O. M. and Johnson Priscilla A. Immune Reactions Induced in Infants by Intestinal Absorption of Incompletely Digested Cow's Milk Protein. *Am J Dis Child* 51: 562 (March) 1936.

rated milk for the infant with atopic background not only during the colostrum period but also subsequently during the first year of life

The next period in the infant's feeding that requires caution is when other foods are added to the diet. We would recommend that foods should be added singly rather than as mixtures. When wheat is added it should be definitely as wheat rather than in a cereal mixture. The one objection to the commercially prepared cereal mixtures is that they frequently contain many ingredients. Unfortunately cooking will not accomplish for wheat what boiling does for milk. If symptoms develop after she starts on a single cereal, the watchful mother quickly suspects the cause of the trouble. The diet can be increased almost as rapidly in this way as by the use of mixtures.

It is our belief that egg white should not be added to the diet until after the first year in infants with an atopic background. It should be thoroughly coagulated before it is given. A simple way of producing a high degree of coagulation of egg white, rendering it easily digestible, is to drop it slowly into boiling water with constant stirring. This produces a finely divided coagulum.

*Active Management*—Dietetic treatment of the atopic infant from the point of view of the pediatrician is discussed in greater detail by Dr. Hill.<sup>14</sup> Here we emphasize the subject briefly from an immunologic point of view. What has been said under diagnosis and prophylactic care applies to the active management. Once the etiologic diagnosis has been determined, the management is not difficult. Most infants will tolerate foods to which they are sensitive if these are thoroughly denatured. We have never found it useful or necessary to give infants injections either of inhalants or of foods for immunizing purposes. Nor has oral immunization proved of value in our hands. It has been our experience that a spontaneous tolerance develops in most infants usually in a few months if the offending food is completely removed. It may be added in a well cooked state, in minute amounts which are gradually increased, with constant surveillance several months after the condition has cleared completely. The exception to this rapid gain in tolerance is found in patients sensitive to egg white. They have a tendency to remain sensitive to the material for much longer periods than to other foods.

Inhalants should likewise be removed rather than injected. Even such a ubiquitous and necessary substance as wool may be replaced in cold weather by cotton clothes made of closely woven poplin or gaberdine cloth, "suede cloth" (cotton), chamois jackets and leggings in highly sensitive patients. In those less sensitive, clothes made of refined woollens such as are used for men's suits will frequently answer the purpose. It is not unusual that the symptoms, after having cleared up, will return at a later date. This is explained by the fact that new sensitivities develop in these children. One must watch them "like a hawk," and when, after a period of improvement, they again have symptoms, the search must again be instituted, provided there has not been some unsuspected break in the regimen.

Local therapy has been omitted from this discussion, as the subject is covered in the papers by Sulzberger<sup>1</sup> and Hill.<sup>14</sup>

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<sup>14</sup> Hill, L. W. Infantile Eczema from the Point of View of the Pediatrician. J. A. M. A. 111: 2113 (Dec. 3) 1938.

## CONFERENCES ON THERAPY

### III DISORDERS OF CARDIAC RHYTHM

*NOTE*—These are actual reports, slightly edited, of conferences by the members of the Departments of Pharmacology and of Medicine of Cornell University Medical College and of New York Hospital. The questions and discussions involved participation by members of the college staff, students or visitors. The next report will concern "The Treatment of Edema".—Ed.

The third of a series of conferences on therapeutic was held at the New York Hospital-Cornell University Medical College on Saturday Morning, Oct. 15, 1938 at 12 o'clock, Dr. McKee Cattell presiding.

DR. MCKEE CATTELL. The conference today will be on the subject of the treatment of disorders of cardiac rhythm and will be opened by Dr. Eggleston, who has kindly come here to give the clinical aspects.

DR. CARY EGGLESTON. The arrhythmias, disturbances in cardiac mechanism, constitute therapeutic problems from time to time, sometimes because they actually endanger life but perhaps more common because of the discomforts that they produce in the patients who are their victims.

The commonest of these arrhythmias in ordinary experience is perhaps the simplest of all in its implications, namely, premature beats. These may occur as isolated premature beats, they may arise in the auricle in the auriculoventricular node or in the junctional tissues below the node. They may occur with extreme frequency, they may occur as coupled rhythm, they may occur in runs of many premature beats together sequentially giving rise to a form of tachycardia, or they may occur as an initial premature beat ushering in a run of paroxysmal tachycardia of ectopic origin.

In the treatment of premature beats, one of the first problems to solve, if you can, is that of the mechanism which is responsible for this localized irritation of the cardiac structures that gives rise to a focus of irritability, with a higher rate of impulse production than that of the normal sinus.

There are many poisons, tobacco, coffee and sometimes other poisons, which may produce premature beats. Alcohol, in my experience, is rarely an aggravating factor. Other forms of intoxication, such as absorption from various septic foci of chronic subacute nature, may be responsible. Where one can with reasonable certainty raise a justifiable suspicion as to the possible intoxication which may be present in a patient, the elimination of that intoxication is the first logical step in treatment. That, however, is not a problem of drug therapy primarily.

Theoretically there are several agents that should be helpful in controlling these premature beats, where they are of sufficient importance to the patient to demand control. Practically a very few seem to be of material value. I am going to run over these and leave the discussion of the pharmacology of their actions to Dr. Gold.

Simple sedatives, such as the barbiturates, either actually control the frequency of ectopic premature beats to a greater or lesser extent or else they diminish the patient's sensitivity to them, so that his discomfort is no longer a troublesome factor.

The bromides act similarly and are sometimes quite as useful.

At times the administration of digitalis, probably by virtue of improving the efficiency of the myocardial con-

traction, diminishes the frequency of premature beats and in some patients eliminates them, at least temporarily.

Of course, the one drug that you probably all think of first is that of the quinine group, particularly quinidine, one of the isomers of quinine. Quinidine often controls premature beats. However, quinidine is a potentially dangerous drug, and even with the use of test doses one is not always secure in administering quinidine, though I myself have never had the misfortune of seeing a serious accident result from its administration. The troubles with quinidine are that in the first place a certain number of patients do not tolerate the cinchona alkaloids. They have an idiosyncrasy toward them which bars the successful administration of quinidine. Secondly, in view of the existence of a certain element of danger inherent in the drug itself, one does not always feel justified in running even small risks for the control of a condition which per se is of no material significance to the patient, except with reference to his comfort.

If your judgment dictates that you should use quinidine, then it may be administered in the usual manner of first trying the patient's susceptibility by giving him one or two test doses, usually small in size, seldom more than 0.2 Gm. per dose, two such doses commonly being given at an interval of three or four hours and it being determined whether the patient has any hypersusceptibility. If not, then one may employ quinidine in rising doses until one has administered either enough to control the premature beats or until the patient manifest signs of intoxication. A disadvantage is that while quinidine may control premature beats for a short time it seems in many patients to lose its effectiveness, and the maintenance dose of quinidine employed in these conditions is often futile in permanently or lastingly eliminating premature beats.

Other agents of a pharmacologic nature are scarcely worth mentioning, in my experience.

This leads me to a common disturbance of the cardiac mechanism that is closely related to premature beats, namely ventricular paroxysmal tachycardia, which is not an unusual complication of coronary artery disease, particularly with myocardial infarction. This possibly may be anticipated in a patient with myocardial infarction during the earlier days or weeks following the immediate accident, anticipated by the development of multiple ventricular premature beats, by the development of periods of excessively rapid heart beats, both of which of course should be checked and analyzed electrocardiographically if that is possible.

The administration of adequate doses of quinidine in anticipation of the development of a ventricular tachycardia apparently may prevent the attack. It is important to prevent it as this condition is probably frequently fatal very rapidly—fatal either because of the additional overstrain on an already damaged myocardium or fatal because of the tendency for the condition, under these circumstances, to pass over into a ventricular fibrillation.

It is difficult to assess the actual preventive value of the administration of quinidine under such circumstances because while we may anticipate the possibility of the development of paroxysmal ventricular tachycardia there is no assurance that it would have developed without the quinidine, and there is no ready means of using controls to check our knowledge based on sound reasoning.

This leads directly and logically to the question of the paroxysmal tachycardias themselves. These are of three types: auricular, auriculoventricular or nodal, both of which are supraventricular in their general classification, and ventricular paroxysmal tachycardias.

From the therapeutic point of view it is important to differentiate these tachycardias. That is not always a simple problem. Theoretically the auricular paroxysmal tachycardias should be recognizable by simple clinical means, because they have certain characteristics, namely, that during an attack successive counts of the heart rate are always uniform. There is no variation. In other words, if the heart rate is 190 and is counted again ten minutes later it will still be 190. Secondly, auricular paroxysmal tachycardia is perfectly rhythmic. Of course, the rate is pretty high, and clinically it is not easy to determine minor variations in rhythm, but electrocardiographically it measures out as perfectly rhythmic. Its recognition is of therapeutic importance because we have means by which it can generally be controlled almost immediately. These include the various factors by which vagal stimulation is brought about: pressure on the eyeballs, the promotion of the carotid sinus reflex by pressure in the neck over one or the other of the two carotid sinuses, the induction of nausea or vomiting by the administration of emetics such as ipecac or apomorphine, or even the stimulation of the vagus by the administration of morphine.

The patient frequently learns tricks of posture that permit him to check his own attacks. He may hold his breath and strain with his glottis closed. He may do a variety of other peculiar stunts which he has learned check his paroxysms, but failing response to any of these the administration of acetyl-beta-methyl-choline, known to the trade as mecholyl, in the form of its hydrochloride, subcutaneously commonly checks a paroxysmal auricular tachycardia almost instantaneously or within a comparatively few minutes at the outside. The dose ranges from 5 or 10 mg. up to 60 or 70 mg., and I have recently seen an example in which the administering physician had rather more courage than I probably would have had myself and administered a single dose of 80 mg. One should always be prepared immediately to check the side actions of acetyl-beta-methyl-choline. They are often quite pronounced. They consist of nausea, vomiting, flushing of the blush area particularly, profuse sweating and often diarrhea. They can be checked at once by the prompt administration of atropine, which is an antagonist,  $\frac{1}{100}$  grain subcutaneously. If the initial dose is 10 mg. and the paroxysmal tachycardia is not checked, one may wait from twenty to thirty minutes and then give a larger dose. I believe it is better to wait than it is to administer small fractions at shorter intervals, though one may proceed by the addition of small fractions.

I know of no satisfactory means of controlling nodal paroxysmal tachycardia. Vagal stimulation is not trustworthy. Mecholyl does not seem to have any particular effect on it. Quinidine may control it but is not as effective in my experience as it is in ventricular paroxysmal tachycardia. Occasionally it would seem as though digitalization checked nodal types of paroxysmal tachycardia. This may be carried out by the usual methods, by oral administration or by intravenous injection in order to bring about a rapid digitalization. I have not had satisfactory results in the control of this form of disturbed cardiac mechanism.

The last of the rhythmic tachycardias is auricular flutter. This condition can be recognized at times clinically and is for the most part readily controllable. There is a high heart rate, usually with essentially rhythmic beating of the heart, the rate however not being excessive. It rarely is above 150 per minute. Above that it is usually paroxysmal tachycardia you are dealing with. It is difficult to differentiate clinically because its features are essentially like an excessive degree of sinus tachycardia. The electrocardiogram solves your problem and permits you to recognize the condition easily. Flutter can be controlled best by overdigitalization or at least maximal digitalization. The administration of digitalis up to or just beyond the point of minor intoxication commonly throws such a patient into a state of auricular fibrillation and then if digitalis is withdrawn the fibrillation is usually replaced by the resumption of a sinus rhythm. Occasionally this does not happen and the patient goes back to flutter. When this is the case, although it introduces an element of hazard, it is sometimes necessary after the termination of digitalization, while the patient is still in the state of fibrillation, cautiously to administer quinidine. Quinidine itself will control a certain proportion of patients with flutter. It must be administered in adequate doses.

Auricular fibrillation is a true arrhythmia, easily recognized clinically, occurring in many organic cardiac diseases, and sometimes without organic cardiac disease of demonstrable nature. The first question we should ask is: Are we justified in checking an auricular fibrillation?

There are two schools of thought on that problem. If the fibrillation is not associated with significant organic heart damage, then one may be justified in terminating it. The best example of this is seen in the patient who has had thyrotoxicosis, who has undergone adequate treatment for it including probably a subtotal thyroidectomy, yet who continues to manifest auricular fibrillation. Here we are often successful in checking the fibrillation lastingly. In general, however, paroxysmal auricular fibrillation, while it may be checked in the majority of cases by the adequate administration of quinidine, usually reappears either on the withdrawal of quinidine or on the reduction of the dose to what is considered safe as a maintenance dose.

In the presence of severe organic heart disease, the commonest form in which we see it being the rheumatic type with mitral stenosis, quinidine is of doubtful value. It is very questionable whether we gain anything by throwing such a patient back into sinus rhythm. For my own part I do not favor its use. I think we can generally control the manifestations of congestive failure more efficiently in such cases by the adequate use of digitalis and allied therapy while the auricles are fibrillating than we can if the heart is reverted to a sinus rhythm. Furthermore, not over about 10 or at most 15 per cent of such patients can be kept in sinus rhythm for any significant length of time.

I should like to speak of one other thing, and that is heart block. Ordinarily mild degrees of heart block, such as simple prolongation of the conduction time, or occasional dropped beats, seldom require any intervention except the elimination of the factor that is responsible, which commonly is digitalis in overdoses. Its withdrawal is followed by a return to sinus rhythm. Where, however, we have the Adams-Stokes syndrome, then we are faced with a crisis which must be met

Here there are two procedures. The first is the administration of epinephrine or ephedrine. At times this immediately increases the heart rate and checks the Adams-Stokes syndrome.

A second remedy of some value, but which carries with it some danger, is barium chloride. This must be administered with very considerable care and circumspection. A dose of from 20 to 30 mg, perhaps rising to as high as 50 mg, three or four times a day may increase the myocardial irritability sufficiently to prevent the occurrence of the Adams-Stokes syndrome or to check an attack.

There is a danger in the administration of epinephrine in that the Adams-Stokes syndrome may be the only recognizable manifestation of a recent myocardial infarction. I have seen two such cases. They were recognized, of course, and checked by electrocardiographic studies subsequently. But here the administration of epinephrine is risky because of the inherent danger of possibly producing a ventricular fibrillation.

But I am sure that I have already spoken long enough, for I have stolen two minutes that were not assigned to me.

#### PHARMACOLOGIC ASPECTS

DR HARRY GOLD. There is experimental basis for the use of the barbituric acid compounds in the treatment of premature contractions and other forms of arrhythmias or disturbance of rhythm involving hyperexcitability or hyper-rhythmicity of the heart. It has been shown experimentally that the barbituric acid compounds prevent idioventricular rhythms by doses of epinephrine or ephedrine which in the untreated animal will produce these rhythm disturbances.

The explanation of the action of the sedatives may be in part their direct action on the heart and in part those other factors which Dr Eggleston has mentioned.

With regard to quinidine intolerance, there are some interesting observations which indicate that the isomers of quinidine may often fail to produce signs of intolerance in individuals in whom quinidine itself produces signs of intolerance, and so you find individuals who cannot take quinidine but can take quinine. Quinine is the levorotatory isomer. Dawson of Texas has made a detailed examination of the related cinchona alkaloids with regard to the production of hyper sensitivity reactions. He found, for example, one individual in whom one of these compounds produced an asthmatic attack. This person could take a compound of opposite rotation without encountering this reaction.

Dr Eggleston used the term "manifest signs of intoxication" in connection with quinidine doses. I think it might be wise to call attention to the fact that there are important toxic actions of quinidine which perhaps are not "manifest." Of course, in a person in whom impaired hearing, impaired vision and gastrointestinal symptoms appear there is no trouble about the recognition of the symptoms, but these effects do not occur in some and the toxic effects are directly on the heart. These are recognizable in their early stages only by an electrocardiogram, in which there is a prolongation of the QRS time. The normal QRS time is about 0.08 second, and after doses as high as 30 grains or 40 grains of quinidine sulfate the QRS time may rise to as high as 0.12 second. I think it would not be well to allow the drug to exceed that, although a prolongation of that order does not appear to be injurious.

The question of tolerance to quinidine was brought up by Dr Eggleston. I think it is a very important subject. There is the prevailing view that tolerance occurs, but we had an occasion to make a very striking experiment with regard to tolerance in an individual who is subject to frequent paroxysms of auricular fibrillation or flutter, with two, three or four such attacks a day, almost entirely incapacitating him. He was subject to them for years, and he was not relieved by anything that he had taken, even quinidine in the doses that had been used before coming to our clinic. We began to give him quinidine in mounting doses until we reached the dose of 60 grains a day. When we got there, all the attacks disappeared, and at the time the case was reported about two and one-half years had passed, and now I believe about four and one-half years has passed in which this patient has been on 50 to 60 grains every single day, with the exception of the experimental periods when we wanted to see what would happen if we withheld it. In him there has at no time been any indication of a developing tolerance to the drug. Every time we withhold it, within three or four days he again has attacks of auricular fibrillation and flutter, sometimes one and sometimes the other.

DR JANET TRAVELL: Didn't that man have some prolongation of QRS time?

DR GOLD: Yes. This was a very interesting case in another respect. It shows how relatively innocuous quinidine can be if it is used in the right way, even though one uses very large doses. He started with a bundle branch block. He had a QRS time of 0.12 second at the beginning and we raised his QRS time to 0.16 second, but it never went beyond that point. It took about 30 to 40 grains a day to bring it up to 0.16 second. Here is a person with a very badly damaged heart, with a bundle branch block to start with, taking 60 grains daily entirely safely and entirely free from attacks, as a result of such doses as one usually thinks would be dangerous. I think it is a safe procedure if one does it in this way, when one reaches a dose of 30 grains a day, begin to take electrocardiograms frequently to see what the QRS time is doing.

The cumulation of quinidine ceases in a very few days with a fixed daily dosage. By that I mean that, if the patient receives 60 grains of quinidine every day, the intensity of the effect measured by whatever phenomenon you select to measure the intensity—suppose it is the QRS time—will cease to increase after a few days. On the first day there will be some effect, on the second day there will be more effect, the third day still more effect, the fourth day perhaps still more effect and about the fifth day the effect will cease to increase. From now on the intensity of the effect that is reached will remain unchanged even though you continue to give exactly the same dose every day for months and years.

This is important to recognize because it means that once you have obtained a level of effect you do not have to worry much about further accumulation of quinidine which might produce more toxic effects on the heart. If you are measuring the QRS time you may find it lengthen to 0.12, 0.13 and perhaps to 0.14 second on the third day and to 0.15 or 0.16 second, let us say, around the fifth day of the use of a large dose of quinidine, but then it will not rise higher. You might ask whether it can rise higher. In the experiments that we carried out in connection with this matter, we determined that it can rise higher if you give larger doses,

so that there is no doubt about the fact that accumulation of quinidine is a self-limiting process and that accumulation ceases after the first four or five days of a fixed daily dosage.

DR ROBERT F. WATSON: I should like to emphasize a few of the points that Dr Eggleston has brought up. The first one concerns the practical aspects of treating paroxysmal tachycardias, especially if one is outside and cannot obtain an electrocardiogram to establish definitely the type with which one is dealing.

Of course most cardiologists realize the small differences clinically between the two essential types of paroxysmal tachycardia (the ventricular and the supraventricular), the differentiation of which becomes important in the therapy. The physician practicing on the outside does not always know or cannot always tell the difference between the ventricular and the supraventricular types clinically. Certainly in those cases one should not use digitalis if for any reason one suspects that the patient may have ventricular tachycardia. It is one instance in which digitalis is not indicated and may be definitely contraindicated.

In that case certainly the best thing to try would be large doses of sedatives, probably morphine, and the usual methods of vagal stimulation, such as carotid sinus pressure or pressure on the eyeballs. If these simpler methods failed then quinidine would probably be a much safer drug than digitalis, especially if there was a chance of the ectopic rhythm being ventricular in origin.

With regard to acetyl-beta-methyl-choline (or mechohyl), a drug which has recently been used in the treatment of paroxysmal auricular tachycardia, I might say that it should not be given until the more common methods of stopping the attack have been tried. It is not entirely without some danger and certainly the more common methods of treatment, such as vagal stimulation, sedation and the administration of ipecac, should be tried before one resorts to mechohyl. Mecholyll is used in varying doses, as Dr Eggleston has said. The dose may vary anywhere from 5 to 10 mg. to 50 or 60 mg., and it is certainly wise to start with a small dose. As a rule, the dose is better tolerated by an older person and varies somewhat with weight, that is, a younger person who weighs approximately the same as an older person usually will be more susceptible to the drug than the older person.

Often after injecting the acetyl-beta-methyl-choline, if the attack does not subside rapidly, that is, within two or three minutes, massaging the site of injection will increase the action of the drug and end the attack. If this does not cause reversion to normal rhythm, vagal stimulation by carotid sinus pressure together with the action of the drug may be effective whereas carotid pressure alone previously had not been successful. Before increasing your dose then it is always wise to try massage of the original site and also pressure of the carotid sinus together with the smaller dose.

It is also necessary that one keep atropine at hand when one is using this drug. It is an antagonist and will relieve the symptoms quite rapidly. Usually a fiftieth to a hundredth of a grain is kept ready and is used intravenously if necessary.

In the tachycardias sometimes all the usual methods (in the supraventricular as well as the ventricular types) may be unsuccessful and the patient may be very dangerously ill with cardiac failure. In that case the



one drug which will probably be most useful is quinidine. Quinidine intravenously occasionally has to be used in very rare cases. The dose varies from 0.2 to 0.4 Gm. given very, very slowly, and just as soon as the rhythm reverts to normal the administration is discontinued.

I should like to ask Dr. Gold about the patient he mentioned with the bundle branch block and the frequent attacks of auricular fibrillation and flutter. Apparently this patient had quite definite heart disease and frequent attacks which bothered him considerably. I wonder if it would not be better in the usual case (not questioning the fact that he obtained very good results with this one case) to digitalize such an individual rather than pushing quinidine to such a degree?

DR. GOLD: The average case of paroxysmal auricular fibrillation cannot be controlled by digitalization. I do not believe that I know any cases of paroxysmal auricular fibrillation or flutter in which we have been able by thorough digitalization, up to as much as they can endure, to abolish their paroxysms.

DR. WATSON: I did not mean to prevent it, I meant to control it when they have an attack.

DR. GOLD: The answer to that from our experience is that if we digitalize the patient in the ordinary way, when a paroxysm of fibrillation develops the heart rate is still rapid and that brings us to an important question: How does digitalis slow heart rate? Let us consider a patient with paroxysmal attacks of auricular fibrillation. When he is not digitalized he comes in with a heart rate of 140. We put him on average doses of digitalis of the order of  $4\frac{1}{2}$  grains or 6 grains daily, and he continues on that way for months. Then two months later he comes in with another attack. He has been on digitalis throughout this period but his rate is still 140.

DR. WATSON: Do you digitalize fully?

DR. GOLD: The problem of the individual who has an attack of paroxysmal fibrillation once in two months is very difficult. It isn't often feasible to have him fully digitalized throughout this time in anticipation of the rare attack.

DR. WATSON: I understood that this patient had it much more frequently.

DR. GOLD: This patient was thoroughly digitalized until he was walking about week on end in a state of nausea and had as many attacks as he had before the quinidine was given. He had been run through every conceivable kind of management, so that for this one digitalis was out of the question. But our experience with these cases by and large is that it is practically impossible to insure a slow ventricular rate when a paroxysm comes, by continued digitalization. I think the reason for that is that the slowing of the ventricular rate by the ordinary doses of digitalis in the ordinary cases of heart failure with auricular fibrillation is not due to the same mechanism by which we are trying to slow it in most cases of paroxysmal auricular fibrillation. We do not have the time now to analyze the situation, but I believe that the slowing in the case of the individual with heart failure and auricular fibrillation is due chiefly to an improvement of the heart failure and that that takes much less digitalis than is required to slow the rate by the direct action on the conducting mechanism, which is the necessary mechanism when heart failure is not present.

DR. CATTELL: Do you care to comment on that, Dr. Eggleston?

DR. EGGLESTON: I think it ought to be emphasized that a large percentage of these patients who are subject to paroxysmal flutter or paroxysmal auricular fibrillation are within the older age group where there are degenerative changes of vascular origin, and the question has arisen in my own mind at least whether we were justified at all in attempting to control these paroxysms unless the paroxysm was a source of genuine discomfort or threat to the patient's welfare. In general, it has been my practice not to control them, not to attempt to prevent the paroxysms.

This is a very interesting case that Dr. Gold speaks of, but within my personal experience I have not been very successful in accomplishing such dramatic results from even maximum tolerated doses of quinidine. I think this is one of the more unusual responses. Is that your experience?

DR. GOLD: We have had several successful cases. In most instances the intervals between attacks are too long to apply this treatment satisfactorily.

DR. HENRY B. RICHARDSON: This morning there has been brought out the clinical distinction of various types of paroxysmal tachycardia. I should like to cite a case that occurred in my experience. A patient had a very violent pulsation in the veins of the neck, and that was improved by his remaining in bed. I believe there is a coincidence in time between the auricular and succeeding ventricular contractions. That appears then to be a point in the differential diagnosis. I should like to know to what extent that is useful.

DR. EGGLESTON: Theoretically that should raise the suggestion that it was a nodal tachycardia with retrograde auricular conduction so that ventricular and auricular systoles approximately coincided. The easy direction for the wave to flow under those circumstances would be back into the veins.

DR. RICHARDSON: Patients with paroxysmal tachycardia of auricular origin sometimes have an increase in the PR interval. If the rate is too rapid the ventricular contraction then coincides with the next auricular contraction, producing a large venous wave in the neck.

DR. ADE T. MILHORAT: Might I say a few more words about mechohyl? It is well to remember that the patient should be in the reclining position because, owing to a fall in blood pressure, the patient might otherwise faint. Secondly, as has been emphasized, massaging the site of injection can induce further action of the drug, therefore the site of injection should be massaged shortly after the drug has been administered. The drug should never be given intravenously.

There are two important conditions in which the drug is contraindicated. These are asthma and hyperthyroidism. Patients susceptible to asthma will have a severe attack if mechohyl is administered, and it should be given cautiously in hyperthyroidism because Nahum and Hoff have observed the development of auricular fibrillation in four patients who previously had normal cardiac rhythm.

We observed the development of auricular fibrillation in this clinic in a patient with myasthenia gravis who was given large amounts of prostigmine. Many of the effects of prostigmine are similar to those of mechohyl. Furthermore, there appears to be an antagonism between quinidine and mechohyl. Patients receiving quinidine are likely not to respond to mechohyl. The mechanism of this antagonism in the cardiac muscle appears to be similar to that observed in the

striated muscles. There is an antagonism between quinine derivatives and drugs which have effects similar to those of vagal stimulation.

DR CATTELL. Why should mechohyl cause fibrillation?

DR MILHORAT. I do not know. I discussed that situation with Dr Starr. He believes that any suitable myocardium might develop auricular fibrillation. Why this should occur he does not know, nor do I.

DR EGGLESTON. I think it should be emphasized that mechohyl should be the last resort and should not be employed in any of these cases until all the usual methods of controlling paroxysmal tachycardia of auricular origin have been tried faithfully.

I find that a large percentage of physicians do not know anything about the carotid sinus. They do not seem to know even where it is and it is pretty much of an accident when they try so-called vagal stimulation whether they approach anywhere near to the carotid sinus or not, but if one can locate by palpation as well as anatomic relations the approximate region of the carotid sinus, pressure on it is very frequently effective.

DR GOLD. I think it is fair to say that no patient has ever had his paroxysmal tachycardia relieved by mechohyl without becoming pretty sick in the process. I think there is an explanation of the fact that mechohyl may cause fibrillation of the auricles. Vagal stimulation shortens the refractive time of the auricle. It is possible that in part the digitalis action in auricular flutter is due to that mechanism, namely, shortening of the refractory time, that may be why a circus movement is set up in the auricle when there is none present. That is why occasionally, in the case of auricular flutter, fibrillation will be produced by mechohyl. After that a regular sinus rhythm is established in much the same way as the way in which digitalis does it. I have often wondered whether in cases of resistant auricular flutter, in which full digitalization is ineffectual, a small dose of mechohyl after the digitalis might not perhaps revert a certain number of them. I refer to those in which digitalis alone appears to be incapable of converting the flutter into fibrillation. I think it would be well worth while trying that out some time.

STUDENT. How often is barium chloride effective in controlling severe heart block?

DR GOLD. It depends on the kind of heart block. I thought of a question in connection with the remarks that Dr Eggleston made about heart block. There are two kinds that cause the Adams-Stokes syndrome. One is the auriculoventricular block in which the heart goes from a regular sinus rhythm to complete block let us say from 80 to 40 a minute, and in that process the patients sometimes faint. The second type is one in which they have a heart block to start with, an idioventricular rhythm which is about 40 a minute, and suddenly it goes down to 10 a minute, they faint in that process. The latter is an anomaly of rhythmicity. Barium chloride is useful in this type. The former is an anomaly of conduction. Occasionally digitalis is helpful here. In the kind in which impaired conduction is the problem, what digitalis does is to produce a persistent auriculoventricular block, and the fainting ceases. They get along pretty well with the constant heart rate of 40 in such cases. I wonder whether Dr Eggleston would comment on this matter.

DR ECCLESTON. I did not think there was time to differentiate between the two conditions. You are quite right, and you have covered the problem. It should be

borne in mind that a complete heart block is consistent with long years of life. Dr Niles and I together have seen a patient who has had a complete heart block from known and proved electrocardiographic signs back in the days when Dr Walter James introduced the first electrocardiograph in this country in the Presbyterian Hospital. How long ago is that Dr Du Bois?

DR EUGENE F DU BOIS. About 1910.

DR EGGLESTON. Twenty-eight years, and he took records on her, and I have seen those original records, and she had a total block then. I saw her within two years, and she is still very well. Her heart rate is just the same.

STUDENT. I would like to ask Dr Eggleston how he finds the carotid sinus and identifies it.

DR EGGLESTON. It lies at the bifurcation of the carotid artery, usually approximately opposite the upper border of the larynx, and I think by gentle manipulation with the fingers, with the neck relaxed, one can make that area out with reasonable certainty. But instead of pressing with a single finger, in order to be on the safe side I have made it a practice of pressing with three fingers, so I would include the carotid sinus without much risk of missing it. At times, of course, you can feel a bulge, but in my experience that is not always possible. I know of no other way of locating it.

The session adjourned at 1:05 p. m.

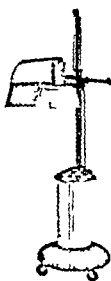
## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS  
HOWARD A. CARTER, Secretary

### BURDICK AIR-COOLED QUARTZ LAMP (PROFESSIONAL SPECIAL) CATALOGUE NO. QA-450 ACCEPTABLE

Manufacturer: The Burdick Corporation, Milton, Wis.

The Burdick Air-Cooled Quartz Lamp, Catalogue No. QA-450, is a professional type ultraviolet lamp. It is self starting without tilting and builds up to operating efficiency in approximately three minutes. It operates on 25 or 60 cycle alternating current only. The base is mounted on four 3 inch hard rubber casters. Immediately above the base is the control unit containing the transformer, relay and other electrical parts for starting and operating the burner. Starting switch and ammeter are mounted on top of the control unit. The ammeter is designed to indicate when the burner is built up and ready for use. The unit is finished in ivory and brown with chrome trimmings.



Burdick  
Air Cooled  
Quartz Lamp

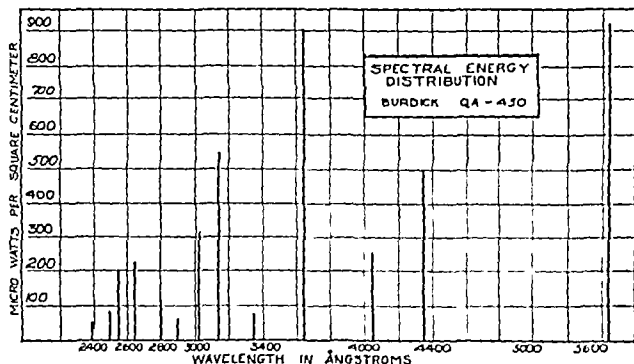
A hot cathode mercury quartz lamp of the H Uviarc type is the source of energy. The burner is mounted in an especially designed aluminum reflector which concentrates the radiation to an area 6 feet long by 22 inches wide. The hood is of double walled construction with provision for ventilation and shutters. The reflector may be adjusted so as to direct the radiation vertically downward, horizontally or at an angle with shutters open or partially closed to limit the area of radiation. The lamp is adjustable from a height of approximately 45 inches to 75 inches, the swivel cross arm having an extension of approximately 15 inches.

The firm claims that the lamp will produce ample ultraviolet radiation at a distance of 30 inches from the burner to the patient to produce a first degree erythema (mild reddening) on the average patient after an exposure of thirty seconds.

The firm submitted data concerning the radiation characteristics of the Burdick QA-450 Lamp as determined by a qualified

physicist. A chart shows the spectral distribution and intensity in microwatts per square centimeter.

The unit was investigated clinically for the Council by a qualified physician and was reported to give satisfactory service.



Spectral energy distribution

In view of the foregoing report, the Council on Physical Therapy voted to include the Burdick Professional Quartz Mercury Ultraviolet Lamp Catalogue No. QA 450 in its list of accepted devices.

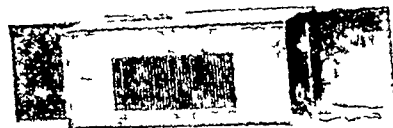
#### AIRGARD AIR FILTER, MODEL 50, ACCEPTABLE

Manufacturer: Airgard Manufacturing Company, 609 North La Salle Street, Chicago.

The Airgard Air Filter, Model 50, is designed to remove pollen, dust or other solid particles from incoming air for the relief of hay fever or other allergic diseases. It consists of a rectangular metal cabinet (28 inches wide by 12 inches high by 14½ inches deep) with a grilled outlet in front and hooded intake in the rear. The cabinet is lined with a sound deadening material. Operating parts include a specially built motor with sirocco fan constructed on a removable chassis which is mounted on rubber to overcome vibration. It requires a power input of about 65 watts an hour on 110 volt, 60 cycle alternating current.

Removable filter pads or cells are employed. These contain six ply air mat material produced from spruce pulp and treated with a colorless, odorless oil of very low evaporation constant. This matting is encased in cardboard frame in 2 inch convolutions with separators between to increase the area in the small space. Each filter contains approximately 15 square feet of material. Air passes through the filter at a comparatively low velocity.

Incoming air is discharged from the blowers into a plenum chamber, which is acoustically treated and designed to absorb mechanical noises from the operating parts and to muffle outside or street noises.



Airgard Air Filter Model 50

The volume control may be regulated up to 500 cubic feet a minute. The fan speed may also be altered. Recirculation of room air or a combination of room and outside air is possible. With accessory equipment the unit may be converted into an air conditioning plant.

The only therapeutic claim made for the unit is that it will remove 97 per cent of all solid matter carried in the incoming air stream, thus offering relief in allergic diseases caused by inhalation of pollens or dust particles. According to the manufacturer, this efficiency will be maintained throughout the life of the filter cell irrespective of pollen or dust concentrations.

In order to substantiate these claims, the unit was investigated by a competent investigator, who reported as follows:

"After proper installation of the Airgard, 0.5 Gm of giant ragweed (*Ambrosia trifida*) pollen was placed at the inlet of the unit. Several slides were placed in front of the outlet grille and in several positions in the room. The machine was then placed in operation for a period of twenty-four hours. The slides were removed at intervals and examined for the presence

of pollen and dust particles. Using 18 sq. cm as the unit of measure representing the area used in calculating the amount of pollen per cubic yard of air in settling counts, no pollen grains were observed on those slides exposed throughout the room. The slides placed in front of the outlet grille showed only two pollen grains in ten unit areas counted. Considering the massive amount of pollen permitted to enter the intake, which was considerably higher than in entire hay fever seasons, total count, the efficiency in pollen removal is good. Only very fine dust particles of sizes smaller than ragweed pollen, which varies between 12 and 20 microns and probably in the neighborhood of 5 microns and less, were observed on the slides. There were, however, not numerous on the slides exposed before the outlet grille but were more numerous on the slides exposed throughout the room. The latter particles may have been stirred up by air currents although the room had been prepared as dust free as possible."

The variable rheostat regulating the flow of air gives volume varying from 100 to 600 cubic feet of air per minute. The grilles may be adjusted to deflect the air in four directions.

In view of the foregoing report, the Council on Physical Therapy voted to include the Airgard Air Filter, Model 50, in its list of accepted devices.

### Council on Pharmacy and Chemistry

#### PRELIMINARY REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING PRELIMINARY REPORT. PAUL NICHOLAS LEACH, Secretary.

#### COLI-BACTRAGEN (AMERICAN HOSPITAL SUPPLY CORPORATION)

Under the trade name Coli-Bactragen the American Hospital Supply Corporation offered for the Council's consideration a preparation of *Escherichia coli* proposed for use as a prophylactic against peritoneal infections. According to the information supplied by the firm the preparation contains gum tragacanth 15 per cent, alcuronate 0.5 per cent, *Escherichia coli* 2,400 million (treated with 0.5 per cent of formaldehyde solution U.S.P.) in 0.5 per cent salt solution. The firm states that merthiolate in 0.1 per cent of the 1:1,000 solution is used as a preservative. It is administered by injection into the peritoneal cavity before closure of the wound. The recommended dose is 25 cc. of the solution. The claims for the product are based on the work of Dr. Steinberg which was reported in *Surgery, Gynecology and Obstetrics* 57:15 (July) 1933 and in the *American Journal of Clinical Pathology* 4:253 (May) 1936. This is a report of 391 patients under observation in hospitals at Toledo, Ohio. The results substantiate the experiments with dogs. It is claimed that the product acts by mobilizing a large number of leukocytes in the peritoneal cavity and that the gum tragacanth serves to retain them there.

Coller and Ransom (*Ann Surg* 104:636 [Oct] 1936) used the product on seventy-two patients operated on for carcinoma of the rectum. Twelve of these patients died, but of other causes than peritonitis. These authors state that they have used the intraperitoneal injection of some form of Bactragen about 300 times without harmful effect and conclude, "Bactragen (Steinberg) has a place in protecting against infection if gross contamination occurs." It is unfortunate that a control group of patients without the use of Bactragen is not reported on by these authors, although it may be assumed that previous operations served as a basis of comparison.

Horsley (*Arch Surg* 36:190 [Feb] 1938) in a general article on peritonitis devotes two or three pages to a description of the use of Coli-Bactragen (Steinberg) with apparent approval but gives no original data as to the results of his use of the product, in a subsequent publication (*Am J Surg* 40:34 [April] 1938) he again stresses the value of Coli-Bactragen on the grounds of personal experience. In a personal communication which was submitted to the Council, Horsley states:

I have used the Coli-Bactragen rather extensively and while of course it is not a panacea for the prevention of peritonitis it is certainly a very great help. I have had this demonstrated in a number of instances.

Commendatory letters have been received from other surgeons.

The available material offers favorable evidence for the usefulness of Coli-Bactragen as a prophylactic against peritonitis in surgical cases in which the danger of peritonitis appears to be imminent or in the presence of gross contamination occurring at the operation or shortly before. Although Steinberg has reported an adequate number of cases in which the product has been used, the Council feels that more published data from independent sources on the use of the product in human cases are necessary. The label, package and package enclosure are satisfactory except that for greater clarity the sentence 'A period of one and one-half or two minutes should elapse before the material is completely evacuated into the syringe' might be changed to "Since the material is gummy, a period of one and one-half to two minutes should elapse while it is being drawn slowly into the syringe."

The following statement on the label is noted. Effective in 3 hours—Lasts for 3 days. The evidence submitted indicates that this phrase is approximately true but it does not appear to have a legitimate place on the label. The Council would not object to the phrase on a package folder or collateral advertising "May be expected to be effective in about three hours and to continue so for about three days." The statement on the label should be deleted.

The Council has not considered the acceptability of the name 'Coli-Bactragen'. It would not appear, however, to be objectionable provided the firm can establish its right to the use of a coined name for the product. The Council postponed consideration of Coli-Bactragen until further corroborative published evidence becomes available, and authorized publication of the foregoing preliminary report.

## REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS  
PAUL NICHOLAS LEECH Secretary

### ALB-ARGENTUM NOT ACCEPTABLE FOR N N R

Under the name "Alb Argentum" the Alb Argentum Laboratories, Inc. of Boston presented for the Council's consideration a preparation stated to be a compound of silver iodide with a soluble, hydrolyzed gelatin base containing from 18 to 22 per cent of silver iodide in colloidal combination and corresponding to from 83 to 101 per cent of metallic silver. It is said to be prepared by treating hydrolyzed gelatin with silver nitrate to form silver gelatose, which is then treated with the combining equivalent of potassium iodide, filtered and evaporated to dryness in vacuo. The finished product is stated to contain from 0.1 to 0.5 per cent excess of combined potassium iodide over that required to effect the formation of silver iodide. The firm claims that it is nonirritating to mucous membranes, is practically nonstaining and will not coagulate albumin. The firm also claims that *in vitro* laboratory tests indicate that it is as effective as like concentrations of phenol against *Staphylococcus aureus* and the *gonococcus*. The Council questioned whether this claim meant that the preparation has several merits not found in any other colloidal silver iodide, chief among them being the five enumerated.

The sale of the product is promoted through detailing physicians by personal call and direct mail. The manufacturer did not submit any special bibliography. Sollmann in his *Manual of Pharmacology* states:

*Silver Iodide*—Freshly precipitated silver iodide was recommended by Siter and Uhle 1905 but has not come into general use. Thum 1915 gives a formula for concentrated solution of silver iodide. Colloid silver iodide has been used intravenously similarly to collargol producing leukocytosis etc. (von Voigt and Coriath 1919). A colloidal silver iodide preparation is marketed as Neo-Silver, a colloidal silver chloride as Iunosal.

The Council considered the name Alb Argentum and pointed out that Alb-Argentum is a proprietary name for a mixture of silver iodide with a gelatin base which yields a colloidal solution. Since apparently there is nothing novel in such a preparation the use of a proprietary name is not acceptable. The firm was informed that the Council would not be adverse to the name Silver Iodide Compound or Colloidal Silver Iodide Compound.

The firm was informed that acceptable critical evidence, both experimental and clinical, of the efficacy and nonirritating quality of this particular colloidal silver iodide preparation must be submitted before the product could receive favorable consideration.

After the firm had considered the Council's report it wrote that it could not meet the stipulation that the name be changed. The firm offered no comment on the other objections enumerated in the Council's report but asked simply that it be permitted to withdraw its request for acceptance. In view of the firm's failure to make the product acceptable it is the duty of the Council to inform the medical profession concerning it. The Council therefore declared Alb-Argentum unacceptable for New and Nonofficial Remedies because it is marketed under a coined proprietary name with claims which are not based on acceptable clinical and experimental evidence.

### PULVOIDS SULFANILAMIDE AND SODIUM BICARBONATE (THE DRUG PRODUCTS CO., INC.) NOT ACCEPTABLE FOR N N R

The Drug Products Company's brand of sulfanilamide has been accepted by the Council. When the firm presented this product it also presented a dosage form under the name of Sulfanilamide-Sodium. The firm's attention was called to the fact that 'Sulfanilamide-Sodium' is an erroneous name because the product is apparently not sulfanilamide sodium but a mixture of sulfanilamide and sodium bicarbonate. The firm then changed the name to "Pulvoids Sulfanilamide and Sodium Bicarbonate." It had also been pointed out to the firm that there appears to be no need of prescribing sodium bicarbonate and sulfanilamide in fixed proportions. The purpose of the sodium bicarbonate is to combat acidosis, which will vary in different individuals. It is so easy for physicians to prescribe sodium bicarbonate concurrently as indicated that the combination represented by the product would appear to offer no advantage except as a sales point under the heading "convenience to the physician." The promotion of such a fixed dosage form is likely to encourage lack of discrimination in prescribing these two drugs in proper amounts. In view of this the firm was informed that the Council could not accept this unnecessary and possibly dangerous dosage form. Despite the Council's statement the firm announced its intention of continuing the marketing of this product.

The Council, therefore, declared Pulvoids Sulfanilamide and Sodium Bicarbonate (The Drug Products Co., Inc.) unacceptable for inclusion in New and Nonofficial Remedies because it is a superfluous and possibly dangerous mixture in fixed proportion of well known drugs which had better be administered separately when indicated.

### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH Secretary

### ANTIPNEUMOCOCCIC SERUM, TYPE I (See New and Nonofficial Remedies 1938, p. 397)

The Gilliland Laboratories, Inc., Marietta, Pa.

*Antipneumococcic Serum Refined and Concentrated Type I*—Prepared by immunizing horses with intravenous injections of the virulent and avirulent cultures of type I and type II pneumococci. Trial bleedings are made at frequent intervals and when the serum has reached a sufficient degree of potency for type I pneumococci the horses are bled repeatedly and the serum is refined and concentrated by the method of Lloyd D. Felton (*J. Infect. Dis.* December 1928, p. 543). The concentrated product contains type II pneumococcus antibodies but not in therapeutically important amounts. After concentration sterility tests are carried out in the manner prescribed by the National Institute of Health and safety tests are carried out by injection into white mice and guinea pigs. The potency of the product is expressed in terms of the unit described by Felton (*Boston M. & S. J.* May 15, 1924, p. 819; *J. Infect. Dis.* September 1925, p. 199; October 1925, p. 309), the unit being one three hundredth cc. of the control serum (P-11) distributed by the National Institute of Health. Marketed in packages of one syringe containing 10,000 units and in packages of one syringe containing 20,000 units each accompanied by a vial of dilute serum (1:10) for the sensitivity test.

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SATURDAY, JANUARY 28 1939

## PRESIDENT'S MESSAGE ON THE NATIONAL HEALTH PROGRAM

Elsewhere in this issue<sup>1</sup> appears the complete text of the President's message with which he sent the report of the Interdepartmental Committee to Coordinate Health and Welfare Activities to the Congress of the United States.

The President's message calls attention to the fact that this report is the outgrowth of the National Health Conference which was held in Washington in July and of conferences by the Interdepartmental Committee with special committees representing various organizations in the medical and the health fields. The President points out that he has been particularly concerned by evidence of inequalities that exist among the states as to personnel and facilities for health services and by equally serious inequalities of resources and medical facilities and services in different sections and among different economic groups. "The objective of a National Health Program," he says, "is to make available in all parts of our country and for all groups of our people the scientific knowledge and skill at our command to prevent and cure for sickness and disability, to safeguard mothers, infants and children, and to offset through social insurance the loss of earnings among workers who are temporarily or permanently disabled." There is no proposal for any great expansion of federal health services. The aim is instead a flexible program to be worked out and administered by states and localities with the assistance of federal money.

The President recognizes the increased length of life and improvement of average levels of health and wealth of our people but he is disturbed by the fact that numbers of individuals are still without the benefits which have come to the vast majority. He has therefore recommended the report of the Interdepartmental Committee for careful study by the Congress.

## THE PURIFICATION OF TUBERCULIN

Eight years after the discovery of the tubercle bacillus in 1882, Koch introduced old tuberculin. A tremendous amount of experimental work has since been carried out in an attempt to elucidate the nature of the active principle. Because of the importance of this problem the Committee on Medical Research of the National Tuberculosis Association selected it for thorough investigation years ago. A decade of research by Dr. Florence B. Seibert and her associates has resulted in valuable contributions to our knowledge of the nature of the substance and of its action. The active principle is protein in nature, when tubercle bacilli are cultivated in a synthetic medium, the development of tuberculin activity coincides with the formation of protein. The chemical changes that occur during growth were studied and this active principle was isolated, now known as the purified protein derivative, a product extensively used as a standard substance for the tuberculin test.

Recent reports<sup>1</sup> describe the use of the most modern research tools in an intensive study of substances prepared from tuberculin medium filtrates. The molecular uniformity of the various fractions isolated was determined by means of the Svedberg ultracentrifuge as well as by electrophoresis. Throughout the study of the various preparations the relationship between tuberculin potency and antigenicity on the one hand and molecular size and shape and electrochemical properties on the other was noted. The ultimate object was to prepare homogeneous fractions having certain definite chemical and immunologic properties. By chemical means a homogeneous protein fraction was obtained from human tuberculin which possessed a molecular weight of approximately 32,000 and which contained only 2 per cent polysaccharide. This substance possessed complete antigenicity both in the production of antibodies and in the elicitation of serum and cutaneous reactions.

Further investigation showed that the nonantigenic purified protein derivative, which was thought to be the smallest potent tuberculin molecule, was not homogeneous in sedimentation and that it contained 22 per cent nucleic acid. Electrophoretic studies also indicated the presence of polysaccharide. By fractional precipitation with hydrochloric and trichloroacetic acids and subsequent electro dialysis, a protein fraction was isolated which possessed a molecular weight of about 16,000. This is approximately the same molecular weight as that found for the molecules in the original medium that are antigenic. It is thought that the loss of antigenicity of the substance isolated is at least partly due to a distortion or change of configuration of its molecular structure. A study of this structure indi-

<sup>1</sup> Seibert, Florence B., Pedersen, Kai O. and Tiselius, Arne. Molecular Weight, Electrochemical and Biological Properties of Tuberculin Protein and Polysaccharide Molecules. *Am. Rev. Tuberc.* 38: 399 (Oct.) 1938. The Purification of Tuberculin, editorial and p. 53.

cated that it was not spherical but rather quite asymmetrical and probably considerably stretched. The present practical use of the purified protein derivative as a standard is not affected by the fact that it is not entirely homogeneous, indeed, the opinion has been expressed - that the purified protein derivative of tuberculin is the best reagent so far produced for diagnostic tests in man. Because of the stability and constancy of the purified protein derivative it is invaluable as an agent for the Mantoux test.

While new ideas are of prime importance in motivating investigation, new experimental methods give fresh impetus to research work and alert investigators are quick to take advantage of them. No better example could be cited than the use of the ultracentrifuge and the electrophoresis apparatus as aids in the purification of tuberculin. In little more than a decade since its invention the ultracentrifuge is being used to obtain fundamental data on a substance which promises to be of great importance to the public welfare.

#### MENTAL DISORDERS IN URBAN AREAS

In a recent investigation of the genesis of mental disorders, Faris and Dunham<sup>1</sup> made a record of the geographic distribution of mental disorders as based on their incidence in different socio-economic areas of one large city (Chicago) and one smaller city (Providence, R. I.). Previous sociologic studies have indicated that Chicago may be divided into more or less distinct concentric zones consisting of a central business district, occupied largely by stores, business offices and so on, then a transition zone, characterized by expanding industries, high land values and deteriorating residential buildings with so-called slums, a third zone consisting largely of working men's homes and intermediate in many respects between the slum areas and the residential areas, and two outer zones composed principally of apartment houses and commuter homes and inhabited largely by upper middle class families, many of them owning their homes. Since all patients with mental disorder in Chicago, who are cared for in public institutions are brought first to the Cook County Psychopathic Hospital, it was not difficult to allocate all state institutional patients to their zones of residence. The total number of cases for each zone (more detailed divisions were actually employed) was divided by the adult population of that community in order to obtain the frequency rates. The resultant rates ranged from a low of 110 cases of mental disease per hundred thousand of adult population in a high-class residential area to a high of 1,757 in the central business district. The distribution, in fact, in Chicago showed a definite pattern, the highest rates being clustered about the

center of the city with progressive lowering as the distance from the center increased, with the exception of certain known deteriorated regions near the periphery. The investigators then plotted the distribution patterns of certain pathologic types of insanity, namely schizophrenia and its clinical varieties, manic-depressive psychosis, alcoholism and drug addiction, dementia paralytica in vice areas and the psychoses of old age. For schizophrenia as a whole, the configuration of distribution was strikingly similar to that of all types of mental disorder combined, although there were certain wide differences in the patterns of certain clinical types. The manic-depressive psychoses, however, were unlike schizophrenia in almost every respect of distribution, the former failing to show a typical pattern or any definite concentration in the more central, disorganized and poverty-stricken areas in the city. In fact there was a manifest tendency, although not clearly defined, for the manic-depressive to come from a higher cultural and economic level than the schizophrenic cases. The rates for alcoholic psychoses and drug addiction were also at their highest in and near the center of the city in the so-called zone of transition, and dementia paralytica had its greatest frequency in the proximity of houses of prostitution. The psychoses of old age, on the other hand, tended to concentrate in the central slum and Negro communities, but the rates did not always appear to represent a function of the distance traveled from the center of the city, as was the case with schizophrenia and mental disorders as a whole. In general, with allowances for local differences, the observations in Providence were similar to those in Chicago.

Following these factual investigations the authors presented a hypothesis to explain at least some of the observations. After discussing other possibilities they suggest that the nature of social life and conditions in certain areas of the city are in some way the cause of high rates of mental disorder. Especially for the schizophrenic group they believe that the lack of adequate social contacts in the disorganized sections of the city, from which most cases of mental disorder arise, produces a sense of isolation in the individual, which moves him in the role of an outcast and has a tremendous effect on the development of the personality. Lack of sufficient self confidence and the consciousness that others do not desire one's company may act as a serious barrier to intimate social relations and may therefore be a significant factor in accounting for the high rates of schizophrenia in certain parts of the city. In further support of this contention are the observations that a "spoiled childhood" is found in the background of more than 50 per cent of persons with schizophrenia and that persons living in communities which are populated not primarily by people of their own nationality or race are more liable to certain forms of mental disorder than when they are living in other communities where the majority of the people are like

<sup>2</sup> Parish H. J. The Modern Outlook on Tuberculin. *Tubercle* 19 (May) 1938.

<sup>1</sup> Faris R. E. L. and Dunham H. W. Mental Disorders in Urban Areas. An Ecological Study of Schizophrenia and Other Psychoses. Chicago University of Chicago Press January 1939.



themselves as to race or nationality. This study shows that urban areas characterized by high rates of social disorganization are also those with high rates of mental disorder. Whatever the validity of the proposed hypothesis to explain this association may prove to be, the facts gathered alone, while they may or may not suggest lines of cleavage that will point the way to a clinical classification, as H. Douglas Singer suggests in the foreword, constitute a contribution of fundamental importance to this difficult subject.

## Current Comment

### INCIDENCE OF TONSILLECTOMY

Glover<sup>1</sup> has recently estimated that 200,000 tonsillectomies are performed annually in England and Wales. After the war, during which there was a lull in the number of tonsillectomies, a rapid rise led to a peak in 1931. In that year Newman strongly urged a more conservative attitude toward this operation. Other similar reports also exerted a definite influence on medical opinion. Since 1935, after a considerable drop, the rate has been rising once more. The operation is more frequent in boys than in girls, the highest age incidence is in the period 5 to 7 years. This high incidence between 5 and 7 is, Glover believes, due to many operations at this age being performed on tonsils for enlargements which are either physiologic—that is, associated with great changes in development and in the oral cavity—or immunologic and in response to the unaccustomed herd infections of the new environment of school or to the sepsis sometimes resulting from the decay of the primary dentition. The geographic distribution in elementary school children revealed no correlation between the rate of incidence and any factor such as overcrowding, poverty, bad housing or climate. Tonsillectomy, furthermore, is not correlated with the general efficiency of the school medical and dental services and in fact defies any explanation other than that of variation of medical opinion on the indications for operation. Large and in some cases drastic reduction in the numbers of operations performed in elementary school children in certain areas have had no unsatisfactory result. Tonsillectomy is at least three times as common in well-to-do classes as in the poor. But in the public schools (corresponding to our private schools) the picked athletes among the boys are tonsillectomized in exactly the same proportions as the other boys in the schools they represent. These facts, together with the undoubted brilliant results of tonsillectomy in individual cases, have led, Glover believes, toward tonsillectomy in many doubtful cases. The operation is too often performed without adequate cause or sufficient regard to the possibility of enlargement being temporary or due to physiologic or immunologic causes. Furthermore, from the English statistics available the mortality from the operation is larger than is generally appreciated. The bare facts of incidence seem to

support the opinion expressed on other grounds by the Schools Epidemic Committee that "it is a little difficult to believe that among the mass of tonsillectomies performed today all subjects for operation are selected with true discrimination, and one cannot avoid the conclusion that there is a tendency for the operation to be performed as a routine prophylactic ritual for no particular reason and with no particular result."

### PRODUCTION OF GONADOTROPIC SUBSTANCE BY PLACENTAL TISSUES

Demonstration by Gey and his colleagues<sup>1</sup> of Johns Hopkins University that test tube cultures of placental cells liberate the gonad stimulating factor resembling "prolan" constitutes the first laboratory confirmation of a currently accepted clinical theory, moreover, their work suggests methods of experimentation presumably applicable to numerous hypothetic or suspected hormones. Most clinicians believe that the placenta produces much if not all of the gonadotropic substance excreted in the urine of pregnancy. Thus far, however, there has been no direct experimental confirmation of this theory. Gey and his colleagues suggested that the postulated placental function might be confirmed by studying the hormonal properties of metabolic products formed by placental cells grown in artificial culture mediums. Two cultures of placental tissues were therefore prepared, one from a three month's placenta obtained by hysterectomy, the other from a hydatidiform mole. Fragments of these tissues were grown in roller tubes,<sup>2</sup> the tubes being rotated at a constant speed of twelve revolutions an hour. The supernatant fluid was changed every three or four days. The culture medium selected for these roller tubes consisted of four parts of human cord serum, four parts of chicken plasma and one part each of beef embryo extract and a balanced salt solution. The production of gonadotropic substance by the placental tissues was tested by performing the Aschheim-Zondek test on 21 day old rats, control tests being made with unexposed culture medium or with the same culture medium after three days' exposure to a culture of normal human muscle fibroblasts. In most of their tests the three day supernatant fluid from one or both of the two placental cultures gave positive Aschheim-Zondek reactions, the control tests being uniformly negative. They conclude from this evidence that "placental cells produce a substance similar to the prolan-like substance found in the urine of pregnant women." The cells responsible for this hormonal activity are presumably the Langhans cells. To their surprise parallel tests with the supernatant fluid bathing cultures of human anterior pituitary cells gave negative assays of the gonad stimulating factor. Gey and his colleagues hope to extend their observations to additional material. Since mole and chorionepithelioma tissues are rarely available they seek cooperation in obtaining a supply of appropriate material.

<sup>1</sup> Glover, J. Alison. Incidence of Tonsillectomy in School Children. *Proc. Roy. Soc. Med.* 31: 1219 (Aug.) 1938.

<sup>1</sup> Gey, George O., Seeger, G., Emory, and Hellman, Louis M. *Science* 88: 306 (Sept. 30) 1938.  
<sup>2</sup> Gey, George O. *Am. J. Cancer* 17: 752 (March) 1933. 274 (May) 1936.

# ORGANIZATION SECTION

## THE PRESIDENT'S MESSAGE ON THE NATIONAL HEALTH PROGRAM

The text of President Roosevelt's message to Congress January 23 proposing a National Health Program follows

"In my annual message to the Congress I referred to problems of health security. I take occasion now to bring this subject specifically to your attention in transmitting the report and recommendations on National Health prepared by the Inter-Departmental Committee to coordinate health and welfare activities.

"The health of the people is a public concern, ill health is a major cause of suffering, economic loss, and dependency, good health is essential to the security and progress of the nation.

"Health needs were studied by the Committee on Economic Security which I appointed in 1934 and certain basic steps were taken by the Congress in the Social Security Act. It was recognized at that time that a comprehensive health program was required as an essential link to our national defenses against individual and social insecurity. Further study, however, seemed necessary at that time to determine ways and means of providing this protection most effectively.

"In August 1935 after the passage of the Social Security Act, I appointed the Inter-Departmental Committee to Coordinate Health and Welfare Activities. Early in 1938, this committee forwarded to me reports prepared by their technical experts. They had reviewed unmet health needs, pointing to the desirability of a National Health Program, and they submitted the outlines of such a program. These reports were impressive. I therefore suggested that a conference be held to bring the findings before representatives of the general public and the medical, public health, and allied professions.

"More than 200 men and women, representing many walks of life and many parts of our country, came together in Washington last July to consider the technical committee's findings and recommendations and to offer further proposals. There was agreement on two basic points, the existence of serious unmet needs for medical service, and our failure to make full application of the growing powers of medical science to prevent or control disease and disability.

"I have been concerned by the evidence of inequalities that exist among the states as to personnel and facilities for health services. There are equally serious inequali-

ties of resources, medical facilities and services in different sections and among different economic groups. These inequalities create handicaps for the parts of our country and the groups of our people which most sorely need the benefits of modern medical science.

"The objective of a National Health Program is to make available in all parts of our country and for all groups of our people the scientific knowledge and skill at our command to prevent and care for sickness and disability, to safeguard mothers, infants and children, and to offset through social insurance the loss of earnings among workers who are temporarily or permanently disabled.

"The committee does not propose a great expansion of federal health services. It recommends that plans be worked out and administered by states and localities with the assistance of federal grants-in-aid. The aim is a flexible program. The committee points out that while the eventual costs of the proposed program would be considerable, they represent a sound investment which can be expected to wipe out, in the long run, certain costs now borne in the form of relief.

"We have reason to derive great satisfaction from the increase in the average length of life in our country and from the improvement in the average levels of health and well-being. Yet these improvements in the averages are cold comfort to the millions of our people whose security in health and survival is still as limited as was that of the nation as a whole fifty years ago.

"The average level of health or the average cost of sickness has little meaning for those who now must meet personal catastrophes. To know that a stream is four feet deep on the average is of little help to those who drown in the places where it is ten feet deep. The recommendations of the committee offer a program to bridge that stream by reducing the risks of needless suffering and death, and of costs and dependency, that now overwhelm millions of individual families and sap the resources of the nation.

"I recommend the report of the Inter-Departmental Committee for careful study by the Congress. The essence of the program recommended by the committee is federal-state cooperation. Federal legislation necessarily precedes, for it indicates the assistance which may be made available to the states in a cooperative program for the nation's health."

## AMERICAN PUBLIC HEALTH ASSOCIATION AND THE NATIONAL HEALTH PROGRAM

The American Public Health Association on January 9 submitted to the Technical Committee on Medical Care its official judgment about the means by which the principles of the National Health Program may be translated into action.

The recommendations of the American Public Health Association were developed by a committee appointed to confer with Miss Josephine Roche, chairman of the Interdepartmental Committee to Coordinate Health and Welfare Activities. The committee met in Washing-

ton, D. C., Nov. 19, 1938, at the request of Miss Roche. The committee consisted of Abel Wolman, Dr. Eng, president of the American Public Health Association and professor of sanitary engineering at Johns Hopkins University, J. N. Baker, M.D., Montgomery, Ala., Louis I. Dublin, Ph.D., New York, A. T. McCormack, M.D., Louisville, Ky., H. S. Mustard, M.D., New York, J. L. Rice, M.D., New York, F. J. Underwood, M.D., Jackson, Miss., and, ex officio, E. S. Godfrey, Jr., M.D., Albany, N. Y., and Reginald M. Atwater, M.D.,

New York The committee's report has been endorsed and accepted by the American Public Health Association

In his press release January 9 the executive secretary of the American Public Health Association said

These recommendations, we believe, agree in most points substantially with the proposals of the Interdepartmental and Technical Committees on the federal-state relationships embodied in the National Health Program, and we agree that the primary federal function is to give financial and technical aid to the states for carrying out approved programs

Following are the recommendations made by the Association to the Technical Committee

1 It is certainly theoretically desirable that a single state agency should be made administratively responsible for carrying out all the provisions of the National Health Program which may be enacted into law

In recommending that this single agency should be the state department of health, we recognize that the present patterns in most states do not conform to this proposal yet we note evidence that organized medicine and many public welfare officials share our opinion that at least ultimately the state health department should be the responsible agency We believe that there are many affirmative reasons why the state health department is the best agency at the state level for this purpose No agency will be able so readily or effectively as the health department to provide professionally qualified personnel and be so readily or effectively able to maintain high professional standards of medical care

In recommending that the state health department should be the primary integrating and coordinating unit, we recognize that the counsel of qualified advisers from the medical, dental, nursing, hospital and ancillary professions will be requisite, that adequate provisions for technical staffs and administrative expense will have to be made from the outset, and that increased funds for training purposes will be essential for successful performance We have concluded further that, however reluctant medical health officers may be at present to take over these added responsibilities, a study of the alternative choices for such purposes will be determinative This basic recommendation does not preclude a working arrangement in some states with existing machinery outside of the official health department which might function well through another channel, provided that the state health officer retains supervisory control over the broad plans and the general purposes of the funds which the state may receive It is further recommended that in such plans due consideration will be given to the allocation of funds by a state department of health to the various substantial governmental

jurisdictions within a state where population, extent of the special problems or financial need justify

We note that this proposal is in accord with the recommendation of the Interdepartmental Committee that this program should be developed around and be based upon existing preventive health services

2 The committee reaffirms and reemphasizes the official declaration of the American Public Health Association that in the initiation and development of the program, wide latitude should be given to the states in the definition of the population to be served, in the selection of the method of providing medical service and in other important phases of the proposed program We believe that similar latitude should be provided with regard to the method of raising funds in the states to accomplish approved objectives

3 The committee finds itself in agreement with the recommendations in the National Health Program that the fundamental objectives involved here are, first, conservation of health and vitality and second reduction of the role of sickness as a cause of poverty and dependency With this in mind it supports the concept that recommendations 1, 2 and 3 of the Interdepartmental Committee (the expansion of public health and maternal and child health services, the expansion of hospital clinic and other institutional facilities, and the provision of medical care for the medically needy) should have priority in initiation

4 We believe that recent experience demonstrates that the Social Security Act provisions for aid to the states for health work provide a suitable framework for the expansion of preventive health services

5 We submit that it is essential that any state program to be approved for federal aid should contain adequate provisions for the maintenance of high personnel standards and that payment of such federal aid to state agencies should be withheld when it is found that substandard services are being furnished Similar policy should obtain with respect to state aid to local areas within a state The appropriate federal administrative authorities should have power to establish minimum standards through rule and regulation after consultation with competent advisory professional bodies

6 Careful study will be necessary to perfect administrative regulations to cover the details concerned with the provision of medical services, so as to assure a high level of quality We believe that standards of medical practice should not be written into basic law Federal aid should be conditioned on inclusion within the state plans of adequate safeguards for maintaining appropriate standards

7 We believe that the extension and improvement of public health services in general throughout the country require complete integration of health services of the federal government under one cabinet officer, preferably a Secretary of Health

## OFFICIAL NOTES

### ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

#### Program of Meetings to Be Held in Chicago, February 13 and 14

The Thirty-Fifth Annual Congress of the Council on Medical Education and Hospitals of the American Medical Association will be held at the Palmer House, Chicago, February 13 and 14 The Federation of State Medical Boards of the United States will participate in the Congress The program follows

#### MONDAY, FEBRUARY 13, 10 A M

*The Protection of the Public Through the Activities of the Council on Medical Education and Hospitals of the American Medical Association*  
Ray Lyman Wilbur M D, LL D, Chairman Stanford University Calif

*College Education for the Future Doctor*

James B Conant, Ph D President Harvard University Cambridge Mass

*The Organization and Subject Matter of General Education*

Robert Maynard Hutchins LL D President, University of Chicago

*Canadian Experiments in Medical Economics*

T C Routley M D LL D, General Secretary, Canadian Medical Association Toronto Ont

#### MONDAY, FEBRUARY 13, 2 15 P M

*The South as Testing Ground for the Regional Approach to Public Health and Public Welfare*

Howard W Odum LL D Director, Institute for Research in Social Science, University of North Carolina, Chapel Hill

#### SYMPOSIUM ON THE SMALL HOSPITAL

*The Community Hospital*

Barry C Smith General Director The Commonwealth Fund New York

*Organization and Management of the Small Hospital*

Malcolm T MacEachern M D Associate Director, American College of Surgeons Chicago

*Planning for a Small Hospital*

William Henry Walsh M D Consultant Specialist on Hospitals Chicago

*The Construction of the Small Hospital*

Carl A Erikson of the firm of Schmidt, Garden and Erikson Architects Chicago

TUESDAY, FEBRUARY 14, 9 30 A M

*The Program of the National Committee for Mental Hygiene*

Clarence M Hincks M D, General Director National Committee for Mental Hygiene New York

*Fundamentals of Industrial Hygiene*

T Lyle Hazlett M D Professor of Industrial Hygiene, University of Pittsburgh School of Medicine and Medical Director, Westinghouse Electric and Manufacturing Company Pittsburgh

*The Relation of Anesthesiology to Medical Education*

Ralph M Waters M D, Department of Anesthesia, University of Wisconsin Medical School Madison

*Tenure of Members of the Faculty in Schools of Medicine*

Anton J Carlson Ph D Frank P Hixon Distinguished Service Professor of Physiology University of Chicago

TUESDAY, FEBRUARY 14, 12 30 P M

Luncheon meeting, to which all those attending the Congress are invited to attend

Address *What the Undergraduate College Should Give the Future Doctor*

William Mather Lewis, LL D President, Lafayette College, Easton Pa

THE FEDERATION OF STATE MEDICAL BOARDS

MONDAY, FEBRUARY 13, 6 30 P M

FEDERATION DINNER

Address *Recent Impressions of British Medical Education*

Willard C Rappleye M D Dean Columbia University College of Physicians and Surgeons New York

Address H J Lehnhoff M D President The Federation of State Medical Boards Lincoln Neb

Round Table Discussion

TUESDAY, FEBRUARY 14, 9 30 A M

*Does Modern Medical Licensure Procedure Conform to the Accepted Standards of Medical Education?*

A C Furstenberg M D Dean University of Michigan Medical School Ann Arbor

*Examination Results Before Massachusetts State Board of Registration in Medicine*

Edward A Knowlton M D, Holyoke Stephen Rushmore M D Boston

*American Graduates of British Medical Schools*

Harold Rypins M D Secretary New York State Board of Medical Examiners Albany

*Citizenship and Medical Licensure*

J Earl McIntyre M D Secretary Michigan State Board of Registration in Medicine Lansing

*Legal Status of the Intern*

Fred E Clow M D Secretary New Hampshire Board of Registration in Medicine Wolfeboro

TUESDAY, FEBRUARY 14, 2 P M

*Hospital Intern Service in the United States*

Robin C Buerki M D Director of Study, Commission on Graduate Medical Education Chicago

*Looking at Health Insurance Abroad*

J George Crownhart Secretary State Medical Society of Wisconsin Madison

*Trends in the Distribution of Medical Care*

R G Leland, M D Director, Bureau of Medical Economics, American Medical Association Chicago

Executive Session

RADIO BROADCASTS

The fourth series of programs broadcast in dramatic form portraying fictitious but typical incidents of significance in relation to health by the American Medical Association and the National Broadcasting Company, entitled "Your Health," began Wednesday October 19 and will run consecutively for thirty-six weeks. The program is broadcast each Wednesday over the blue network of the National Broadcasting Company at 2 p m eastern standard time (1 p m central standard time, 12 noon mountain time, 11 a m Pacific time) <sup>1</sup>

These programs are broadcast on what is known in radio as a sustaining basis, that is, the time is furnished gratis by the radio network and local stations and no revenue is derived from the programs. Therefore, local stations may or may not take the program, at their discretion, except those stations which are owned and operated by the National Broadcasting Company.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

February 1	Preventing Epidemics
February 8	Avoiding Arthritis
February 15	Healthy Hearts

<sup>1</sup> Owing to program conflicts there will be no Chicago broadcast of the network program. Instead a recording of the program will be broadcast over station WENR at 8 p m each Wednesday. This recording will be an identical rebroadcast of the network program broadcast earlier the same day.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

*Changes in Status*—Public hearings will begin Wednesday morning, February 1, at 10 a m, on social security legislation, in the Ways and Means Committee room of the new House Office Building, Washington, D C. S Res 25 has been agreed to by the Senate, authorizing the Senate Select Committee on Government Organization, created by the Seventy-Fifth Congress, to continue and to have authority to perform the duties and exercise the functions contained in the resolution by which the committee was created.

*Bills Introduced*—S Res 31, submitted by Senator Shepard, Texas, proposes to create a Senate Committee on World War Veterans' Legislation, to consist of seventeen Senators. S 259 introduced by Senator McNary, Oregon provides service pensions for persons who served ninety days in foreign service under the jurisdiction of the Quartermaster General, Surgeon General of the United States Army the Secretary of the Navy or the Marine Corps during the Spanish-American War including the Philippine Insurrection and the Chinese Boxer Rebellion. S 168 introduced by Senator Nye, North Dakota, proposes to prohibit the importation of dairy products produced from milk or cream other than from cows either accredited free of bovine tuberculosis or under test for bovine tuberculosis. S 622 introduced by Senator Lodge Massachusetts proposes to authorize an appropriation of \$1 400 000 to build a new veterans hospital and diagnostic center at or near Boston. S 658 introduced by

Senator Capper, Kansas, is entitled a bill to aid in alleviating the loss caused by sickness. This bill, identical with a bill introduced by Senator Capper in the Seventy-Fifth Congress, proposes an annual federal appropriation of \$200 000 000 to induce the states to develop and maintain adequate systems of health insurance. A federal Health Insurance Board is to be created it is proposed, to administer the act. State plans must be submitted to this board and receive its approval. A state plan to be acceptable must provide for cash benefits to be paid employees for loss due to disability and for medical benefits for employees, their dependent spouses, and dependent children and other members of their family who are dependent on them and live in the same household. Employees entitled to medical benefits, it is proposed, will be permitted to choose physicians from among a list of those who have agreed to render services under the health insurance plan. A majority of physicians or dentists, respectively in a given locality who have agreed to furnish medical benefits under the health insurance system may determine the manner in which they are to be paid for their services being permitted to choose from the following methods: (1) a salary system, (2) a per capita system whereunder payment will be based on the number of persons entitled to medical benefits included in the practitioner's list, (3) a fee system whereunder payment will be based on the extent and character of the treatment given and services rendered by the practitioner to persons entitled to medical benefits and (4) any combination or modification of the systems heretofore stipulated. S 655, introduced by

Senator Barkley, Kentucky, and H R 2890, introduced by Representative Bland, Virginia, propose to create in the United States Public Health Service a Division of Water Pollution Control S 799, introduced by Senator Pittman, Nevada, and H R 2760, introduced by Representative McReynolds, Tennessee, propose to extend the facilities of the United States Public Health Service to active officers of the Foreign Service of the United States S 859, introduced by Senator Crawley, Arkansas, proposes to refund to each physician the amount collected from him by the federal government during the period June 1, 1920, to June 30, 1931, for the privilege of prescribing the hot waters from the Hot Springs National Park provided that no more than \$660 shall be refunded to any one physician H R 31, introduced by Representative Cannon Missouri proposes to reenact all public laws granting medical and hospital treatment, domiciliary care, compensation and other benefits to veterans and their dependents that were repealed by the Economy Act of March 20, 1933 H R 2223 introduced by Representative Connery, Massachusetts proposes to recognize the high public service rendered by soldiers who volunteered and served in trench fever experiments in the American Expeditionary Forces H R 2292 introduced by Representative Rankin, Mississippi, proposes to direct the Administrator of Veterans' Affairs to furnish outpatient pneumothorax therapy, insulin and liver extract to veterans requiring such treatment or medication notwithstanding that the disease necessitating the treatment may not be directly or presumptively service connected H R 2320, introduced by Representative Rankin, Mississippi, proposes to provide domiciliary care medical and hospital treatment and burial benefits to persons recognized as veterans of the Spanish-American War including the Boxer Rebellion and the Philippine Insurrection H R 2404 introduced by Representative Sirovich New York proposes to require a surgeon and ship hospital on every steamer of the United States or of any foreign country navigating the ocean and licensed to carry more than twenty-five passengers that leaves or attempts to leave any port of the United States, except steamers between ports of the United States less than 500 miles apart H R 2425, introduced by Representative May, Kentucky, provides that in no event shall any person by reason of wilful misconduct be denied any of the service-connected benefits under veterans' laws, provided such misconduct did not interfere during service with full performance of military or naval duty H R 2646, introduced by Representative Jarman, Alabama, proposes to provide that any veteran shown to have active pulmonary tuberculosis of a compensable degree shall be deemed to be totally disabled for purposes of compensation when hospitalized H R 2650, introduced by Representative Rogers, Massachusetts, proposes to authorize hospital care and treatment for American veterans residing in foreign countries in such manner as the Administrator of Veterans' Affairs shall by regulation prescribe H R 2746, introduced by Representative Pace, Georgia proposes to authorize an appropriation of \$2,500,000 to erect in the southwest section of Georgia a 800 bed veterans' hospital for the accommodation of veterans entitled by law to such facilities H R 2753, introduced by Representative Voorhis, California proposes to amend the Social Security Act so as to extend its benefits to individuals who are physically disabled H R 2877, introduced by Representative Van Zandt, Pennsylvania, proposes to provide that any person who served in the military or naval forces of the United States during a recognized campaign or expedition, and who was honorably separated from such service, shall be granted hospitalization and domiciliary care by the Veterans' Administration subject to the same restrictions and limitations as are now applicable to World War veterans H R 2892, introduced by Representative Izac, California, proposes to provide that retired personnel of the Army, Navy, Marine Corps, and Coast Guard and Fleet Naval and Fleet Marine Corps reservists requiring hospitalization shall be entitled to enter any Army or Navy hospital on their own request, under the same conditions as are now, or which may hereafter be, fixed for the active service H R 2963, introduced by Delegate Dimond Alaska proposes to authorize an appropriation of \$2,500,000 to establish a hospital for the insane of Alaska H R 2974 introduced by Representative

Voorhis, California, proposes to amend the Social Security Act so as to authorize an appropriation of \$7,000,000 annually to assist states, counties, health districts and other political subdivisions of states to provide medical care to nonresident needy persons on the same basis as to resident needy persons. H R 2979, introduced by Representative Van Zandt, Pennsylvania, proposes to authorize an appropriation of \$2,000,000 to construct in the central Pennsylvania area a veterans' hospital and domiciliary facility for the treatment of general medical and surgical disabilities H R 2985, introduced by Representative Green Florida, proposes to authorize an appropriation of \$2,500,000 to construct in Jacksonville, Fla., a marine hospital H R 2986, introduced by Representative Johnson Indiana, proposes to repeal the Economy Act of March 20, 1933 H R 2988, introduced by Representative Schwert, New York, proposes to provide that in the discretion of the Administrator of Veterans' Affairs, hospital care, including medical treatment may be furnished to veterans of the World War temporarily sojourning or residing abroad, for disabilities due to war service in the armed forces of the United States

## STATE MEDICAL LEGISLATION

### Arizona

*Bills Introduced*—H 3 proposes to require applicants for licenses to marry to present a physician's certificate that they are free from 'infectious contagious and venereal disease' A physician's certificate must be based on physical examination, tuberculin tests and laboratory reports of microscopic examination or the complement fixation test for gonorrhea, or both, and the blood Wassermann test or Kahn test for syphilis, or both. H 7 proposes to exempt from the sales tax the proceeds of sales of 'medicines purchased through a physician's prescription'

### California

*Bills Introduced*—S 130 and A 493 propose to require a physician or other person attending a pregnant woman to obtain or cause to be obtained a blood specimen at or within ten days after his first professional visit. The blood specimen thus obtained must be submitted to an approved laboratory for a standard laboratory test for syphilis. S 144 A 490 and A 492, to amend the laws relating to vital statistics propose that a certificate of birth include in addition to the information now required by law, the following item 'Prenatal examination for syphilis, including period of gestation in months or weeks at which examination was made, and if examination was not made including reason for not making such examination' S 173 and A 106 propose as a condition precedent to the issuance of licenses to marry that each party to a prospective marriage present a physician's certificate that he or she 'has been given such examination, including a standard serological test, as may be necessary for the discovery of syphilis, made not more than 30 days prior to the' application, 'and that in the opinion of the physician the person either is not infected with syphilis, or if so infected, is not in a stage of that disease which is or may become communicable to the marital partner' A 235 proposes to exempt from the Use Tax Act of 1935 'The storage, use or other consumption in this State of orthopedic supplies' A 236 proposes to exempt from the Retail Sales Tax Act of 1933 'the gross receipts from sales of orthopedic supplies' A 342 proposes to prohibit the issuance of a license to marry unless both parties to the prospective marriage file a certificate made by a physician within ten days of the application showing that both parties are free from any contagious, infectious or communicable disease A 437 to supplement the Business and Professions Code proposes to make it a misdemeanor for any person who does not possess a physician's and surgeon's certificate or a drugless practitioner's certificate to use in any sign or advertisement the term 'drugless physician, drugless methods naturopath, naturopathic physician, sanipractor, masseur physiotherapist physical therapist diet specialist or health adviser or who uses any degree or the abbreviation relating to or standing for all or any of the foregoing terms' A 438, to supplement provisions of the Business and Professions Code relating to the practice of medicine, proposes that 'The fraudulent representation by advertisement or otherwise that a manifestly incurable condition or sickness, disease, deformity, ailment or injury of any person can be cured

constitutes unprofessional conduct within the meaning of this chapter." A 449 proposes that on and after July 1, 1940, every applicant for a physician's and surgeons or drugless practitioners certificate, or for a certificate to practice chiropody or midwifery must be a citizen of the United States. A 450 proposes to make the sale, dispensing or prescribing of dinitrophenol for therapeutic purposes a misdemeanor. A 477, to supplement the Business and Professions Code, proposes that unless a person holds a physician's and surgeon's certificate, or is licensed or authorized to use the title "doctor" or the letters or prefix "Dr.," the use of the title or letters or prefix without further indicating the type of certificate held, constitutes unprofessional conduct. A 469, to supplement the Business and Professions Code, proposes to make it unprofessional conduct within the meaning of the chapter relating to medicine, for a licensee knowingly to make or sign any certificate or other document required by law which falsely represents the existence or non-existence of a state of facts. A 478, to amend the Business and Professions Code proposes that the drugless practitioners certificate provided for by the code, in addition to the authority it now confers, shall also authorize "the general and local application or use of any and all mechanical manipulative electro-therapeutical hydro-therapeutical dietary and psychological methods of treating the sick or afflicted for any purpose including physiotherapy physical therapy, colonic therapy all methods of massage, baths and any and all other types of drugless methods of treatment for the sick and afflicted." A 484 proposes to authorize courts on the application of the people the Board of Medical Examiners or the Board of Osteopathic Examiners to restrain the unlicensed practice of medicine or osteopathy.

#### Connecticut

*Bills Introduced*—S 20 to amend the dental practice act, proposes to make it a cause for the revocation of a license to practice dentistry for the holder to advertise for patronage by means of hand bills, posters circulars stereopticon slides or motion pictures. S 57 proposes to authorize the formation of nonprofit hospital service corporations to establish, maintain and operate plans whereby hospital care may be provided at the expense of such corporations by approved hospitals to subscribers to plans formulated by the corporations.

#### Georgia

*Bills Introduced*—H 47 proposes to enact a separate naturopathic practice act and to create an independent board of naturopathic examiners. The bill proposes to define naturopathy as "a system of diagnosing and treating the human body by use of natural methods and shall include the following therapeutic measures: Mechanotherapy, hydrotherapy, psychotherapy, phytotherapy, phototherapy, thermotherapy, electrotherapy, biochemistry, and embracing such practices as massage, mineral, thermal, electrical and vapor baths, external applications and dietetics." S 4 proposes to prohibit the retail sale or distribution of amylal, veronal, luminal or any similar drugs which may have a base or be a derivative from barbital, barbiturates and barbituric acid, except on the written prescription of a licensed physician or dentist.

#### Idaho

*Bill Introduced*—S 12 proposes to authorize the Department of Health to survey and study the various industrial health hazards of the state, to devise methods for their control and to provide services to various state agencies, industry, labor, the medical profession and other organizations interested in industrial hygiene.

#### Kansas

*Bill Passed*—S 13 has passed the senate proposing to prohibit the retail sale or distribution of barbital sulphonethylmethane (trional), sulfonmethane (sulfonal), diethylsulfon diethylmethane (tetronal), carbromal, paraldehyde and chloral or chloral hydrate or chlorbutanol except on the written prescription of a duly licensed physician, dentist or veterinarian.

#### Massachusetts

*Bills Introduced*—H 320 proposes to require for all public school pupils to be examined annually to ascertain defects in sight or hearing and other physical defects tending to prevent

a pupil from receiving full benefit of school work. The eye and ear examinations are to be made respectively by ophthalmologists and otologists. H 551 proposes that applicants for licenses to marry file with the clerk authorized to issue such licenses a physician's certificate with respect to each party to a proposed marriage that each applicant has been given such examination, including a standard serologic test as may be necessary for the discovery of syphilis, made on a day not more than twenty days prior to the application, and that in the opinion of the physician the person is not infected with syphilis or, if so infected, that the disease is not in a stage whereby it may become communicable. H 756 and H 757 propose that after the removal of any limb or organ the operating physician explain to the patient or his representatives the nature and necessity of the operation performed. H 670 authorizes the department of public health to issue certificates of approval to bacteriologic laboratories and to specify in such certificates what bacteriologic or serologic procedures performed in such laboratory are approved by the department. The bill proposes to define a bacteriologic laboratory as a "place or establishment which is advertised, announced or maintained in whole or in part for the purpose of accepting for and subjecting to bacteriological study or analysis specimens of blood, sputum, urine, feces or other fluids, secretions or excretions of the body of persons ill or suspected of being ill with a disease dangerous to the public health."

#### New York

*Bills Introduced*—A 130 authorizes municipal corporations to appoint physicians, at an annual compensation of not to exceed \$750, to treat indigent persons. Apparently any qualified physician may apply for such appointment and if appointed will be subject to call in the political subdivision in which he resides or maintains his office. S 130 and A 175 propose to require every local board of health and every health officer to exercise proper and vigilant inspection of all persons, 21 years of age or over, infected with poliomyelitis and to provide at the remedial stages of the disease suitable surgical, medical or therapeutic treatment or hospital care and necessary appliances and devices for such person so infected or exposed who cannot otherwise be provided for.

#### South Dakota

*Bill Introduced*—H 10 proposes to require applicants for licenses to practice any form of the healing art, as a condition precedent to examination and licensure by their respective professional boards, to pass examinations in anatomy, physiology, bacteriology, pathology and chemistry to be given by a board of basic science examiners. Members of this board must be full time professors or associate or assistant professors, teaching the subjects of the basic sciences in any university or college in the state accredited by the North Central Association of Secondary Schools and Colleges and must not be actively engaged in the practice of healing or any branch thereof. This bill went to second reading on January 13.

#### Tennessee

*Bills Introduced*—H 183 proposes to repeal the Chiropractic Practice Act adopted in 1931. H 202 proposes to authorize sexual sterilization of such inmates of state institutions as are insane, feeble-minded or epileptic. H 203 proposes to prohibit county clerks from issuing a license to marry unless both parties to a proposed marriage file a physician's certificate setting forth that each party is free from venereal diseases so nearly as can be determined by a thorough examination and by the application of recognized clinical and laboratory tests of scientific search [sic], when in the discretion of the examining physician such clinical and laboratory tests are necessary.

#### Texas

*Bill Introduced*—S 26 to amend the medical practice act proposes, in effect to permit persons to apply or use the principles, tenets or teaching of their church in the ministrations to the sick or suffering by prayer without the use of any drug or material remedy and to charge fees for so doing.



## Utah

**Bills Introduced**—S 34, to supplement the laws relating to the practice of naturopathy, proposes that an applicant for a license to practice naturopathy must (1) be a graduate of a legally chartered naturopathic college, requiring as a prerequisite to graduation at least a four years residence course of instruction of not less than eight and one-half months each year, (2) be a graduate from a four year high school (3) have completed one year of college work in a college of liberal arts, and (4) must have a course of training of not less than twelve months in a hospital approved by the board of naturopathic physicians or, in lieu thereof a course of training for a period of twelve months in the office of a licensed naturopathic physician in the state. S 33 to supplement the laws relating to the practice of naturopathy proposes to define naturopathy as the system of treating human ailments by natural methods as taught in naturopathic colleges and includes the following: Mechano therapy, hydro therapy, physio therapy, massage, articular manipulation, Swedish movements, phyto therapy, thermo therapy, chromo therapy, vibro therapy, gynecology [sic], mineral baths, electro therapy, and obstetrics, minor surgery, organo therapy, biochemistry, dietetics, emergency use of anodynes."

## Vermont

**Bills Introduced**—H 15 proposes as a condition precedent to the issue of licenses to marry that each party to a proposed

marriage present a physician's certificate that he or she has been given "such examination, including a standard serological test, as shall be prescribed by the State Board of Health as necessary for the discovery of syphilis" and that in the opinion of the physician each party is not infected with syphilis or, if so infected, is not in a stage of that disease whereby it may become communicable. H 34 proposes to enact what appears substantially to be the uniform narcotic drug act. The bill proposes to designate as "narcotic drugs" coca leaves, opium, cannabis and every substance neither chemically nor physically distinguishable from them.

## Washington

**Bills Introduced**—S 15 proposes to enact a food, drug and cosmetic act to prevent the manufacture, shipment and sale of adulterated or misbranded food, drugs, devices and cosmetics. S 24 and H 11 propose to prohibit the retail sale and distribution of amylal, luminal, veronal, barbital, acid diethylbarbituric, para amino benzoic, sulfonamide, sulfanilamide, sulfanilic acid, prontosil, prontosil, neo prontosil, neo pronylin, or edmanlin except on the written prescription of a licensed physician, dentist or veterinarian surgeon. S 39, to amend the narcotic drug act, proposes (1) to define narcotic drugs so as to include dihydromorphone sulfate and barbital and (2) to authorize the establishment of state clinics for the treatment and rehabilitation of narcotic addicts.

## WOMAN'S AUXILIARY

## California

The auxiliary to the San Diego County Medical Society sponsored its fourth public health institute recently. The speakers included Dr Samuel J. McClendon, on contagious diseases of the school child, Harvey Stallard, DDS "Care of the School Child's Teeth," and Drs Bryant R. Simpson, Stephen A. Parowski and Rufus A. Schneiders, tuberculosis.

## District of Columbia

The educational committee appointed by the auxiliary to place a young woman in a nurses' training school in Washington has selected the Sibley Hospital Training School. Her expenses, including uniforms and equipment, are defrayed by the auxiliary. Mr Theodore Wiprud, executive secretary of the Medical Society of the District of Columbia addressed the auxiliary October 5.

## New York

The auxiliary to the Rockland County Medical Society and the society arranged a program of movies and lectures on cancer control recently. Three lectures were given by Dr John M. Swan, executive secretary of the New York State Committee of the American Society for the Control of Cancer, in the high schools of Suffern, Nyack and Haverstraw.

The auxiliary to the Albany County Medical Society met recently at St Peter's Hospital, Albany. Miss Marguerite Jacobsen, R.N., associate executive secretary of the New York State Nurses Association, spoke on the "New Nurse Practice Act." Plans were made for supplying lavettes to the Visiting Nurse Association of Albany.

## Pennsylvania

The auxiliary to the Allegheny County Medical Society held a membership rally in Renziehausen Park, McKeesport, September 14. Mrs David B. Ludwig, president, addressed the group on the aims and accomplishments of the auxiliary, and a talk on socialized medicine was given by Mrs Joseph P. Dobo.

The auxiliary to the Chester County Medical Society visited Pennhurst State School September 20. Dr George B. McC Wilson showed colored motion pictures of the school's activities.

At the tenth annual meeting of the auxiliaries of the Second Council District at Norristown Dr Frederick J. Bishop,

president of the Medical Society of the State of Pennsylvania suggested that a clipping bureau be established to collect all newspaper articles pertaining to the medical profession and that a speakers' bureau be organized.

## South Dakota

At a recent meeting of the Seventh District Auxiliary in Sioux Falls, Dr L. J. Pankow explained the new basic science law which will be voted on at the coming session of the state legislature.

## Tennessee

Through the efforts of Mrs Rogers N. Herbert, Nashville past *Hygeia* chairman of the Woman's Auxiliary to the American Medical Association, *Hygeia* is being sent to every public elementary and high school in the state of Tennessee, a total of 6,182 schools. The state legislature having appropriated funds for distributing public health literature among the schools, the Woman's Auxiliary in cooperation with the state board of education selected *Hygeia* as the magazine best fitted to be distributed under this appropriation. If any *Hygeia* chairman cares to work along similar lines, she may write to Mrs Herbert at Franklin Road, Nashville or to Mrs James D. Lester, present National *Hygeia* Chairman, Granny White Pike, Nashville, Tenn.

## Texas

At a meeting of the auxiliary to the Henderson County Medical Society at Athens, September 13, Mrs W. R. Love reviewed "The Citadel."

Socialized medicine was discussed at a meeting of the Jasper Newton Counties Auxiliary in Kirbyville, September 14.

The auxiliary to the Tarrant County Medical Society entertained the wives of physicians attending the Fort Worth Medical and Surgical Clinics September 7. Seventy-five women were in attendance. The auxiliary held a public relations tea at Fort Worth October 14. Three hundred and fifty women were present. Dr S. E. Thompson, Kerrville, spoke on socialized medicine. Presidents of women's clubs, parent teacher organizations and members of the Tarrant County Medical Society were guests at the tea.

The auxiliary to the Taylor-Jones Counties Medical Society at Abilene cooperated with the City Federation of Women's Clubs in preparing an exhibit at the county fair.

## MEDICAL ECONOMIC ABSTRACTS

## PAID NEWSPAPER ADVERTISING PROPOSED IN NEW JERSEY

At a meeting of the Committee on Public Relations of the Medical Society of New Jersey at Trenton, December 4, the advisability of a paid advertising program for the medical profession of New Jersey was considered.

The committee approved of paid institutional advertising in newspapers to acquaint the public better with the ideals, policies, program and work of the county medical societies in New Jersey. The members of the Committee on Public Relations believe that the question of paid advertising should be decided by each county medical society.

The committee recommends the inauguration of such a program by the county medical societies on a county-wide basis. The public must be told how it benefits from a system of medical practice which is free from coercion and political red tape and how politicalization of medicine will result in a poorer type of medical care for them. This proposed advertising program constitutes no departure from medical ethics. Several of the county medical societies have on occasion advertised in newspapers. What is advocated in this program is the advertising of the institution of the private practice of medicine, not the advertising of the individuals who comprise that institution. It is in keeping with medical ethics to try to preserve the best system of medical care, judged by results, which exists anywhere in the world, and to keep it free from unnecessary political restraints.

Each county can be adequately covered through a selective list of newspapers of large circulation. It is for the body of physicians of New Jersey to decide whether improved public relations, and possibly the future status of medicine itself, is worth to them an annual investment approximating the amount received from one office call.

If the county medical societies approve this suggested advertising program, the committee is prepared to undertake the preparation of advertising copy which will be a credit to the institution sponsoring it from the standpoint of both content and typography.

The Committee on Public Relations of the Medical Society of New Jersey urges that this question be placed on the agenda of county medical societies for its earliest possible consideration. The members of the committee are Drs. Joseph H. Kler, chairman, J. Berkeley Gordon, G. Barton Barlow, Edgar P. Cardwell, Homer I. Silvers and J. Allen Yager.

## THE IOWA COOPERATIVE CASE FINDING PROGRAM

The Iowa Tuberculosis Control Service, says Dr. C. K. McCarthy in the *Journal of the Iowa State Medical Society* (28:632 [Dec.] 1938), is so planned and so functions that it does not miss the infant, the child of preschool age or the child of school age. It does not miss the teachers or any persons who have had contact with a case of tuberculosis. Most important of all, it places the responsibility for the education of the public not in the public press, not in the hands of enthusiastic but often misinformed laymen but right in the hands of the family physicians who, working in conjunction with especially trained public health nurses, tell the people in the privacy of home or office the things they should know about tuberculosis. Of course the purpose of the program is to find at the earliest stage possible, those persons who have been infected by tubercle bacilli as a result of close association with an open case of tuberculosis. There are three ways of locating such individuals: through reported morbidity, through reported mortality and through personal contact with the private practitioners. In the final analysis this means that there is only one way—through the doctors. It is they who make the morbidity and mortality reports which constitute the starting point. If physicians failed to do this there would be no starting place. However, Iowa physicians do not fail.

The personnel consists of a clinic director, a supervising nurse, tuberculosis field nurses, an x-ray technician and a clerk. The

equipment consists of a portable x-ray machine and an x-ray laboratory. Never under any circumstances does the service attempt to put case finding into execution in a county until the county medical society has invited it to do so. Such an invitation must be made in writing. Furthermore, it cannot be made until after the director or some other staff member has explained the program in detail to the county medical society. It is extremely important that there shall be no misunderstanding on the part of the private practitioners as to just what the state department of health is trying to do. It was made clear that no encroachment was being made on their private practice and no attempt to force on them that specter which at times haunts all good doctors, the specter of state medicine.

The physician receives the sum of one dollar for doing the tuberculin test. This is paid by the department of health and is additional to the regular fee which the patient pays the doctor for examination.

The program has been in operation actually only since December 1937. At the present time the service is averaging a clinic a week. There are four field nurses. County nurses also are available in counties where a full time public health service is in operation, thus making it possible to double the number of surveys being conducted in a given period. Thirty-four clinics have been held since December 1937, at which 2,205 patients have been roentgenographed, all of whom had positive Mantoux tests. It is too early for statistical studies of value. Fifty-seven counties have accepted the service to date. Not a single county that has asked for an explanation of the program has failed to approve it afterward. Primarily the program was intended to serve only those counties of the state having a population of 30,000 or less. There are eighty such counties in the state.

## CAUSES OF MATERNAL MORTALITY

The minister of health was asked in the House of Commons recently whether he could make any further report on the effect on maternal mortality of the special foodstuffs granted by the special commissioners through the National Birthday Trust Fund for expectant mothers. He replied that particulars of the results of this nutrition scheme, which was now being carried on by the joint Council of Midwifery, covering the period from July 1 to Dec. 31, 1937, were now available.

They showed that among 4,446 mothers receiving special food the puerperal death rate was 0.45, the maternal death rate from associated causes 0.67, and the infant death rate (stillbirth and neonatal) 54. Among 9,040 mothers not receiving special foods the corresponding rates were 3.54, 1.33 and 83 respectively. When asked what would be the next steps in the experiment, in view of the satisfactory results already achieved, Mr. Walter Elliott said that they had to complete the experiment for which the special commissioner had given another £3,000 (*Journal of the Royal Institute of Public Health and Hygiene* 1:572 [July] 1938).

## APPARENTLY THEY DON'T WANT IT

At the meeting of the house of delegates of the Medical Society of the State of Pennsylvania, October 3-6, it was reported that Dauphin County organized a County Medical and County Dental Society Bureau directed by an experienced welfare worker and including on its staff a medical social worker and offered the people of the county a free choice medical or dental service care on a budgeted or partial fee basis, or without any charge if properly certified. Disappointed with the very slight response the bureau, at its own expense, carried advertisements in three daily newspapers and later for ten consecutive weeks a series of advertisements with accompanying explanatory articles in a labor journal of the county reaching 20,000 employed persons. Again the results were negligible.

It is quite apparent that between existing hospitals, dispensaries, clinics, physicians and dentists in private practice, without mentioning other well organized institutions and agencies the present day sickness needs, both preventive and corrective, of the people of this populous county are being met as those in need of such services will seek and accept them.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATIVE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ADDITIONAL MEDICAL COLLEGE NEWS AND ARTICLES APPEAR IN THE STUDENT SECTION, PAGE 373

### ALABAMA

**Personal**—Dr. William L. Bonks, formerly of Monticello, Tenn., has been appointed associate in charge of the division of child hygiene of the state department of health.

**Foreign Graduates Must Become Citizens**—At a recent meeting of the state board of censors of the Medical Association of the State of Alabama, sitting as a board of medical examiners, it was voted that after January 1 full citizenship papers in the United States will be required of any applicant who is a graduate of a European medical school seeking a certificate of qualification to practice medicine in Alabama.

### ARKANSAS

**Dental Health Program**—The Arkansas State Board of Health has employed fifteen dentists on part time who will conduct dental health programs in fifteen counties having full time health units, according to the *Health Officer*. These dentists will be part of the health department staff working under the supervision of the county health officer.

**District Meetings**—At the semiannual meeting of the Third District Medical Society in Marion recently, "Differential Points in the Diagnosis of Angina Pectoris and Coronary Occlusion with Therapeutic Indications of Each" were reviewed by Dr. William C. Colbert, Memphis. "Pollens Therapy in Allergic Diseases" was described by Dr. Irwin W. Barrett, Clarksdale, Miss., and "Chest Conditions in Children" were considered from the medical point of view by Dr. Walker L. Rucks, Memphis, and from the x-ray aspect by Dr. Horace D. Gray, Memphis.—The First Councilor District Medical Society recently held its seventy-second semiannual meeting in Jonesboro. Dr. Martin E. Branton, Jonesboro, showed motion pictures of the eyes, Dr. Charles D. Tibbels, Black Rock, spoke on puerperal eclampsia, and Dr. Edward R. Barrett, Jonesboro, "Amebiasis in Our District."

### CALIFORNIA

**Rabies Quarantine**—The state department of health placed a rabies quarantine on Santa Clara County December 16 with the exception of Palo Alto and San Jose. An order issued Nov. 19, 1937, had covered a portion of the county, but because of the spread of the disease it became necessary for a later order to quarantine the entire area.

**Gift for Metabolic Research**—A gift of \$50,000 has been received by the Scripps Metabolic Clinic, La Jolla, from Mrs. Harry W. Child, Helena, Mont., to be known as the Harry W. Child Memorial Fund. The income from this fund is to be devoted to metabolic research. Mr. Child, formerly president of the Yellowstone Park Transportation Company, died of diabetes in 1932.

**Society News**—The Alameda County Medical Association devoted its meeting January 16 to a round table discussion on newer concepts and procedures in tuberculosis. The speakers were Drs. Henry Chesley Bush, Livermore, chairman, Charles A. Dukes, Joseph Lloyd Eaton, Sumner Everingham, Paul C. Samson, Harold G. Trimble and Marshall B. Tucker, Oakland, and Clifford V. Mason, Livermore.

### CONNECTICUT

**Dr. Abell Addresses State Society**—Dr. Irwin Abell, Louisville, Ky., President of the American Medical Association, was the guest of the Connecticut State Medical Society at a dinner January 21 in New Haven, he discussed socialized medical developments.

**Changes in Health Officers**—Dr. Walter S. Lay has been appointed health officer of Hamden. Dr. Josephine Evarts, Cornwall Bridge, has been appointed health officer of Kent, and Dr. Reuben Rothblatt, acting health officer of Willimantic, filling the vacancy caused by the resignation of Dr. Nathan M. Spector. Dr. Howard G. Stevens, New Milford, has been appointed health officer of Sherman.

### DISTRICT OF COLUMBIA

**Society News**—A symposium on disorders of the kidneys in childhood was presented by the section on pediatrics before the Medical Society of the District of Columbia January 18, the speakers included Drs. Edgar P. Copeland, John H. McLeod, L. Clarence Rice, Jr., Hugh J. Davis and Charles P. Howze. Drs. Lawrence Kolb, Washington, and Dexter M. Bullard, Rockville, Md., participated in a symposium on narcotic addiction before the society January 11.—Ellsworth Huntington research associate in geography, Yale University, New Haven, discussed 'Effect of Climate and Weather on Human Health and Efficiency' before a meeting of medical and dental officers of the navy on duty in the District and vicinity December 5.

**Annual Graduate Clinic at George Washington University**—The seventh annual graduate clinic of the George Washington University School of Medicine will be held February 18. On the same date the annual banquet and alumni reunion of the medical school will be held at the Mayflower Hotel with Dr. Roy R. Kricke, professor of bacteriology and pathology, Emory University (Ga.) School of Medicine as the principal speaker. Those who will present papers on the clinic program include:

Dr. Charles S. White, The Establishment of a Blood Bank.  
Dr. Francis R. Hagner, Torsion of the Spermatic Cord.  
Dr. Cushtee Hall, The Smith-Petersen Nail in Intracapsular Fractures of the Hip.  
Dr. George B. Roth, An Analysis of the Proprietary Tragedy—Elmer of Sulfanilamide.  
Dr. Albert J. Sullivan, Medical Management of Peptic Ulcer.  
Drs. Theodore J. Abernethy and Harry F. Dowling, Use of Sex Chemotherapeutic Agents in the Treatment of Lobular Pneumonia.  
Dr. Walter A. Bloedorn, Popular Misconceptions in the Management of Patients with High Blood Pressure.  
Dr. Paul Padgett, Baltimore, Treatment of Tuberculous Dorsalis. Review of 900 Cases.  
Dr. Joseph I. Howard, Roentgen Therapy in Puerperal Mastitis.

Members of the District of Columbia Medical Society, members of medical societies of neighboring states and officers of the army, navy, veterans' administration and the U. S. Public Health Service are invited.

### GEORGIA

**Changes in Health Officers**—Dr. Thomas H. D. Griffith, director of the Henry R. Carter Memorial Laboratory of the U. S. Public Health Service, Savannah, has been appointed acting city health officer, filling the vacancy created November 3 by the deaths of both Dr. Victor H. Bassett, health officer, and his assistant, Dr. Alfred Larson.—Dr. Dudley A. Reekie, Louisville, Ky., field director of county health work in Kentucky, has been appointed assistant city health officer of Atlanta, it is reported.—Dr. Thomas W. Collier, Lyons, has resigned as health commissioner of Toombs County to engage in the private practice of medicine in Port Arthur, Texas.

**Special Society Meetings**—At the first annual meeting on Sea Island Beach recently the Georgia Industrial Surgeons Association was addressed by Dr. Robert Drane, Savannah, on 'Importance of the X-ray in Industrial Work', Dr. Lonnie W. Grove, Atlanta, "Organization of a Medical Service in Industry", Mr. A. B. Robertson, Atlanta, "The Problem of the Claim Men," and Mr. J. H. Allen, president of the Union Bag and Paper Company, "The Employers' Interest in Industrial Practice." Officers are Drs. Cornelius F. Holton, Savannah, president, Robert L. Rhodes, Augusta, vice president, and John W. Simmons, Brunswick, secretary and treasurer.—The Georgia Pediatric Society held its annual meeting in Augusta January 12. The guest speakers included Drs. Charles Hendee Smith, New York, Alexis F. Hartmann, St. Louis, and Thomas B. Cooley, Detroit.

### ILLINOIS

**Health Week in Moline**—The week of February 6 has been designated "health week" in Moline. A public meeting will be held February 9 with Dr. August Henry Arp, mayor, presiding. Dr. Albert C. Baxter, Springfield, acting state health director, will speak on 'The Meaning of a Public Health Department to a Community.' The observance was instigated by the Y. M. C. A. in cooperation with local medical societies, clubs and schools.

**Memorial to Physician**—A boulder and plaque were unveiled on the grounds of the Schmitt Memorial Hospital, Beardstown, recently, in honor of the late Dr. Frederick Ehrhardt. The inscription on the plaque reads: "This site was donated to Beardstown for a hospital in memory of Dr. Frederick Ehrhardt by his heirs. Dr. Ehrhardt graduated in medicine at the University of Gottingen, coming to

America in 1846. He practiced in Baltimore a year before coming to Beardstown. He died in 1881. Dr Ehrhardt was the original owner of the site given to the city for the hospital, which was dedicated in 1931.

### Chicago

**The Bacon Lectures**—Dr Walter Schiller, director of laboratories, Cook County Hospital, will deliver the Charles Sumner Bacon Lectures for 1938-1939 in the Medical and Dental College Laboratories Building, University of Illinois College of Medicine, February 15-16. His subjects will be 'Endometrioma and Endometriosis and Congenital and Acquired Sex Changes'.

**Private Physicians Carry on Syphilis Testing Program**—Under a plan adopted January 10 by the council of the Chicago Medical Society with the approval of Dr Robert A. Black acting president of the board of health, private physicians will replace physicians of the board of health in the city's syphilis testing program, it is reported. In the future, persons will be asked through educational pamphlets and lectures to go to private physicians for physical examinations, including a syphilis test the examinations for indigents to be free. Heretofore, health department physicians went into high schools, factories and neighborhood stations to make mass tests of all volunteers. In 1938 over 140,000 tests were made.

**Society News**—A symposium on disturbances of adolescence was presented before a joint meeting of the Chicago Medical and Pediatric societies January 11, the speakers were Drs Edward D. Allen, Paul L. Schroeder, Chicago, and Elmer L. Sevringhaus, Madison, Wis. At a joint meeting of the Chicago Medical Society with the Chicago Roentgen Society January 18 Dr Byrl R. Kirklin, Rochester, Minn., spoke on 'Value of Roentgen Diagnosis as It Pertains to the Physician in General Practice,' and Bernard P. Widmann, Philadelphia, 'X-Ray, Radium and Cancer'—O. C. Durham discussed 'Inhalant Allergens in the Upper Air' before the Chicago Society of Allergy January 16 and Dr Franz Alexander, 'Psychogenic Factors in Clinical Allergy'—Dr Daniel B. Kirby, New York, addressed the annual meeting of the Chicago Ophthalmological Society January 16 on 'The Surgery of the Exophthalmos'—At a meeting of the Chicago Neurological Society January 19 Drs Theodore T. Stone and Alex J. Arieff spoke on 'Temporal and Maxillary Osteomyelitis with a Report of Two Cases of Multiple Cranial Nerve Paralysis and Diabetes', John Martin, 'Studies of Ventricular Casts Made in Cases of Intracranial Tumor', and Leo M. Davidoff, Brooklyn, 'Newer Aspects in Diagnosis by the Aid of Pneumoencephalography'.

### IOWA

**Epidemic of Tularemia**—More than five times as many cases of tularemia were reported to the state department of health in November and December 1938 as in any previous year on record, according to the state medical journal for January. The distribution by counties of 100 cases of tularemia thus far reported officially is Appanoose twenty-two, Black Hawk one, Clarke one, Clinton two, Dallas one, Davis five, Decatur five, Des Moines seven, Henry two, Iowa one, Jefferson one, Johnson one, Keokuk one, Lee nine, Louisa four, Lucas four, Mahaska one, Marion three, Marshall two, Monroe two, Muscatine two, Polk seven, Ringgold one, Scott four, Van Buren one, Wapello four, Warren two, Washington three and Wayne one. It is noteworthy that with the exception of Black Hawk County no cases have been reported in the northern half of the state.

### KENTUCKY

**Society News**—Dr Edward J. O'Brien, Detroit addressed the Jefferson County Medical Society December 5 under the auspices of the Louisville Tuberculosis Association on 'Surgical Treatment of Pulmonary Tuberculosis'—Drs Eshe Asbury Cincinnati and William O. Johnson, Louisville addressed the Bourbon County Medical Society, Paris recently on 'Hip Fractures' and 'Endocrinology' respectively.

**Meeting of Psychiatrists**—Dr Floyd K. Foley, Lexington was chosen president elect of the Kentucky Psychiatric Association at its second annual meeting in Lexington December 9-10 and Dr S. Spafford Ackerly, Louisville was installed as president. Dr Lieuen M. Rogers, Lexington was elected vice president and Dr Robert H. Felix, Lexington secretary. Among the speakers were Drs Seymour D. Vestermark, Lexington, on 'Psychiatric Needs of General Practice and of the General Hospital', John W. Cronin, Lexington, 'Management of Head Injuries in Relation to the Prevention of Mental Disorder', and William K. Keller, Louisville, 'Occupational

Therapy in the Treatment of the Mentally Disordered'—A mental hygiene session open to the public was held Saturday afternoon with Dr William E. Gardner, Louisville, as chairman. The annual dinner was held Saturday evening with Frank L. McVey, L.H.D., president of the University of Kentucky, as the speaker on 'The Contribution of Culture to Healthful Living'.

### LOUISIANA

**In Memory of Dr Pierson**—A picture of the late Dr Clarence Pierson Pnevville, was recently placed in the room of medicine of the Cabildo, Louisiana State Museum, New Orleans. The inscription reads "Dr Clarence Pierson, Scientist, Builder Humanitarian, 1868-1934". Dr Pierson graduated from the Tulane University of Louisiana Medical Department, New Orleans, in 1894. He at one time served as medical superintendent of the Central Louisiana State Hospital, Pnevville, which he founded, and the East Louisiana State Hospital, Jackson. He also served as special consultant to the three eleemosynary institutions, the two already mentioned and the State Colony and Training School, Alexandria. He was a member of the House of Delegates of the American Medical Association, 1919-1920 and at one time president of the Sixth Council District of the Louisiana State Medical Society.

**Graduate Seminar**—The Graduate School of Medicine of Louisiana State University Medical Center, cooperating with the general extension division of the state university, conducted a seminar at the Lafayette Charity Hospital, Lafayette, December 2-3. The speakers included:

- Dr George W. McCoy, New Orleans, Preventive Medicine with Special Reference to Medical Practice
- Dr Charles J. Bloom, Foods for Infants
- Dr Isidore Cohn, Masses in the Neck
- Dr Charles A. Bahn, Recent Ophthalmic Advances for Practicing Physicians
- Dr James K. Howles, Some of the More Common Skin Conditions Encountered by the General Practitioner in This Vicinity, Their Diagnosis and Treatment
- Dr Henry W. E. Walther, Diagnosis and Treatment of Prostatic Disease
- Dr Daniel N. Silverman, Diagnosis and Treatment of Common Types of Diarrhea
- Dr Ben R. Heninger, Some Modern Concepts of Heart Disease
- Dr John F. Dicks, Treatment of Sterility
- Dr Valentine H. Fuchs, Ear, Nose and Throat Conditions Met by the General Practitioner
- Dr Thomas B. Sellers, Office Gynecology

### MASSACHUSETTS

**Personal**—Dr Paul I. Yakovlev, Waltham, has been appointed clinical director of the Walter E. Fernald State School, Waverley.—Edward M. East, Ph.D., professor of genetics, Harvard University, died November 9 in Massachusetts General Hospital, Boston. He was the author of 'Mankind at the Crossroads' and 'Heredity and Human Affairs'—Dr William E. Hmes, Hingham, has been appointed medical examiner of the fifth Plymouth district, succeeding Dr John G. Sweeney. The district includes Hingham, Nantasket and Hull.

**Public Lectures**—A series of free public lectures on medical subjects was begun January 8 by the faculty of Harvard University Medical School, Boston, to end March 19. The speakers include:

- Dr Leroy D. Fothergill, January 8, The Menace to Human Beings of Disease in Domestic Animals
- Dr Clarence Guy Lane, January 15, The Skin—What It Does and the Care It Needs
- Dr Tracy B. Mallory, January 22, Cancer
- Dr James J. Durrett, Washington, D. C., U. S. Food and Drug Administration, January 29, Food and Drugs—Safe and Unsafe
- Dr Harold M. Teel, February 5, Health and Hygiene During Pregnancy (for women only)
- Dr Henry N. Pratt, February 12, Asthma—Hay Fever
- Dr William C. Quimby, February 19, The Significance of Syphilis and Other Venereal Diseases
- Dr Vernon P. Williams, February 26, Nervous Breakdowns
- Dr S. Burt Wolbach, March 5, Vitamin Deficiencies
- Dr Timothy Leary, March 12, Hazards in the Modern Home
- Dr Robert B. Osgood, March 19, Chronic Rheumatism

### MICHIGAN

**Graduate Fellowship at Butterworth Hospital**—James Rowland Lowe, president of the board of trustees of Butterworth Hospital, has created a fellowship in memory of his parents, Edward and Susan Lowe, carrying with it a cash prize of not less than \$500 for graduate study by members of the medical staff who have shown increased proficiency in diagnosis and in medical or surgical treatment and fulfil other stipulations. Recipients of the award, to be known as the Edward and Susan Lowe Fellowship, must agree to expend it within one year in defraying expenses of graduate study out-

side Grand Rapids and must consult and abide by the recommendations of the staff executive committee of the hospital as to the best method of utilizing it. On his return to the hospital the holder of the fellowship is to share with the staff the knowledge he has gained by a review of his experience before a general staff meeting and other means. First award of the fellowship may be made this month.

**Secretaries' Conference**—The Michigan State Medical Society held its annual county secretaries conference at the Hotel Olds, Lansing, January 15. The speakers included:

Dr. Louis Fernald Foster, Bay City, secretary, state medical society, Michigan's Group Hospitalization and Medical Care Plans.  
Dr. Harold A. Miller, Lansing, chairman, legislative committee of the state society.  
Our legislative director.  
Mr. Lee White, Detroit, *News Detroit*, The Physician in the Press and on the Air.  
Mr. Joe W. Savage, Charleston, secretary, West Virginia State Medical Association, The Duties of a 100 Per Cent County Secretary.

Vernon J. Brown, Mason auditor general of Michigan, representing the governor, addressed the luncheon session on "The Affairs of State."

**Society News**—Dr. Russell L. Harden, Cleveland, discussed "Treatment of Anemias" before the Calhoun County Medical Society, Battle Creek, January 3.—Dr. Kellogg Speed, Chicago, addressed the Genesee County Medical Society in Flint, January 11 on the management of fractures.—Dr. Leides M. Laton, Rochester, Minn., discussed "Pain Characteristic of Various Neurologic Disorders" before the Kalamazoo Academy of Medicine, January 17.—Physicians in Van Buren County are organizing a county medical society.—Dr. Paul A. O'Leary, Rochester, Minn., discussed "Neurosyphilis and Its Treatment" before the Detroit Dermatological Society, January 16.—Dr. George E. Rockwell, Cincinnati, is the guest speaker, discussed "The Value of Oral Pollen Therapy" before the Michigan State Allergy Society in Bay City recently. Dr. Buenaventura Jimenez, Ann Arbor, is president of the society and Dr. George L. Waldbott, Detroit, secretary. Five meetings will be held during the coming year, three of which will be in Ann Arbor.—At a meeting of the Muskegon County Medical Society in Muskegon, January 20, Dr. Harry E. Mock, Chicago, spoke on herd injuries.

## MINNESOTA

**Forum on Government in Medicine**—The Minnesota State Medical Association sponsored a forum on government in medicine at the St. Paul Hotel, St. Paul, January 14. The speakers included Mr. J. George Crowhart, executive secretary of the State Medical Society of Wisconsin, Madison, and Drs. Gilbert G. Cottam and William A. O'Brien, Minneapolis.

**Personal**—Dr. Len L. Culp, Minneapolis, was recently voted life membership in the Fort Wayne, Ind. Medical Society.—Dr. Frederick P. Arny, Preston, has been appointed coroner of Fillmore County.—Dr. Charles F. McComb, Duluth, eight times elected coroner of St. Louis County, retired January 1. He is 81 years of age. Dr. John W. Ekblad was chosen to succeed him. Dr. McComb was president of the Minnesota State Medical Association in 1888, was the first president of the Interurban Academy of Medicine and was twice president of the St. Louis County Medical Society. He has practiced in Duluth since 1883.

**Society News**—The Minnesota Pathological Society was addressed January 17 by Drs. J. Grafton Love, Rochester, and Lawrence Berman, Minneapolis, on "Protrusion of the Intervertebral Disks" and "An Extragenital Chorionepithelioma," respectively. Elvin C. Stakman, Ph.D., professor of plant pathology, University of Minnesota Medical School, discussed "Virus Diseases of Plants" before the society November 15.—The Minnesota Academy of Medicine was addressed in St. Paul December 14 by Drs. Robert G. Green on "Filterable Viruses in Relation to Tumors and Malignant Growths" and Ernest M. Hammes, "Recent Progress in Neurology and Psychiatry."—The Minneapolis Surgical Society was addressed January 5, among others, by Drs. Donald C. MacKinnon on "Carcinoma of the Pancreas" and Robert G. Allison, "Radiation Therapy in Tumors."

## MISSISSIPPI

**Changes in Health Officers**—Dr. Benjamin F. Hand Jr., Greenville, has been appointed health officer of Washington County, it is reported. Dr. Littleton H. Eubanks, Lexington, assistant health officer in Lauderdale County, has been appointed in charge of the unit in Holmes County. Dr. John H. Hines, Atlanta, Ga., has succeeded Dr. Eubanks in Lauderdale County. Dr. Thomas Lon Owings, Poplarville, is acting health officer

in Pearl River County to relieve Dr. Ransom J. Jones, health officer, who is on leave of absence for study at Johns Hopkins University, Baltimore. Dr. Robert A. Clanton, Grenada, has been appointed health officer of Grenada County, succeeding the late Dr. Thomas J. Brown.

## NEW JERSEY

**Lectures on Dermatology**—A graduate course on dermatology for the general practitioner will be offered by the Bergen County Medical Society continuing each Thursday from January 2 to March 9 at Hackensack Hospital, Holy Name Hospital, Tenack, and Englewood Hospital. The lectures will be:

Dr. Richard J. Kelly, New York, Management of Acne and Seborea.  
Dr. Elias William Abramowitz, New York, Drug Eruptions.  
Dr. Leslie Paxton Barber, New York, Cutaneous and Mucous Membrane Manifestations of Syphilis.  
Dr. George Clinton Andrews, New York, Diagnosis and Treatment of Precancerous Eruptions.  
Dr. Howard Fox, New York, Diagnosis and Treatment of Common Diseases of the Skin in Childhood.  
Dr. George M. Lewis, New York, Diagnosis and Treatment of Common Lung and Infections.

## NEW YORK

**Society News**—Dr. Everett D. Kiefer, Boston, addressed the Dutchess County Medical Society, January 11 in Poughkeepsie on "Functional Disorders of the Gastrointestinal Tract."—Dr. Alexander D. Langmuir, assistant director of the bureau of pneumonia control in the state department of health, Albany, addressed the Broome County Medical Society, Binghamton, January 10 on "Higher Types of Pneumonia."—Drs. Lark E. J. Mack and Arthur E. Harris, Syracuse, addressed the Onondaga County Medical Society, Syracuse, January 3 on "Infectious Mononucleosis" and "Filterable Virus Diseases" respectively.—Dr. Alvin L. Barch, New York, addressed the Utica Academy of Medicine, December 13 on "Advance in the Therapeutic Use of Oxygen, Helium and Positive Pressure."

**Pneumonia Institute in Buffalo**—The Medical Society of the State of New York and the bureau of pneumonia control of the state department of health will sponsor an institute on pneumonia at the Buffalo City Hospital, February 16 under the auspices of the Medical Society of the County of Erie. In the morning the following program will be presented:

Dr. Edward C. Keifenstein, Syracuse, Early Clinical Diagnosis of Pneumonia.  
Dr. George M. Mackenzie, Cooperstown, Bacteriologic Diagnosis of Pneumonia.  
Dr. Jesse G. M. Bullowa, New York, Serum Treatment of Pneumonia.  
Dr. David D. Rubinstein, Albany, The New York State Pneumonia Control Program.

In the afternoon there will be a panel discussion by the four speakers with questions from the floor and practical demonstrations of the technique of serum administration.

**Legislative Committee Recommends Study of Health Insurance Before Action**—The New York State Temporary Commission to Formulate a Health Program, a committee of the state legislature, in a preliminary report adopted January 11 recommended that legislative action on a health insurance plan be postponed for another year while a broad and thorough study of the subject is being made. Eight recommendations on which action will be pressed during this session of the legislature were adopted for inclusion in the preliminary report of the commission. Briefly these are:

Establishment of therapeutic and diagnostic, tumor and cancer clinics and of a plan to make state owned radium available to approved institutions for treatment.

Extension of public health education on a broad base to include full information on the availability of health and medical facilities and services.

Encouragement of sound voluntary health and medical insurance schemes with ample provisions for record keeping and current analyses to provide the actuarial soundness of the different plans as a basis for future planning.

Provision for uniform record keeping and reporting of municipal expenditures for public health.

Expansion of public health and school nursing facilities.

Expansion of county laboratory systems or approval of existing laboratories to make diagnostic facilities available.

Amendment of the public welfare law and necessary additional appropriations to provide state aid for maternity cases.

Establishment of informal interdepartmental committees to coordinate health welfare and curative services conducted by various state and local divisions.

The commission recently held a public hearing in New York to obtain a cross section of opinion on the public health needs of the state. At its meeting in Albany Assemblyman Lee B. Mailler of Orange County was elected chairman, Senator Joe R. Hanley of Wyoming County vice chairman and Assemblyman Robert F. Wagner Jr. reelected secretary.

## New York City

**Scholarships Available for Graduate Study**—The New York Post-Graduate Medical School, Columbia University, announces that it has a scholarship fund available for qualified graduates in medicine who wish to take graduate courses at the school. By the terms of the endowment, applicants from Allegheny County, Pa. are given preference, other circumstances being equal. For information and application forms address the Director, New York Post-Graduate Medical School and Hospital, 303 East Twentieth Street New York.

**Illegal Practitioners Convicted**—Two men pleaded guilty in the court of special sessions recently of practicing medicine without licenses. Earl H. Weidling, Ozone Park, Queens, a second offender, was sentenced to three years in the penitentiary. Fake medical licenses, diplomas and certificates and a physician's automobile license plate were found in his home. J. Augustin Bombard, said to be a chiropractor, paid a fine of \$100 after admitting that he had written a prescription for a woman detective and charged her a large fee for diagnosing her pretended ailment as 'knotted nerve ends.'

**Official Tribute to Private Practitioners**—The Council of the City of New York at a meeting December 20 adopted a resolution of 'recognition of the part played by the seven thousand physicians of the city of New York for protection of the public health.' The resolution declared that 'emphasis is laid on the city work in reducing mortality and sickness through units sponsored by the city with a woful disregard of the part played by the general practitioner.' Finally it urged that the council 'take official cognizance of the great part played by the forgotten 7,000 private practitioners in this city in the reduction of sickness, disease and the death rate and deplore any attempts which may be made to minimize their great contributions.'

**Gifts to New York University**—Among gifts and bequests to New York University for medical purposes recently announced by Chancellor Harry Woodburn Chase were the following:

The de Long Corporation for the cardiac clinic fund under the direction of Dr. Clarence E. de la Chapelle, college of medicine \$12,000.  
The Commonwealth Fund for research in gynecology and obstetrics under Dr. William E. Studdiford, Jr., college of medicine \$8,299.87, also \$7,250 on account of grant to the department of preventive medicine.  
Rockefeller Foundation on account of grant for studies on influenza under Dr. Thomas Francis, Jr., college of medicine \$6,500.  
Merek and Company, Inc. for research on anesthesia under Dr. Emory A. Roventine \$1,500.  
Lucius N. Littauer for studies on pneumonia under Dr. Jesse G. M. Bullowa, college of medicine \$1,500.  
Phi Delta Epsilon fraternity to increase the Dean John Wyckoff lectureship endowment fund, college of medicine \$1,500.  
Friedsam Foundation Inc. for research in the department of urology under Dr. Meredith F. Campbell \$1,500.  
Lederle Laboratories for the Lederle Fund, college of medicine \$1,250 for the prophylaxis fund under Dr. Charles Hendee Smith, department of pediatrics \$1,050 and for the first quarterly payment of grant for research in pneumonia under Dr. Bullowa \$1,000.  
Carroll Dunham Smith Pharmaceutical Company for research in therapeutics under Dr. Arthur C. De Graff \$1,100.  
International Cancer Research Foundation for research in cancer under Robert Chambers, Ph.D., department of biology, Washington Square College \$1,000.

## NORTH CAROLINA

**Hospital News**—St. Joseph's Sanatorium Asheville, has been remodeled to care for general medical and surgical patients and will now be known as St. Joseph's Hospital. The building has four floors, two have been reserved for tuberculous patients. Obstetric patients will not be received at present. There will be ninety-six beds.

**CCC Pneumonia Patients Receive Serum**—The North Carolina State Board of Health reports that CCC enrollees and soldiers at Fort Bragg are hospitalized; their blood is typed and specific serum is administered when indicated. If the serum is not available at the hospital where the patient is undergoing treatment, arrangements have been made to obtain it from a distributor in Raleigh, it was said. In case of emergency, airplane transportation will be used for isolated and distant hospitals and stations.

**University Extension Course**—A six weeks graduate course in medicine opened in Durham January 11 to be given on successive Wednesdays. Dr. Alfred Stengel, Philadelphia, gave the first lecture, on 'Diagnostic Problems of the Abdomen' and the remainder of the series is as follows:

Dr. Paul D. White, Boston, Late Heart Disease.  
Dr. Maurice C. Pincoff, Baltimore, Blood Disorders.  
Drs. Baldwin H. E. W. Lucke and Francis C. Wood, Philadelphia, a clinicopathologic conference.  
Dr. Joseph Stokes, Jr., Philadelphia, Respiratory Infections.  
Dr. Loyal Davis, Chicago, Surgical Problem of the Treatment of Hypertension.

## OREGON

**Personal**—Dr. Charles L. Coyle, formerly of Marshfield, has resigned as health officer of Coos County to engage in private practice in Grants Pass.—Dr. Daniel C. McDonald, Hillsboro, has resigned as health officer of Washington County, Dr. Richard N. Sherwin, St. Helens, succeeded him.

**Society News**—Dr. Robert E. Mullarky, Seattle, addressed the Central Willamette Medical Society, Corvallis, November 3, on 'Peritoneoscopy'.—Drs. Laurence Selling and John E. Raaf, Portland, discussed 'Herniation of the Nucleus Pulposus and Hypertrophy of the Ligamentum Flavum' at a meeting of the Multnomah County Medical Society, January 18. Dr. Ralph A. Fenton, Portland, made the introductory remarks for a motion picture on 'Hygiene of Swimming'. At the January 4 meeting, Dr. Herbert Minor Nichols, Portland, presented a paper on 'Appendicitis: A Statistical Study Showing the Value of Early Operation' and Dr. John G. Cheetham, Portland, 'A Study of the Newer Agencies Used in the Treatment of Gonorrhea, with Special Reference to Sulfanilamide and to Hyperpyrexia.'

## PENNSYLVANIA

**Society News**—Dr. William A. Womer, New Castle, addressed the Lawrence County Medical Society, New Castle, January 5, on 'Ten Years of Syphilis: A Socio-Economic Study'.—Dr. Maxwell J. Lick, Erie, addressed the York County Medical Society at its annual banquet in York, January 12, on 'Medical Fads and Fancies'.—Dr. William Wayne Babcock, Philadelphia, addressed the Lycoming County Medical Society, Williamsport, January 13, on 'Recent Trends in Surgical Practice.'

## Philadelphia

**Annual Oration in Urology**—Dr. Gilbert J. Thomas, clinical associate professor of urology, University of Minnesota Medical School, Minneapolis, delivered the B. A. Thomas Annual Oration of the Philadelphia Urological Society, January 17, on 'Changing Concepts of Urogenital Tuberculosis.'

**Director of Health Appointed**—Dr. Charles F. Nassau, clinical professor of surgery, Jefferson Medical College, has been appointed director of public health of Philadelphia to succeed Dr. William C. Hunsicker, who died January 10. Dr. Nassau, 71 years old, graduated from the University of Pennsylvania School of Medicine in 1891 and Jefferson Medical College in 1906. He is chief surgeon at Frankford Hospital, surgeon to St. Joseph's Hospital and Girard College and assistant surgeon to Jefferson Hospital.

**Society News**—Dr. Herbert Fox, among others, addressed the Pathological Society of Philadelphia, January 12, on 'Primary(?) Tuberculosis of the Spleen: Inclusions in Giant Cells in Tuberculosis(?) of the Spleen'.—At the annual meeting of the Philadelphia Pediatric Society, January 10, Drs. Irving J. Wolman, Rachel Ash and Ralph S. Bromer spoke on 'Diagnosis of Congenital Cardiac Defects in Infancy' and Dr. Bernard L. Kahn, on 'Congenital Ectodermoses in Infancy and Childhood'.—Drs. John F. McCloskey and James A. Lehman addressed the Philadelphia Academy of Surgery, January 16, on 'Living Fascial Suture in the Repair of Large Inguinal Hernias'.—Drs. Burtis M. Hance, Easton, Pa., and Walter W. Baker addressed the Philadelphia Urological Society, December 19, on 'Suprapubic Prostatectomy and Its Relationship to Infection' and 'Surgical Treatment of Horseshoe Kidney' respectively.

## UTAH

**Meningitis Among Indians**—The Associated Press reported January 14 an epidemic of meningitis among Indians of the Navajo reservation which occupies parts of Utah, New Mexico, Colorado and Arizona. There have been fifteen deaths. The Utah State Board of Health warned travelers to avoid the reservation; it was said.

## WASHINGTON

**Personal**—Dr. John R. Corkery, Jr., has resigned as health officer of Spokane to engage in private practice. Dr. Fred Charles Harvey succeeded him.

**Seminar in Internal Medicine**—Dr. Dwight L. Wilbur, San Francisco, conducted a seminar in internal medicine at the Seattle General Hospital, December 28-30. Among the subjects of his lectures were recognition and treatment of vitamin deficiency states, differential diagnosis and treatment



of gastrointestinal bleeding, nervous indigestion, peptic ulcer and the Vitamin B complex in medicine with particular reference to thiamin chloride and nicotinic acid Dr Wilbur addressed a special meeting of the King County Medical Society December 28 on "Recent Advances in Nutrition"

### WISCONSIN

**Intercity Meeting**—The Interurban Academy of Medicine held its annual meeting in Superior November 16 with Dr Charles H Slocumb, Rochester, Minn., as the speaker on "Diagnosis and Treatment of Rheumatism" Dr David L Tilderquist, Duluth, was elected president and Dr Frank J Elias, Duluth secretary

**Group Hospitalization**—At the midwinter conference of the Wisconsin Hospital Association in Milwaukee January 11 a special committee was appointed to study group hospitalization plans and to promote legislation permitting it. In a resolution proposing this action the Rev Herman L Frischel, superintendent of the Milwaukee Hospital pointed out that the state medical society had recently approved the principle of the plan. Fees proposed were 75 cents per month for each member for full coverage, 50 cents per month for the first dependent and 25 cents each for additional dependents. Hospitals would provide care for twenty-one days, including board and room in a three or four bed ward general nursing and operating room services, all formulary drugs and an \$8 allowance for serums, surgical dressings, limited laboratory and x-ray services and special services such as oxygen therapy, diathermy, ultraviolet and radiant heat treatments. Not included would be chronic ailments such as mental disease and tuberculosis

### GENERAL

**Editor of Surgical Journal Appointed**—Dr LOVEL DAVIS, professor and chairman of the department of surgery, Northwestern University Medical School, Chicago has been appointed editor of *Surgery, Gynecology and Obstetrics* to fill the vacancy caused by the death of Dr Allen B Knavel. Dr Davis was made assistant editor of the journal in 1927 and associate editor in 1933. He graduated at Northwestern in 1918.

**Grants Available to Aid Research**—The Committee on Scientific Research of the American Medical Association invites applications for grants of money to aid in research on problems bearing more or less directly on clinical medicine. Preference is given to requests for moderate amounts to meet specific needs. For application forms and further information please address the committee at 535 North Dearborn Street Chicago.

**Physicians Wanted**—Physicians throughout the country are invited to compete for positions in the Michigan State Service. Positions are open as hospital physician and public health physician at salaries ranging from \$200 to \$240 per month, less maintenance. Women physicians in particular are sought. The examination will be held in the near future and those interested are urged to communicate at once with the Michigan Civil Service Department, Lansing, Mich., for application blanks and additional information.

**History of Science Meeting**—The History of Science Society in cooperation with the American Historical Association met at the Palmer House Chicago, Dec 29-30 1938. The speakers included

Dr Arno B Tuckhardt Chicago Dr William Beaumont and the recently acquired Beaumont Memorabilia of the University of Chicago  
Dr Ko K Chen Indianapolis Chair of the South American Indians  
Dana B Durand PhD Cambridge Mass Science and Philosophy in Late Scholasticism  
George de Santillana Winthrop Mass The Emergency of Scientific Concepts in History—Machivelli  
George Sarton LI D Cambridge Comenius and Bayle

**Macy Foundation Grants for Medical Research**—During 1938 the Josiah Macy Jr Foundation made grants aggregating \$175,420 for medical research to thirty institutions in Europe and the United States. At the annual meeting in December it was announced that Mrs Walter G Ladd who established the foundation in 1930 in memory of her father, had made a substantial gift in further support of the work. Drs Stanhope Bayne-Jones, New Haven, Conn., and Charles Sidney Burwell, Boston, were elected to the board of trustees.

**Prints of "Beaumont and St Martin"**—John Wyeth and Brother, Philadelphia has about 3,000 reproductions of "Beaumont and St Martin" that are available to physicians on request. The picture shows Dr William Beaumont at Fort Mackinac drawing gastric juice from the fistula in Alexis St Martin's side. The pictures contain no advertising and are

suitable for framing. The original painting, by Dean Cornwell, owned by John Wyeth and Brother, is done in oil and is the first of six large paintings commemorating "Pioneers of American Medicine," sponsored by Wyeth and Brother. Mr Cornwell will be the artist.

**Dana Medal Awarded to Dr Alger**—The Leslie Dana Gold Medal, awarded annually by the Association for Research in Ophthalmology and the St Louis Society for the Blind, was presented to Dr Ellice M Alger, New York, December 1 at the annual meeting of the National Society for the Prevention of Blindness. Dr Alger was honored for his contributions to ophthalmology during the past thirty years and his work as a teacher. A graduate of the University of Vermont School of Medicine in 1893 Dr Alger taught at his alma mater and at the New York Polytechnic Medical School. For many years he has been professor of clinical ophthalmology at New York Post-Graduate Medical School and Hospital.

**Society News**—The annual national conference of the Progressive Education Association will be held in Detroit at the Book-Cadillac Hotel February 22-25. The International Council for Exceptional Children will meet in conjunction with the association. Dr Walter B Cannon, Boston, was elected president of the American Association for the Advancement of Science at its midwinter meeting in Richmond, Va., December 27-31. Dr Carl J Wiggers, Cleveland was elected vice president and chairman for the section on medical sciences (N). Dr Edmund R Long Philadelphia, was elected a member of the executive committee to succeed the late Dr Earl B McKinley. Dr John F Fulton, New Haven, Conn., was elected president of the Association for Research in Nervous and Mental Diseases at the annual meeting in New York December 27.

**Examinations by Obstetric Board**—The general oral clinical and pathologic examinations for all candidates, part II examinations (groups A and B) will be conducted by the American Board of Obstetrics and Gynecology meeting in St. Louis, May 15-16 immediately prior to the annual meeting of the American Medical Association. Notice of time and place of these examinations will be forwarded to all candidates well in advance of the examination dates. Candidates for reexamination in part II must request such reexamination by writing the secretary before April 1. Candidates who are required to take reexaminations must do so before the expiration of three years from the date of their first examinations. Applications for admission to group A in the May examinations must be on file in the secretary's office by March 15. Application blanks and booklets of information may be obtained from Dr Paul Titus secretary, 1015 Highland Building Pittsburgh.

## Government Services

### Snow Medal Awarded to Dr Parran

The American Social Hygiene Association has awarded the 1939 William Freeman Snow Medal to Dr Thomas Parran, surgeon general, U S Public Health Service "for his great contribution to the health and happiness of the American people through his persistent efforts against syphilis and the conditions which favor its spread." Presentation of the medal will be made by Dr Livingston Farrand, Brewster, N Y, as part of the National Social Hygiene Day program at the Hotel Mayflower, Washington, February 1. The social hygiene society of the District of Columbia will be host to the national organization. Mrs Franklin D Roosevelt and Dr Parran will be the principal speakers.

### Changes in U S Public Health Service

Dr Frederick J Krueger has been promoted and commissioned as passed assistant surgeon in the regular corps of the U S Public Health Service. The following have been appointed and commissioned as assistant surgeons in the regular corps: Drs Albert Gallatin Love Jr, Waldron M Senott, Kenneth M Joyce, John P Turner and Walter E Sharpe Jr. Included among those appointed and commissioned as assistant surgeons in the reserve corps are Drs Harms W Bloemers at U S Marine Hospital, Detroit, Edwin E Corcoran at U S Public Health Service Dispensary, Washington, and Bothwell Graham III at U S Marine Hospital Staten Island, N Y.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Dec 31, 1938

#### Physicians' Practices in Case of a National Emergency

Physicians are becoming increasingly concerned as to their practices in the event of a national emergency. Some of the problems to be solved are (1) arrangements at first aid posts for surgical assistance (at the time of the crisis experienced surgeons were to be allotted to hospitals only, but it has been suggested that senior medical students might man the first aid posts), (2) whether physicians will be asked to report at once to a local station and whether they will be organized by the civil defense department or carry out their own organization and (3) remuneration for services (if physicians are needed for public work they will be unable to carry on private work and must look to the authorities for maintenance).

The British Medical Association has prepared a model scheme for the protection of the practices of physicians who in time of national emergency are engaged in whole time war service. The intention is to protect the capital value of the practice of an absentee physician and to insure that 50 per cent of the money received for the treatment of his patients while he is on service and for an agreed period thereafter shall be paid to his legal personal representative, less an approved deduction for administrative expenses. The scheme will be effective only if the majority of the physicians in the area agree to join in the communal arrangement. It is strongly desired that all in the area shall agree to join, as any other method will almost certainly lead to confusion and loss. Thus the nomination of one physician to conduct the practice of an absentee would not completely protect his interests. Some of his patients might decline to be treated by the nominee, or his illness or death might bring the arrangement to an abrupt end with serious depreciation of the capital value of both practices. The evacuation on a large scale of places such as cities specially liable to air raids will require a considerable amount of accountability in the allotting of capitation payments for insured persons under the panel system, for which it is proposed to establish a bureau. In London the British Medical Association has formed a local emergency committee to deal with all these matters. In case of war this body will become the local medical war committee and will deal with the recruitment of physicians.

#### Roentgenographic Appearances of the Lungs in Measles

The roentgenographic appearances of the lungs in measles were first described by Kohn and Koriansky in 1929 who observed in 55 per cent of the cases shadows suggesting infiltration, which varied in type, being disseminated mottling in various areas, large homogeneous triangles or large opacities obscuring the hilar and paravertebral regions. These changes frequently occurred in the preeruptive stage suggesting an intimate association between pulmonary infiltration and the disease rather than a secondary infection. The health officer of the London County Council, Sir Frederick Menzies, has published a series of researches on the measles epidemic of 1935-1936 made in the council's hospitals for infectious diseases. The fifth report which has just been published, is a monograph on the roentgenographic appearances of the lungs in measles by M. F. Covey, assistant medical officer of the North-Eastern Hospital and A. C. Dixon, visiting radiologist. Routine examination of all patients was not attempted but sixty-one children showing definite clinical evidence of pulmonary involvement usually bronchopneumonia, were selected. In the majority of cases roentgenograms were taken when clinical signs were no longer present and the patient was well advanced in the convalescent stage. In some cases however they were made when the tem-

perature was raised or signs of bronchopneumonia were present. The object was to detect pulmonary changes of a temporary or permanent nature when the patient had recovered from measles.

In every case roentgenographic signs were present. In 62.3 per cent there were no physical signs in the lungs and the temperature had subsided at the time of roentgen examination, in 14.7 per cent there were still pyrexia and signs of bronchopneumonia, in 18 per cent there were a few coarse rales but no pyrexia and in 5 per cent there were no physical signs but mild pyrexia. The roentgenographic changes corresponded with those noted by Kohn and Koriansky and included (1) pulmonary infiltration (fine mottling or coarser infiltration at the bases), (2) increased hilar shadows in all cases, (3) abnormal intensity of the pulmonary markings and (4) pleuropulmonary changes. The results emphasize the importance of keeping under roentgenographic observation for a considerable time all patients who have had bronchopneumonia as a complication of measles, as the probability of permanent changes is much greater than is usually supposed. In many cases the changes were present at the time of the patient's discharge from the hospital and were suggestive of permanent damage. It is proposed to extend the roentgen examination of the chest during the next epidemic of measles.

#### Graduate Courses for Panel Physicians

More than 1,100 panel physicians attended graduate courses in 1938. Next year the number will be increased to more than 1,500. The course lasts a fortnight and is held at sixteen medical centers in all parts of the country. The year 1938 was the first complete year for the working of the scheme. So eager were the panel physicians to avail themselves of these courses that three times as many applications were received as there were vacancies. The cost is defrayed by the national health insurance funds. Grants are made to cover the fee for the course, traveling expenses, subsistence allowance and the payment of a locum tenens when one is necessary. The courses are arranged by the ministry of health after consultation with an advisory medical committee. The arrangements for the selection of individual physicians are made through the insurance committee of the British Medical Association. It is hoped to arrange courses at five year intervals for all panel physicians who wish to take advantage of them. The object is to keep the physicians down to date in the advances of medicine more efficiently than can be done merely by reading. Hence physicians are not eligible until they have been qualified more than five years. More than half the courses in England are held at the British Postgraduate Medical School, London, which will provide continuous courses from March 7 onward.

#### Research on the Atmosphere in Mines

Recent work on silicosis and dust in coal mines, methods of suppressing dust in the air, underground illumination and the pressure and quantity of firedamp in coal seams are the subject of a report by the Director of the mining research laboratory. Attention is called to the close connection between the high incidence of bronchitis and silicosis in the western area of the South Wales coal fields. A probable cause is the subjection of the miners still hot and perspiring after their work to the cold blast of air in the riding spakes. Another possible cause is daily exposure to small quantities of nitrous fumes after shot firing.

Investigations have been made of the dust suspended in air and the methods for its suppression during the driving of hard headings or when there is ripping in rock. A great reduction in concentration was found to be produced when dust traps were in use or when wet drillings were employed. Ventilation in which the vitiated air is withdrawn through tubes by means of a suction fan or by the ventilation pressure of the pit has the great advantage that the workmen are not exposed to harmful dust or fumes. In many cases the dust used for stone dusting was unnecessarily fine and in view of its harmful effect such

a large proportion of particles of a size less than 5 microns is deprecated. In the removal of coal dust and water mist was found much more efficient than a spray, it gave an efficiency of the order of 90 per cent. Where the dust is highly siliceous and a respirator capable of filtering out the finest particles is necessary. A high air velocity for increasing the cooling power at the working face was found to have the drawback that with velocities greater than 600 feet a minute the amount of dust carried became a nuisance.

#### Terminal Disinfection

At the Society of Medical Officers of Health an important discussion on terminal disinfection and the exclusion of contacts from school was opened by Dr. Duncan Forbes, health officer for Brighton. He pointed out that the persistence of anthrax bacilli in hides for years and of tubercle bacilli in dried sputum and dust for months gave rise to the mistake that infection lived on in bedding, clothes and the like. But the discovery of diphtheria carriers and of mild overlooked cases of scarlet fever and of carriage of infection by spray showed that apparently healthy carriers were the chief cause of the spread of scarlet fever and diphtheria and that the part played by fomites was negligible. On these grounds orthodox disinfection of mattresses and bedding was abandoned in Brighton in 1910 and spraying in 1921. The boiling of sheets, washing of blankets, dusting of bedrooms and scrubbing of floors was substituted. Home contacts after measles have not been excluded from school at Brighton since 1922, as this did not prevent general infection of the school, and the excluded children played with and infected neighbors' children.

Dr. Andrew Topping said that terminal disinfection was a survival from times of complete ignorance of how infection was spread. We now knew that organisms responsible for infections were extremely short lived outside the human body and that infection did not normally lurk behind picture rails or in the depths of a mattress but is almost invariably due to carriers. But under certain circumstances microbes—for example hemolytic streptococci—could survive outside the body for considerable periods. Recent experiments at Queen Charlotte's Hospital showed that they could be recovered from dust. The moral was: Remove the dust. There was no better way than a liberal use of soap and water.

#### PARIS

(From Our Regular Correspondent)

Dec 24, 1938

#### Lectures on the Ultraviruses

Professor Levaditi, director of the Gournier Institute of the Pasteur Institute of Paris, has organized a course on the status of our knowledge of the ultraviruses. The lectures will be given by Professor Levaditi aided by Drs. Lepine, Mollaret, Magroux and Paie and the subjects will be the virus of variola, herpes, rabies, encephalitis, yellow fever, poliomyelitis, Nicolas-Favre disease and choriomeningitis, the ultravirus of certain diseases in animals, the ultravirus of vegetal cirruses, chemico-physical methods applied to the study of the ultravirus and general considerations on the action and composition of ultraviruses. The first lecture will be given January 6 at the Pasteur Institute of Paris.

#### Promotion in Legion of Honor for Bacteriologist

During the dedication ceremony incident to the opening of the new buildings of the Pasteur Institute at Garches, a suburb of Paris, the minister of public health conferred the rank of commander of the Legion of Honor on Prof. Gaston Ramon, director of the branch. This honor is a well merited recognition of his work during the past fifteen years in immunology, especially the more recent contributions, such as vaccination against diphtheria and tetanus by the respective toxoids.

#### Dedication of Branch of Pasteur Institute

The older quarters of the branch of the Pasteur Institute at Garches having been found inadequate to house its rapidly increasing activities, a large new addition was built. The opening of the new laboratories was marked by an elaborate ceremony presided over by M. Rucart, minister of public health. After Dr. Louis Martin, director of the Pasteur Institute of Paris, had recalled the fact that diphtheria antitoxin was first prepared at Garches, Professor Ramon stated that the rapid development of serotherapy and of the use of toxoid vaccination methods had necessitated the construction of more adequate quarters.

Attention was called to the fact that the use of the toxoid to vaccinate children against diphtheria had resulted in a drop in the mortality rate of 75 per cent in ten years in Paris where only one half of the children had been vaccinated, and of more than 90 per cent in New York, where 80 per cent of the children had been vaccinated. The mortality in Canada has been practically eliminated, nearly every child is now being given three doses of the toxoid as a prophylactic measure against diphtheria. Vaccination of French army horses against tetanus with the specific toxoid has been followed by absolute suppression of the disease during the past ten years. Since August 1936 antitetanus vaccination with the specific toxoid has been made obligatory in the French army. Every soldier is given an 'associated' vaccination against typhoid, diphtheria and tetanus. A visit to the laboratories at Garches, where all the serums and toxoids now distributed by the Pasteur Institute of Paris are elaborated, will be of interest to every one interested in immunology. Garches can be reached by automobile in about twenty minutes from the center of Paris.

#### Effects of Lowering of Atmospheric Pressure

Experiments on human and animal subjects have been made here during the past few years to note the influence of a lowering of the atmospheric pressure as encountered by aviators at very high altitudes. At the Oct. 25, 1938, meeting of the Academie de medecine of Paris, a report of experimental observations was submitted by Dr. Cluzet and his co-workers. Special attention was devoted to the analytic and graphic study of electrocardiographic disturbances as well as to alterations of blood pressure. Experiments were carried out in a caisson to create an atmospheric depression corresponding with rabbits and dogs to that at altitudes of between 10,000 and 11,000 meters (30,000 to 35,000 feet) and with human subjects to that at altitudes not exceeding 6,500 meters (20,000 feet).

In the first series, the influence of such artificially produced lowering of the atmospheric pressure revealed itself in marked changes in the electrocardiogram, which indicated failure of the right ventricle followed by total myocardial impairment. These electrocardiographic changes disappeared after inhalation of oxygen or of the mixture of oxygen and carbon dioxide proposed by Yandell Henderson. An adjuvant therapeutic action of less importance was noted after intravenous or subcutaneous injection of either strychnine or acetylcholine or both of these drugs.

In a second series of experiments, observations were made on the influence on arterial tension of gradual increases in the artificial lowering of atmospheric pressure. Until the pressure corresponded to that at an elevation of 8,000 meters (about 25,000 feet) a progressive rise of the blood pressure was noted. Above this altitude there is a more or less sudden drop in the blood pressure, which is indicative of a severe cardiac failure. Both in man and in animals the inhalation of oxygen as well as that of the carbon dioxide oxygen mixture suppresses almost completely the rise in blood pressure.

up to an altitude of 8,000 meters as well as the tendency to a drop in blood pressure above this altitude. Intravenous injections of strychnine sulfate and acetylcholine apparently do not modify the hypertensive effect of diminished atmospheric pressure in animals up to an altitude of 8,000 meters. On the contrary, at altitudes above 8,000 meters a noteworthy increase in the blood pressure is noted in animals instead of the customary drop above this altitude.

The practical conclusions of these experiments are that they confirm the favorable influence of inhalations of oxygen and of the carbon dioxide-oxygen mixture on cardiovascular disturbances at high altitudes. The differences in the action of oxygen and the carbon dioxide-oxygen mixture are too slight to indicate that the reaction of the carbon dioxide-oxygen mixture is better. Inhalations of either oxygen or the carbon dioxide-oxygen mixture will suffice to prevent cardiovascular disturbances in aviators if they are employed above an altitude of 6,000 meters. From this altitude upward, inhalations of oxygen or of the carbon dioxide-oxygen mixture are difficult to carry out, but this is not true of injections of strychnine and acetylcholine, which should be used as substitutes above this altitude.

### BERLIN

(From Our Regular Correspondent)

Dec 19, 1938

#### News of the Universities

Since the last report on the universities (THE JOURNAL July 9, 1938, page 184) interesting developments have taken place. National Minister of Education Rust, in opening the university congress at Leipzig spoke of the early antagonism of the universities to the Nazi revolution, which, he said, was based on misunderstanding. The goal is not a material domination of the universities, the schools themselves must spontaneously espouse the doctrine of German racial superiority. Institutions of higher learning are primarily concerned with training students for various professions, whereas the new German state has in hand their spiritual orientation. It is no longer a question of whether or not the universities should continue in existence, it is a question of their reorganization. Minister Rust declared that it is often better to march along the street in a column than to engage in discussions. No one wishes to deprive the scholar of his quiet workroom but there must be a natural interrelation of scientific endeavor and the nation as a whole.

At a festival at Cologne University, Rust stated that the racial theory of the new German reich is opposed to the idea extolled by a French cabinet minister at the dedication of a memorial to the Jewish war dead at Verdun. By the concepts of liberty and equality which stem from the French Revolution reason was enthroned as the most sovereign authority. However this ideology later became the source of marxism and bolshevism. Human reason could never set up for itself the law of heroism. Whoever proclaims the principle of personal liberty as the basis of a government will never be able to make supreme the power of the state. Nazism had to face the fact that the disastrous concepts of liberty and equality were prevalent in German universities. Hitler has established a new fundamental concept, namely, a nation based on race. Rust advocated continuation of the old German universities in the belief that Germany stands today on the threshold of an era of greatness. But a university based on purely scientific principles alone ought not to survive. The school must be thoroughly Nazi, for otherwise it cannot keep abreast of the times. The minister expressly wished this last remark to be understood as an appeal.

At the Congress of German Students in Heidelberg an official report was circulated which said that every student should work for a time on a farm or in a factory, an experience of paramount importance for the acquisition of self discipline and political maturity. During the summer vacation of 1937 more than 9,800

students, men and women, put in eight weeks working on farms. At the same time more than 1,100 students worked in factories and thus enabled 2,100 regular industrial workers to take 21,000 extra days off.

#### WAR AGAINST INTELLECTUAL PARTICULARISM

At the same congress Dr. Scheel, national führer of students, stated that war should be waged against intellectual particularism. Although German students recognize the function of a university, their understanding will be incomplete if the school is not thoroughly imbued with the Nazi philosophy. The university stands in constant danger of degenerating into a purely intellectual institution, whereas its true function is that of a training center. In future the sharply outlined obligatory 'pattern of manhood' will certainly rest on more than an academic basis. It must be made plain to the youth of Germany that science, far from being a useless occupation, represents an important phase in the struggle between the Nazi weltanschauung and its adversaries.

#### STUDENT AID

The national government has created a "National Student Aid" based on student benefit organizations, which will be concerned with the economic and physical welfare of the new academic generation. Its president is the national führer of students. The funds are obtained from government subsidies, from volunteer contributions and from officially regulated contributions by the student bodies. Of the total of about 60,000 university students, the number receiving aid is constantly about 6,000, and 700 of these are helped throughout their student careers. Another 1,500 students are helped by the local student aid services in collaboration with the central organizations. Another 2,000 students are admitted to free meals and other benefits. About 1,500 special scholarships are awarded annually, the largest being grants of 1,200 marks to certain students preparing for final examinations. The assets of the National Student Aid in 1938 amounted to around 4,000,000 marks exclusive of the funds of the local organizations in certain universities.

#### NAZI ALUMNI AND STUDENT ORGANIZATIONS

In the past, alumni members of student fraternities were organized into special associations of "old grads," which served to keep alive old academic contacts and to aid the undergraduate members of the respective clubs. These alumni groups were a traditional part of the German university. As previously reported, all these alumni groups had been disbanded. Recently, however, they have been revived under government auspices and united into a German students' alumni association. This step represents the fruition of special efforts made by the government to appease the university alumni. The "Nazi alumni association" now sole organization of university alumni in Germany, held its first rally in Heidelberg. It was announced that all Catholic organizations of students and alumni had been disbanded and their funds confiscated "for the benefit of organized Nazi activities among students." An enormous increase in the membership of the Nazi alumni association has lately been made known, in 1937 there were some 7,000 members and at present there are nearly 50,000.

The Heidelberg rally was also the occasion for an address by Dr. Scheel, who spoke of the social clubs which have replaced the old student fraternities as "cells of the Nazi party." He also remarked that the survival of academic life depended on the adaptability of the universities to the Nazi movement.

#### THE YOUNGER ACADEMIC GENERATION

An acute problem is that of aid for the younger academic generation. The national führer of university instructors, Dr. Schulze, some time ago submitted a report saying that the shortage of young professional men was due to the exodus of university students into business following the Nazi accession.

The universities were unable to keep pace with the speedy tempo of new developments. Then too the remuneration offered the young men by the universities could not compete with that offered in the industrial field. Five months later Dr. Schultze stated that with respect to the filling of teaching posts and the numbers of the younger academic generation the needs of the universities were not being met. Since 1935 the young graduates in engineering have not been able to meet the demand. He requested that people desist from unjustified criticism of universities.

The decreases in enrolment in the universities is shown by a report on Bavarian institutions. Students admitted to the first semester numbered 2,957 in the summer semester of 1931, but in the winter semester of 1937-1938 the number was only 940. In the winter of 1913-1914 a total of 9,340 students were matriculated, the number was 13,819 in the winter of 1932-1933 and only 6,825 in the winter of 1937-1938 and 6,092 in the summer of 1938. The enrolment in the past year was far below that of prewar times. Moreover, the number of medical students has dropped from 593 in 1928 to 240 in the summer of 1938. To counteract this dearth of younger professional men an abbreviation of the time spent in study was proposed. A decree of the national minister of the interior has already reduced the medical course by about one semester, the entire course now covers ten half year periods instead of eleven.

As to the new generation of university teachers, an endeavor is being made to remedy the depletion of their ranks. As stated in the article "Qualified for a Professorship" (in *Nat.-Soz. Parteikorrespondenz*) there is no need for a meticulous investigation of a teacher's past prior to 1933 and one must differentiate between a single misstep and an antigovernment attitude of mind.

#### DECREE AGAINST JEWISH STUDENTS

In November, after the assassination of von Rath in Paris, all Jews (an extremely small number) who had been allowed to attend the universities were summarily expelled. The few Jewish pupils remaining in the public schools were similarly dealt with. Likewise all loans to Jewish students were immediately called in.

#### AUSTRALIA

(From Our Regular Correspondent)

Dec 20, 1938

#### National Insurance Postponed

Following a parliamentary crisis in which a move was made to shelve indefinitely the scheme for national health and pensions insurance in Australia, its introduction has been postponed until September 4, nine months later than originally planned and four months later than the date fixed under the amended legislation. This step has been forced on the government by pressure from a powerful section of the Country Party, whose claim is that the record defense expenditure of £63,000,000 combined with low price levels for primary production make postponement imperative in the interests of the people. Concessions made to the Country Party during the recent crisis include the introduction of new legislation to provide benefits for small employers and self-employed persons, but there is still a powerful faction determined to fight for the definite postponement of the entire scheme. It has also been suggested that the whole scheme be redrafted and reconstituted, but it is unreasonable to suppose that a second scheme could be formulated under present conditions which would be more generally acceptable.

#### College of Physicians

The inaugural ceremony of the Royal Australasian College of Physicians took place December 13 in the great hall of the University of Sydney. Fraternal messages were received from the Royal College of Physicians of London, the Royal College of Physicians of Edinburgh, the American College of Physicians

and the Royal Australasian College of Surgeons. Great interest was attached to the occasion by the inclusion in the inaugural program of a valuable series of lectures and demonstrations.

#### Training of "Nursing Aids"

The department of health in New Zealand has been considering the question of the training of nursing aids for work among the chronic sick and, in consultation with the Nurses' and Midwives' Registration Board, has prepared a scheme with this object in view. To show the necessity for the proposal it may be stated that according to the last census about 140 women who were not registered nurses and who had either no training or very little were engaged in private nursing in the dominion. It will be the function of these "nursing aids" to care for the chronically ill. The proposed scheme will have the additional advantage of bridging the gap between leaving school and entering a hospital for general training. On completion of the course in nursing aid, a concession in time will be allowed toward general training if the student wishes to proceed further. The course covers two years and conforms to the regulations prescribed by the Nurses' and Midwives' Registration Board. The first year's practical experience will be devoted to a training in domestic arts and will include experience in domestic duties, laundry and kitchen. The second year will be spent in the wards of an approved hospital and will include experience in the personal care of the patient and general ward hygiene. Theoretical instruction will include in the first year hygiene, an elementary introduction to anatomy and physiology, and the principles of cooking and nutrition and in the second year a series of lectures on the principles of general nursing and first aid. Similar schemes for the training of "nursing aids" have been tentatively tried out in the United States of America, Great Britain and Canada, but in no country so far has any such comprehensive scheme as is now contemplated been put into force.

#### POLAND

(From Our Regular Correspondent)

Jan 3 1939

#### Spotted Fever Epidemic

Spotted fever has broken out from time to time in the eastern districts of Poland, particularly Polesie, because of the great number of lice harbored by the country folk living there. Dr. W. Skomoroch has reported on some peculiarities in the clinical picture in many cases he recently observed. The disease started, as usual, with headache, uneasiness and a rise in temperature. The temperature kept at a high level for a fortnight and then dropped abruptly. The Weil-Felix test was positive. The most striking feature was the complete absence of any rash. Another unusual feature was the absence of nervous disorder. The mortality rate was relatively low, about 5 per cent. No case of enlargement of the spleen or desquamation was observed.

#### Complications Following Spinal Punctures

Dr. I. Suss of the neurologic clinic of the University of Cracow reported statistical data concerning complications following spinal puncture. The material consisted of 2,913 punctures done in the clinic during the last eighteen years. Of these 2,817, or 96.7 per cent, were lumbar, while seventy three, or 2.5 per cent, were suboccipital and twenty three, or 0.7 per cent, were intraventricular. Complications occurred in 216 cases, or 7.4 per cent. The complications were fatal in twelve cases, ten of lumbar puncture and two of intraventricular puncture. In nine of the ten fatal cases brain tumor was found by post mortem examination. In these cases the cerebellum was squeezed into the foramen occipitale magnum and the tumor was found in the fossa cranii posterior. In all the cases the death occurred immediately or, at the latest, within four days after the puncture. The death was preceded by bradycardia, diminishing of the pulse, paleness of the skin and vomiting. In some cases the temperature rose remarkably before death, in others

the author observed spastic hemiplegia followed by a deep coma. In the two cases of intraventricular puncture death was due to faulty technic, in one it was attributed to hemorrhage caused by a lesion of a brain vessel and in the other a large amount of air was introduced into the ventricle, the passage of the cerebrospinal fluid from the ventricles into the subarachnoid space being obliterated. The meningeal syndrome, the most frequent complication due to lumbar puncture, developed in 65 per cent of the cases in which there were complications. Either it was in an abortive form with headache, cervical and sacral pain, nausea and vomiting, or there were evident typical meningeal symptoms, such as rigidity of the neck and Brudzinsky and Kernig signs. The lumbar punctures were followed by complications more often in adults than in children and more often when the puncture was carried out with the patient sitting than lying down.

#### Withdrawal of Jews from the Medical Profession

The Association of Physicians in Poland, since introducing in its statutes the Aryan paragraph previously reported in *THE JOURNAL*, has taken strong action to withdraw Jews from the medical profession. A deputation of the association appealed to the medical departments of all Polish universities not to admit Jews. The demands were partially followed by the universities. The percentage of Jewish candidates admitted lately to the medical departments in all Poland amounts only to 37.

### Marriages

WILLIAM RUSSELL FUNDERBURG New Carlisle Ohio, to Miss Anna Marie Couch of Orlando Fla. Sept 10 1938

MARVIN SMITH CASHION, Mooresville N C to DR DOLORES ISABEL MENDEZ of San Juan, P R, Nov 12 1938

JOSEPH RUSSELL COOK, Huntington W Va, to Miss Sue MacIn Burr of Blacksburg Va. Nov 23 1938

ARTHUR WILLIAMS ROBISHAW Elyria Ohio, to Miss Ora Elizabeth Champion of Bellevue, Oct 26, 1938

LAWRENCE EDWARD FOULKE, Washington, Ill., to Miss Lois Merle White at La Grange, Ill., Oct 25 1938

SUMNER WILDMON BROWN Donalds S C to Miss Mary Robertson of Gold Hill, Ala. Aug 24 1938

PATRICK JOSEPH FAHEY Des Plaines Ill to Miss Theresa Noon of Onaway, Mich., Sept 10 1938

THOMAS JOHNCEY FLOYD JR, Jersey City, N J, to Miss Juliet Jordan of Hartsboro Ala, recently

HENRY CLAY SMITH, Boyce Va to Mrs Mary Martin Singer of Clarke County, Oct 25 1938

THOMAS F FARFEL, Prairie du Chien, Wis, to Miss Juanita Heberer of St Louis Nov 16 1938

JOE EDWARD FRID COLUMBIA S C, to Miss Katherine Werts of Prosperity, Nov 10, 1938

GEORGE COOPER JR to Miss Juliet Foster Paine, both of Charlottesville, Va., Nov 24, 1938

JOHN WESLEY RICE, Sturgis Mich, to Miss Edythe Ball of Montrose, Ill, in November 1938

ALVIN H JACOBS, Pittsburgh, to Miss Opal Sedalia Wilson of Wendell N C, Nov 5 1938

HERBERT FOX Philadelphia to Miss Mary Harlan Rhoads of Moorestown, N J Dec 3, 1938

EDGAR CLAY HARPER to Mrs Dorothy Seaman Albright both of Richmond Va, Oct 15 1938

WILLIAM FELIX FEAR Westmont, N J, to Miss Rosahe M Reilly of Berlin Nov 24, 1938

WILLIAM ABEL FRITZ to Miss Elaine Morell Maness both of Hickory, N C, Nov 24 1938

JAMES LUTHER FULLER to Miss Lillian Mae Abbott both of West Point Miss recently

#### CORRECTION

The date of the marriage of Dr Gustave Freeman published in *THE JOURNAL* January 14 page 165 should have been Oct 29, 1938 instead of Dec 29 1938

### Deaths

Alfred A Chapman of Sweetwater, Texas, University of Texas School of Medicine, Galveston, 1904, past president of the Nolan-Fisher Counties Medical Society, served during the World War, for many years member and president of the school board, on the staff of the Sweetwater Hospital, formerly health officer, at one time member of the board of trustees of the Southwestern University, Georgetown, aged 64, died, Oct 7, 1938, of Hodgkin's disease

John Champlin of Westerly, R I University of the City of New York Medical Department 1886, member of the House of Delegates 1902-1904 1906-1909 and in 1912, past president of the Washington County Medical Society, formerly chairman of the state board of public welfare, on the staffs of the Westerly (R I) Hospital and the Rhode Island Hospital, Providence, aged 75, died, Nov 27, 1938, of coronary thrombosis

Charles Serpa Neves, Montclair, N J, Harvard University Medical School, Boston, 1913, member of the Medical Society of New Jersey school physician, served during the World War, at various times on the staffs of St Vincent's Hospital, Community Hospital and the Mountainside Hospital, Montclair and the Essex County Hospital for Contagious Diseases, Belleville, aged 51 died, Nov 4, 1938, of coronary occlusion

Robert Miller Cochrane of Surg, Lieut Commander U S Navy, Dahlgren, Va, University of Pennsylvania School of Medicine, Philadelphia, 1917, served during the World War, entered the Navy in 1921 served as urologist at the Naval hospitals at New York, Boston and Philadelphia and in the Nicaraguan expedition, aged 46, died, Nov 30, 1938, of coronary occlusion

Paul Rutherford Macfadyen, Concord, N C, University College of Medicine, Richmond 1901, member of the Medical Society of the State of North Carolina, fellow of the American College of Surgeons, on the staff of the Cabarrus County Hospital, formerly physician in charge of the Concord Hospital, aged 64, died, Nov 26, 1938, of acute hepatitis and cirrhosis of the liver

Jose Antonio Lopez y Antongiorgi of San Juan, P R Syracuse University College of Medicine 1904 member of the Medical Society of the State of New York, at one time professor of surgery at the New York Polyclinic Medical School and Hospital New York, aged 57 died, Nov 19, 1938, in the New York Polyclinic Hospital, following an appendectomy

William Henry Schwingel of Aurora, Ill Rush Medical College Chicago, 1905 past president of the Kane County Medical Society, fellow of the American College of Surgeons, on the staff of St Joseph Mercy Hospital, Copley Hospital and St Charles Hospital, aged 67, died Nov 7 1938 of injuries received in an automobile accident near Osceola, Wis

Theodore Alpheus Felch, Ishpeming Mich, Detroit Medical College, 1874, member of the Michigan State Medical Society, member of the House of Delegates of the American Medical Association in 1903 and in 1909, formerly mayor of Ishpeming and health officer aged 91, died, Nov 21, 1938, of arteriosclerosis and myocarditis

Andrew Clinton Harrison, Charleston, Miss, Memphis (Tenn) Hospital Medical College, 1899 member of the Mississippi State Medical Association, aged 72, died Nov 14, 1938 in the Methodist Hospital, Memphis, Tenn, of hypertrophy of the prostate, bacterial endocarditis and brain abscess

Hugh H Haralson, Vicksburg Miss, University of Louisiana Medical Department New Orleans, 1883 member past president and secretary of the Mississippi State Medical Association formerly member of the state board of health county jail physician aged 84, died Nov 18 1938

Frederick Earl Diemer, Denver, University Medical College of Kansas City, Mo 1908, member of the Colorado State Medical Society served during the World War aged 53 died, Nov 29, 1938 in the Fitzsimons General Hospital of arteriosclerosis hypertension and cerebral hemorrhage

Nathan Powell Graham of Indianapolis Medical College of Ohio Cincinnati 1899 at one time assistant in medicine, Indiana University School of Medicine on the staff of St Vincent's Hospital served during the World War, aged 62, died Nov 27 1938, of cerebral hemorrhage

Samuel Adams of Jersey City N J, New York Homeopathic Medical College and Hospital New York 1900 police surgeon and school physician aged 77, died Nov 16 1938 in the Fifth Avenue Hospital New York, of chronic myocarditis, carcinoma of the stomach and cholelithiasis



**David Handmacher**, Cleveland, Cleveland Homeopathic Medical College, 1898, Cleveland College of Physicians and Surgeons, Medical Department Ohio Wesleyan University, 1904, aged 83, died, Nov. 28, 1938, of arteriosclerosis, pyelitis and hypertrophy of the prostate.

**Albert Andrew Crabbe** ♂ Traer, Iowa, Keokuk Medical College, College of Physicians and Surgeons 1900, past president and secretary of the Tama County Medical Society, for several years health officer, aged 67, died suddenly, Nov. 29, 1938, of coronary occlusion.

**William Lincoln Carden**, Andersonville, Tenn. (licensed in Tennessee in 1889), member of the Tennessee State Medical Association, past president of the Anderson County Medical Society, aged 73, died, Nov. 3, 1938, in St. Mary's Hospital, Knoxville, of cholecystitis.

**George Bales Breedlove**, Martinsville, Ind., University of Tennessee Medical Department, Nashville 1900, served during the World War, formerly county health officer, aged 72, died Nov. 10, 1938, of coronary and cerebral thrombosis, myocarditis and hypertension.

**Samuel L. Brister**, Greenwood Miss., Memphis (Tenn.) Hospital Medical College, 1888, for many years member of the board of trustees of the city schools, on the staff of the Greenwood-Leflore Hospital, aged 74, died, Nov. 10, 1938, of carcinoma of the prostate.

**Edward Ellsworth Blythe**, Riverside Iowa State University of Iowa College of Medicine, Iowa City, 1904, member of the Iowa State Medical Society, aged 64, died Nov. 5, 1938, of lobar pneumonia, diabetes mellitus and hypertrophy of the aorta.

**Henry Muncie Lyda**, Grisco City, Ala., Memphis (Tenn.) Hospital Medical College, 1905, member of the Medical Association of the State of Alabama, veteran of the Spanish American War, aged 70, died, Nov. 4, 1938, of cardiorenal vascular disease.

**Aristides Tillou Barbin**, Marksville, La., University of Nashville (Tenn.) Medical Department 1901, member of the Louisiana State Medical Society, parish coroner and formerly mayor, aged 61, died, Nov. 5, 1938, of multiple abscesses of the liver.

**John Henry Andrews**, Hyannis, Mass., Harvard University Medical School, Boston, 1902, member of the Massachusetts Medical Society, for many years on the staff of the Cape Cod Hospital, aged 62, died, Nov. 22, 1938, of cerebral hemorrhage.

**Augustus Melville Harrelson**, Stringer, Miss., University of Tennessee Medical Department, Nashville Tenn., 1892, served during the World War, aged 73, died, Nov. 27, 1938, in Bay Springs, of cerebral hemorrhage and cirrhosis of the liver.

**Arthur Albert Kahala**, Crookston, Minn., Minneapolis College of Physicians and Surgeons, 1902, member of the Minnesota State Medical Association, fellow of the American College of Surgeons, aged 61, died, Nov. 19, 1938, of chronic myocarditis.

**Willis Joseph Colbert** ♂ Youngstown, Ohio, Georgetown University School of Medicine, Washington, D. C. 1918, on the staff of St. Elizabeth's Hospital, aged 44, died, Nov. 28, 1938, of acute coronary occlusion and chronic myocarditis.

**Porter Barry Lennox**, Washington, D. C., Howard University College of Medicine, Washington, 1917, assistant professor of pathology at his alma mater, aged 50, died, Nov. 9, 1938, of peritonitis abscess and acute nephritis.

**John Tugaw Legier** ♂ Carmi, Ill., Bellevue Hospital Medical College, New York, 1891, past president of the White County Medical Society, on the staff of the Carmi Hospital, aged 71, died, Nov. 7, 1938, of nephritis.

**Andrew Otteraaen**, Wenatchee, Wash., Loyola University School of Medicine, Chicago, 1917, member of the Washington State Medical Association, county health officer, aged 54, died, Oct. 30, 1938, of coronary thrombosis.

**James Carlisle Dodson**, Richelieu, Ky., University of Louisville Medical Department 1912, member of the Kentucky State Medical Association, aged 51, died, Nov. 1, 1938, of acute infectious pyelitis and hypertension.

**William Austin Mills**, Hohokus, N. J., University of Vermont College of Medicine, Burlington 1881, veteran of the Spanish-American and World Wars, aged 82, died, Nov. 30, 1938, of cerebral hemorrhage.

**William Wilson Houston**, Good Hope, Ill., Keokuk (Iowa) Medical College, College of Physicians and Surgeons 1901, aged 61, died Nov. 8, 1938, in the Marietta Phelps Hospital, Macomb, of chronic nephritis.

**Norman Walter File** ♂ Lynchburg, Va., Baltimore Medical College 1908, served during the World War, aged 34, on the staff of the Virginia Baptist Hospital, where he died, Nov. 4, 1938, of cerebral hemorrhage.

**Willis London Franklin**, Ky., Vanderbilt University School of Medicine Nashville Tenn., 1888, member of the Kentucky State Medical Association, aged 74, died Nov. 6, 1938, of hypertension and myocarditis.

**Joseph Alonzo Lockett**, Dell, Ark., University of Tennessee College of Medicine, Memphis, 1916, member of the Arkansas Medical Society, aged 60, was killed, Nov. 22, 1938, in an automobile accident.

**John A. M. Nolen**, Alexander City, Ala., Medical College of Alabama Mobile, 1904, member of the Medical Association of the State of Alabama, aged 61, died, Nov. 8, 1938, of cerebral hemorrhage.

**William H. Kalbfleisch**, Balgonie, Sask. Canada, Western University Faculty of Medicine, London Ont. 1898, for many years mayor, aged 70, died recently, of a skull fracture received in a fall downstairs.

**Marcenus C. Mason**, Rochester, N. Y., University of Buffalo School of Medicine 1888, died Oct. 26, 1938, of arteriosclerotic heart disease, cerebral hemorrhage and benign prostatic hypertrophy.

**Samuel Solomon Danziger**, Columbus, Ohio, Detroit College of Medicine and Surgery 1916, served during the World War, aged 43, died Nov. 28, 1938, of acute cardiac decompensation.

**William Pomeroy Biggart**, Lancaster, S. C., Medical College of the State of South Carolina Charleston 1923, aged 40, died Oct. 22, 1938, in the Veterans Administration Facility, Columbia.

**Eugene J. Brown**, Stanford, Ky., University of Louisville Medical Department 1891, member of the Kentucky State Medical Association, aged 71, died, Nov. 11, 1938, of cerebral hemorrhage.

**Eugene Aaron Hawley**, Terrell, Texas, Rush Medical College, Chicago 1896, member of the Arkansas Medical Society, aged 62, died, Nov. 4, 1938, of pneumonia and heart disease.

**J. Russell Mosier**, Harfield, Pa., University of Maryland School of Medicine, Baltimore, 1883, member of the Medical Society of the State of Pennsylvania, aged 83, died, Oct. 14, 1938.

**Callender L. Johnson** ♂ Dallas, Texas, Howard University College of Medicine, Washington, D. C. 1897, aged 70, died, Nov. 14, 1938, of coronary occlusion, hypertension and nephritis.

**Alonzo Allen Fuson**, Summum, Ill., St. Louis University School of Medicine 1912, on the staff of the Graham Hospital, Canton, aged 55, died suddenly, Nov. 18, 1938, of heart disease.

**Peter John Fisher Houston**, Toronto Ont. Canada, University of Toronto Faculty of Medicine 1904, on the staff of the Toronto East General Hospital, aged 60, died, Nov. 7, 1938.

**John Thomas Craddock** ♂ Mackinaw City, Mich., Ohio State University College of Medicine, Columbus 1925, aged 46, died Nov. 12, 1938, of coronary thrombosis and hypertension.

**John William McKay**, New Glasgow, N. S. Canada, Bellevue Hospital Medical College, New York, 1886, on the staff of the Aberdeen Hospital, aged 79, died, Oct. 9, 1938.

**Llewellyn Jordan**, Takoma Park, Md., Columbian University Medical Department Washington, D. C. 1894, also a dentist and lawyer, aged 71, was found dead, Nov. 5, 1938.

**Robert Leon Hill**, Boonville, Mo., Howard University College of Medicine, Washington, D. C., 1897, aged 63, died Nov. 22, 1938, in St. Joseph's Hospital of cirrhosis of the liver.

**George Oliver Emerson Danville**, Va., University College of Medicine, Richmond 1898, member of the Medical Society of Virginia, aged 66, died, Nov. 21, 1938, of endocarditis.

**Casper Swart Dodd**, Kansas City, Mo., University Medical College of Kansas City 1901, aged 68, died Oct. 18, 1938, in the Trinity Lutheran Hospital of cerebral hemorrhage.

**Henry Edward Frost**, Anacortes, Wash., Jefferson Medical College of Philadelphia 1906, member of the Washington State Medical Association, aged 62, died in November 1938.

**Alcinous Burton Jamison**, New York, Medical College of Fort Wayne Ind. 1878, aged 87, died, Nov. 15, 1938, in St. Luke's Hospital of arteriosclerotic heart disease.

**Michael McCormack Nolan** ♂ Birmingham, Ala., Jefferson Medical College of Philadelphia, 1912, served during the World War, aged 51, died suddenly, Nov. 23, 1938.

## Bureau of Investigation

### RX MEDICINAL SPIRITS

#### The Peculiar Claims for a "Nonintoxicating" Whisky

For about a year a group using the trade style "R<sub>x</sub> Medicinal Spirits," 2100-2120 South Morgan Street, Chicago, has been promoting to physicians a whisky named "Prescription Brand." Apparently prior or coincidental to this, R<sub>x</sub> Medicinal Spirits of Peoria, Ill., was distributing a similar product called "RMS Private Formula." One of the advertising pieces for the latter product, distributed with the compliments of the manufacturer of the former, was entitled "Authentic Abstracts on Alcohol and Whiskey." It contains reprints of what appear to be photostatic copies of articles appearing in various scientific journals. Inquiry of the editors of these journals indicates that, at least in most cases, permission was not obtained to reproduce this material. Since some of the articles were taken from *THE JOURNAL*, the firm was asked to discontinue the use of the material, which it claims it has done.

Although this whisky is labeled "94 proof" and carries the state of Illinois tax stamp for one pint of alcoholic liquor, it is claimed that it is practically free from poisonous congeners which the United States Pharmacopeia does not even recognize. An advertising folder includes a copy of the U S P description of whisky, and to this description the manufacturers have added notations that the assays are 45 years old and that no mention is made of fusel oil, furfural and aldehyde, all of which are marked poison.

The method of purification is described in a form letter as follows:

Our manufacturing technique begins where the manufacturer of beverage whisky stops. For example, we take a 2 to 4 year old whiskey that is supposed to be finished and ready for bottling by the beverage manufacturer and we then by means of complete fractionation and absorption remove the poisonous congeners. This is all done without disturbing the mellowness palatability alcoholic content or optic value. After this whiskey has been washed and cleansed ready for consumption it has a much milder taste and there is no harsh after reaction.

The claim of the manufacturer and distributor is that the toxic, habit-forming narcotics and hypnotics have been reduced to a minimum in this brand of whisky. The firm states in one of its form-letters that:

Used as a prophylactic it will prohibit the possibility of ever becoming an inebriate. Used as a remedial whiskey in chronic alcoholism it tends to make a moderate and sane drinker. The physiological and psychological results are automatic because the patient is not denied his liquor and in the absence of narcotics the quantity imbibed decreases.

No doubt such a treatment would be acceptable to the drunkard. It could never, by the greatest stretch of the imagination, be considered a cure for chronic alcoholism. The suggestion appears as a pernicious piece of folderol.

According to the manufacturers, they have been able to reduce the furfural, the aldehyde and "amyl" and "iso-amyl" (sic). That these ingredients may be poisonous is not denied. That they are any more poisonous in the quantity in which they may occur in U S P whisky than the whisky itself, or the alcohol content therein, is most certainly not at all evident, in spite of the reports from the literature entitled "Authentic Abstracts."

During Prohibition some drinkers partook of grain alcohol, diluted and flavored, and even straight, it seemed to be a satisfactory product for producing the euphoria and the inebriation desired by those addicted to alcohol. This is not surprising, in view of the following quotation from Sollmann's "A Manual of Pharmacology," 1936 (Philadelphia, W B Saunders Company):

The impression prevails widely that the impurities [higher alcohols and ethers and esters formed from these and called collectively fusel oil] add materially to the harmfulness of the liquors but practically all scientific investigations have confirmed the conclusion that there is practically no objectively discoverable difference in action between any of the potable spirits ranging from the rawest to the most delicate. They are all about equally and quite insignificantly more irritant and more toxic than pure ethyl alcohol. The differences are purely in the flavor and its psychic suggestion. This has been the practically uniform result of all critical investigations and could be deduced from the nature and quantity of the impurities.

Some of the authentic abstracts would seem to refute some of these statements, others, however, support it.

**Landon Armstrong Colquitt** ☉ Waskom, Texas, University of Texas School of Medicine, Galveston, 1922, aged 42, was killed Nov 22, 1938, in an automobile accident.

**James Augustus Johnson**, Philadelphia Howard University College of Medicine Washington, D C, 1906, aged 57, died, Oct 27, 1938, of uremia and chronic nephritis.

**Garvyn Priestly Hicks**, Bruceton, Tenn., University of Nashville Medical Department, 1905, aged 58, died, Nov 23, 1938, in Lake Worth, Fla., of coronary thrombosis.

**Grant Giles**, Bloomfield Iowa, Keokuk Medical College, 1898, aged 70, died, Nov 26, 1938, of carcinoma of the prostate and hypostatic pneumonia.

**S MacDonald**, Collinsville, Miss Mississippi Medical College Meridian, 1909, aged 57 died Nov 18 1938, of injuries received when a horse he was riding fell on him.

**Lucien Clyde Fausold** ☉ Glenshaw, Pa., University of Pittsburgh School of Medicine, 1913, aged 55 died, Nov 13 1938, in St Louis, of carcinoma of the bronchus.

**Minerva Herrick**, Chicago, Illinois Medical College, Chicago, 1906, aged 77, died, Nov 13, 1938, of acute dilatation of the heart, myocarditis and arteriosclerosis.

**Verden Giddings Slater**, San Bernardino Calif., Stanford University School of Medicine, San Francisco, 1932, aged 33, died, Oct 29, 1938, of pulmonary tuberculosis.

**M Samuel Alexander**, Goose Creek, Texas, Memphis (Tenn.) Hospital Medical College, 1912, health officer, aged 68, died, Nov 8 1938, of diabetes mellitus.

**Howard Nelson Leeds**, Cincinnati, Medical College of Ohio, Cincinnati, 1907, served during the World War, aged 55, died, Nov 10, 1938, of carcinoma of the rectum.

**Charles Wainwright Birnie**, Sumter, S C., University of Pennsylvania Department of Medicine, Philadelphia, 1898, aged 64, died, Nov 22 1938, of a spinal tumor.

**Charles Gordon Brown**, Spokane Wash Long Island College Hospital Brooklyn, 1876 aged 90, died, Nov 8, 1938, in St Maries, Idaho, of coronary thrombosis.

**Thomas Duncan**, Fleta Ala Medical College of Alabama, Mobile, 1892, aged 72, died, Nov 17, 1938, in a hospital at Montgomery, of gangrene of the intestine.

**Arthur O Jones**, Greensboro N C (licensed in North Carolina in 1890), aged 71, died Nov 25, 1938, in the Piedmont Memorial Hospital of bronchopneumonia.

**Edwin J Lowell Robinson**, San Diego, Calif., Homeopathic Hospital College, Cleveland, 1883, aged 78, died, Oct 25 1938, of ulceration of the stomach.

**Jess Henry Moeller**, Maddock N D, Kongelige Frederiks Universitet Medisinske Fakultet, Oslo, Norway, 1892 aged 73, died, Nov 23, 1938, of heart disease.

**Rowland Francis Altree**, Tampa Fla., Medical College of Alabama, Mobile, 1899, aged 66, died, Oct 22, 1938, of chronic myocarditis and nephritis.

**Paul Barnabus Bauer** ☉ White Hall Ill., University of Illinois College of Medicine, Chicago, 1934, aged 36, died, Nov 15, 1938, of brain tumor.

**Julius K Elms**, Lincoln Neb., Chicago Homeopathic Medical College 1879 aged 88 died, Oct 22 1938, of chronic nephritis and arteriosclerosis.

**Robert Wilson Cook**, Adolphus Ky Vanderbilt University School of Medicine Nashville, Tenn., 1894, aged 78 died Nov 16, 1938, of angina pectoris.

**Walter B House**, Saugatuck Mich., Chicago Homeopathic Medical College, 1885, aged 81, died, Nov 30 1938, of cerebral hemorrhage.

**William Hyndman**, Jackson Mich Detroit Medical College 1877, aged 87 died Nov 28 1938, of arteriosclerosis and cerebral hemorrhage.

**Fred Leslie Redman**, Corinna Maine, Medical School of Maine, Portland 1893, aged 79, died Oct 30, 1938 of hemorrhage of the stomach.

**Edward Joachim Couillard** ☉ Northbridge Mass Baltimore Medical College, 1909, aged 57, died, Oct 8, 1938, of cerebral hemorrhage.

**John C Bryan**, Chicago, Rush Medical College Chicago, 1877, aged 88, died, Nov 4, 1938 of chronic myocarditis and arteriosclerosis.

**Frank E Burgess**, Dexter Maine (licensed by years of practice), aged 81, died, Oct 23, 1938, of valvular heart disease.

**Selmon A Casady**, Shenandoah Iowa Keokuk Medical College 1891, aged 87, died Nov 15 1938, of coronary sclerosis.

In the promotion of this whisky in the treatment of alcoholism, the firm is using a case history which reads as follows:

The patient, whose clinical course I am about to relate was referred to me by Dr T on June 25 1937. J M, a professional man from southern Illinois aged 37 was first seen by Dr T on April 7 1935 at which time he was admitted to the St Francis Hospital for the treatment of Acute Alcoholism. Since that date until the present admission he has been in and out of the Hospital at least once every month for treatment of the same condition. On May 31 1935 he developed a toxic myocarditis as evidenced by the definite tachycardia etc. During the latter part of December 1935 for the first time he became very unruly and vicious. Also at this time there occurred a rupture of some esophageal varices. Since December 1935 every time that he would go on a drinking bout he would become very vicious and wild—throwing furniture about and even grabbing small children by the nape of the neck and throwing them around.

On this last admission to the Hospital he entered on June 21 1937 and from that date until June 25th the treatment of his condition consisted of 5% glucose solution intravenously hydrothermy sodium bromide 10 grains as needed and whiskey one ounce every four hours. During this time he would get up and about and come out into the corridors bother visitors, and loudly insisted on using the desk telephone—thus presenting quite a nursing problem. His pulse rate ranged well over a hundred—the highest being 132.

The morning of June 25 1937 the patient was started on Private Formula Whiskey and all other medications were stopped. He was allowed to consume as much of this whiskey as he desired. That night he slept well without the aid of any sedatives or hypnotics much to the surprise of the night supervisor. The following morning he awoke without any headache or hangover and ate some breakfast—the most he had eaten since his admission. The next two days June 26 and 27 he was allowed again as much Private Formula Whiskey as he wished to drink. He began to eat something, at mealtimes and was content to stay in his room and sleep. His pulse rate ranged in the 90's—the highest being 100 despite the fact that he consumed approximately six and one half pints during these three days. On the morning of June 28th he stated that he did not want any more whiskey and that all he wanted was something to quiet his nerves. That noon he had an emesis of bright red blood but the following morning (June 29) he felt much better and was so docile that his sister thought he was worse since she had always seen him wild and unruly. He was discharged from the Hospital on that date.

The use of 6½ pints of whiskey over a three day period should satisfy any but the exceptional drunkard, it is not at all surprising that he had no desire on the third day for anything except something to "quiet his nerves." Since this patient was discharged at this time and further data concerning him are not given, the evidence of the effect of this preparation on his habits is completely inadequate. In spite of this, the doctor on whose stationery this case is mimeographed summarizes as follows:

From my experience with this patient who no doubt was a heavy drinker for at least three years to our knowledge the use of Private Formula Whiskey was of definite therapeutic value. To summarize what in my opinion are the important facts:

- 1 There were no prohibitions put on the one and only thing that the patient wanted and there were no prohibitions placed on the amount that he could drink. As a result his wholehearted cooperation and confidence were gained and certainly these are necessary in treating such a patient.

- 2 He lost the taste for whiskey and could not be persuaded to take another drop. In fact the patient was quite pleased about it and even told the nurses that they should never bring any more whiskey into his room.

- 3 He suffered no headache or hang over and his pulse rate was not alarmingly increased.

- 4 No sedatives or hypnotics were necessary for sleeping or restlessness during the administration of Private Formula Whiskey.

- 5 He became a gentleman instead of being wild and unruly.

At this writing I have observed in consultation the use of this Whiskey in three other patients and the results obtained have been similar. The clinical records are not available at present, so I am unable to report them. However, one of these patients was on the border line of Delirium Tremens and the use of Private Formula Whiskey controlled the condition very remarkably much to the amazement of the Attending Physician. I do not think that definite scientific conclusions should be made from such a small number of cases but certainly they reasonably demonstrate the efficacy of Private Formula Whiskey as a positive therapeutic aid in the treatment of Chronic Alcoholism.

Everything under the sun has been used in the attempt to cure drunkenness, inebriation and chronic alcoholism. The idea of using whiskey in unlimited quantities, however, whether or not it contains the various impurities which this manufacturer claims to have reduced, is preposterous. As far as we know, the only way to "fix up" whiskey so that it does not produce drunkenness, inebriation and eventually habit in some individuals who become addicted to it is to remove the alcohol—and then it isn't whiskey.

While this method of treating alcoholism may become popular with alcoholics, the continued use of this product will not lead to either sobriety or abstinence. The promotion of this product in the complete absence of satisfactory evidence is a triumph of ingenuity and imagination but it is certainly not scientific.

## Correspondence

### AN UNFORTUNATE SITUATION IN THE FIELD OF BACTERIAL CHEMOTHERAPY

To the Editor.—In spite of the hopeful outlook in the field of bacterial chemotherapy, certain tendencies which have become obvious in the past three years should cause grave concern to serious and thoughtful students of this subject. It may be opportune to call attention to several of these in the hope that all concerned may attempt to combat these pernicious tendencies which threaten to delay advance in a field of so much importance to the health of mankind. The meaningless therapeutic experiments on mice which are constantly being published by investigators of presumably good scientific standing, the administration to human beings of chemical compounds before any detailed information of the chemical structure and properties of such compounds has been made available to medical investigators or practicing physicians, and the use of drugs in sick human beings before adequate toxicologic and pharmacologic investigation on animals is available can only impede true progress and lead to unnecessary human suffering and death.

A new and promising field is always immediately invaded by workers from other fields. Results must be obtained over night and reputations made (or blasted) in a month. Instead of the time-honored slow and laborious method of reaching conclusions some short cut method is adopted without the investigator (we hope so at first) being aware that the experiment cannot yield an answer to the question at issue. Almost every week one sees articles which describe the attempts of an investigator to compare either two or more methods of administering the same drug or two or more drugs administered by the same method as to their therapeutic efficiency on some experimental bacterial infections of mice but the investigator uses such a limited number of animals that his conclusions are unjustified. The experiments cause other workers a loss of time and effort and frequently are taken over into the clinic with unsatisfactory or even disastrous results. Many of the investigators who have entered this field have made no attempt to evaluate the significance of their figures or to analyze and test their meaning by even an elementary statistical technique.

To decide if a new compound is active as an antibacterial agent in mice, only a few animals are necessary provided the untreated controls all invariably die in a few days. Prolongation of life or survival of some of the treated animals gives an unequivocal answer to the question. But this answer is only a qualitative one and with a few animals no statement can be made as to the relative efficiency of two drugs or two different methods of administering the same drug. The number of mice which it is necessary to use to answer such questions will depend on the magnitude of the difference. Thus, for example, when two groups of six mice are used and one mouse in one group and five in the other survive, the probabilities of such a difference being due to chance are about 1 in 10. With ten mice in each group the death or survival of three in one group and seven in the other is not statistically significant, since divergences as extreme as this are likely to occur by chance about one in six times.

If investigators refuse to recognize the simplest statistical principles I suggest that the editors of reputable journals refuse to accept the manuscripts of such investigators and inform them in no uncertain terms of the inadequacy of their results. The difficulties which are involved in accurately assessing two procedures of treatment or two different drugs are many but those which are due to an insufficient number of animals should not be countenanced.

The identity and purity of a chemical compound to be used as a drug and administered to human beings have not been accorded the attention they deserve from the physicians who order the administration of the drug. Recently a compound stated to be 2-sulfamimidopyridine was found to be extremely effective in pneumococcal infections in mice. Quickly this compound was tried in pneumonia in man with apparent beneficial results. The drug is still under trial and is being administered to thousands of sick persons, but as yet no description of the substance has been published. The proof of its chemical structure, analyses for purity and chemical properties are withheld from investigators and physicians who are using the drug. Obviously this is due to the patent situation with regard to new drugs.

Another serious situation is the fact that new drugs are introduced into human therapy before an adequate toxicologic study of their properties has been performed on animals. The need for this appears obvious but there has been a tendency in the clinical literature on sulfamidamide derivatives to take the point of view that toxicity experiments carried out on animals are of little use in determining the toxicity of this group of drugs for the human being. These statements are based on the fact that many toxic reactions are seen in patients when the drug is administered which could not be predicted from animal experimentation. This is no new thing to pharmacologists but has been known almost since the birth of scientific pharmacology. I know of no case in which the toxicology and pharmacology of a new drug have been satisfactorily worked out even in a preliminary way by a competent pharmacologist and the drug found to be dangerous for clinical use that clinical trial has reversed this opinion. I need only refer to the recent instance, which is fresh in the minds of all physicians, of the wholesale slaughter of patients by the use of a solution of sulfamidamide dissolved in diethylene glycol. A few simple animal experiments could have avoided this disaster.

One could quote hundreds of instances in which chemical compounds possessing some desirable therapeutic effect have been discarded for clinical trial because preliminary animal experiments indicated that the drug would be highly dangerous and too toxic for human use. The reverse of this proposition is, however, not true. Even when a drug has been subjected to a complete and adequate pharmacologic investigation on several species of animals and found to be relatively nontoxic it is frequently found that such a drug may show unexpected toxic reactions in diseased human beings. The reason for this difference is, I believe, threefold. With the higher development of man, it is to be expected that many drugs will prove more toxic for man than for the lower animals. Second there is every reason to believe that one will find more hypersensitive individuals to any given drug among diseased human beings than among a group of laboratory animals. Indeed it is quite probable that many drugs are more toxic to the diseased than to the normal individual. Third, it is known that idiosyncrasies occur in normal and diseased human beings and so far this has not been predicted by animal experimentation. In spite of this adequate pharmacologic investigation on animals is necessary.

Should more argument be needed for the importance of the proper support of pharmacology in our medical schools it is certainly furnished by the recent history of bacterial chemotherapy. Owing to the almost miraculous therapeutic results which have been obtained with the sulfonamide group of drugs in infectious disease it is certain that stupid and unscientific use of these and similar new drugs will be attempted in the future. A recognition of the value of pharmacology in connection with the development of a drug as a chemotherapeutic agent is essential, if disastrous results are to be avoided.

E. K. MARSHALL, JR., PH.D., M.D., Baltimore

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON LOCAL MATTERS WILL NOT BE NOTICED. LETTERS MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### TRICK AP ONSET OF MENSTRUAL PERIOD

*To the Editor:* A white married woman aged 36 had both tubes, the right ovary and the appendix removed in March 1905 following rupture of an ectopic pregnancy. For about a year thereafter her menstrual periods were apparently normal with no dysmenorrhea. Then, for no apparent reason, she began having severe cramps at her periods and fever as high as 104.1, beginning an hour or two after the onset of the menses and lasting three or four hours subsiding as suddenly as it had arisen. Nausea and occasional vomiting and pain on the stomach are concomitant symptoms. There are no intermenstrual symptoms. Uterine size is normal and the patch tuberculin test is negative. Pelvic examination reveals an anteflexed uterus with normal ovaries. What could cause such a transitory high fever and what method of treatment should be used?

LEIGH PRATT BROWN, M.D., Redford, Ohio

*ANSWER:* It seems probable that this patient's symptoms and fever are due entirely to a pelvic disorder and not to exacerbations of some systemic disease (such as tuberculosis) during the catamenia. The first possibility that suggests itself is a uterine fistula which allows the escape of menstrual blood and detritus into the peritoneal cavity. Such a fistula might follow imperfect healing of the uterine canal after excision of the tubes. A uterine fistula would account for the fever (peritoneal reaction to free blood), endometriosis, which would be expected as a sequel to the fistula, would account for the dysmenorrhea, cervical atresia, or kinking of the cervical canal due to extreme flexion of the uterus would favor the passage of blood through the fistula. In studying this patient one would first make careful vaginal and rectal examinations with endometriosis in mind. The discovery of nodules in the cul-de-sac would be suggestive, and increase in the size and tenderness of these nodules at the time of menstruation would be strongly suggestive of endometriosis. The cervical canal should be sounded and should be well dilated if there is any evidence of blockage. A Rubin test would show any communication between the uterine and the peritoneal cavities. Should such a communication be found, it should be further studied by x-rays to try to determine whether a fistula or a short segment of tube is present. Utero-peritoneal fistulas should be closed as a prophylaxis against endometriosis. The fistula is easier to locate and excise if methylene blue solution is injected into the cervical canal under pressure immediately before or just after the abdomen is opened. Care should be taken to excise or destroy any endometrial transplant found, especially those in the isthmus tract (salpingitis isthmica nodosa) in the hope of relieving the dysmenorrhea. Every effort should be made to provide a free cervical passage for the menstrual flow. The cervix should be widely dilated and any extreme flexion of the uterus should be corrected. As presented, the history does not suggest simple pelvic inflammatory disease or periodic psychosis, but these possibilities cannot be ruled out from the data available.

### DEXTRINS IN DIET

*To the Editor:* Please give opinions pro and con on the use of dextrins for infants and adults. Has any work ever been advanced showing the harmfulness of dextrins? D. P. FINEBERG, M.D., Los Altos, Calif.

*ANSWER:* Dextrins are polysaccharides intermediate between starch and maltose. They are not fermented by most intestinal bacteria but they are readily converted into maltose through the action of enzymes normally present in the intestinal tract. Commercial dextrin is usually a mixture of various dextrins.

It is believed that the usefulness of dextrins in infant feeding can be attributed in part to the gradual formation of maltose which when hydrolyzed into dextrose, is absorbed. Hence when dextrins are fed there is not at any one time an excess of fermentable carbohydrate in the intestinal tract. The Council on Foods (J. AM. J. Hyg., May 29, 1914, p. 1890) has pointed out that the carbohydrate preparations used in the artificial feeding of infants can conveniently be divided into three groups: pure sugar, hydrolyzed starch preparations and mixtures. The dextrin of course can be obtained by the partial hydrolysis of starch. It is interesting to note that it was the consensus of the Council in the light of evidence available that the choice of a sugar for use in infant feeding is of relatively minor impor-

tance as compared with other problems of infant feeding, but in individual cases it might be desirable to select one sugar over another.

Administered in reasonable amounts, dextrin should have no toxic action for either infants or adults.

#### DERMATITIS FROM CORE\*

*To the Editor*—I have two cases of severe dermatitis in young healthy men truck drivers who recently required this condition following exposure to some form of chemical transported in bags which sifted down on them in their sleeping quarters in transit. The material is known to the commercial trade as core and is shipped and used regularly in foundries. The patients present a generalized dermatitis of the face and neck the parts exposed during sleep to the reaction of the chemical. No other portion of the body is involved either symptomatically or clinically. They state that the powder is fine and black and that it completely covered their faces and necks during the hours of sleep. No symptoms were experienced until after washing the face in the morning. At the present time they are complaining of intense burning of all exposed areas of the hands and face but the scalp. Can you advise me what chemical is commonly used by foundries which might produce this condition?

P. W. FLAGGE, M.D., High Point, N. C.

**ANSWER**—The term "core" is not sufficient to identify fully any particular commercial product. However, in foundry practice cores are commonly made up of sand, bound together by some adhesive material, and are made stable by baking. A number of binders are available including granular pitch. This core material may not consist entirely of granular pitch but instead may be mixed with finely ground bituminous coal called "sea coal." The "sea coal" may be regarded as an adulterant but it may serve a useful purpose in limiting the hardness of the core after contact with hot metal. Tars, dextrin and molasses are also used as core binders. Cores are sometimes washed with suspensions of graphite or plumbago. Mention in the query that the irritating substance to which exposure occurred was black prompts the belief that the particular core material was a powdered pitch, tar or asphalt with or without powdered bituminous coal. Any one of these three substances might produce a dermatitis, particularly when the exposure is to fine particles. If the assumptions in this reply are correct, no persistent effects may be expected and prompt recovery after the acute episode may be anticipated.

#### ESTROGENS AND HYPERTENSION

*To the Editor*—Three years ago following a series of administrations of estrogen (5,000 international units) for menopausal flushes the patient's blood pressure dropped from 190 to 140 and remained at the lower level. Since then I have treated eight other patients with estrogen and have noted the same drop in blood pressure. In some cases this lowered blood pressure persisted for more than a year after the treatment was terminated. I also purposely treated with estrogen a man aged 52 with malignant essential hypertension and a systolic blood pressure of 210. His blood pressure fell 30 points. The type and degree of the cardiovascular conditions in the patients varied. Some were of ten years duration and accompanied by considerable cardiac and kidney changes yet a systolic and diastolic drop was effected in every one of these cases. I attributed this effect to the 'suppressive' action of the estrogen on that part of the pituitary responsible for control of blood pressure. I would appreciate your comment.

M. D., New York.

**ANSWER**—The vasodepressor activities of estrogens have been repeatedly observed, although it is but recently that clinicians have had available relatively pure preparations of the various pituitary and ovarian fractions. In 1916 Culbertson (*Surg Gynec & Obst* 23:667 [Dec] 1916) suggested that the climacteric type of hypertension and vasospasticity might be due to associated secretory changes in the pituitary. Similar changes in thyroid and adrenal activity are also to be considered. There is also evidence that normal ovarian secretion has a vascular sedative action. Alvarez and Zimmermann (*Arch Int Med* 37:597 [May] 1926) pointed out that in young women with abnormal menstrual cycles the average arterial tension is found higher than in the normal. The type of hypertension associated with the menopause is of a spastic, variable character and is greatly affected by the emotions (Maranon, Gregorio, *The Climacteric*, edited by Carey Culbertson, translated by K. S. Stevens, St. Louis, C. V. Mosby Company, 1929). Similar "emotional hypertension" is frequently observed in patients with abnormal sexual appetites, especially among those with borderline nymphomania (Stieglitz, E. J. *Am J M Sc* 179:775 [June] 1930).

More recent studies (Liebhart, S. *Zentralbl f Gynak* 58:1896 [Aug 11] 1934) on the clinical administration of follicular extracts reveal that it is effective in hypertensive women entering the menopause. Its application to other forms of hypertension has been, on the whole, much less satisfactory.

It must be reemphasized that hypertensive arterial disease is due to many etiologic factors, that frequently there are several provoking factors superimposed in the same patient and that each and every case of the disease must be treated as an individual problem. The variable results recorded in the query illustrate this. That endocrine disturbances not infrequently are etiologic factors in hypertensive disease is true but in every instance by any means. With careful diagnostic analysis, it is possible to elicit many contributing or provoking etiologic factors in a series of hypertensive patients. Perhaps the analysis is the most important aspect of effective therapy. It must be anticipated that in many cases the therapeutic results from the administration of estrogen will be disappointing.

#### POLYGRAPH OR LIE DETECTORS

*To the Editor*—I should like to know where I can obtain a detector and literature concerning it. Are lie detectors for sale on the market?

M. D. Kenner

**ANSWER**—There is actually no 'lie detector' and the present status of this whole question is controversial. Much of the existing chaos is due to the fact that although the principles underlying this field of research, the translation of emotional reactions into physiologic terms, are usually identical, machines are being patented, exploited for the most part by nonmedical men and sold to operators interested either in psychology or in medicine. Yet this apparatus involves the most complicated forensic clinical principles and instruments of precision. Usually a brief period of instruction of two or more weeks or mailed directions are given by those selling the machines, with attempts by them to control all further work carried out by the operator. One inevitable result is that the majority of those operating lie detectors for the police departments and commercial firms have no knowledge of the lying principles and are using the method as a psychological third degree. Unfortunately, the same operators are giving instructions, advertising "lie detectors" and some of the leaders, besides exploiting machines, are pictured in current magazines advertising commercial products.

Before purchasing any apparatus or conducting any experiments, one should consult the following minimum references:

- Burrill H. E. *Legal Psychology* New York: Prentice Hall Inc. 1931.
- The author is professor of psychology at Ohio State University, Columbus, Ohio.
- Larson John A. in collaboration with Haney George W. and Keeler Leonarde. *Lying and Its Detection* University of Chicago Press. 1932. Includes twenty three pages of bibliography.
- Reichsmid Christian A. *The Psychology of Feeling and Emotion*, New York: McGraw Hill Book Company Inc. 1936. The author was formerly professor of psychology at University of Iowa.
- Goldstein Irving. *Trial Technique* Chicago: Callaghan & Co., 1931. pp. 13-19. The author is instructor in trial technique, Northwestern University School of Law.
- Marston William. *The Lie Detector Test* New York: Richard L. Smith 1938. Since this book contains sweeping statements the following reviews should be consulted also: Larson John A. *Legal Review* 23:451-453 (March) 1938. Inbau Fred. *Journal of Criminal Law and Criminology* 29:305 (July-Aug.) 1938.

The apparatuses at the present time being exploited as 'lie detectors' include:

The "Keeler Polygraph" patented by Leonarde Keeler, formerly of the Crime Detection Laboratory at Northwestern University, now taken over by the Chicago Police Department including the apparatus and personnel with the exception of Mr. Keeler. The machine is manufactured by the Western Electric and Mechanical Company Incorporated, Oakland, Cal. The price was formerly \$450. Recently there has been added a galvanometer.

The Lee Polygraph or "Berkeley Psychograph," Lee and Sons, 1909 Delaware Street, Berkeley, Calif., \$250. The apparatus is the simplest to operate and mostly approximates the principles and polygraph used by Larson from 1923 to 1927.

The Darrow photopolygraph \$1,000, manufactured by the Stoelting Company, Chicago. This is the most complete apparatus available for research purposes. Included are the respiratory changes, vasomotor and blood pressure changes as recorded in the modified Thomas Polygraph, Lee and Keeler polygraphs, the Luria tremographs and voice keys (The Behavior Research Photo-Polygraph, *Journal of General Psychology* 7:215, 1932). This is also described as Lie Detector (An Improved Lie Detector Darrow Photo Polygraph, *Police* 13:13 [April] 1935). However, complaints have been received that this apparatus is much too complicated for practical procedure. To this Darrow may add a continuous quantitative method of determining blood pressure.

The "Pathometer" A psychogalvanometer devised by Father Summers, recently deceased, of the department of psychology of Fordham University. A picture of this was printed in the *Saturday Evening Post* May 21, 1938, in connection with a commercial advertisement. The claims made for the apparatus which is in use at Fordham University and by the Michigan State Police Department have been strongly criticized by Marston in his book and in more detail by Jordan (*Evidence Admissibility of Deception, Journal of Criminal Law and Criminology* 29, No 2, 1938). Samuel Renshaw and Bernard Higley describe "An Improved Device for the Continuous Pneumatic Recording of Respiration and Changes in Blood Pressure" (*Journal of Psychology* 4 281, 1937).

Larson reports satisfactory experimental results from the usage of a modified Thomas polygraph made by Earl Bryant of California. He does not regard as satisfactory any of the apparatuses now on sale with implications that they are "lie detectors." He feels that the psychogalvanometric method alone has not as yet proved its efficacy in criminologic work.

Hoover's conservative impressions may be found in "Scientific Methods of Crime Detection in the Judicial Process."

#### PRURITUS ANI

To the Editor—A man aged 45 has had pruritus ani for fifteen years. His general physical examination and routine laboratory tests including the Wassermann test have all been negative. He has had some small internal hemorrhoids which have reacted satisfactorily to the injection of quinine and urea solution. The treatment of the pruritus has included roentgen therapy, injection of alcohol and nupercaine with benzyl alcohol in almond oil. An autogenous vaccine has been made from his stool and has been used with complete failure. Gentian violet solution made the condition worse and caused a stubborn eczema to develop. I advised that he has reached the stage where surgery (Ball operation) offers the only hope for success. Could you suggest anything less radical but affording some hope of cure?

A A SKEMP MD LaCrosse, Wis

ANSWER—A careful search should be made for a fungous infection of the skin which not infrequently occurs and which would respond to Whitfield's ointment. The injection of alcohol through multiple punctures about one-half inch apart, from 1 to 2 minims (0.06 to 0.12 cc) being injected in each puncture throughout the area of dermatitis at a level of about one-half inch below the skin has been just as effective as the Ball operation. One should also make sure that there are no infected crypts, that the patient has no diarrhea that he does not have a fermentative stool with frequent passage of gas, and that he does not take liquid petrolatum. It is highly important that nothing come in contact with the skin but moist detergents and that the skin be kept scrupulously clean with soap and water. The measures should be tried before further operation.

#### EXTRAVASATION OF ARSPHENAMINE—PRURITUS AFTER ARSPHENAMINE

To the Editor—Aug 11 1938 I gave a patient an intravenous injection of 0.6 Gm of nearsphenamine. Unfortunately owing to the patient's restlessness some of the solution entered the tissues around the elbow. At the present time there is a small hard red lump that at times is painful and itchy and annoys the patient. Can you suggest a procedure to relieve this condition? After the ninth injection the patient developed a generalized pruritus without any dermatitis. I am giving him intravenous injections of 10 per cent calcium gluconate as well as external applications of 0.25 per cent phenol in olive oil. Is this the proper procedure?

M D Connecticut.

ANSWER—Regarding the first question, further treatment is not required. Extravasation of one of the arspenamines produces a localized cellulitis which may be sufficiently intense to break down and suppurate. If this can be avoided, however, the condition is then self limited and will in time subside, although it may require several months for the subcutaneous scar tissue to be absorbed. After the acute stage is over, local treatment is useless and attempts at surgical intervention merely serve to make the situation worse.

With the meager information furnished, an accurate answer to the second question is more difficult. Generalized itching developing after an injection of an arspenamine product is usually a danger signal warning the physician that further treatment with an arspenamine must be given with the greatest caution and only after intravenous testing, in the manner described by H M Robinson (*Intravenous Testing in Post-arsphenamine Dermatitis South M J* 29 411 [April] 1936), has demonstrated tolerance to the drug to be employed. This type of itching however, is short lived seldom lasting more than from twenty-four to forty-eight hours unless it is followed by a generalized eruption. It does not require treatment.

#### SMALL DOSES OF INSULIN IN OTOLARYNGOLOGY

To the Editor—What information can you give me regarding the use of insulin in ear nose and throat disorders especially chronic otitis media?

HENRY H AMSDEN, MD Concord N H

ANSWER—D C Jarvis of Barre Vt, has written a good deal on the use of small doses of insulin in ear, nose and throat disorders. The basis on which he makes his recommendations is in part theoretical and in part his own clinical experience and that of a correspondence study group. One may, of course, not agree with theoretical considerations and still have to pay attention to the claims of experienced clinicians when these claims are based on careful study of patients. Knowledge gained this way is frequently discovered in later years to have a sound basis in fact even though the theory proposed may be found faulty. However, in this case much more confirmatory evidence is needed.

The best exposition on the use of small doses of insulin in ear, nose and throat practice is to be gained from the writings of Jarvis himself. A recent article entitled "Small Doses of Insulin in Otolaryngologic Practice. Clinical Experience of a Correspondence Study Group" appeared in the *Archives of Otolaryngology* in July 1937.

In general the proponents of the "oxygen metabolism theory" state that small doses of insulin are useful in common colds both for prophylaxis and for treatment. They have been found of value in excessive nasal secretion and in the treatment of nasal polyp and acute and chronic otitis media as well as in other conditions. The curative value of small doses of insulin in cases of chronic otitis media in which the usual methods of treatment have failed is attested by a number of competent observers. The usual dose is three units given subcutaneously daily with a lengthening of the interval as clinical improvement takes place. Eventually the insulin may be given no oftener than once a week and continued for months.

#### ANGINA PECTORIS IN PAINTER

To the Editor—A man who has worked fifteen years as an automobile painter presents a probable angina pectoris syndrome. Symptoms began three months ago and have progressively become more severe. An attack is usually brought on by physical exertion for example, while walking to work. Emotional incidents have also produced the same effect. It begins with a sick feeling in the lower part of the chest and afterward changes to a burning sensation in the same region ascending to the anterior part of the chest and radiating to the back and down both arms to the elbows being more severe on the left. He also presents a general muscular wasting beyond his increasing years. He is 48 years of age and is generally high strung and apprehensive. The blood pressure is 105 systolic 60 diastolic. For the last twelve years he has had many abscessed teeth and a few remaining lower ones are abscessed and decayed. The rest of his physical examination is essentially negative. Blood count reveals red blood corpuscles 5 380 000 white blood corpuscles 12 950, hemoglobin from 95 to 100 per cent (Tallqvist). The blood Wassermann reaction is negative. Urinalysis is negative. He has used many varieties of paint during the last fifteen years. In recent years he has been painting by the spray method. Some of the many used paints are Duco Deluxe (synthetic enamel) and aluminum paint. He has had little contact with lead paints. I would appreciate any information you may have that would explain the possibility or impossibility that paints as described might be the cause of this clinical picture.

BARNEY LIHW MD Vineland N J

ANSWER—Angina pectoris cannot be regarded as a characteristic occupational disease among painters although Gerbis (*Arch f Gewerbepath u Gewerbehyg* 7 421 1936) has described angina pectoris resulting from the inhalation of trichlorethylene in another industry. On the other hand, hand painting and spray painting in the absence of suitable protective devices must be reckoned as associated with far more exposures than most occupations. This is less true in the present decade than it was for periods twenty or thirty years ago. This betterment is due to the use of less toxic materials in paints in later years. Among old time painters, the degenerative diseases are highly prevalent and the onset of such degeneration is earlier than for workers in general.

The National Tuberculosis Association in 1934 reported a much higher frequency of heart disease as a cause of death among painters than for selected other trades and for all occupations. In a hundred thousand gainfully occupied men the death rate from heart disease for painters was 247.3 and for all occupations 174.4. The corresponding death rate from nephritis was 89 for painters against 57.6 for all occupations. Likewise deaths from cerebral hemorrhage were more frequent among painters than for all occupations.

In this instance the angina pectoris described probably is not the result of working with any particular substance common to the painters trade and possibly is unrelated to work in any respect as a direct cause. However it is undoubtedly true that this painter has been exposed in the course of many years of



painting work to a fair number of substances which might have exacted some toll from his body. The number of possible agents includes benzene, toluene, lead, arsenic chromates, naphthalene, aniline oil, paranitraniline, acetates, esters and ketones. The substances mentioned in the query, such as Duco, are perhaps less harmful than other substances in wide use were two or three decades earlier. It is quite impossible to attribute this condition to any particular material found in the printer's work, but it may be recognized that painting as a trade leads to some deleterious effect on life and well being.

#### INHALATION OF BLACK FLAG OR PYRETHRUM

*To the Editor*—A white woman aged 73 while spraying flies with black flag about six weeks ago inhaled some vapor of the spray and noticed immediately severe burning sensations in the nose throat and the pit of the epigastrium in the order given. Ever since then she has been complaining of these unpleasant sensations. She also has hypertension and noises in her ears. She has been treated for the hypertension and has improved as far as the head noises and circulation are concerned. An anemist found two weeks after her so called poisoning (I did not see her before that) has improved also. In spite of all types of antacid medication she still appears to suffer enormously. Inhalations of functure of benzoin give transient relief. X-ray examination does not show any abnormality except for a severe ptosis of the stomach. What is the composition of black flag? Are there any chemicals in its composition that might be injurious to a human being? If so what antidotes are desirable? If it is necessary to have the contents of this can of black flag analyzed where can I have it done and at what fee?

M D Vermont

**ANSWER**—In THE JOURNAL July 12 1930, page 111, a case of black flag dermatitis associated with some systemic involvement is described by Sulzberger and Weinberg. On chemical analysis the responsible insect powder showed the presence of pyrethrum. Pyrethrum insect powder is derived from the pulverizing of buds of certain varieties of chrysanthemums. The pyrethrum industry flourishes in Dalmatia, California and Japan, among other places. This powder contains an effective insecticidal agent, when used as such or the active principal may be chemically extracted. Many of the commoner household insect sprays represent an extract of pyrethrum with naphthalene, deodorized kerosene or related petroleum derivatives. At least in times past, chlorinated hydrocarbons have been utilized in the manufacture of some sprays.

Granting that pyrethrum is a severe local irritant it is surmised that in the instance cited the immediate discomfort following inhalation of vapor was chiefly due to the action of the leaching liquid, probably a naphthalene or naphthalene-like body. Such vapors may irritate the nose and throat, but it is most unlikely that hypertension, head noises or anemia may be traced to this casual inhalation of hydrocarbon vapors containing pyrethrum. Occasionally persons become sensitized to the constituents of spray insecticides and as long as any trace is present about the household may suffer from skin disorders or minor respiratory irritation or peculiar perversions of tastes and odors. Unless in the present instance this condition is perpetuated on an allergic basis, and if the full extent of exposure was that described in the query, it seems reasonable to dismiss this insecticide as the source of any prolonged or severe manifestations from any organic disease. The advanced age of 73 is significant and may be more important than external irritants.

There are no known antidotes, but in pyrethrum dermatitis removal from further exposure, together with palliative treatment, is usually efficacious. It would seem advisable first to ask the manufacturer if he will supply the exact composition.

#### HANDLEY OPERATION FOR CARCINOMA OF BREAST

*To the Editor*—Is there an operation known as Handley's used to extirpate the breast? Is it a proper procedure in cancer of the breast? Would you please describe it and the rationale of its performance? Are the pectoral muscles removed? In the instance I know of they were not.

THOMAS I O DRAIN M D Philadelphia

**ANSWER**—The Handley operation for carcinoma of the breast is the one described by Sampson Handley (Carcinoma of the Breast and Its Treatment, New York, Paul B Hoeber 1922, p 239, also Christopher's Textbook of Surgery, Philadelphia, W B Saunders Company, 1936, p 958). Auchincloss (Christopher's Textbook of Surgery) says of this incision that emphasis is placed on the necessity for putting the growth in the center of the incision not only from the standpoint of the skin, but because the specimen to be removed should be similar to a bi-convex lens with the tumor in the center. This means an extensive undermining of the subcutaneous tissue and fascia. The amount of skin to be removed as recommended by Handley is not as great as that recommended by Halsted. The incision might be criticized from the standpoint of not removing enough

skin. The remainder of the operation is just the same as the standard radical operation in which both pectoralis major and pectoralis minor muscles are removed. The term "Handley operation" simply refers to the skin incision of which there are many. The fourteen principal ones are described by Auchincloss.

#### FUMES FROM ELECTRIC ARC WELDING

*To the Editor*—A patient who does electric welding has a bad reaction to the toxicity of the fumes formed he thinks by the heat from the asbestos like covering of the welding "rods". The rods go under the trade name of Lincoln Rods.

S F MENGEL M D Schuylkill Haven Pa.

**ANSWER**—Little is actually known about the fumes which arise from the coatings of welding rods, since they are in practically all instances trade secrets as to exact composition. They have been reported to contain copper, nickel, bronze, sodium fluoride, phosphorus and arsenic. Probably the chief harmful gases produced are the oxides of nitrogen, which even in low concentration are capable of producing pulmonary edema.

#### References

- Cottman R W. Gases from Carbon Arcs. *J Indust Hyg & Toxicol* 20 289 (April) 1938.  
MacQuiddy I I. Tollman J Perry LaTowsky Leroy W and Bryliss Milward. The Biological Effects of Inhalation of Carbon Arc Fumes. *ibid* 20 298 (April) 1938.  
Combustion Products of the Carbon Arc. *ibid* 20 317 (April) 1938.  
Health Protection of Welders published by the Metropolitan Life Insurance Company.

#### GARLIC IN GASTROINTESTINAL DISEASES

*To the Editor*—I have a patient with colitis and understand that garlic is used as a treatment. Will you please give me what information you have?

GERRIT MARIS M D Hull Iowa

**ANSWER**—The use of garlic (*Allium sativum*) as a medicine as well as a condiment can be traced to earliest antiquity, and periodically it has been exploited for this or that condition. Some years ago the use of garlic had a revival first in France and later in England, and then proprietary preparations claimed to be derivatives of garlic were put on the market. Preparations of garlic have not been shown to be of value except perhaps as irritant expectorants with local action on the stomach. The medical profession of this country appears not to have been impressed with the reported value of garlic preparations. Its use in gastrointestinal disease, especially diarrhea, constipation and colitis, is related in isolated case reports and poorly controlled trials published in the German literature. Its greatest popularity was enjoyed ten years ago and since then this use of garlic has markedly waned.

#### TRAUMA OVER HEALED OSTEOMYELITIS

*To the Editor*—I am interested in knowing whether a contusion or bruise in the region of an old apparently healed osteomyelitis or old healed suppurative arthritis will cause development of an abscess in the overlying soft tissues. I have recently seen two cases where there has been such a flare up. One was the development of osteomyelitis of the metatarsal bone in a patient who had an old suppurative osteomyelitis in the same foot in an adjacent metatarsal several years previously which had apparently healed. The other was a flare up in the soft tissues overlying a latent or apparently healed suppurative arthritis of the hip. Any information on this matter would be appreciated.

M D Wisconsin

**ANSWER**—Unfortunately, trauma to any areas covering old osteomyelitis scars is apt to produce trouble, and the patient should always be warned to avoid injury to such areas. It is particularly prone to occur in the tibia when the fatty subcutaneous tissue has disappeared and the skin is adherent to the bone. When trauma is inflicted on such an area the skin does not have the normal mobility and the full force of the blow is expended on the devitalized tissue, and even though no true infection arises the skin may be so devitalized that it sloughs.

#### CLIMATE FOR ASTHMA

*To the Editor*—1 Could you suggest a locality in the United States which is best suited for an asthmatic patient? 2 Could you suggest a hospital or clinic in the vicinity of New England which specializes in the treatment of asthma?

M D Rhode Island

**ANSWER**—1 The only type of asthma which is affected to any appreciable extent by climatic conditions is that which is due to respiratory infection (paranasal sinuses or bronchi, especially bronchiectasis). Asthma due to these conditions is better in a dry warm climate (New Mexico, parts of Texas, Arizona and similar regions). It is unwise to send a patient with asthma to any of these regions without a thorough study of the effect of pollens, perennial inhalants, contact substances and foods.

many cases no matter where the patient goes he may be his enemy with him

There are numerous well trained men who specialize in various conditions all through New England, especially in the big centers, such as Boston, New York, Pittsburgh and Philadelphia. The larger hospitals in these cities have one or more men eminent in this field on their staff

#### HEPTYL ALDEHYDE AND MOUSE TUMORS

*To the Editor*—In the August 8 issue of *Time* page 24 under Cancer was an article on the active principle of wintergreen oil heptyl aldehyde being used experimentally by Dr. Strong of Yale Medical School in cancer in mice and dogs. How much truth is there in it and where heptyl aldehyde is obtained?

A GAEBLER M D Chicago

**ANSWER**—There is no reason to doubt the statement of Dr. Strong of Yale University Medical School that a certain number mouse and dog tumors have disappeared under treatment with heptyl aldehyde. There is no evidence at present that this treatment will be effective on human beings with cancer. According to Bernthsen (Organic Chemistry), normal heptylic aldehyde (heptanol)  $C_7H_{16}O$ , is obtained by the dry distillation of castor oil under diminished pressure. Eastman Organic Chemicals sells heptanol (Heptylic aldehyde) under Heptaldehyde B. P.  $42^{\circ}/10$  mm. Heptyl aldehyde can be made by any good organic chemist perhaps one of the large drug houses might prepare some.

#### EPIDERMOPHYTOSIS AND FUNGI ON DRESSED LEATHER

*To the Editor*—Many employees of a local shoe plant have epidermophytosis of the hands. The leather used often has a so-called fungous bloom on it. I understand this is a true fungous growth involving the leather. What type of fungus is this? Could it infect human skin?

M D Indiana

**ANSWER**—The only way to answer this question is by study of the fungus by a mycologist. It is probable that several kinds will be found on different lots of leather. Although undressed hides may carry ringworm infection to those who handle them (White, R. Prosser, *The Dermatogoses*, London, H. K. Lewis & Co., 1934, p. 375) the fungi growing on dressed leather are more probably "tramps," those whose spores are carried by the wind. These are ordinarily nonpathogenic to man but under certain circumstances may cause disease, as in infections of the external auditory meatus.

#### PEROXIDES OF BODY

*To the Editor*—Kindly advise me the specific names of five or six peroxides that are part and parcel of the human body and kindly state which of them are intracellular. It is said that hydrogen peroxide probably does not exist as such in the human body. Simons chemistry says acetic acid is found in the secretions of some glands but does not mention the glands. Sollmann speaks of acetyl peroxides as existing in the body but does not say where or how it is formed and Stirling speaks of the body having mixtures containing peroxides but no book of reference in my library specifically names any intracellular or extracellular peroxides of the body. The only organic peroxides that I find specifically named are those derived from other than animal life, such as benzoyl acetyl peroxide (benzozone acetozone), a benzoacetic ester and succinic peroxide (alpozone) both of which are obtained from distillation of fossils of plant life (wood coal).

G W TAYLOR M D Perth Amboy N J

**ANSWER**—A careful search of the literature up to the year 1937 failed to disclose any trace of peroxides that are part and parcel of the human body being isolated as such. The Manuel de biochimie of Pierre Thomas (Paris, Masson & Cie) writes in confirmation with the preceding statement "The presence of organic peroxides cannot be made evident."

#### AIRPLANE TRIP FOR BABY

*To the Editor*—A young mother with a 6 weeks old baby wishes to take a trip of about 800 miles. Is there any reason why it would not be advisable for her to go on an airplane? The baby is a normal healthy child. The trip would require about four or five hours of flying time.

M D Kansas

**ANSWER**—There should be no contraindication against a 6 weeks old baby taking a four or five hour trip by airplane presuming that the plane flies at a reasonable altitude. The ordinary changes in oxygen pressure, temperature, motion of the ship and other conditions met in airplane transportation should not affect a healthy, normal baby.

## Medical Examinations and Licensure

### COMING EXAMINATIONS

#### STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in *THE JOURNAL*, January 21 page 265.

#### NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II Medical centers having five or more candidates desiring to take the examination Feb. 13-15 May 12 (Part II only—limited to a few centers) June 19-21 and Sept. 11-13 Ex Sec Mr. Everett S. Elwood 225 S. 15th Street Philadelphia

#### SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY An Affiliate of the American Board of Surgery. Written examination Part I will be held in various cities of the United States and Canada April 8. Oral examinations for all candidates St. Louis May 13-14. Applications must be filed not later than sixty days prior to the date of the examinations. Sec. Dr. Paul M. Wood 745 Fifth Ave. New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY St. Louis May if there are sufficient applications before Feb. 1 to warrant holding an examination Philadelphia Oct. 30-Nov. 1 Sec. Dr. C. Guy Lane 416 Marlboro St. Boston.

AMERICAN BOARD OF INTERNAL MEDICINE Written examinations will be held in various parts of the United States Feb. 20 Sec. Dr. William S. Middleton 1301 University Ave. Madison Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY General oral clinical and pathological examinations for all candidates Part II examinations (Groups A and B) will be held in St. Louis May 15-16. Application for admission to Group A examinations must be on file in the Secretary's office by March 15. Sec. Dr. Paul Titus 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY Written Various cities throughout the country March 15 and Aug. 5 Oral St. Louis May 15 and Chicago Oct. 7 Sec. Dr. John Green 6830 Waterman Ave. St. Louis.

AMERICAN BOARD OF OTOLARYNGOLOGY St. Louis May 12-13 and Chicago Oct. 6-7 Sec. Dr. W. P. Wherry 1500 Medical Arts Bldg. Omaha.

AMERICAN BOARD OF PATHOLOGY Richmond Va., April 8-9 Sec. Dr. F. W. Hartman Henry Ford Hospital Detroit.

AMERICAN BOARD OF PEDIATRICS Cincinnati Nov. 15. Appointments must be made before July 15. Sec. Dr. C. A. Aldrich 723 Elm St. Winnetka Ill.

AMERICAN BOARD OF RADIOLOGY St. Louis May 11-14 Sec. Dr. Byrl R. Kirklin 102-110 Second Ave. S.W. Rochester Minn.

### Illinois October Examinations

Mr. Homer J. Byrd, superintendent of registration, Illinois Department of Registration and Education reports the written examination (graduates of foreign schools given also a practical test) held in Chicago Oct. 18-20, 1938. The examination covered ten subjects and included 100 questions. An average of 75 per cent was required to pass. Ninety-two candidates were examined, ninety of whom passed and two failed. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Howard University College of Medicine	(1937)	79	
Chicago Medical School	(1938)	78	
78 80 80 81 81 83 83 84 85			
Loyola University School of Medicine	(1938)	79 80	
82 83 86 86*			
Northwestern University Medical School	(1935)	81	
(1938) 82 83 85 83* 84 84* 84* 85 85 86 86 88			
Rush Medical College	(1936)	84*	
(1937) 79 82 84 84* 85 85 85 86 88			
School of Medicine of the Division of Biological Sciences	(1937)	83	
83* 85 87*			
University of Illinois College of Medicine	(1937)	83*	
(1938) 76 79 79* 80 81 81 81* 82* 83 83 84			
84* 85 85 86			
University of Michigan Medical School	(1937)	79	
St. Louis University School of Medicine	(1937)	84	
Columbia University College of Physicians and Surgeons	(1934)	84	
(1935) 79			
University of Oregon Medical School	(1937)	80*	
Medical College of the State of South Carolina	(1933)	86	
Marquette University School of Medicine	(1938)	80	
University of Wisconsin Medical School	(1935) 84	(1936)	80*
University of Toronto Faculty of Medicine	(1926) 83	(1937)	83*
Karl Franzens Universität Medizinische Fakultät Graz	(1937)	81	
Christian Albrechts Universität Medizinische Fakultät Kiel	(1918)	78	
Friedrich Wilhelms Universität Medizinische Fakultät Berlin	(1923) 77 (1927) 81	(1929)	77
Johann Wolfgang Goethe Universität Medizinische Fakultät Frankfurt am Main	(1930) 80	(1933)	84*
Julius Maximilians Universität Medizinische Fakultät Würzburg	(1930)	78	
Ludwig Maximilians Universität Medizinische Fakultät München	(1905) 79 (1906) 81	(1937)	80*
Rheinische Friedrich Wilhelms Universität Medizinische Fakultät Bonn	(1925)	78*	
Schlesische Friedrich Wilhelms-Universität Medizinische Fakultät Breslau	(1924)	78	
Regia Università degli Studi di Bologna Facoltà di Medicina e Chirurgia	(1930)	80	

Regia Università degli Studi di Firenze Facoltà di Medicina e Chirurgia	(1935)	82
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia	(1937)	78
Regia Università di Napoli Facoltà di Medicina e Chirurgia	(1935)	77
Universität Bern Medizinische Fakultät	(1936) 76	(1937) 77
School	FAILED	Year Grad
Friedrich Wilhelms Universität Medizinische Fakultät Berlin		(1921)
Regia Università degli Studi di Roma Facoltà di Medicina e Chirurgia		(1933)

Thirty-two physicians were successful in the practical examination held for reciprocity and endorsement applicants in Chicago, October 20. The following schools were represented:

School	PASSED	Year Grad	Reciprocity with
University of California Medical School		(1935)	California
University of Colorado School of Medicine		(1937)	Colorado
Howard University College of Medicine		(1936)*	Tennessee
Loyola University School of Medicine		(1937)	California
Northwestern University Medical School		(1931)	Maryland
(1936) Indiana			
Rush Medical College		(1935)	Missouri
School of Medicine of the Division of Biological Sciences		(1935)	California
Indiana University School of Medicine		(1931)	
(1931) (1935) (1936)* Indiana			
State University of Iowa College of Medicine		(1936)	Iowa
University of Kansas School of Medicine		(1934)	Kansas
Johns Hopkins University School of Medicine		(1930)	Maryland
St. Louis University School of Medicine		(1918) (1929)*	Missouri
Washington University School of Medicine		(1929) (1936)*	Missouri
John A. Creighton Medical College		(1917)	Nebraska
University of Nebraska College of Medicine		(1937)	Nebraska
University of Cincinnati College of Medicine		(1936)	Ohio
University of Pennsylvania School of Medicine		(1933)	Pennsylvania
Vanderbilt University School of Medicine		(1935)	Tennessee

School	PASSED	Year Endorsement Grad of
Rush Medical College		(1937)* N B M F x
School of Medicine of the Division of Biological Sciences		(1933) N B M F x
University of Louisville School of Medicine		(1931)* N B M F x
Tulane University of Louisiana School of Medicine		(1936) N B M F x
Harvard University Medical School		(1936) N B M F x
Washington University School of Medicine		(1930) N B M F x
McGill University Faculty of Medicine		(1935) N B M F x

\*License has not been issued

## Book Notices

**The Foot** By Norman C. Lake M.D. M.S. D.Sc. Senior Surgeon and Lecturer on Surgery, Charing Cross Hospital, London. Second edition. Cloth. Price \$4.50. Pp. 366 with 113 illustrations. Baltimore: William Wood & Company, 1938.

This book is a real contribution and an invitation to members of the medical profession to increase their interest in the common ailments of the feet. In his preface the author refers to the comment of a reviewer of the first edition: "Provided that the reader realizes that this book was not written for any one in particular (i.e., surgeons, general practitioners, students, chiropodists, etc.), he will not be disappointed." Nevertheless it seems that the author, as a surgeon, has collected and published his studies and experience primarily for the general practitioner in order to help him within his own circle of patients to handle these cases understandingly and with confidence. The author's deep interest in the foot is indicated clearly by his method of presentation. By starting with a concise discussion of the evolutionary and embryologic phases of the foot's development, it is obviously his desire to build his reader's interest on fundamental knowledge of the foot and through a process of reasoning. Also he gives a brief history of the development of shoes, which is quite relevant since they have long been regarded as a common source of foot trouble. Criticisms have suggested that his inclusion of surgical measures and of unusual diseases and anomalies confuses the purpose of the book, especially since the discussion on these points is not always carried into full detail. Such criticism seems, however, to reveal the author's real purpose of the book as one for physicians. Admittedly it would be a useful member in the library of any orthopedic surgeon. As for the general practitioner, in addition to being familiar with what logically lies within his own range of helpfulness, it is necessary that he should also have some acquaintance with the less usual and more advanced conditions and their treatment. Otherwise he could not make recommendations to his patients as intelligently whenever more specialized surgical

or orthopedic services were required. Although the book covers the disorders of the skin, nails, toes and foot generally, the presentation of the functional disorders, affecting the longitudinal arch and metatarsal region, deserves special mention. Here, instead of a didactic repetition of orthodox views, the subject is discussed in the light of newer studies from different points of view. It challenges the exercise of the reader's own reasoning powers. This is a thoughtfully prepared book by an experienced clinician and able writer.

**Konstitution und Wesensänderung der Epileptiker** Von Dr. Karl H. Stauder, Facharzt für Nervenkrankheiten, München. Boards. Pp. 194 with 31 illustrations. Leipzig: Georg Thieme, 1937.

This monograph describes studies of the constitution and character of the epileptic. It is by a specialist (facharzt) in nervous disease in the mental and nervous clinic of Prof. Bumke. There are fourteen chapters divided into experimental and clinical material. The former consists of eight chapters in which Rorschach's studies in relation to all types of epilepsy are made. The clinical portion consists of six chapters and discusses character, mental symptoms and dementia in relation to all types of epilepsy. No new contributions are made. The bibliography is by no means complete. No mention is made of good work done by Americans in this particular field. The book is much too long. It serves no more than an additional work of reference regarding all the previously published facts on epilepsy and its mental and constitutional characters.

**Endocrine Therapy in General Practice** By Elmer L. Serrin M.D. F.A.C.P. Professor of Medicine, University of Wisconsin. Cloth. Price \$2.75. Pp. 192 with 39 illustrations. Chicago: Medical Book Publishers, Inc., 1938.

The recent rapid advances in the physiology and biochemistry of the endocrine glands have made it extremely difficult for the general practitioner to keep abreast of the diagnostic methods and of the potent therapeutic products of glandular origin which are available to him. This is rendered even more difficult by the necessity for distinguishing between the theoretical and the practical, the proved and the untried, the true and the false, in the confusing welter of periodical literature and commercial exploitation which assails the conscientious student of medicine. This book is intended to summarize the facts which may be accepted as proved in the present state of our knowledge and to apply these facts to the diagnosis and treatment of endocrine disorders, as far as they can be applied by physicians in general practice. The author is to be congratulated on the degree to which he has fulfilled his purpose. This volume is simply written, systematically arranged and well illustrated with excellent photographic plates of typical cases of endocrine dysfunction. Beginning with two short chapters on the biologic significance of hormones and an outline of systematic endocrinology, the author then treats each gland in turn. Syndromes are described, diagnostic procedures outlined, potent endocrine preparations listed and dosage given. An index is appended for rapid reference. This is not a book for the scientific investigator or the specialist in endocrinology; nor can it be expected to remain up to date for long. But it is a book which every general practitioner might read with pleasure and profit at this time.

**Posibilidades radiográficas en el cáncer de la faringe** Por Pedro Rebolledo, profesor agregado de otorinolaringología y Nicolás L. Caubarrere jefe de servicio de radiología del Ministerio de salud pública. Trabajo presentado en el VII reunión anual de la Sociedad rioplatense de otorinolaringología (29 y 30 de Enero de 1938). Paper. Pp. 72 with 76 illustrations. Montevideo: The Authors, 1938.

The authors review the radiographic examination in tumor of the larynx as suggested and studied by Coutard since 1922, adding to this the advantage of the recent study of the larynx by planigraphy or tomography. They arrive at the conclusion that the lateral view is indicated in cancer of the superior portion of the larynx as well as in the anterior subglottic tumors. They advise planigraphy in tumors of the medial portion of the larynx and in lateral subglottic tumors. The paper is illustrated with a large number of roentgenogram and drawings of the clinical conditions.

**Modern Surgical Technic** By Max Throck M.D. K.L.H. K.C. Prof. Clinical Surgery Cook County Graduate School of Medicine Chicago. With a foreword by Donald C. Balfour M.B. M.D. LL.D. Head of Section in Division of Surgery The Mayo Clinic Rochester Minnesota. Complete in three volumes. Volume I General Operative Considerations Surgery of the Head and Neck and Plastic Surgery. Volume II Surgery of the Thorax Vessels Bones Surgery of Breast and Chest. Volume III Abdominal Surgery Hernia Genito-Urinary and Gynecologic Surgery. Cloth Price \$33 per set Pp 526 527 1229 1231 2045 with 2174 illustrations. Originals principally by W. C. Shepard Philadelphia New York Montreal & London J. B. Lippincott Company 1938.

If it is possible to write a "stream-lined" modern version of surgical procedure and art, this three volume edition comes close to the mark. Surgery has reached a state of minute subdivision and there are now specialists in the surgery of individual organs. A vast literature has grown up in each of the various fields. The author has tried to dispense as much as possible with needless discussion. The work is divided in the usual manner into topographic divisions including the head and neck, chest, breast, hernia, abdominal surgery, pelvic and genito-urinary. Other portions include bones and joints, the neglected field of amputations, and other accessory information necessary to the surgeon.

This work reflects the author's experience. Much space is devoted to his method of electrocoagulation of the gallbladder. However, he follows this with an excellent description of Maingot's technic. He departs from usual conservative procedure in advocating a minimum of drainage following cholecystectomy, and he certainly understresses the necessity of examining the biliary tract at operation on the biliary system. Since this is a book which will appeal a great deal to the general practitioner who must also concern himself with surgery, his remarks on appendectomy and especially with regard to the McBurney incision and treatment of appendical stumps are highly pertinent. In the main, the usual accepted procedures are well described and the author gives full credit to the historical originators of an operation and his own and others' variations. The listed comments of various surgical authorities on the advantages or disadvantages of the methods described are a fascinating feature and acquaint the reader with a number of surgical personalities.

A working description of the anatomy accompanies each section in order to reacquaint the surgeon with the area. A fine feature is the diagrammatic description of the local anesthesia useful in that particular locale and for the various procedures to be attempted. This is in addition to the chapter on general and regional anesthesia at the beginning of volume I. The indexing is excellent and the author has solved one annoying problem by listing his references as footnotes to the pages on which they appear.

Numerous illustrations of high quality are spread with a lavish hand throughout. Dr. Thorek's well known artistic abilities have endowed him with that peculiar talent of selection in which every illustration serves its purpose and wherever possible speaks a volume of words. To busy practitioners and general surgeons these volumes should be of great service.

**Zur Erblichkeitsfrage des endemischen Kretinismus. Untersuchungen an 204 Kretinen und deren Blutsverwandten. Teil 1.** Von J. Eugster. Separatabdruck aus Archiv der Julius Klaus Stiftung für Vererbungs-forschung Sozialanthropologie und Rassenhygiene Band XIII Heft 3 1938. Paper Pp 383 494 with 110 illustrations. Zurich Art Institut Orell Füssli 1938.

Investigating the incidence of cretinism in regions previously studied for goiter incidence (*Arch. f. Hyg.* 81, 1913, and 111, 1933) the author found a marked similarity in geographic distribution. In localities in the cantons of Aargau and Zurich with a high goiter incidence, there were seventeen cretins among 1,627 inhabitants. In the middle range of goiter incidence there were only two cretins among 688 inhabitants, and in the endemic free localities not a single case of cretinism was found among 580 investigated in 1912 and again in 1932. The incidence of cretinic manifestations, in their various degrees of severity, was higher than previously assumed. In certain localities thirty-five cretins per thousand inhabitants were found and the average incidence was 6 per thousand for the total region previously investigated for goiter. Particularly interesting were the families studied in which cretinic characteristics marked an entire group of sisters and brothers.

A greater frequency among near relatives of the parents of cretins was not demonstrated in the material studied. The frequency in near relatives was not greater than the average for the total population. Among the children of healthy parents, the percentage of children affected was just as great as when one of the parents was cretinoid. In all cases in which the father was cretinoid and the mother was healthy there was no case of cretinoid children. In five families observed in which both parents were cretinoid the relatively high number of healthy children was notable. The investigation of brother and sister groups revealed a greater occurrence in the late births. Among people coming into the districts studied, cretinism may appear in the second, occasionally in the first, generation of children, but never was a case of acquired cretinism observed in the immigrants themselves. The investigation of twins indicated a nonhereditary anlage. There were nine identical and fifteen dissimilar pairs in the twenty-four pairs of twins. The concordance-discordance relationship of the first may be expressed 6:3 and of the latter 10:5. Definitely the dissociation of symptoms was revealed, that is, the manifestations of disturbance of growth does not parallel the other main symptoms such as defective hearing and lowered intelligence.

**Physical Diagnosis** By Richard C. Cabot M.D. and F. Dennette Adams M.D. Instructor in Medicine in the Harvard Medical School. Courses for Graduates. Boston. Twelfth edition. Cloth Price \$5. Pp 846 with 391 illustrations. Baltimore: William Wood & Company 1938.

This is an expanded revision of the previous editions embodying much that is new. The views of the co-author as well as those of the teaching staff of the Massachusetts General Hospital have been incorporated to give a much more complete volume on physical diagnosis. The arrangement with the increased emphasis on the relationship to symptomatology and clinical entities adds to the readability and the appeal to the medical student. The many new illustrations are well chosen and aptly supplement the text.

**The Handicap of Deafness** By Irene R. Ewing M.Sc. and Alex W. G. Ewing M.A. Ph.D. Cloth Price \$5.40. Pp 327 with 85 illustrations. New York Toronto & London Longmans Green & Co 1938.

This book accomplished a useful purpose. It tells in clear, succinct language of the handicaps and social disabilities of deafness and tersely may be summarized as presenting ways to alleviate incurable deafness. The deaf and the deafened, divided into class groups, are each accorded separate treatment in the text. The young of either sex who are becoming deaf, the middle aged with partial deafness, the child with defective hearing, and those born deaf each presents a different problem. The authors first present the problems with which each group is confronted and then they fully discuss in detail the steps to be undertaken to promote alleviation of the situation for each group. The book contains a great amount of first-hand study by the authors together with correlated scientific data not generally found collected in one volume. The book therefore is particularly valuable to educators and to students of the problems inherent in the education and the social and personal adjustment of the deafened in their everyday environment. The contents will also interest the medical profession. Otolologists will be amply repaid for reading about the influence of deafness on speech in the young and its effect on the adult who becomes deaf, chapters on the assessment of deafness, the distortions and loudness factors inherent in defective hearing, and the methods which the authors recommend to test intelligibility of speech. This is comprehensible when one realizes that the elements which go into the pathogenic lesions which result in deafness and those which promote the physiologic act concerned in listening are not too clearly comprehended by otologists. It would take us too far afield to open a discussion of the many interesting and provocative chapters which the authors of this book present. Perforce this must be omitted here, but the book is recommended for study by all interested in deafened persons. The stress on the educational phases to alleviate deafness is clearly emphasized and deserves special mention. The reader of this volume will be made to realize what a many-sided problem the persons handicapped by deafness present, and a path is outlined to alleviate the conditions which are the barriers to social, economic, medical and personal adjustment to an

otherwise incurable situation. Physicians generally, otologists particularly, and the social workers among the deafened will find in the book a valuable guide and source material. The book is written in such a way that it is commended to the League for the Hard of Hearing in this country for reading. It will help deafened persons to understand themselves and perhaps to help themselves.

*Revisão da família Trichostrongylidae Lelper 1912* Por Lauro Trassos. Monographias do Instituto Oswaldo Cruz No 1. Paper. Pp 512 with 295 illustrations. Rio de Janeiro. Typ do Instituto Oswaldo Cruz 1937.

This is a systematic monograph of an important family of nematode worms parasitic in vertebrates. It includes thirteen subfamilies, ninety-three genera and 335 species. They are known from all classes of vertebrates but only in one fish, a few amphibians, fewer reptiles and more birds and they seem to have reached their greatest evolution in mammals, in which they range from monotremes to man. Two species, *Haemonchus contortus* and *Mecistocirrus digitatus*, occur in man, the former being found also in the bear, pig, several ground squirrels, camel, reindeer, elk, caribou, several American deer, buffalo, many antelopes, sheep, goats, bison and cattle. The latter species has fewer hosts, being known only from the pig, cattle and Indian buffalo. The organs usually infested are the stomach and intestine. This monograph gives the bibliography, synonymy, measurements, morphology, organs infested, geographic distribution, and a diagnostic figure of each species but unfortunately no figures of ova. It will be of value to veterinary science and will help in the identification of the trichostrongylid worms which man may occasionally pick up from his domesticated animals. It is interesting to note that man has not inherited any of eight species of these worms found in other primates.

*La anemia de la enfermedad de Carrion (verruca peruana)*. Por el Dr. Alberto Hurtado, profesor de fisiopatología y director del Laboratorio de Investigaciones y Srs. Julio Pons M. y Cesar Merino M. ayudantes del Laboratorio de Investigaciones. Laboratorio de Investigaciones. Departamento de fisiopatología. Facultad de ciencias medicas. Lima. Paper. Pp 206 with 53 illustrations. Lima. Peru. Libreria e Imprenta Gil S. A. 1938.

This is a report of investigations on the morphology of the blood and other characteristics of the anemia resulting from Carrion's disease (verruca peruana). Forty-six cases of this disease were studied and the results compared with similar observations on a hundred normal subjects. The authors conclude that the anemia which is frequent and severe in this disease is characterized by (1) its great rapidity of development, (2) macrocytosis, (3) anisocytosis and (4) hypochromemia. The degree of the last three of these characteristics was directly proportional to the severity of the anemia. The erythrocytes increased in thickness more than in diameter, tending to become spherical. Determinations made on total blood volume revealed an intense reduction in total circulating erythrocytes and hemoglobin with a compensatory increase in quantity of plasma, an increase which exceeded the erythrocyte loss in certain periods of the anemia, thereby effecting a cellular dilution. This would introduce a moderate error in the estimation of the anemia when the latter is determined solely by the numbers of cells per unit volume of blood. Hyperbilirubinemia was observed in the majority of cases. It was greatest during the periods of greatest anemia and, in fatal cases, during the last few days of life. There were indications that the jaundice was related to the greater erythrocytic destruction and to a diminution in the excretory power of the hepatic cells. Frequently an increased fragility of the red cells accompanied the period of intense anemia. Parasitism of the erythrocytes by *Bartonella bacilliformis* was rather constant during the anemia. The majority of cases showed signs of intense erythropoietic activity which was proportional to the degree of the anemia. This was responsible for the macrocytosis, hypochromemia, reticulosis and the presence of normoblasts in the blood.

The leukocytes occurred in normal numbers in uncomplicated cases, with an occasional leukopenia. During the period of greater anemia a moderate "regenerative reaction" and a more intense "degenerative reaction" occurred. When "cellular crises" occurred they came at times when the leukocytes were

between 24 and 32 millions per cubic millimeter and were apparently not related to the erythrocytic regeneration. This crisis corresponded, in general, to the time at which the parasitism and the signs of abnormal cellular destruction disappeared.

Achlorhydria and hypochlorhydria were evident in the majority of cases. Liver therapy did not arrest the anemia but apparently did accentuate the processes of regeneration.

The appearance of macroscopic eruptive lesions did not correspond to a definite level of cells per cubic millimeter but in three cases was preceded by the "cellular crisis." The morphologic similarities between Carrion's anemia and the experimental bartonellosis in animals (*B. canis* and *B. muris*) are discussed. The authors believe that the pathologic mechanism in Carrion's anemia consists fundamentally of an accentuation of the processes of cellular destruction.

They conclude that their results suggest the need for including liver extracts and iron in the treatment.

*Arbeit und Gesundheit. Sozialmedizinische Schriftenreihe aus dem Gebiete des Reichsarbeitsministeriums. Herausgegeben von Professor Dr. Martineck, Ministerialdirektent im Reichsarbeitsministerium. Heft 3: Tabes dorsalis. Klinische, erb- und konstitutionspathologische sowie sozialmedizinische Untersuchungen. Unter Verwertung der Erfahrungen aus der Kriegsbeschädigtenversorgung. Von Prof. Dr. F. Curtius, Dr. med. H. Schlotter und Dr. phil. Edm. Scholz. Paper. Price 14 marks. Pp 275 with 80 illustrations. Leipzig: Georg Thieme 1938.*

This study of 101 tabetic patients is of little value to the clinician. Of the 262 pages of text, 160 are devoted to a survey of constitutional, individual and familial predisposing factors and thirty-eight to the effect of war service on the development of tabes. Only thirty-nine pages are given to clinical considerations and no space is allotted to treatment. On the whole, the monograph might more profitably have been presented as a series of short papers in the periodical literature. The conclusions, based on an elaborate presentation of individual case histories, tables and charts, are that the various factors of human constitution studied by the authors are not concerned in the pathogenesis of tabes, except bodily habitus, which is frequently of the asthenic type (though it is not made clear whether patients develop tabes because they are asthenic or become asthenic after they develop tabes) and "neuropathic constitution." By the latter is meant that the families of tabetic patients include a higher proportion of psychiatrically unstable persons than do those of normal people. Many constitutional factors are considered in great detail and, though the results are largely negative, the work will be of value to students of this phase of medicine. With characteristic German disregard of science elsewhere than in Germany, the bibliography of 160 references includes 147 to German authors, eleven to French, one to an Italian and one to an English speaking author, the last to a twenty-four year old article by C. J. White (*A Statistical Study of Syphilis. The Relation of Its Symptoms to Subsequent Tabes Dorsalis and General Paralysis*, *THE JOURNAL*, Aug. 8, 1914, p. 459) and even this lone English article is incorrectly cited.

*The Sex Criminal*. By Bertram Pollens. Foreword by Richard L. McGee, Warden, Rikers Island Penitentiary. New York City. Cloth. Price \$2. Pp 211 with 5 illustrations. New York: Macaulay Company 1938.

In his preface the author makes acknowledgment to great numbers of officials in New York who have aided him with advice and opportunities in the development of this book. The author is senior psychologist to the penitentiary of the city of New York and as such has had administrative charge of the sex clinic in association with psychiatrists and technicians. The book takes up the matter from the point of view, therefore, of the physician and of the psychologist, as well as from that of the lawyer. Each year about 1,500 so-called sex criminals are arrested in New York City. Sex crimes, however, are more frequent, the number apparently decreasing from about 7,000 in 1923 to 3,700 in 1935. The author approaches the subject from the Freudian point of view, one of his most extensive chapters being that entitled "Infantile Sexuality." It seems doubtful, however, that many Freudians would recognize this author as competent for such a performance. Later chapters are concerned with homosexuality and sexual deviations. Fortunately the conclusions of the author are much more sound

than the discussions which gave them birth. He recommends psychiatric studies of the sex criminal and of the subject of sex in childhood, sympathy by parents with the problems of the child and sex education in the home.

**A Historical Chronology of Tuberculosis.** By Richard M. Burke, M.D. State Veterans Hospital Sulphur, Oklahoma. Cloth Price \$1.50. Pp. 84. Springfield, Illinois & Baltimore: Charles C. Thomas, 1938.

Our knowledge of tuberculosis is as old as our knowledge of medicine itself. Evidence of tuberculosis of the spine have been found in men of 5000 B.C. The poet Homer refers to the disease and Hippocrates provided the first detailed description of the nature of tuberculosis. Year by year since that time medicine has added important foundation stones to our knowledge. The following significant dates in the history of tuberculosis have proved most important:

460-370 B.C. Hippocrates provides an accurate clinical description of phthisis.

1679 Sylvius sees tubercles (nodules in the lung) as the actual precursors of phthisis.

1810 Bayle teaches that tubercles are a specific local formation causing a specific disease.

1815 Laënnec establishes the unity of the tubercle. He discovers the stethoscope and founds modern physical diagnosis.

1859 Brehmer begins the modern institutional treatment of tuberculosis.

1865 Villemin demonstrates experimentally that tuberculosis is a specific infection due to an inoculable agent.

1882 Koch discovers the cause of tuberculosis, the tubercle bacillus.

1890 Koch introduces tuberculin, a glycerin extract of tubercle bacilli.

1894 Forlanini pioneers the use of artificial pneumothorax in the treatment of pulmonary tuberculosis.

1895 Roentgen discovers x-rays.

1907 Pirquet introduces a cutaneous test for tuberculosis.

**Einführung in die chemische Physiologie.** Von Dr. E. Lehnartz, a.o. Professor an der Universität Göttingen. Second edition. Paper. Price 18 marks. Pp. 434 with 70 illustrations. Berlin: Julius Springer, 1938.

This book presents a more thorough treatment of the organic chemistry of carbohydrates, lipids and proteins than appears in any of the recent textbooks of biochemistry in English. It may be useful to some readers for that reason. Approximately 100 pages are devoted to what might be considered pure organic chemistry. The next fifty pages are devoted to physical-chemical questions, the treatment of which introduces more biologic material, however, it would still seem possible to devote more attention to specific physiologic questions. Vitamins, hormones and enzymes occupy the next section, of 120 pages. The treatment of these questions is thoroughly down to date and includes an adequate amount of physiologic material. The rest of the book, 140 pages, is devoted to metabolism. This section of the book is closely packed with important information but is somewhat too short to accomplish a satisfactory treatment of the subjects in question. The whole problem of fat metabolism, for example, occupies only six pages. The treatment of what might be called clinical chemistry is almost completely lacking.

**Acidosis y alcalosis en la clínica.** Por B. Varela Fuentes, profesor de la Facultad de medicina de Montevideo. Prólogo del Profesor Gregorio Marañón. Paper. Pp. 445. Buenos Aires: Espasa Calpe, Argentina. S. A. 1937.

In this book the author studies the acid-base equilibrium, both normal and pathologic. The book is divided into three parts, which deal respectively with the normal acid-base equilibrium from biochemical and physiologic angles, the various types of acidosis and alkalosis and their pathogenesis, and the treatment of the various types of acidosis and alkalosis which are observed by practitioners of internal medicine, clinical surgery, pediatrics, urology, gynecology and several other medical specialties. Special reference is made to the treatment of grave conditions caused by the rupture of the acid-base equilibrium which have to be rapidly controlled by introduction, in the blood, of a radical amount of which is insufficient in the blood plasma, such as, for instance, rechloridation in alkalosis from hypochloremia and administration of injections of sodium chloride solutions in the course of Addison's disease and of calcium in hypocalcemia in

tetany. The subject, on the whole, is dealt with in a precise, clear, didactic and interesting style, covering the various fields of theory and clinical practice. The literature is critically reviewed and there is a selected bibliography. The book contains graphic illustrations and tables of the most important points related to the acid-base equilibrium, both normal and pathologic. It ends with a subject index. The book is of value for physicians in the various medical specialties, especially Spanish-speaking physicians.

**A Manual of Surgery for Nurses.** By Charles Wells, M.B., F.R.C.S., Honorary Surgeon with Charge of Out Patients, Royal Southern Unit of the Royal Liverpool United Hospital, Liverpool. Cloth. Price \$4. Pp. 409 with 160 illustrations. Baltimore: William Wood & Company, 1938.

This is a small, non-exhaustive book on surgery, intended primarily to introduce the student nurse to the science and art of surgery as well as to prepare her for the required state examinations. The book, though brief, is unusually complete. It covers all of general surgery including gynecology, orthopedics and the conditions of the eye, ear, nose and throat. It does not, however, deal with any of the practical nursing procedures. Written in simple clear style and illustrated by line drawings to clarify the text, it easily fulfils the purpose for which it was intended.

**Symptoms of Visceral Disease. A Study of the Vegetative Nervous System in Its Relationship to Clinical Medicine.** By Francis Marion Pottenger, A.M., M.D., LL.D., Medical Director, Pottenger Sanatorium and Clinic for Diseases of the Chest, Monrovia, California. Fifth edition. Cloth. Price \$5. Pp. 442 with 97 illustrations. St. Louis: C.V. Mosby Company, 1938.

The latest edition of this well known book is not greatly altered from the earlier printings. Attention is called to the close interrelations between the vegetative nervous system, the glands of internal secretion and the electrolyte balance. One may not agree either with the argument or with the conclusions, but one must admit that the book is always interesting and stimulating.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Charitable Hospitals Liability to Pay Patient for Negligence of Employee.**—An appendectomy was performed at the defendant hospital on the plaintiff's minor son, a pay patient. Subsequent to the operation, a nurse employee of the hospital injected one-fourth grain of morphine, instead of the one-fourth grain of codeine ordered by the attending physician. The patient died soon thereafter from the effects of the injection. The plaintiff then sued the hospital. The defendant hospital demurred to the complaint, contending that it was incumbent on the plaintiff to plead that the hospital was *not* a charitable institution, which he had not done. The plaintiff appealed from the judgment of the trial court sustaining the demurrer, and the Supreme Court of Utah reversed the judgment and remanded the cause to the trial court with directions to overrule the demurrer. *Sessions v. Thomas Dee Memorial Hospital Ass'n*, 89 Utah 222, 51 P. (2d) 229 (abstr. J. A. M. A. 107 453 [Aug. 8] 1936). After the demurrer was overruled by the trial court, the plaintiff amended his complaint so as to allege in effect that, even though the defendant hospital was a charitable institution so far as its organization, aims and purposes were concerned, nevertheless it was liable for the negligence of its employee because the person injured as a result of the negligence was a pay patient. The defendant hospital then demurred to the amended complaint and when the trial court sustained that demurrer and entered judgment for the defendant the plaintiff again appealed to the Supreme Court of Utah.

The Supreme Court, citing with approval *Henderson v. Twin Falls County*, 56 Idaho 124, 50 P. (2d) 597 (abstr. J. A. M. A. 106 1228 [Apr. 4] 1936) held in effect that where a hospital has entered into a contract to render service to a patient for compensation, even though the general purposes of the hospital are charitable, it is liable to that patient for injury caused by



the negligence of its nurse employee. Accordingly, the judgment of the trial court was reversed and the cause again remanded with directions to overrule the demurrer.

In a dissenting opinion the chief justice and another justice were of the opinion that a charitable hospital is not liable for the negligence of its servants, whether the person injured be a charity patient or a pay patient, when it uses reasonable care in the selection and retention of its employees.—*Sessions v Thomas D Dec Memorial Hospital Ass'n (Utah)*, 78 P (2d) 645

**Compensation of Physicians Liability of County for Nonemergency Medical Services to Indigent**—On June 4, 1935, a woman resident of Noble County, Okla., was severely burned. On June 7, after self treatment proved unsuccessful, a physician, one of the six plaintiffs who as copartners operated a clinic, was called. As the patient was an "indigent person" within the meaning of the statutory definition of that term, the physician attempted to get into touch with a member of the board of county commissioners, who by statute were designated as overseers of the poor, to obtain authorization for her admission to a hospital at Perry as a county patient. He was unsuccessful. Failing to obtain such authorization, he nevertheless sent the patient to that hospital for admission as a county patient, but admission was refused. At the direction of the plaintiffs, she then was taken for treatment to the plaintiffs' own hospital at Ponca City. Two days before she left their hospital, the plaintiffs filed a claim with the county clerk for their fee for services rendered. The board of county commissioners, however, refused to pay, because they had not authorized treatment, and the plaintiffs brought suit against the board. From a judgment in favor of the plaintiffs, the board appealed to the Supreme Court of Oklahoma.

To support their claim, the plaintiffs cited *Board of Commissioners of Garfield County v End Springs Sanitarium & Hospital* 116 Okla 249, 244 P 426, in which the Supreme Court of Oklahoma said:

The general rule is that in cases of emergency attendance of a proper physician may hold the county liable although he acted without the request or the consent of the persons designated by statute as overseers of the poor where such poor person requires the immediate attention of a physician who renders services to relieve the necessity and where it appears that the board of county commissioners was not in session at the time and that notice could not have been given to the board of county commissioners before rendering necessary medical and surgical services the physician and surgeon may recover reasonable compensation from the county within the limit of the fund provided by law for such purpose.

But, said the Supreme Court, in the present case it has not been shown that an emergency existed which would not permit delay. The evidence showed that when the patient was admitted to plaintiffs' hospital her condition was critical but was not one of imminent danger to life. The evidence showed further that the plaintiffs did not have and did not attempt to obtain authorization for themselves to render medical and hospital services. The court concluded, therefore, that the county was not liable and so it reversed the judgment of the trial court and remanded the case with direction to enter a judgment accordingly.—*Board of Comrs of Noble County v Niemann et al (Okla)*, 78 P (2d) 672

**Optometry Practice Acts Corporation May Not Practice Optometry Through Licensed Optometrists**—The plaintiffs, individually as licensed optometrists, and as trustees of the Philadelphia County Optometric Society, and the Pennsylvania Optometric Association, instituted this suit to enjoin the defendant corporation from practicing optometry. The trial court entered a decree enjoining the defendant from holding itself out as an optometrist, by advertisement, sign or otherwise, and from practicing optometry. The plaintiffs, not being satisfied with the decree as entered, appealed to the Supreme Court of Pennsylvania, urging that the decree be enlarged specifically to prohibit the defendant from employing licensed optometrists to examine the eyes of its customers.

The defendant corporation leased a portion of its store to a partnership which operated therein an optical department for the examination of eyes and the fitting and supplying of glasses. This leased portion of the store was known and operated as the "Optical Goods Department." The lease was of indefinite duration but might be canceled on thirty days'

notice. The rental was \$12,500 a year, plus one third of the lessee's gross annual business in excess of \$50,000. The lease provided that the name of "Gimbels" should alone be used in advertising the department and obligated the lessees to expend a certain percentage of their annual sales, at least \$3,000, in advertising under the name and direction of the defendant. The store sign outside the leased department read "Gimbel Brothers' Optical Department." Prior to the commencement of the present suit, advertisements appeared under the name "Gimbel's Modern Optical Shop" with no mention of the names of the registered optometrists in attendance. Thereafter, the advertisements did name the optometrist actually in charge of the department. The registered optometrists in attendance and all other employees of the department were hired and paid by the partnership but were under the supervision and control of the corporation, which had a right to dismiss them. The registered optometrists did not conduct a practice of their own and were required to charge for all examinations and fittings of glasses in the defendant corporation's name and the corporation received all fees therefor. The charges for services rendered by the optometrists were fixed by the partnership but were required to be as low as in any other department store in the city, so as successfully to compete. Bills rendered for the examination of eyes and their fitting with glasses were in the defendant's name and on its billheads.

The plaintiffs conceded that the defendant corporation had a right to lease space in its store to a person to carry on his professional calling but contended that, when the leasing was accompanied with such control as was here shown, the lessee becomes the agent of the defendant, and since it cannot obtain a license to practice optometry it may not engage in such practice through agents. With this contention the Supreme Court agreed and in doing so quoted from the decision of the Supreme Judicial Court of Massachusetts in *McMurdo v Geller*, 10 N E (2d) 139, as follows:

The defendants contend that they are not practicing optometry illegally although they are not registered optometrists and yet reap all the financial reward of a practice conducted by their servant who is a physician and as such entitled to practice optometry without registration. A different rule has been applied to the learned professions. There are characterized by the need of unusual learning, the existence of confidential relations, the adherence to a standard of ethics higher than that of the market place and in a profession like that of medicine by intimate and delicate personal ministrations. Professional men may be held to a higher ethical code for example by the restriction of advertising than men engaged in ordinary business. The rule is generally recognized that a licensed practitioner of a profession may not lawfully practice his profession among the public as the servant of an unlicensed person or a corporation and that if he does so the unlicensed person or corporation employing him is guilty of practicing that profession without a license. A corporation as such cannot possess the personal qualities required of a practitioner of a profession. Its servants though professionally trained and duly licensed to practice owe their primary allegiance and obedience to their employer rather than to the clients or patients of their employer. The rule stated recognizes the necessity of immediate and unbroken relationship between a professional man and those who engage his services.

Expressing itself as fully in accord with the views thus voiced by the Massachusetts court, the Supreme Court of Pennsylvania in the present case concluded that the decree of the trial court should be enlarged to prohibit the defendant from employing registered optometrists to examine the eyes of its customers. It ordered the decree to be modified accordingly.—*Neill et al v Gimbel Bros, Inc (Pa)*, 199 A 178

## Society Proceedings

### COMING MEETINGS

American Orthopsychiatric Association	New York	Feb 23	D
Norvelle C La Mar	149 East 73d St	New York	Secretary
American Society of Anesthetists	New York	Feb 10	Dr Paul M.
Wood	131 Riverside Drive	New York	Secretary
Annual Congress on Medical Education and Licensure	Chicago	Feb 13-14	
Dr W D Cutter	535 North Dearborn St	Chicago	Secretary
Mid South Post Graduate Assembly	Memphis	Feb 14-17	Dr A F
Cooper Goodwyn Institute Bldg	Memphis, Tenn		Secretary
Western Section American Laryngological Rhinological and Otolological Society	Spokane Wash	Jan 29	Dr Frederic G Sprowl
Arts Bldg	Spokane Wash		Chairman

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

#### Alabama State Medical Assn Journal, Montgomery

S 197 232 (Dec.) 1938

Chronic Nephritis in Pregnancy W B Anderson Nashville, Tenn.—p 197

Cyclopropane Anesthesia H Linder Birmingham—p 199

Burns Fundamentals of Successful Treatment T W Pickell, Brewton—p 203

Prenatal Syphilis and Its Treatment A E Thomas Montgomery—p 208

Four Year Medical School Its Importance to the State E V Childwell Huntsville—p 210

#### American Journal of Clinical Pathology, Baltimore

S 597 696 (Nov.) 1938

Desirability of State Licensure (or National Approval) for Laboratories Performing Venereal Disease Tests (Incorporating More Than 300 Replies to a Questionnaire on This Subject) F H Lamb Davenport Iowa—p 597

Correlation Studies of Basophilic Aggregation and Reticulocytes in Various Clinical Conditions M D Pearlman and L R Limarzi Chicago—p 608

The Ebb and Flow of Theories About Pernicious Anemia W Dock San Francisco—p 620

Some Etiologic Factors and Lesions in Cerebral Anoxia F W Hartman Detroit—p 629

#### American Journal of Diseases of Children, Chicago

56 1189 1440 (Dec.) 1938

Congenital and Familial Hemolytic Disease in Children R Debre M Lamy G See and G Schrameck Paris France—p 1189

Altered Lipid Metabolism in Acute Infections of Infants and of Older Children A V Stoesser Minneapolis—p 1215

\*Giardiasis in Children P Veghelyi Budapest Hungary—p 1231

\*Treatment of Gonococcal Infections in Children with Sulfanilamide Eleanor L Adler New York—p 1242

Evidences of Disturbed Prenatal and Neonatal Growth in Bones of Infants Aged One Month II Contributing Factors L W Sontag and Louise Maxwell Harris Yellow Springs Ohio—p 1248

Sulfanilamide Eruption Study of Patients with Morbilliform Rash and of Their Subsequent Reactions E R Schlesinger and W L Mitchell Jr New York—p 1256

Action of Ergosterol and of Purified Vitamin D on Poliomyelitis Virus J A Toomey and W S Takacs Cleveland—p 1274

Hormone Reactions of Pregnancy L Dobszay Gyula Hungary—p 1280

\*Active Immunization Against Whooping Cough with Various Specific Vaccines M Siegel New York—p 1294

Effects of Serum Transfer in Patients with Rheumatic Fever M Friedman R Klein and P Rosenblum Chicago—p 1304

**Giardiasis in Children**—Veghelyi states that of 1,391 children between the ages of 2 and 17 years examined for infestation with *Giardia lamblia* 155 proved to be positive. Of these only 144 could be precisely examined. In addition to tests for tuberculosis and syphilis, careful roentgen and electrocardiographic examinations and detailed laboratory tests were made in the majority of the cases in order to eliminate the possibility that causes other than *Giardia* were responsible for the condition. Thirty-two children gave evidence of various other diseases and twenty gave a positive reaction to tuberculin. Ninety-two children were left. All the symptoms found were compared with those of healthy children of the same age. Some infested children were symptomless and some had symptoms of no significance. But gastrointestinal complaints, anemia and inadequate development were present in a high percentage of cases. Aside from the common infectious diseases without complications, the histories showed that six children had dysentery and two typhoid from two to five years before the present examinations. Anorexia, headache, dizziness and abdominal pain were frequent. From one third to more than one half of the children had these

complaints. Pain in the abdomen together with loss of weight and anemia was often observed by the parents of the children. Intense, acute pain over the cecal region occurred independently of meals and appeared in cramplike attacks. Mucus, pus or blood had been seen in the feces of one fourth of the children who were infested. Two thirds complained of irregular bowel movements. Similar conditions cannot be found in healthy children. Fifty-one of the infested children were asthenic while only thirteen were of athletic constitution. No pathologic condition could be revealed by the physical examination of the lungs, hearts and kidneys of the ninety-two infested subjects. The most striking difference between the infested and healthy subjects was shown by the comparison of weights. Of the ninety-two infested children only thirteen attained or surpassed the average weight, while seventy-nine were below it. The development of their height was but slightly impeded. The hepatic disorders often found in adults were not present in these patients. All the symptoms may be explained by the impeded resorption capacity of the intestinal tract. The symptoms disappeared in twenty-nine of thirty-two children after treatment with acetarsone. Regeneration of the blood of anemic children and rapid development of those who were retarded in weight quickly started after successful treatment. Healing was not a consequence of the tonic action of arsenic. In the three cases in which treatment was not successful the symptoms were further aggravated.

**Sulfanilamide for Gonorrhea in Children**—Adler used sulfanilamide in the treatment of twenty-two cases of gonorrheal vaginitis, five of gonorrheal urethritis in boys and nine cases of gonorrheal conjunctivitis. The dose of sulfanilamide used was calculated on the recommendation of Long and Bliss, 1 Gm to 20 pounds (9 Kg) of body weight being given daily in three or four doses at equal intervals throughout the twenty-four hours. Eight of the nine patients with conjunctivitis responded promptly to sulfanilamide therapy, irrigations were required only at intervals of two or three hours after one or two doses of the drug and were discontinued after a few days of treatment. The results add further evidence to the report of Willis that, in cases of gonorrheal conjunctivitis, sulfanilamide gives a more rapid cure than any other method of treatment. In four of the five cases of urethritis there was a prompt response to treatment. Thirteen of the twenty-two children with vaginitis showed a prompt and definite response to sulfanilamide therapy, with cessation of discharge and with consistently negative smears after an average of two days of treatment. Three failed to respond to an adequate trial with sulfanilamide but the infection cleared up subsequently by treatment with estrogen, only to recur within a short time and respond satisfactorily within forty-eight hours to a second trial of sulfanilamide. An inadequate dose of the drug seems to account for three failures. In one other case in which there was no response the concentration of the drug in the blood, from 12.6 to 25 mg per hundred cubic centimeters, suggests that dosage and the concentration in the blood are not the only factors which determine success or failure.

**Active Immunization Against Whooping Cough**—In order to determine the prophylactic value of various whooping cough vaccines, Siegel followed up 1,270 vaccinated and 1,016 control children for from fourteen to twenty-three months. There were eight groups of vaccinated children under consideration. Familial exposure occurred in 1 per cent of all cases and extrafamilial exposure in 49 per cent. There were forty-six cases of characteristic whooping cough among the vaccinated children, as compared with forty-three among the controls. The incidence of characteristic whooping cough ranged from 0 to 6.72 per cent among the various groups of vaccinated children. It was lower among those inoculated with 80 billion bacilli than among those inoculated with smaller doses. There were no occurrences of characteristic whooping cough in two groups, 294 children, who were inoculated subcutaneously with 80 billion bacilli of Sauer's vaccine or the vaccine of the New York Department of Health. Familial exposure occurred in only one case, no symptoms developed in this instance. Extrafamilial exposure was suspected in ten cases, in three of which a cough unaccompanied by a whoop developed. Doses of 50 billion bacilli or less seemed to have little, if any, prophylactic value, this also seemed to be true of doses of 80 billion bacilli of a vaccine prepared from an old stock strain.

**American J Obstetrics and Gynecology, St Louis**

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- \*Diagnosis of Occurrence of Toxemia of Pregnancy by Examination of the Unknown Placenta Study of 100 Cases R A Bartholomew and E D Colvin, Atlanta Ga.—p 909
- Studies on Pelvic Arrests W E Caldwell H C Moloy and D A D Esopo, New York.—p 928
- The Cesarean Scar Experimental Study O H Schwarz R Paddock and A R Bortnick St Louis.—p 962
- Problems in Etiology and Prevention of Stillbirths T L Montgomery, Philadelphia.—p 975
- Technic and Results of Routine Fetal Electrocardiography During Pregnancy E O Strassmann and R D Mussey, Rochester Minn.—p 986
- \*Relation of Basal Body Temperature to Fertility and Sterility in Women T T Zuck Cleveland.—p 998
- Excretion of Hormones in a Case of Habitual Abortion A Palmer, San Francisco.—p 1005
- Hysterectomy A Ten and a Half Years Study A Mathieu Jean D Kindschi, G Nelson and G McShatko Portland Ore.—p 1028
- Comparative Study of Classic and Cervical Cesarean Sections at the Brooklyn Hospital in a Series of 164 Cases J Casagrande Brooklyn.—p 1033
- \*Some Observations on Infectious Agents Causing Leukorrhea During the Childbearing Period H A Poindexter Washington D C.—p 1052
- Primary Cancer of the Vagina F V Emmert St Louis.—p 1058
- Sarcoma of the Uterus Report of Three Cases W C Danforth Evanston Ill.—p 1062
- Puerperal Infection from Vincent's Organisms F W Peyton, Lafayette Ind.—p 1068

**Toxemia of Pregnancy and the Placenta**—According to Bartholomew and Colvin, placental infarcts of the more acute types are definitely associated with toxemia of pregnancy. The hypercholesteremia of pregnancy is the basis for vascular changes in the placental arteries which predispose to infarction. Hypothyroidism and a diet rich in cholesterol-containing foods are important factors in excessive hypercholesteremia. The trauma of fetal movements on the placental arteries in the latter part of pregnancy is not only a predisposing cause of localized cholesterol change in the vessels but also an exciting cause of thrombosis or rupture at the site of such change, with resulting infarction. The high content of arginine in placental tissue is the probable explanation of the specific eclamptogenic character of placental autolysate, through the formation of guanidine. The known pathologic effects of guanidine, peptone and histamine apparently explain the clinical and pathologic manifestations of toxemia of pregnancy. The results of a gross examination of 100 placentas from both toxic and normal cases, without knowledge of the clinical history, shows that it is possible to diagnose the occurrence of severe toxemia in 90 per cent of the cases. Conversely, it is possible to predict the type of infarcts that will be found in the placenta, from a knowledge of the clinical history of the pregnancy as to toxemia. With the experience of examining placentas as "unknowns," it has been found possible to establish criteria for an exact classification of placental infarcts and their relation to toxemia.

**Body Temperature and Fertility**—Zuck presents data which offer a practical method for the regulation of conception in fertile women. They may also be valuable in the study of women who are reputedly barren. In an effort to obtain further information on human ovulation, he began in 1930 to collect instances of carefully recorded coital exposure which resulted in pregnancy. He enlisted the assistance of young women planning pregnancy and willing to serve in an experiment in which the time of the midperiod could be determined. The women were instructed to keep menstrual records and to observe signs of the midperiod (mittelschmerz). From 1935, morning rectal temperatures also were taken by the women. Rupture of the follicle may actually be felt by the woman after careful observation of her own temperature curve. Sixteen planned pregnancies were successfully started by using midperiod symptoms as indicative of rupture of the ovarian follicle. There were no exposures during the cycle other than those indicated and no subsequent exposures until after pregnancy had been proved. No pregnancy occurred before the eleventh day of the cycle or after the eighteenth day regardless of the length of the cycle. Pregnancy never occurred at any other date of the menstrual cycle despite exposures permitted in previous months during the assumed sterile days. When the daily rectal temperature records are plotted, the resulting curve usually shows that just before menstruation begins there is a slight fall in the temperature, which in most women reaches 98 F. This level is main-

tained during menstruation. At the end of the period there may be a temporary lowering of the temperature, which then rises to somewhat above 98 F before falling abruptly, to reach its lowest level at the midperiod, when it may descend to 97 F or even lower. After this fall the temperature rises to a level usually above 98 F and remains about stationary until the onset of the next menstrual period. This phase is usually regarded as the lutein phase. Not all menstrual cycles show these clear cut variations, but in the sixty-seven women studied this variation was characteristic of more than 80 per cent of the menstrual cycles. Records of the last menstrual cycles of twenty women identify ovulation with the approximate date of the midperiod low temperature. No pregnancy occurred before the tenth day or after the twentieth day of the cycle regardless of the length of the cycle. In no woman did pregnancy occur more than three days before or one day beyond the initial rise of temperature from the midperiod low level. After conception the temperature no longer undergoes a cyclic change except in those few women who menstruate or perhaps even ovulate after pregnancy starts. The temperature during pregnancy remains high, as in the last part of the menstrual cycle, and can be used as a sign of pregnancy before other methods of diagnosis are positive. In every woman the morning nausea started at what by computation would be the date of the next ovulation after conception. Hence morning sickness of pregnancy may be related to a change in the ovulation cycle. The human fertile period is shown to vary from woman to woman and from cycle to cycle. It is necessary to study each woman's variation in order to understand her particular variability. As a minute method of determining the time of ovulation the basal rectal temperature is offered, since it is easily determined and bears a close relation ship to the time of ovulation. Studies of basal body temperature may be used as a guide or to supplement other data in studying sterility.

**Infections Causing Leukorrhea During Childbearing Period**—Poindexter states that of 1,975 patients examined during a venereal disease survey in Tallahatchie County, Miss., in 1937, 399 gave leukorrhea as a chief symptom, 318 of these women were in the childbearing age and eighty-one had passed the menopause. The infectious agents which should be considered in patients who present the symptom of leukorrhea as a primary complaint during the childbearing age are *Neisseria gonorrhoeae*, *Trichomonas vaginalis*, *Haemophilus ducreyi*, *Monilia albicans*, various streptococci and staphylococci, coryne bacteria and Vincent's spirillum. The frequency, about 50 per cent, with which nongonococcal organisms appear in cases of infectious leukorrhea warrants microscopic examination and culture if necessary for *Trichomonas vaginalis* and *Monilia albicans*. This is especially important when sulfamidamide is to be used. Sulfamidamide therapy is most effective when used in acute cases of gonorrhea and has no significant effect on leukorrhea due to *Trichomonas vaginalis*. There is an apparent antagonism between *Trichomonas vaginalis*, *Monilia albicans* and Doderlein bacilli against the gonococcus in vivo.

**American Journal of Psychiatry, New York**

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- Biochemistry of Dementia Praecox Review R A McFarland and H Goldstein New York.—p 509
- Physiologic Studies in Experimental Insulin and Metrazol Shock. Composite Preliminary Study by Members of the Department of Medical Research Banting Institute University of Toronto G E Hall Toronto.—p 553
- Early Schizophrenia. D E. Cameron, Worcester, Mass.—p 567
- Prognosis in Schizophrenia Preliminary Report J Romano and F G Ebaugh, Denver.—p 583
- Electro-Encephalographic Analyses of Behavior Problem Children. H H Jasper P Solomon and C Bradley, East Providence R I.—p 641
- \*Psychoses Among College Students T Raphael and Mary A Gordon, Ann Arbor Mich.—p 659
- Seeming Aggravation of Drug Delirium After Withdrawal of the Drug and Its Bearing on Question of the Harmfulness of Withdrawal M Levin, Mayview Pa.—p 697
- The Problem of the Alcoholic in the Community Extramural Study and Treatment. R V Seliger, Baltimore.—p 701
- Experimental Aspects of Huntington's Chorea E G Lion and E Kahn New Haven, Conn.—p 717

**Psychoses Among College Students**—Raphael and Gordon discuss the experience of the psychiatric unit of the student health service established in 1930 at the University of Michigan. The total enrolment during the seven years in question was

85,543, with a yearly average of 12,220. The number of students coming to the attention of the mental hygiene service was 4,779, an average of 7.67 per cent. In 114, psychoses of various types were observed. Of the 114 individuals developing psychoses sixty-four were men and fifty women. The average age range for schizophrenia was from 17 to 40, for the manic depressive group from 17 to 43 and for the paranoid conditions from 19 to 56 years. Psychoses among the student population, while not frequent, do represent a definite contingency which the college must appreciate and be prepared to meet. Properly approached and with adequate facilities, the problem can be satisfactorily dealt with, often with an excellent long-term result to the individual and academic result. In the college situation an almost unique opportunity is afforded for the early detection, study and treatment of psychotic conditions, actually in their incipience. In this naturally there should be much of benefit to the individual and, respecting the schizophrenic reaction type particularly, to the science of psychiatry itself through the realization of the mental hygiene principle. A psychiatric unit of the student health service of a college or university may further the institution's fundamental objective and the psychiatrist may render a vital and far reaching service.

## Am J Roentgenol & Rad Therapy, Springfield, Ill

40 645 804 (Nov.) 1938

- Chromophobe Adenomas of the Pituitary. Pathologic Features and Response to Irradiation Based on Study of Eighty One Verified Cases. M T Schnitzer Toledo Ohio. E C Cutler Boston. O T Bailey Cambridge Mass and W W Vaughan Durham N C—p 645
- The Place of Irradiation in Acromegaly. Report of Fifty Three Cases. W W Vaughan Durham N C—p 660
- Displacement and Recession of the Choroid Plexus. R M Lowman and T J C von Storch Boston—p 669
- Suppled Epiphyses with Congenital Hypothyroidism (Cretinoid Epiphysal Dysgenesis). W A Reilly and F S Smyth San Francisco—p 675
- Typical Form of Humerus Varus. Adolescent Humerus Varus. M S Burman New York—p 682
- Diverticulosis of the Small Intestine. Report of Case with Intestinal Obstruction. M J Hubeny and S Pollack Chicago—p 689
- Experimental Studies on Gastric Physiology in Man. VI Relation of Size Shape and Position of Stomach to Its Acid Secretion. Analysis of Posture Habitus Height and Weight as Influencing Factors on Gastric Form Secretion and Motility. J Gershon Cohen H Shay and S S Fels, Philadelphia—p 695
- \*Barium Sulfate Suspension in Colloidal Aluminum Hydroxide. Improved Contrast Medium for Roentgenographic Diagnosis of Gastrointestinal Lesions. E E Woldman Cleveland—p 705
- Radiation Treatment of Pancreatic Cancer. G T Pack and G McNeer New York—p 708
- Carcinoma of the Urinary Bladder Cervix Uteri and Prostate Treated by Supervoltage Roentgen Rays. Supplementary Report. J E Wirth Seattle—p 715
- New Instrument for Irradiation of Tumors of the Nasopharynx with Radium or Radon. J V Blady New York—p 723
- \*Pyelo-Ureterography in Inclined Planes. R J Price, Dayton Ohio—p 730
- Metastatic Obstruction of the Esophagus. C W Perkins Norwalk Conn—p 737
- Control and Calibration of Roentgenographic Apparatus. C Weyl S R Warren Jr and D B O'Neill Philadelphia—p 741

**Barium Sulfate in Colloidal Aluminum Hydroxide**—Woldman recommends barium sulfate suspended in colloidal aluminum hydroxide for roentgenographic examination of the gastrointestinal tract as having advantages over the barium-water mixture now generally employed. Because of the colloidal nature of the aluminum hydroxide, the barium is held in suspension and hence can be used in smaller quantities. In these studies 60 Gm of barium sulfate was added to 7 ounces (210 cc) of a mixture of equal parts of colloidal aluminum hydroxide and water to form the contrast substance. The preparation is fluid so that it enters all the recesses in a homogeneous manner, and yet viscid and tenacious so that a small quantity coats the wall of the digestive tract and yields a satisfactory roentgenographic visualization of the mucosal folds. The barium sulfate-aluminum hydroxide suspension is nontoxic and does not alter the acid-base equilibrium of the blood. The addition of aluminum hydroxide to the barium mixture does not render it less palatable.

**Pyelo-Ureterography**—As an aid in the diagnosis of obscure lesions of the urinary tract, Price always takes a flat pyelo-ureterogram in the horizontal supine position. Then the usual cystoscopic examination is done, followed by sodium iodide or sodium ortho-iodohippurate injection, and another pyelo-ureterogram is taken in the Trendelenburg position. Following this the catheters are drawn down and a pyelo-ureterogram is

taken in the erect position. The films may be flat, stereoscopic, oblique or lateral. These positions afford maximal excursion of kidneys and ureters and afford valuable information in determining whether a given condition is postural, functional or organic. The lesions of the ureter, well shown by this routine, include calculus, stricture, kink, stenosis, adhesions, reduplication, mucous membrane valves, megalo ureter, aberrant implantation, atresia, fascial bands, anomalous vessels, extra-ureteral pressure, neoplasms, cysts, granuloma, chronic ureteritis, rupture into the duodenum and secondary calculus.

## Archives of Dermatology and Syphilology, Chicago

38 837 1044 (Dec.) 1938

- Syphilis Among Arabs in the Near East. Bejel and Loath in Irak and Syria. Firjal and Latta in Palestine. Laghout in Lebanon. Abou Laghif and Jifar in Trans Jordan. C M Hasselmann Manila Philippine Islands—p 837
- Favus Involving a Toenail. Report of Case. R M Montgomery Mary E Hopper and G M Lewis New York—p 856
- Cutaneous Manifestations of Tularemia. J M Hitch Raleigh N C and D C Smith Charlottesville Va—p 859
- Steatocystoma Multiplex Congenitale. Ten Cases in Three Generations. W Sachs Jersey City N J—p 877
- Symmetrical Erythema of the Soles. Symmetrical Lividities of Soles of the Feet (Pernett). J M Hitch Raleigh, N C and R F Hansen Des Moines Iowa—p 881
- Hereditary Ectodermal Dysplasia of the Anhidrotic Type (Congenital Ectodermal Defect). L W Lord and W D Wolfe, Baltimore—p 893
- Large Epithelioma of the Cheek. Report of Case. H N Roback Medical Lake Wash—p 902
- \*Cosmetic Irritants. L Tulipan New York—p 906
- Kline Flocculation Test. Its Significance and Application in the Obstetric Service of the Queens General Hospital. Kate Freeman Miller Corona N Y—p 918
- \*Treatment of Dermatophytosis with Vaccines. J A Tolmach and E F Traub New York—p 925
- Evaluation of the Frei Test with Mouse Brain Antigen. Comparison with Human Antigen. R F Reider and O Canizares New York—p 930
- Mycosis Fungoides in Mother and in Daughter. Further Report. U J Wile and C W Knerler Ann Arbor Mich—p 939
- \*Mapharsen in Treatment of Congenital Syphilis. V A Cornell and G D Astrachan New York—p 943

**Cosmetic Irritants**—Tulipan points out that cosmetic dermatitis usually appears abruptly and is characterized by erythema, edema, papules, vesicles, exudation, crusts and finally desquamation. It tends to form patches with indefinite borders and is usually accompanied with pruritus. When the condition is chronic the skin becomes thickened, infiltrated, pigmented and fissured. Clinically and microscopically the condition is indistinguishable from eczema. Perfumes, hair dyes, face powders and lotions and, in fact, practically all toilet articles containing such general irritants as alkalis, even though in small quantities, have at some time given rise to dermatitis venenata. Cosmetic preparations may cause irritation of the skin ranging from slight erythema to severe burns. Any product capable of producing such lesions among consumers is even more dangerous to workers in the cosmetic trade. The harmful ingredients in various cosmetics include lead, mercury, pyridine, denatured alcohol, isopropyl alcohol, arsenic, paraphenylenediamine, potassium carbonate, pyrogallol, alkaline sulfides, thallium acetate, salicylic acid, phenol, copper, ammonium and sodium carbonate, silver nitrate, aluminum salts, quinine, quinone bodies, acetone, colocynth, dimethyl sulfate, nitrobenzene, essential, natural and synthetic oils, alum and talc.

**Treatment of Dermatophytosis with Vaccines**—On the basis of reports that fungicidal elements existed in the serum of patients with dermatophytosis, Tolmach and Traub prepared a convalescent serum. Their results in sixty-five cases have been so unfavorable that they publish them in order to discourage the waste of patients' time and money and physicians' efforts and to point out that much more experimental work is necessary before such products will have any practical use. Three different vaccines were used. More than 60 per cent of patients were entirely unimproved by the treatment. About 9 per cent were apparently cured. The reports of cure and of improvement are subject to question.

**Mapharsen in Congenital Syphilis**—Cornell and Astrachan confirm the low toxicity of mapharsen stressed by almost all investigators. The serologic reactions in more than 50 per cent of their thirty-one cases of late congenital syphilis improved as a result of the treatment. This percentage is a fairly good one.

in cases of late congenital syphilis, in which biologic cure is difficult to obtain, and in not less than 50 per cent of instances there is a fixed serologic reaction regardless of the treatment given. Several patients who did not respond to nearsphenamine improved greatly under mapharsen therapy. Mapharsen caused complete reversal of the serologic reactions in 44.4 per cent of the authors' eleven cases of early congenital syphilis after only twelve injections (2.5 mg average dose) were given (concurrently with the use of bismuth medication). Further experimentation with larger doses of mapharsen will have to be done before any definite conclusion can be reached about its use in early congenital syphilis.

### Archives of Internal Medicine, Chicago

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Course of Polycythemia N Rosenthal and F A Brascen New York —p 903

\*Utilization of Intravenously Injected Sodium *d*-Lactate as Test of Hepatic Function J J Soffer D A Dantes and H Sobothka with assistance of Mildred D Jacobs New York —p 918

Hepatic Complications in Polycythemia Vera with Particular Reference to Thrombosis of the Hepatic and Portal Veins and Hepatic Cirrhosis A R Solvay New York —p 925

Blood Guanidine in Arterial Hypertension Review of 800 Cases R H Major Kansas City Kan —p 946

Clinical Aspects of Aneurysm J H Mills and B T Horton Rochester Minn —p 949

\*Articular Manifestations of Meningococcic Infections A J Schein New York —p 963

\*Circulation During Pregnancy C S Burwell Boston W D Strayhorn D Flickinger, M B Corlette E P Bowerman and J A Kennedy Nashville Tenn —p 979

Thlathasemia Report of Case E S Mills Montreal —p 1004

Sympathetic Vasodilator Fibers in Upper and Lower Extremities Observations Concerning the Mechanism of Indirect Vasodilatation Induced by Heat T J Fatheree and E A Allen Rochester Minn —p 1015

Syphilis Review of Recent Literature P Padgett M Sullivan and J E Moore Baltimore —p 1029

**Sodium *d*-Lactate in Test for Hepatic Function**—Soffer and his associates differentiated between extrahepatic and hepatic jaundice by determining the utilization of sodium *d*-lactate injected intravenously. The test is dependent essentially on the ability of the intact parenchyma of the liver to convert into glycogen the lactic acid that is circulating in the blood stream. The normal person is capable of utilizing all or almost all the injected *d*-lactate within thirty minutes. None of twenty-five normal persons retained more than 5 mg per hundred cubic centimeters of the injected lactate at the end of half an hour. Of twenty-seven patients with acute diffuse hepatic parenchymal damage with jaundice twenty-six showed retention of 5 mg or more per hundred cubic centimeters of the injected sodium *d*-lactate after thirty minutes. In thirteen instances of jaundice due to extrahepatic obstruction only one showed an abnormal retention of sodium *d*-lactate. The test was used on five patients with diabetes of mild, moderate or severe intensity. The first patient, with a blood sugar value of 150 mg per hundred cubic centimeters during fasting, showed a retention of 5.2 mg per hundred cubic centimeters of lactic acid above the control level. This patient, however, had a large liver, which extended to the level of the umbilicus. The remaining four patients, despite considerable elevation of the blood sugar level, utilized the injected sodium *d*-lactate in a normal fashion. Other hepatic function tests were compared and it was found that in the patients with hepatitis the sodium *d*-lactate and the sodium benzoate tests yielded the greatest incidence of positive results, while the galactose tolerance test and the determination of the ratio of total cholesterol to cholesterol ester showed hepatic damage in only approximately half the instances. For the group of patients with obstructive jaundice the results obtained with the sodium benzoate test were misleading, since in ten instances of proved extrahepatic obstruction with icterus the latter tests yielded seven positive results. In the group of thirteen patients with obstruction, the results with the sodium *d*-lactate test were negative for twelve and the results of the galactose tolerance test were negative for eleven, whereas the determination of the ratio of total cholesterol to cholesterol ester indicated no hepatic damage in nine instances.

**Articular Manifestations of Meningococcic Infections**—Schein presents twenty-three cases and reviews the literature on articular manifestations of meningococcic infections. The study was prompted by a case of meningococcic arthritis

(the patient was seen at Bellevue Hospital after cerebrospinal meningitis) which went on to destroy several joints and produce ankylosis. This was contrary to the author's understanding of the prognosis in this condition. The reports of these cases were selected from the records of the last ten years of Bellevue Hospital (seventeen cases), of Mount Sinai Hospital (four cases) and of private physicians (two cases). All the patients had meningitis at some time during the course of the disease, some had clinical and bacteriologic meningococcemia. The age, sex, severity and duration of the infection and type of treatment (excluding the more recent specific antitoxic antiserum and sulfanilamide) have no influence on the severity, frequency, duration or joints involved in the arthritic lesions. In two cases the articular manifestations preceded the meningitis and in several others the meningeal signs were of such low grade, compared with the accompanying arthritic symptoms, that the diagnosis was confused. In the remaining cases the onset of articular manifestations ranged from the second or third day after full-blown meningitis to as late as four weeks. In one case obvious articular involvement was present only after two and one half months, but since the stupor of the patient was so prolonged and the lesions were so deeply placed this involvement may have been overlooked until then. More than half of the patients showed articular involvement between the fifth and the twelfth day after onset of the general infection. Serum sickness occurred in eleven cases and was questionable in several others, swelling of the joints being the only symptom. Of the joints which became badly destroyed, the elbow was involved in two cases, the hip in two, the wrist in one and the knee in one. Involvement of the knees and hands tended to be more arthritic than arthralgic. The small joints of the hands and feet were attacked in one infant. All the authors who have presented groups of cases of meningococcic arthritis have emphasized the innocuousness of this condition and its fine prognostic import. These and the authors of the textbooks consulted have stated that resolution is the only result to be expected. However, in three cases in this series the joints were permanently destroyed. In addition to these cases the severity of meningococcic invasion of joints is attested by the fact that in six cases aspiration was necessary, in four cases splinting with circular or molded plaster splints was resorted to and in two cases traction was employed to correct flexion deformity of the knee. In only one case was antiserum injected intrarticularly. Three patients died. In none did the arthritis have any relation to the fatal outcome. This confirms the benign prognosis given in the literature as to the outcome of the general infection in patients who show the arthritic complication. The more severe articular manifestations occurred in persons more than 12 years of age, including the cases in which ankylosis resulted and those in which orthopedic treatment was required. In children, then, the outcome of meningococcic arthritis is truly benign, but in adults it is by no means so. In recent cases of meningitis in which antitoxic antiserum (Hoyne) has been given there has been a lower incidence of complications as well as a lower mortality rate than in controlled series in which ordinary antiserum was employed. It is possible that the newer types of treatment, antitoxic antiserum and possibly sulfanilamide, may eliminate meningococcic arthritis, especially in its ankylosing forms.

**Circulation During Pregnancy**—Burwell and his colleagues find that the chief alterations in the circulation of pregnant women are an increased cardiac output per minute, a decrease in the arteriovenous difference, a rise in the pressure in the veins of the lower extremities, an increase in pulse rate and pulse pressure, a loud bruit over the site of the placenta and an increase in the total blood volume. The demonstrated phenomena of the circulation in pregnant women and pregnant animals, plus the available knowledge concerning the structure of the placenta, lead to the conclusion that the changes in the circulation during pregnancy are in the main to be ascribed to two mechanisms: (1) an arteriovenous leak through the placenta and (2) an obstruction to venous return by the enlarged uterus.

**Archives of Otolaryngology, Chicago**

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- Benign Tumors of the Larynx Study of 722 Cases G B New and J B Frick Rochester Minn—p 841  
Nasal Teeth Report of Case W J Hirschler Philadelphia—p 911  
Malignant Disease of the Ear F R Spencer Boulder Colo—p 916  
Acoustic Motor Reactions Especially the Cochleopalpebral Reflex H Strauss C Landis and W A Hunt New York—p 941  
Present Status of the Problem of Otosclerosis J G Wilson Chicago—p 946  
Auditory Threshold of Unpleasantness in Normal and in Hard of Hearing Subjects M Ansberry Tempe Ariz—p 951  
Thrombosis of the Lateral Sinus Survey of Current Opinion and Records W H Evans Youngstown Ohio—p 959  
Advances in the Field of Allergy as Related to Otolaryngology During the Year 1938 W W Duke and C M Kohn Kansas City Mo—p 1003

**California and Western Medicine, San Francisco**

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- Chronically Ill and Convalescent Patients Their Care in Institutions Medical and Statistical Survey of the Inmates of the Laguna Honda Home San Francisco J C Geiger Roslyn Miller and Hilda F Welke San Francisco—p 430  
Tuberculosis in San Quentin L L Stanley San Quentin—p 436  
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\*Hypoglycemia in Relation to the Anxiety States and the Degenerative Diseases J F Quinlan San Francisco—p 446  
Pollen Survey Report on the Arcata District Humboldt County Calif W C Deamer H L Jenkins Arcata and Dorothy Scott Lazarus San Francisco—p 450  
Relation of Childhood Infections to Behavior A R Timme Los Angeles—p 454

**Hypoglycemia**—From his study of the relation of anxiety states and degenerative diseases to hypoglycemia, Quinlan concludes that hypoglycemia may be a transient phenomenon but that there is good reason to believe that it is a constant feature of chronic states which are significant from the standpoint of prophylaxis in cancer, degenerative arthritis and noninfectious cardiovascular disease. Hypoglycemia is pathognomonic of an anxiety state, treatment directed against it primarily is only symptomatic and highly empiric. Anorexia nervosa as a disease is not confined to women, the symptom complex being modified only by the differing gonadal component. It is a redundancy in diagnosis and serves only to confuse a phase of medicine not yet clearly defined and distorts, by exaggeration, one symptom, anorexia, in a train of symptoms more adequately defined under the generic title "anxiety neurosis." An anxiety state is a primary etiologic factor in the degenerative diseases. Endocrine incoordination is its immediate effect. Defective cholesterol catabolism is the result. The prevention of the degenerative diseases lies in the body's capacity completely to excrete or catabolize cholesterol which is in excess of the needs of the body. The problem of medicine, in the face of a cumulatively aging population, is the degenerative diseases.

**Journal of Experimental Medicine, New York**

68 789 962 (Dec) 1938 Partial Index

- Studies on Nasal Histology of Epidemic Influenza Virus Infection in the Ferret I Development and Repair of the Nasal Lesion T Francis Jr and C H Stuart Harris New York—p 789  
Id II Resistance of Regenerating Respiratory Epithelium to Reinfection and to Physicochemical Injury C H Stuart Harris and T Francis Jr New York—p 803  
Id III Histologic and Serologic Observations on Ferrets Receiving Repeated Inoculations of Epidemic Influenza Virus T Francis Jr and C H Stuart Harris New York—p 813  
\*Plasma Prothrombin Effect of Partial Hepatectomy E D Warner Iowa City—p 831  
Cellular Reactions to Tuberculooproteins Compared with Reactions to Tuberculo lipids Florence R Sabin New York—p 837  
Cellular Reactions to Defatted Tubercle Bacilli and Their Products Florence R Sabin and A L Jovner New York—p 853  
Study of Human Skin Grafted on Chorio-Allantois of Chick Embryos E W Goodpasture B Douglas and Katherine Anderson Nashville Tenn—p 891  
Lymphatic Pathway from the Nose and Pharynx Absorption of Certain Proteins J M Yoffey E R Sullivan and C K Drinker Boston—p 941

**Plasma Prothrombin and Partial Hepatectomy**—Warner presents further support for the theory that the liver has an essential part in the manufacture of prothrombin by experiments showing that partial hepatectomy in rats also lowers the

prothrombin level of the plasma. The degree of lowering is somewhat variable from rat to rat, but in many instances the prothrombin falls to extremely low levels during the first twenty-four hours after operation. The prothrombin level returns to normal in the period required for restoration of the liver to normal weight.

**Kentucky Medical Journal, Bowling Green**

36 539 590 (Dec) 1938

- Stockholders of Health W E Gardner Louisville—p 541  
Medical Education of the Public C Bailey Harlan—p 546  
Acute Appendicitis Study in Mortality F M Massie Lexington—p 550  
Medical Treatment of Pyogenic Inflammation of the Nose and Nasal Accessory Sinuses S Watkins Louisville—p 554  
The Development of Ophthalmology in Kentucky A O Pfingst Louisville—p 561  
Mucous Membrane Lesions of Interest to the General Practitioner A B Loveman Louisville—p 569  
Clinical Types of Hyperinsulinism and Its Relation to Convulsive Seizure S Harris Birmingham Ala—p 575

**Missouri State Medical Assn Journal, St Louis**

35 467 512 (Dec) 1938

- Pneumonia Recent Advances in Diagnosis Treatment and Public Health Control H I Spector St Louis—p 467  
Id Causes and Complications M P Neal Columbia—p 470  
Biology of Pneumonia W Baumgarten St Louis—p 476  
Types and Typing of Lobar Pneumonia H Allen St Louis—p 477  
Technic of Dosages and Use of Antiserums for Lobar Pneumonia J J Hammond St Louis—p 477  
Prognosis in Lobar Pneumonia C H Neilson St Louis—p 478  
The St Louis Health Division Program for the Control of Pneumonia H I Spector St Louis—p 479  
Pneumococcus Typing and Specific Therapy E H Schorer Kansas City—p 480  
Hyperthyroidism New Clinical and Laboratory Concepts R V Byrne Los Angeles—p 480  
Gallstone Ileus S F Beam St Louis—p 485  
Pulmonary Tuberculosis Early Diagnosis Perennial Problem P Murphy and A J Steiner Koch—p 487  
Cancer Therapy Present Possibilities and Future Expectations F J Taussig St Louis—p 489

**New Jersey Medical Society Journal, Trenton**

35 709 778 (Dec) 1938

- Office Treatment of the Common Rectal Disorders J Gerendasy Elizabeth—p 713  
A Record Breaking Hernia L S Sica Trenton—p 720  
Some Considerations in Gallbladder Surgery Analysis of 100 Cases V B Seidler Montclair—p 723  
Gallbladders That Require Surgical Treatment M Danzis Newark—p 729  
Types of Gallbladder for Medical Treatment F G Reed East Orange—p 733  
Hydrotherapy and Its Use at the Betty Bacharach Home D B Allman Atlantic City—p 735  
Congenital Absence of the Esophagus Report of Case S O Wilkins Red Bank—p 737

**Oklahoma State Medical Assn Journal, McAlester**

31 399 438 (Dec) 1938

- Factors of Safety in Surgery of Toxic Goiter R M Howard Oklahoma City—p 399  
\*Masked Intermittent Malaria A Study D W Gillick Shawnee—p 404  
Treatment of Acute Empyema H D Collins Oklahoma City—p 410  
The Sinus Problem W L Bonham Oklahoma City—p 414  
Surgical Treatment of Ectropion and Entropion C B Barker Guthrie—p 418

**Masked Intermittent Malaria**—Gillick states that the masked intermittent type of malaria may assume the forms of paresthesia, anesthesia, convulsion or paralysis. It may also appear under the guise of edema, hemorrhages from the various mucous outlets of the body or into the skin, diarrhea, dysentery, dyspepsia, bronchitis, pneumonia, appendicitis and the like. Since infections such as the foregoing may obey the law of periodicity, one is not justified in making a diagnosis of malaria unless the condition yields readily to specific therapy or the parasite is found. In most cases of masked malaria the author found the estivo-autumnal parasites. The organism appeared as a small hyaline disk, a ring form within the red blood corpuscle often but few being present. Another feature of the hematologic study of these cases was the marked leukopenia ranging down sometimes to as low as 3,000, and in the differential diagnosis a marked monocytosis was observed which seems to be characteristic of chronic malarial infection in the afebrile period.



**Radiology, Syracuse, N. Y.**

31 651 786 (Dec.) 1938

- Disklike Atelectases A Oppenheimer Beirut Lebanon Syria—p 651  
 Roentgen Diagnosis of Intussusception J B Kirsner and J T Miller  
 Chicago—p 658  
 Effect of Treatment of Brain Tumors with Roentgen Rays Review of  
 University Hospital Cases C B Nessa Minneapolis—p 670  
 Roentgen Diagnosis of Pregnancy J T Elward and J T Belur  
 Washington D C—p 678  
 Lymphoblastoma with Signs of Renal Involvement Improved by Roent-  
 gen Therapy Report of Three Cases H M Odel and W C Popp  
 Rochester Minn—p 687  
 Palliative Results in Radiation Therapy of Advanced Carcinoma of the  
 Cervix A B Friedman Brooklyn—p 693  
 Biophysical Basis of Ultra Short Wave Therapy B Rajewsky Frank-  
 fort on the Main Germany translation by Edith H Quimby New  
 York—p 697  
 Newer Studies on Clinical Application of Very Short Electrical Waves  
 J Puetzold Erlangen Germany—p 707  
 The Roentgen Diagnosis of Retrocecal Appendix T E Butler and  
 I M Woolley Portland Ore—p 713  
 \*Methods Used to Attain High Speed in Roentgenography N C Beese  
 Bloomfield N J—p 716  
 Results of Radiation Therapy in Primary Operable Rectal and Anal  
 Cancer G E Binkley New York—p 724  
 \*Carcinoma of the Cervix Mortality Reduction W Clarkson and A  
 Barker, Petersburg, Va—p 729

**High Speed Roentgenography**—Beese believes that the chief advantage of using condenser discharges in roentgenography is the reduction of blurring caused by motion. This results in increased sharpness of detail. Other desirable features, such as uniformity of film density in successive exposures are obtained because exposure times are eliminated. With a relatively small x-ray transformer and power lines of low capacity, one can do roentgenographic work equivalent to that done with the largest commercial x-ray machines.

**Carcinoma of the Cervix Mortality Reduction**—Clarkson and Barker point out that cancer of the cervix accounts for nearly 20 per cent of all deaths from cancer in women. Their observations agree with those of Norris, who thinks that a cross section of all cases of carcinoma of the cervix will show five year survivals of not more than 10 per cent. When one considers the fact that five year survivals of well over 50 per cent have been reported following proper roentgen treatment of moderately advanced cases, it becomes obvious that the number of deaths can be greatly reduced by the more effective application of treatment methods. Inadequate knowledge of cancer and geographic inertia afflict both the average physician and the general public. Through close cooperation with local medical societies, rotating cancer clinics could carry cancer control to the public and to the physicians. The establishment of cancer clinics would stimulate the demand for specialization in oncology and there is no field of medicine in which intense specialization is more urgently needed.

**Texas State Journal of Medicine, Fort Worth**

34 517 584 (Dec.) 1938

- Surgical Lesions of the Stomach and Duodenum W Walters Rochester Minn—p 521  
 \*Acetyl Beta Methylcholine Chloride by Iontophoresis in the Treatment of Arthritis and Certain Peripheral Vascular Disturbances of the Extremities O B Kiel Wichita Falls—p 530  
 Aneurysm of the Pulmonary Artery W W Waite, El Paso—p 535  
 The Neurocirculatory Syndrome W E Nesbit San Antonio—p 537  
 Heart Disease with Especial Reference to Early Diagnosis and Treatment W G Mitchell San Angelo—p 541  
 Effect of Pituitary Disorders on the Heart Report of Two Cases C H Burge and J S Shaver Galveston—p 544  
 Diagnosis of Acute Mastoiditis A N Champion San Antonio—p 550  
 Hoarseness T Barr Dallas—p 553  
 The Problem of Drug Addiction T Parran Washington D C—p 555  
 The New Deal and the Socialization of Medicine W B Russ San Antonio—p 558  
 Defects of Provision for Medical Services Under the Texas Workmen's Compensation Insurance Act K E Ashburn Lubbock—p 563

**Iontophoresis in Arthritis and Vascular Diseases**—Of the 161 individual cases that Kiel treated with acetyl beta methylcholine chloride iontophoresis, seventy-eight were rheumatoid arthritis, twenty-three osteo-arthritis and sixty an assortment of vascular diseases. Forty-three of the seventy-eight patients with rheumatoid arthritis are reported as "completely relieved

(the involved joints function in a normal manner), twenty six as "partially relieved," and nine as having no relief. Any patient reported as partially relieved had a reduction in the swelling of the joints, some relief of the pain, an increase in endurance, lessening of fatigability and a feeling that considerable good had been accomplished by the treatment. Of the twenty-three patients with osteo arthritis four were completely relieved, ten were partially relieved and nine experienced no relief. In the miscellaneous group three of eight patients with thrombo-angitis obliterans were completely relieved or restored to a normal state of health. Of the six patients with gonorrheal arthritis five were completely relieved. These cases in many respects simulate rheumatoid arthritis. Specific therapy was a necessary adjunct to the treatment of these cases. The remainder of the cases are classified as Raynaud's disease, neuritis, bursitis, myositis and traumatic arthritis. Of the total number of patients in this group thirty-five were completely relieved, fourteen were partially relieved and seventeen received no relief. In the rheumatoid group a total of 1,824 treatments were given, representing an average of twenty three treatments for each patient. The osteo arthritic patients received a total of 533 treatments, averaging twenty-three treatments per patient. In the miscellaneous cases 1,525 treatments were given, with an average of about twenty-five treatments each. By far the greater number of treatments was given to those affected with thrombo-angitis obliterans. The least number of treatments with the most encouraging results was given the group of patients with ulcers of the extremities. No patient with a clearcut, uncomplicated ulcer received more than eighteen treatments.

**United States Naval Med Bulletin, Washington, D C**

36 455 646 (Oct.) 1938 Partial Index

- Gastric Surgery Discussion of the Present Day Trends F R Hook—p 455  
 Diagnostic Errors in Diseases of the Colon with Illustrative Case Reports J Burke—p 482  
 Treatment of Lung Abscess R M Mayne and T G Clement—p 483  
 Ruptured Cruciate Ligaments of the Knee Modified Hey Groves Reconstruction Operation with Case Reports E M Wade—p 491  
 \*Improved Method of Lip Fixation for Harelip and Other Defects E C Ebert and R C Boyden—p 501  
 Healing Time in Fractures of the Mandible C C Welch and R W Taylor—p 513  
 A Formula for Immediate Chemical Prophylaxis H W Smith—p 522  
 Active Immunization Against Tetanus Using Alum Precipitated Tetanus Toxoid R Hyden and W W Hall—p 524  
 Mental Diseases in the United States Navy Comparative Analysis of the Incidence F L McDaniel—p 536  
 Penalties of Upright Posture R A Benson—p 563

**Improved Method of Lip Fixation**—Ebert and Boyden treated a relatively large number of cases of congenital deformities of the lip by the following technique. Fixation is accomplished by impaling the lip on an ordinary wooden tongue depressor with heavy common bankers' pins. Closure lines having been marked out, the incision is made along these lines. The authors prefer to employ a new sterile razor blade held in a curved hemostat. Approximation of the segments of the lip is rendered more facile and exact by manipulation of the free ends of the tongue depressors. The edges are brought into place and held there by an assistant while the operator places the sutures. The cosmetic and functional results in the cases in which operation was performed were exceptionally satisfactory.

**West Virginia Medical Journal, Charleston**

34 533 580 (Dec.) 1938

- Injuries of the Knee Joint C B Pride Morgantown—p 533  
 Surgical Treatment of Peptic Ulcer I Abell Louisville Ky—p 540  
 Advantages Offered by an Organized Anesthetic Service H S Roth Philadelphia—p 545  
 Sulfanilamide in Treatment of Typhoid Fever Case Report F S Harkleroad Beckley—p 549  
 Hyperfunctioning Lesions of the Ductless Glands W Walters and E J Kepler Rochester Minn—p 550  
 Report on Hospital Service Association After Five Years of Continuous Operation R O Rogers Bluefield—p 558  
 Umbilical Hernia at Birth Containing Viscera Other Than Intestines Case Report W M Warman Morgantown—p 563

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Medical Journal, London

2 1071 1126 (Nov. 26) 1938

- Cancer of the Breast G. Gordon Taylor—p. 1071  
Treatment of Pain in the Face by Intramedullary Tractotomy G. F. Rowbotham—p. 1073  
\*The Employment of Diabetics R. D. Lawrence and Kate Madders—p. 1076  
Acute Bulbar Paralysis: Report of Two Cases D. M. Anderson and J. H. Dixon—p. 1077  
Hemorrhage Following Tonsillectomy D. W. Ashcroft—p. 1079  
Perforated Peptic Ulcer in Organic Nervous Disease A. H. Hunt and E. C. O. Jewsbury—p. 1082  
Administration of Pituitary Extract in the Third Stage of Labor G. W. Blomfield—p. 1083

**Employment of Diabetic Persons**—Lawrence and Madders consider the discriminating attitude of employers against diabetic employees as unfair and unjust. This attitude is a survival of preinsulin days, when ill health and early death of the diabetic employee were the rule. In an effort to remedy this handicap of the diabetic employee the authors studied 100 employed diabetic persons. This investigation showed that 77 per cent lost no time from work because of their diabetes after the initial stabilization of treatment, the figure is 85 per cent if the ultimate stabilization on insulin of another 8 per cent originally treated by diet alone is included. About 55 per cent of the employees lost some time because of illnesses unconnected with their diabetes. The survey has no statistical accuracy but it does show that most diabetic persons treated adequately are good employees from the point of view of health. It is hoped that the widespread prejudice against their employment may be removed.

2 1127 1188 (Dec. 3) 1938

- The Septic Hand D. Wilkie—p. 1127  
The Correct Name of the Malignant Tertian Malaria Parasite R. Christophers and J. A. Sinton—p. 1130  
Management of Trial Labor and Selection of Cases W. Hunter—p. 1134  
\*Acute Anterior Poliomyelitis: Four Simultaneous Cases in a School G. O. Barber—p. 1137  
Rapid Production of Autogenous Vaccine for Treatment of Pneumonia: Notes on Its Use F. P. G. de Smidt—p. 1140  
\*2 Sulfanilyl Aminopyridine (M. & B. 693) in Treatment of Gonorrhea R. C. L. Batchelor, R. Lees, Marjorie Murrell and G. I. H. Braine—p. 1142

**Acute Anterior Poliomyelitis**—Four cases of acute anterior poliomyelitis occurring on the same day in a boys' school are reported by Barber. Since no other cases occurred in this school, a close analysis was made of the daily habits and lives of these four boys. Cases did appear later in the village and two of them occurred in the family of one of the maids employed by and living in the same house of the school that the four boys lived in. These cases were attributed to the maid having carried the infection home. As she was in the house for the rest of the term and no further cases occurred there, and as one attempt to infect a monkey from her proved negative, there is no actual evidence that she was a carrier. The house in which the four boys lived has separate feeding arrangements and a separate domestic staff from the rest of the school. Only two of the boys slept in the same dormitory. The other two were in different dormitories, and each was unconnected with the others in any activity. In the house-room all four were in different corners and one of them was present only occasionally as a house prefect. In the school all four were well scattered, being in different classes and other categories. The only common factors appeared to be the same feeding arrangements and contact with the same domestic staff. The only connection with food was that strawberries, obtained from two farms (one of them at Halstead which had been affected) were served only in the house in which the affected boys lived. If it is conceivable that the virus should be present in such contamination, accident would no doubt account for its being ingested by only a small number of those eating the fruit. The simultaneous onset certainly resembles a food-poisoning outbreak rather than an epidemic spread by droplet infection. This possible route of infection has already been discussed by Kling in Sweden on

rather different evidence. The present account is given with the object of suggesting an additional line of investigation.

**Sulfapyridine in Gonorrhea**—Batchelor and his co-workers used sulfapyridine in the treatment of 102 cases of gonorrhea. Apparent cures were obtained in more than 91 per cent of the patients. Toxic effects were encountered in 29 per cent. The commonest manifestations of intolerance were nausea and headache, and in most instances these symptoms were slight and the patients were able to continue with the treatment in reduced dosage. In the successful male cases, clinical cure was attained in less than a week. In the successful female cases, signs which might be interpreted as denoting infection persisted for two weeks but gonococci disappeared from the smears almost as quickly as in the male cases (less than three days). Thus in the early cases the gonococcal infection was cured before the time when the disabling complications, epididymitis or salpingitis, are to be expected. Also cure was effected without the time-consuming and often badly applied local irrigation treatment. In the future the fear of stricture of the urethra, with its ever present threat of retention or extravasation of urine, should be much less and the depressing picture of the chronic pelvic invalid should be less often encountered among the habitués of spas and health resorts. Above all, the possibility of spread of the disease should be greatly reduced, since the period of infectivity is shortened.

## Medical Journal of Australia, Sydney

2 845 886 (Nov. 19) 1938

- Nonsurgical Drainage of Alimentary Tract Lyon's Technic W. R. Angus—p. 845  
Extrapleural Artificial Pneumothorax A. H. Penington—p. 851  
Schick Testing and Carrier Rates After Diphtheria Immunization J. M. Dwyer—p. 852  
Note on Administration of Vinyl Ether G. Kaye—p. 856  
Gas Gangrene C. Craig—p. 860  
Use of Derivatives of Acetylcholine and Eserine in Retention of Urine G. Brown—p. 863

## South African Medical Journal, Cape Town

12 781 828 (Nov. 12) 1938

- Specialism and Teamwork G. E. Nesbitt—p. 783  
From the Hospital's Point of View I. S. Robertson—p. 787  
Treatment of Supracondylar Fractures J. Ritchkin—p. 792  
Some Remarks on Gout in Holland J. van Breemen—p. 793  
Sulfanilamide in Treatment of Venereal Diseases F. W. F. Purcell—p. 796

12 829 866 (Nov. 26) 1938

- Compost from Urban Waste P. le Fras Nortier—p. 831  
Some Aspects of Strabismus E. F. Birkenstock—p. 833  
\*Experimental Studies on Treatment of Malarial Splenomegalies by Method of Ascoli I. Froilano de Mello—p. 835  
Notes on Epidemiology and Parasitology of Malaria A. Soeiro and A. Rebelo—p. 841  
Anemia in Pregnant and Parturient Women J. J. C. Pietersen—p. 848

**Treatment of Malarial Splenomegalies by Ascoli Method**—Froilano de Mello used the method of Ascoli in the treatment of twenty cases of malarial splenomegaly. The method consists in the daily intravenous injection of increasing doses of epinephrine. The beginning dose is 0.01 mg and it is increased daily by 0.1 mg until 0.1 mg is reached. This last dose (0.1 mg) is continued for twenty days. The reduction of the spleen, in the author's experience, has rarely been absolute by the Ascoli method alone. In the majority of cases it has reached about 50 per cent of the initial hypertrophy. The combination of Ascoli's method with specific antimalarial chemotherapy has given in one case unexpectedly good results. But more observations are required to give value to such combined treatment. In some patients the amelioration in the general state is more pronounced than the reduction of the spleen. The method of Ascoli does not prevent relapses. The number of injections and the unpleasant, sometimes serious, symptoms (bodily sensation of heat, decrease in pulse rate, palpitation, abdominal cramps, tremors, cardiac arrhythmia, giddiness and the like) observed do not recommend such a method as an advisable routine treatment, at least among the malarial folk in rural India. However, the use of such a method in hospital practice should be encouraged, provided the unpleasant reactions are avoided either by a less diluted dosage or by some process of desensitization requiring further research.

**Archives des Maladies de l'Appareil Digestif, Paris**

28 913 1040 (Nov.) 1938

- Pancreatic Lithiasis and Diabetes M. Labbe—p. 913  
 \*New Method of Treatment of Ulcer of Stomach and of Duodenum S. Okada and T. Doi—p. 935  
 Regarding Rapid Duodenal Catheterization and Device Suggested by M. Schlumberger L. Carius—p. 949  
 Hysteria and Neurasthenia in Digestive Pathology P. Godard—p. 953  
 New Method of Treatment of Chronic Constipation B. P. Kouchelevsky and E. I. Milutine—p. 970

**Treatment of Gastric and Duodenal Ulcer**—Okada and Doi prepared an extract from the mucosa of the stomach and another one from the mucosa of the duodenum. The two preparations, which contain all the essential parts of the two mucosae, have a regenerating effect which is specific for the mucosae of the stomach and the duodenum respectively. The authors administered the preparations by intravenous injection in sixty cases. Discussing the mode of application, they say that the patients who were treated at the hospital were usually given one injection daily. The initial dose is usually 0.5 cc., but this quantity is gradually increased. After about thirty injections have been given the treatment is usually terminated, but some patients require a more, others a less prolonged treatment. Toward the end, some patients are treated with diminishing doses. It seems that at the beginning the best dose is 2 cc. If after five injections of this dose the symptoms diminish, the same dose is repeated, if not it is increased to 3 cc. Occasionally 4 or 5 cc. may be administered. The authors say that the results obtained with this treatment are highly satisfactory. Of the eighteen patients with gastric ulcer who were treated with extract of the gastric mucosa, fourteen were cured and four were improved. Of four patients with gastric ulcer who were treated with duodenal extract, two were cured and two improved. Of thirty-six patients with duodenal ulcer who were given duodenal extract thirty were cured and four improved, and of the six patients with duodenal ulcer who were treated with the extract of gastric mucosa one was cured and four were improved. The late results seem to be favorable in about two thirds of the cases, however, additional observations will be necessary for a final evaluation.

**Journal de Radiologie et d'Electrologie, Paris**

22 529 576 (Nov.) 1938 Partial Index

- \*Radicular Paralysis of Obstetric Origin and Their Treatment P. Duhem, Monmignaut and Moro—p. 531  
 Roentgenologic Aspects of Almost Generalized Osteoperiostosis Associated with Hypertrophy of Palpebral Tarsi of Teguments of Face and of Extremities of Members New Syndrome J. N. Roy and A. Jutras—p. 539  
 Radiosensitivity of Ewing's Tumors G. C. Leclerc—p. 550  
 Diverticulum of Duodenojejunal Angle G. Dumont—p. 552  
 Turgid and Diffuse Cystic Aspect of Inferior Maxilla in a Senegalese Castav—p. 556  
 Voluminous Coxofemoral Osteosarcoma of Left Side Carteret, Dilleneger and P. Bertrand—p. 558

**Radicular Paralysis of Obstetric Origin**—The radicular paralyzes that are the subject of this paper by Duhem and his associates are generally caused either by obstetric traumatism in the course of delivery or by accidental traumatism of the shoulder and neck during life. It is generally considered that three types of factors are likely to cause the appearance of radicular paralyzes: (1) osseous lesions on the superior extremity of the humerus, (2) lesions of the shoulder joint and (3) direct lesions of the motor nerves of the cervical region (brachial or cervical plexus). All these lesions can be produced in the course of difficult labor with or without the application of forceps, in normal deliveries they are rare but not impossible. The determination as to which of the three possible causal factors is responsible in an individual case is usually not difficult. If there is a doubt as to whether a voluminous hematoma or a deformation of the epiphyseal region is responsible, roentgenoscopy will reveal it. The clinical aspects, the paralysis and electrodiagnosis will disclose whether a nervous lesion exists. Electrodiagnosis is resorted to when roentgenoscopy has demonstrated that osseous or articular lesions are absent. To be sure, the nervous lesions do not manifest themselves immediately by a reaction of degeneration, a certain time is necessary, which is rarely less than two weeks. The diagnosis may be complicated by the fact that the lesions are multiple. Distortions or epiphyseal detachments may be accompanied by vascular

lesions (lacerations and the like), which may be the cause of ischemic troubles and these in turn of secondary paralyzes. In view of the complex nature of some of the lesions (osseous, tendinous, nervous and so on), it has been suggested that the general and inclusive term of "traumatism of the shoulder of the newborn" be applied. The authors point out that the complex lesions result in the formation of perinervous and perivascular cicatricial tissues, which are the principal factors that prevent a spontaneous cure. This is why they utilize the solvent action of potassium iodide, which is introduced in situ by means of galvanic current. It was Leduc who gave them this idea of the solvent action of the iodine ion. This treatment must be employed as early as possible, particularly in case of nervous lesions, for the functional results become problematic if the nerve fibers have had time to degenerate. The authors discuss the sites of application of the electrodes (Erb's point and axilla) and state that they employ a 1 per cent solution of potassium iodide. The applications last thirty minutes and are made with an intensity of 4 or 5 milliamperes. The authors begin with a series of twenty treatments, the first seven or eight of which are given daily. After an interval of three or four weeks the treatments are resumed. In most cases a second and third series of treatments are necessary and in grave cases the treatments may have to be continued for eighteen months or two years. In answer to the question whether excitomotor current should be applied to the paralyzed muscles, the authors say that this depends on the electrical reactions. If from the beginning no reactions of degeneration are observed, the treatment with potassium iodide rapidly effects cure and the excitomotor currents may be employed to give more force to the recuperated muscles. In case of partial degeneration it is necessary to await amelioration, because if not employed with great care the excitomotor current may be more harmful than beneficial. The authors advise against the use of the faradic current because it is too brutal. In the conclusion they stress the necessity of persistence on the part of the physical therapist in cases of radicular paralysis of obstetric origin.

**Presse Medicale, Paris**

46 1761 1776 (Nov. 30) 1938

- \*Arteriolar Spasm in Cardiac Insufficiency Its Therapeutic Consequences H. Warenbourg, M. Linquette and J. Ravaut—p. 1761  
 Two Tests of Dehydration in Surgical Patients J. Bollin—p. 1763

**Arteriolar Spasm in Cardiac Insufficiency**—Warenbourg and his associates point out that the heart and the peripheral circulation are so intimately related that failure of the one leads always to considerable disturbances in the function of the other. They studied the peripheral circulation of sixty-four patients with heart disease. On the basis of the roentgenologic and electrocardiographic studies the sixty-four patients could be grouped into three categories. The first group of eighteen patients presented no signs of cardiac decompensation. In the second group of twenty-nine patients are classed those with hyposystole presenting signs of ventricular insufficiency. Seventeen patients with complete asystole made up the third group. To explore the arteriocapillary circulation the authors subjected these groups of patients to three different tests: (1) to hot and cold baths of the forearm, (2) to intradermal histamine tests and (3) to intradermal tests with acetylcholine. On the basis of these studies on the peripheral circulation of patients with heart disease the authors conclude that arteriolar spasms frequently exist in decompensated cardiopathies. In the sphere of the capillary circulation this arteriolar hypertension is accompanied frequently by spasm or perhaps by dilatation. To counteract the arteriolar barrier and assist the cardiac function, the authors regard it advisable to employ, in addition to the classic cardiotonic therapy, vasodilative drugs, among which the papaverine extracts of opium appear to furnish the best results.

46 1793 1816 (Dec. 7) 1938

- Tuberculosis and Renaissance of Medicine J. Troissier—p. 1793  
 \*Treatment of Extrasphinctral Anal Fistulas Method of Elastic Ligation P. Rochet and M. Violet—p. 1798

**Treatment of Extrasphinctral Anal Fistulas**—Rochet and Violet call attention to the difficulties that are encountered in the treatment of anal fistulas, to the technical difficulties, to the frequency of relapses and to the risk of incontinence follow

ing section of the anal sphincter in extrasphincteral fistulas. The frequency of relapses has led many surgeons to suspect that the tuberculous origin is responsible for this development toward chronicity. Whereas numerous authors maintain that anal fistulas are always tuberculous, other observers regard the tuberculous origin of anal fistulas as comparatively rare. In the second part of this report the authors describe the formation of an extrasphincteral anal fistula from a submucous abscess and show the necessity of finding a procedure which drains the fistula in its entire course and which sections the interposed tissues without lesion of the sphincter. Such a procedure was known in the time of Hippocrates under the term of "apolinosis." The elastic ligature, a modification of the ancient method, was first described in 1862. Its mode of action has been defined as follows: A rubber drain by its elastic quality effects a uniform and constant compression on the surrounding tissues and destroys, layer after layer, by progressive ulceration, it does not cut but ulcerates, it does not remove but destroys, flattening and obliterating the vessels before it divides them. The most interesting aspect of this slow and continuous section is the penetration of the anal sphincter: the latter is sectioned in its entire thickness, without there ever being a complete solution of the continuity. The intervention is made under spinal anesthesia. Anal dilation is usually superfluous, since the sphincteral relaxation caused by the spinal anesthesia is generally sufficient. The injection of a solution of methylene blue into the cutaneous orifice greatly facilitates the intervention, because it makes it possible to follow the fistulous passage and may even disclose a microscopic rectal perforation. It is necessary to excise the fistulous passage that is indicated by the methylene blue stain. The elastic ligature is put in place by introducing it through the cutaneous wound and letting it emerge again through the anal orifice. It consists of a rubber drain, 5 mm in diameter. The intervention is terminated by placing a wick in the excised region. The authors accompany the description of the intervention by diagrams. Discussing the postoperative course, they say that the rubber drain falls out spontaneously between the fifth and the twelfth day. The time required for total cicatrization depends on the extent of the fistulous passage, it varies between twelve and forty days. The authors say that since 1935 they had occasion to treat twenty-six extrasphincteral fistulas. In more than half of the cases a previous operation had been followed by relapse. The authors did not have a single failure. All the reexamined patients were free from relapse of any kind. The condition of the anal sphincter was always excellent. The authors stress the simplicity of the method, which employs the elastic ligature, and recommend its use to those who regard the treatment of anal fistulas as a hopeless enterprise.

### Sang, Paris

12 913 1046 (No 9) 1938

Comparative Tests of Immunity with Aid of Leukocytic Movements and of Agglutinins. Leukocytic Changes as Test of Immunity. G Wallbach—p 913

New Investigations on Technique of Sedimentation Speed of Erythrocytes. Edhem—p 924

\*Spleen and Lipoid Exchange. M B Roseblum and B A Sapiro—p 944

Influences of Solutions and Various Medicaments on Coagulability of Blood. Therapeutic Value of Medicaments Injected Intravenously. L Blacher—p 956

Syphilis and Reticulo Endothelial System. A Touraine—p 970

**Spleen and Lipoid Exchange.**—Roseblum and Sapiro state that the spleen is closely connected with a number of glands of internal secretion. After citing evidence of its connection with the thyroid and the genital glands they show that the lipoid (cholesterol) exchange is largely dependent on the hormone of the spleen. They investigated the status of cholesteremia in various disorders with splenic involvement because they reasoned that, if the hormone of the spleen really influences cholesteremia, a study of the modifications of cholesteremia in diseases of the spleen might be helpful in finding a method for the functional diagnosis of these disorders. To determine the influence of the splenic hormone on cholesteremia in various disorders they resorted to the intravenous injection of extract of hog spleen. Before this injection is made and while the patient is still fasting, a specimen of blood is withdrawn and these withdrawals are repeated at hourly intervals

for five hours after the injection. The cholesterol content of the specimens is determined according to the method of Smirnova and of Engelhardt. The authors made this test on twenty-one patients. In summarizing their results they state that the injection of splenic extract provokes an increase in the cholesteremia. The evolution of myelosis and erythrocytosis is accompanied by a low cholesteremia curve and these patients do not react to the introduction of extract of hog spleen by an augmentation in cholesterol. However, after an efficient roentgen therapy of myelosis, extract of hog spleen produces an increase in cholesteremia. In diseases of the liver accompanied by grave impairment of the parenchyma the cholesteremia curve is low and it does not react to the administration of extract of hog spleen. The authors conclude that the increase of cholesteremia under the influence of splenic extract in healthy persons, and the absence of this phenomenon in splenomegaly disorders, raises the question whether in the future this method may not serve as a functional test for the liver.

### Schweizerische medizinische Wochenschrift, Basel

68 1289 1308 (Nov 26) 1938

Clinical Aspects and Differential Diagnosis of Poliomyelitis. R Weber and E Schmid—p 1289

Almost Total Closure of Vena Cava Inferior. W Berblinger—p 1295  
After Treatment of Arthrotomies and Internal Injuries of Joints Particularly on Knee. R Meyer Wildisen—p 1297

\*Question of Gonotoxic Icterus. M Oppenheim and A Fessler—p 1299

**"Gonotoxic Icterus"**—Oppenheim and Fessler direct attention to a report by Popper and Wiedmann in which it was demonstrated that in recent years catarrhal icterus has been comparatively frequent in the course of gonorrhea. Popper and Wiedmann were of the opinion that there was a causal connection between impairment of the liver and gonorrhea, assuming that the icterus was produced by toxins of the gonococci and consequently designating this icterus as "gonotoxic icterus", to be sure, they emphasize that another factor, such as an alimentary intoxication or vaccine therapy, is usually necessary for the manifestation of the hepatic impairment, but they regard as unlikely a harmful effect of acriflavine hydrochloride. Oppenheim and Fessler, on the other hand, deny that the icterus which develops in the course of gonorrhea is due to hepatic impairment by the toxins of the gonococcus. They are of the opinion that this icterus, if it cannot be traced to an alimentary intoxication, is the result of intolerance toward the mode of treatment (intravenous injection of acridine dyes, vaccine therapy or fever therapy with bacterial proteins). They base this opinion on the fact that the literature contains only few reports about icterus in gonorrhea, that they themselves never observed an appreciable number, although their annual material consists of from 700 to 800 cases, and that, even in cases of the severest septic complications of gonorrhea, icterus is rare. In contradistinction to Popper and Wiedmann, the authors are of the opinion that treatment with acriflavine hydrochloride is an important factor in the development of so-called gonotoxic icterus. That the incidence of this type of icterus has so greatly increased in recent years they ascribe to the fact that parenteral therapy has largely replaced the local treatment. They detected three cases of icterus that had been treated elsewhere either with acriflavine hydrochloride or with vaccine. They were not able to obtain information about the dosage, but they think that hepatic impairment develops without excessive doses, since hypersensitivity is involved.

### Annali Italiani di Chirurgia, Bologna

17 827 905 (Oct) 1938

Different Tolerance of Bone to Metals Used in Osteosynthesis. R Berti Riboli—p 827

Resistance and Sedimentation Speed of Erythrocytes. Time of Coagulation and Hemorrhage in Animals Subjected to Anesthesia with Warm and Cold Ether. J Jacobellis—p 863

\*Local Anesthesia in Treatment of Traumatic Arthritis. G Muzzarelli—p 881

**Traumatic Arthritis.**—Muzzarelli reports satisfactory results from local periarticular anesthesia in the treatment of posttraumatic arthritis, especially of the knee and elbow joints. The treatment consists in administration of three or four injections

of from 5 to 10 cc of a 1 per cent solution of procaine hydrochloride given in the periarticular space of the knee joint or in the epitrochlear, epicondylar and olecranal regions of the elbow with intervals of two weeks between injections. Immediately after the injection is made the patient complains of a tolerable transient local burning sensation. Movement, flexion and extension become immediately normal. The patients can go up and down stairs and walk with confidence. If there is an overlooked partial fracture the functional results are not the same as those obtained in simple traumatic arthritis, in which pain either disappears after the first injection or reappears greatly diminished in intensity one week after the injection and then disappears in the course of the treatment. The treatment is complemented by local application of heat and physical exercise by the patient. It is indicated in cases of articular trauma with slight internal or external lesions or after prolonged immobilization of a joint in fractures. It is valuable in detecting simulators. Five cases are reported, in all of which satisfactory results were obtained.

### Folia Medica, Naples

24 1225 1279 (Nov. 30) 1938 Partial Index

\*Influence of Intravenous Epinephrine Therapy on Metabolism in Malaria N. Bonarrigo—p. 1229

Experimental Reticulosarcoma from Thorotrast Case O. Onufrio—p. 1245

**Influence of Epinephrine on Metabolism in Malaria**—In fourteen cases of chronic malaria with splenomegaly, Bonarrigo observed the behavior of the metabolism before and after making tolerance tests of dextrose and stearic acid, which he did before and after the administration of the intravenous epinephrine treatment for malaria. The tolerance tests were made after oral administration of either 30 Gm of dextrose or 20 Gm of stearic acid. The author found that the general metabolism is disturbed in malaria. The patients suffer, while fasting, from hypoglycemia (and in rare cases from hyperglycemia) and also from hyperketonuria regardless of the fact that they are fed on a diet rich in carbohydrates. There is a poor utilization of dextrose as shown by the crises of hypoglycemia late in the course of the dextrose tolerance test. There is also an abundant elimination of ketone bodies through the urine after the tolerance test of stearic acid. When the tests are repeated after completion of the epinephrine treatment the results show a better utilization of dextrose by the body and a diminished elimination of ketone bodies through the urine in comparison to that which takes place when the tests are performed before the administration of the epinephrine. According to the author the metabolic disturbances in malaria are due partly to malarial anatomopathologic lesions of the liver and partly to functional disturbances of the hypophysis by which the neurosympathetic equilibrium is ruptured with consequent disturbances of the correlations between endocrine glands, diminished secretion of insulin and lowering of the tonus of the spleen. Epinephrine, administered by the intravenous route, normalizes or greatly reduces the size of the spleen. The neurosympathetic disorder and the correlations of endocrine glands are controlled by the treatment by which the production of insulin increases, the spleen maintains a normal tonus and the general metabolism becomes normal. On completion of the treatment splenomegaly permanently disappeared and the crisis of the blood, elimination of ketone bodies through the urine and general condition of the patient were either normal or greatly improved. The results of the treatment are permanent.

### Giornale di Batteriologia e Immunologia, Turin

21 657 824 (Nov.) 1938 Partial Index

\*Etiology of Influenzal Otitis A. Pirodda—p. 657

Experimental Brucellosis in Guinea Pigs U. Pagnini—p. 681

Experimental Virulence to Streptococci in Acute Tonsillitis B. Giovanni—p. 697

Resistance of Granulation Tissue to Pyogenic Bacteria A. De Vincenzis—p. 741

**Influenzal Otitis**—Pirodda attempted to produce experimental influenza in ferrets by inoculating them with the pathologic material from the middle ear of four patients suffering from influenzal otitis. The otitis developed early in the course of influenza and was grave, hemorrhagic and with mastoid

complications in two cases. It developed during convalescence from influenza and was benign in two cases. In all cases the pathologic material was taken from the middle ear after paracentesis and disinfection of the auditory canal. With a portion of the material, cultures in blood agar were prepared, and another portion of the material was inoculated into ferrets. *Haemophilus influenzae* could not be isolated from the cultures. The ferrets did not develop influenza. The author therefore concludes that influenzal otitis is caused by the influenzal filtrable virus alone without interference of the influenzal bacilli. Experimental influenza develops from inoculation of pathologic material which contains both the filtrable virus and *Haemophilus influenzae* in synergy. It does not develop when the inoculated material contains either etiologic factor alone.

### Archiv für klinische Chirurgie, Berlin

191 1 170 (Nov. 7) 1938 Partial Index

Brown Tumors and Bone Cysts H. Puhl—p. 1

Microscopic Studies of Fractured Neck of Femur Which Has Been Operated on F. Felsenreich—p. 96

Experimental Study of Effect of Contrast Medium (Roentgenologic) on Narcosis N. Sugihara—p. 135

\*Relationship of Cholelithiasis to Primary Cancer of the Gallbladder W. F. Bottiger—p. 146

**Brown Tumors and Bony Cysts**—According to Puhl, bony cysts are benign mesenchymal tumors with moderate tendency to growth and a poor blood supply. The latter fact explains the breaking down of its tissue and the rapid formation of cavities. The formation of capillaries bears an embryonal character and attempts to provide the blood supply for mesenchymal tissue, which may easily be confused with granulation tissue. If the process is inadequate, extensive breaking down of tissue leads to new formation of large cavernous spaces the walls of which are made up of mesenchyma of its more mature type. These observations contradict the concept of a hematoma or of granulation tissue as the underlying character of cystic formation. Giant cell tumor is a benign mesenchymal neoplasm with a greater tendency to growth and richer cellular structure. The nourishment of its mesenchymal tissue depends on the blood spaces, which are formed with the aid of greatly increased giant cells. In this manner the nutrition of the tumor is easily provided for and breaking down of the mesenchyma takes place rarely. The angiocavernous blood spaces may likewise lead here to the formation of one or several cysts. Fibrous tissue, osteoid tissue and bone formation, as well as cartilaginous structures, belong to the typical maturation manifestations of the mesenchyma and are therefore to be regarded as neoplastic tissues. The same applies to the cavernous spaces and their variously constructed walls, which have nothing in common with normal blood vessel walls. The author regards a central fibroma as a healed form of a genuine cyst. According to the same concept they represent, very much like certain chondromas, osteomas, and angiomas, matured mesenchymal hematoma, with a slight tendency to growth. The possibility of a secondary malignant degeneration of a giant cell tumor has been definitely established. It is to be expected that other types of osteogenic sarcoma will be found even though the osteoid, chondroid and bony structures suggest a benign tumor. Many errors arise from the fact that a characteristic representative of a primary osteogenic sarcoma, described by Geschickter and Copeland as osteolytic, resembles closely, aside from its cellular polymorphism, the giant cell tumor. The author considers this type of sarcoma a representative of the malignant group of primary mesenchymal bone neoplasm. He considers it most likely that the other forms of osteogenic sarcoma develop from mesenchymal tissue. The formation of primary bony tumors is therefore regarded as a group of benign and malignant mesenchymal neoplasms arising on a dysontogenic basis. A relatively small group of neoplasms arising from the basis of regeneration are represented by tumors arising from a callus, the radium sarcoma and the Paget variety.

**Cholelithiasis and Primary Cancer of Gallbladder**—According to Bottiger the etiologic role of gallstones in the causation of the primary cancer of the gallbladder is demonstrated by the striking preponderance of primary carcinoma of the gallbladder in women. Eighty per cent of primary gall bladder carcinoma is associated with stones, whereas metastatic

carcinoma of the bladder is associated in only 15 per cent with stones. The author demonstrates statistically that the relationship of secondary gallbladder carcinoma in men and women is the reverse of that which appears in primary carcinoma. It was possible experimentally to produce an adenocarcinoma through gallstones. The author believes that it is not the mechanical irritation of the concretions that acts as a direct cause of cancer formation in the gallbladder, but rather the chronic regenerative process accompanying it coinciding with the age during which the organism displays a general disposition to cancer formation.

### Monatsschrift für Kinderheilkunde, Berlin

76 163 304 (Nov. 17) 1938 Partial Index

- Comparative Investigation on Treatment of Florida Rickets with Massive Doses of Vitamin D and D<sub>2</sub> H J Hartenstein—p 163  
Influence of Ultra Sound Waves on Vaccine Virus M Kasahara M Tatsumi S Ogata K Yoshio and H Kambayashi—p 179  
Bactericidal Power of Blood After Administration of Quinine F Horn and K Schwartz—p 182  
Acrocephalosyndactylia with Cutis Marmorata Telangiectatica Congenita K Schwartz—p 193  
Modification of Schick Reaction by Vitamin C K Schwartz and L Stockebrand—p 197  
Significance of Rice Water like Stools in Acetonemic Vomiting Irmgard Schaff—p 202

#### Modification of Schick Reaction by Vitamin C—

According to Schwartz and Stockebrand it is not definitely decided as yet whether the administration of adrenal cortex extract and ascorbic acid produces a decided change in the course of diphtheria. Although it is possible to protect guinea pigs against fatal doses of diphtheria toxin, the results obtained in human subjects are not convincing, for the modification of the toxic symptoms produced by the diphtheria toxin is only slight and it seems unjustified to designate ascorbic acid as true antitoxin. To be sure, it cannot be denied that vitamin C and adrenal cortex extract have a certain significance for the defense against infections. In every infectious disease a vitamin C deficit develops and counteracting this deficit has a favorable effect on the course of the disease. In order to determine to what extent variations in the vitamin C content of the organism play a part in the changing susceptibility to diphtheria, the authors made Schick tests and studied the vitamin C elimination in the urine of twenty-five children, some of whom were healthy and some were convalescents from tuberculosis and scarlet fever. A table indicates that twenty-one children had a positive and four a negative Schick reaction. The latter four did not show an especially high vitamin C elimination in the urine. The twenty-one children with the positive Schick reaction were subjected to oral treatment with vitamin C and then a second Schick test was made. It was found that the administration of vitamin C did not effect a weakening in the Schick reaction, however, the susceptibility toward the nonspecific protein component of the diphtheria toxin was noticeably reduced.

### Strahlentherapie, Berlin

63 403 560 (Nov. 26) 1938 Partial Index

- Significance of Discovery of Radium and of Radioactive Substances for Treatment of Uterine Carcinoma A Doderlein—p 403  
Thirty Years Experiences with Therapy of Uterine Carcinoma A Mayer—p 407  
Results of Treatment in Malignant Ovarian Tumors F Crainz—p 434  
Could Radium Bomb Be Used Intravaginally for Treatment of Uterine Cancers and Could Distribution of Rays Be Essentially Improved Thereby? R du Mesnil de Rochemont—p 465  
\*Radium Therapy of Hemangiomas W Baensch—p 496  
\*Technic of Production of Neutrons and of Artificial Radioactivity A Bouwers—p 545  
Animal Experiments on Distribution of Injected Soluble Radium in Various Tissues of Body F Daels H Fajerman, van de Putte and Van Hove—p 545

**Radium Therapy of Hemangiomas**—Baensch discusses the histologic structure of hemangiomas, pointing out that the structure determines the selection of the technic of the radium therapy. Describing the histologic aspects of simple or plexiform angioma, he shows that especially during the first months of life these hemangiomas spread rapidly. Growths which at birth are the size of a lentil may extend over an area four or five times as large at the end of two months. Another form, the cavernous angiomas, go much deeper than does the simple type and they appear chiefly in the region of the skull, more especially

in the so called embryonal clefts, that is, on the inner canthus, the upper lip and below the ear. It is important to know that such cavernous hemangiomas are generally not limited to the visible and palpable surfaces but may extend through the bone clefts to the deeper layers and even into the cranium. The third type of vascular tumor discussed by the author is the angio-plastic sarcoma. In contradistinction to the first two types, which are always benign, this form may become malignant. The author mentions three methods of radium therapy. The first one, the application of pastes that contain radon, is suited only for simple, superficial angiomas. Moreover, it has the disadvantage that it requires much time. The second form of treatment, which employs the moulage method, likewise requires considerable time. The author employed a more rapid method, the introduction of radium into the tissues by means of needles. The needles contain 1, 2 or 4 mg of radium, and filtration is effected by means of platinum-iridium. In nurslings (of the fifth month) the author introduces the needles under a short ethyl chloride anesthetic, in older children or adults, under local anesthesia. The size of the needles is adapted to the extent of the hemangioma, and the needles are distributed in such a manner that about 1 mg is introduced per cubic centimeter. The sites of insertion are selected so as to insure favorable cosmetic results, for instance, in the region of the lips and cheeks, the needles are introduced by way of the oral mucosa. In case of large angiomas the radium puncture can be combined with the moulage method. After the first radium puncture of two days' duration the patient is discharged, for the irradiation is repeated only after at least two or three months has elapsed. It has been observed that during this time the retrogressive process continues. In order to avoid disappointment, attention should be called to the slowness of the process. The author employed this method with good results in 230 cases. In 2 per cent of the cases superficial necroses developed, but these healed with smooth scars. Injurious effects of the rays were not observed. Follow-up examinations, extending over six or seven years, never disclosed damage to adjoining organs such as the eyes or the bones. The author gives brief histories of several cases and reproduces photographs illustrating the good results.

### Zeitschrift für experimentelle Medizin, Berlin

104 465 628 (Nov. 10) 1938 Partial Index

- Gastritis in Circulatory Decompensation Animal Experiments M Gulzow and T C Afendulis—p 465  
Investigations on Action of Vitamin B<sub>1</sub> on Carbohydrate Metabolism I Magyar—p 495  
Basal Metabolism Tests on Specific Dynamic Action of Pyroracemic Acid H W Hering—p 504  
\*Action on Metabolism of Coffee With and Without Caffeine H Steudel—p 542  
Depth Action of Heat in Partial Baths R Gruner—p 554  
Modification of Frequency of Frog Heart by Short Electric Waves. E. Hasche and J Bolze—p 596  
Question of Spontaneous Diuresis U Schaare—p 611

**Action on Metabolism of Coffee With and Without Caffeine**—After calling attention to the growing consumption of coffee, from which the caffeine has been extracted, Steudel admits that the pharmacologic effects of caffeine and the fact that they are frequently undesirable cannot be denied. However, the experiments which were carried out to demonstrate the actions of caffeine were often made with large quantities of caffeine that are never consumed under ordinary conditions. The author studied the behavior of ordinary coffee and of caffeine-free coffee in artificial digestion and then he made experiments on dogs. The artificial digestion experiments proved that coffee, when used in normal quantities, does not disturb the digestive processes. These experiments disclosed no differences between coffee which contained caffeine and the coffee from which the caffeine had been extracted. When coffee was given to dogs in physiologic quantities it was found that the elimination of nitrogen in the urine was reduced, irrespective of whether the coffee infusion had been made with ordinary coffee or with coffee from which the caffeine had been extracted. When the coffee was left out of the diet, the elimination of nitrogen in the urine increased again. The quantity of nitrogen, by which the urinary secretion is reduced, does not appear in the feces. In what form the nitrogen is retained in the organism during the time of the administration of the coffee the author



is unable to state with certainty. He says that during the fifty-nine days when the animals were given coffee they lost some weight. Nevertheless it must be concluded that coffee contains substances which act on the nitrogen exchange by effecting retention. That this effect is due to a specific action of the coffee is proved by the fact that when substitutes in the form of infusions of roasted, malted grains were used there was no change in the elimination of nitrogen in the urine.

### Klinicheskaya Meditsina, Moscow

16 1275 1484 (No 10) 1938 Partial Index

- Therapeutic and Surgical Types of Pulmonary Abscess B E Linberg —p 1275  
 Biochemical Characteristics of Basic Constitutional Types M N Chernorutskiy —p 1300  
 Present Concept of Shock P M Staroshklovskaya —p 1311  
 Thrombosis in Cardiovascular Patients M B Burgsdorf —p 1321  
 Etiology of Obliterating Endarteritis and Spontaneous Gangrene D I Panchenko —p 1328  
 Topical Diagnosis of Cardiac Infarcts P E Lukomskiy —p 1334  
 Basal Metabolism in Hypertonia E Ya Reznitskaya and P Ya Spivak —p 1410

**Basal Metabolism in Hypertonia**—On the basis of their studies of basal metabolism in 620 cases of hypertension, Reznitskaya and Spivak conclude that no relationship exists between the height of maximal pressure and the height of basal metabolism. The gravity of the clinical manifestations of hypertensive disease does not necessarily depend on the height of the maximal pressure. They found that basal metabolism in cases of compensation and of mild decompensation is normal or near normal, even in the presence of severe hypertension. The thyrogenous form of hypertension, however, is accompanied as a rule by increased basal metabolism. Insignificant alterations in the basal metabolic rate were present in hypophysisal types, such as Cushing's disease, in obesity and in hypertomas of genital origin. Basal metabolic rate was normal in hypertension of pancreatic origin (accompanying mild types of diabetes). In fourteen cases of hypertension of the arteriosclerotic type nine showed normal metabolic rates and five insignificant deviations from the normal. In a group of twelve patients with nephritic hypertension, four had a considerable increase in the basal metabolic rate while eight had a rate close to normal. The authors conclude that determinations of the basal metabolic rate do not aid in the differential diagnosis of the type of hypertension.

### Nederlandsch Tijdschrift v Geneeskunde, Amsterdam

82 5365 5464 (Nov 5) 1938 Partial Index

- Clinical Manifestations of Tumors on Base of Skull P M van Wulften Palthe —p 5366  
 Syndrome of Löffler Transient Pulmonary Shadows and Eosinophilia H J Viersma —p 5372  
 Observations on Actinomycosis H Ensing —p 5381  
 Arrest of Hemorrhage from Hand Forearm or Upper Arm by Injured Person Himself and by Others W R H Kranenburg and O Bánki —p 5390

**Actinomycosis**—Ening surveys seventy-nine cases of actinomycosis which were treated at the surgical clinic in Groningen in the course of the last thirty years. There were forty-six cases with localization in the region of the neck and jaw, thirty-one cases with abdominal localization and two cases with thoracic and pulmonary localization. Follow-up examinations were possible in most cases and these disclosed that in actinomycosis of the neck and jaw there were 88 per cent of recoveries and in abdominal lesions 28.5 per cent of cures. After discussing the role of occupation in the development of actinomycosis the author takes up the port of entry, the diagnosis and the treatment and cites noteworthy case reports. About the treatment he says that the superficial processes often react favorably to roentgen irradiations. Extensive surgery is now largely dispensed with, particularly in cases of actinomycosis of the neck and jaw, the more so since the cosmetic results are usually not good. Even in abdominal actinomycosis the results of surgical treatment are not satisfactory. The author thinks that roentgen irradiation combined with moderate surgical treatment is the best method. These measures can be sustained by potassium iodide given orally, by fuadin injections and blood transfusions. In appropriate cases the gold-vaccine treatment of Neuber can be considered.

### Acta Obstet et Gynec Scandinavica, Stockholm

18 359 498 (No 4) 1938 Partial Index

- \*Treatment of Diffuse Postabortal Peritonitis F Holst —p 367  
 Bilateral Extra Uterine Pregnancies T Olovson —p 380  
 Diabetic Parturient Woman Treated Without Diet M Reutill —p 412  
 Differences Between Radiologic and Anatomic Measurements in Determining Size of Fetal Skull Roentgenologically C Wegelius —p 428  
 Aneurysms in Renal, Lienal and Hepatic Arteries Three Cases Rupture After Pregnancy K Östling —p 444  
 Treatment of Uterine Atony in Labor by Means of Scalp Forceps P Kuhnel —p 466  
 Pylonephritis in Pregnancy Caused by Bacillus Pyocyaneus G Thorsen —p 490

**Diffuse Postabortal Peritonitis**—In attempting to establish the principles of the treatment of diffuse postabortal peritonitis, Holst collected a material of 176 cases, 100 of which had been treated by laparotomy and drainage. A comparison between this surgical method and the radical operation shows that the first method is to be preferred, because the general condition is frequently so poor that the patient will not tolerate a more complicated intervention and also because functionally important organs are thus saved. To be sure, the results that have been obtained with this method, so far, are not encouraging, only twenty of 100 patients have survived. This is chiefly due to the fact that the operation was performed too late, in order to improve the results it is necessary to intervene at an early stage. Consequently an operation is indicated not only in the presence of clear signs of diffuse peritonitis but also when there are symptoms which indicate that the infection is spreading to the abdomen, particularly when they increase rather than subside or when the general condition is impaired to such an extent that a severe infection must be suspected.

### Ugeskrift for Læger, Copenhagen

100 1273 1294 (Nov 10) 1938

- \*Action of Streptomide on Leukocytes E Bruun —p 1273

**Action of Sulfanilamide on Leukocytes**—Bruun concludes that in addition to the toxic effects of sulfanilamide preparations previously described there is undoubtedly an action on the white blood picture with depression of the leukocyte count selectively affecting the granulocytes. It may be rapid and intensive, as a rule disappears at once when the preparation is discontinued, seems to be without fatal results and is assumed to be due to a toxic destructive action on the leukocytes in the peripheral blood. The acute lethal agranulocytosis observed in rare cases after the administration of large amounts of sulfanilamide (from 40 to 60 Gm) and dosage for over three weeks, is accompanied by marked changes in the bone marrow, it may depend on ordinary overdosage of the substance or perhaps on an idiosyncrasy. The author reports twenty-three cases of scarlet fever, seventeen of which were treated with from 1 to 36 Gm of sulfanilamide daily for not more than five days, of these thirteen (85 per cent) showed a reduction in the granulocyte count. The course in scarlet fever was apparently not influenced by the treatment, there was usually a lytic fall in temperature and the duration of the fever did not differ in the patients treated with sulfanilamide and those treated without sulfanilamide.

100 1295 1316 (Nov 17) 1938

- Posttraumatic Arteriospasm Objective Establishment of Circulatory Disturbances and Impairment of Power Reflexorily Caused by C<sub>1</sub> S Ulrich —p 1295  
 \*Preventive Therapy with Erythrol Tetramtrate in Angina Pectoris N Bay —p 1300  
 Porphyrinuria O Kirstein —p 1303  
 Eight Cases of Congenital Syphilis in Siblings A E Larsen —p 1305  
 Two Cases of After Shock in Metrazol Shock Treatment E B Johansen —p 1307

**Erythrol Tetramtrate in Angina Pectoris**—Bay reports that in ten of eleven patients, aged from 66 to 82, with angina pectoris the attacks ceased during treatment with from 7.5 to 15 Gm of erythrol tetramtrate three or four times daily, while in one patient, with a positive Wassermann reaction and an aortic aneurysm, who had had two attacks daily, only one attack every third week occurred during this treatment. No by-effects of the treatment were seen.

# THE STUDENT SECTION

of the

## Journal of the American Medical Association

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### Speech Defects in Relation to Physical Condition and Health

H J HELTMAN, A B, AND L M HICKERNELL, M D

SYRACUSE, N Y

For many years physicians as well as those who specialize in speech correction have been conscious of the somatic aspects of speech defects. Often physicians undertake to treat such disorders on the assumption that the establishment of normal health per se will result in the acquisition of normal speech. Conversely, there are speech correctionists who attack this problem with complete lack of understanding that there may be organic pathologic changes which cannot be corrected through the efforts of the speech therapist alone. Qualified practitioners in both fields, however, are aware that either or both of these factors may be the root of the trouble. Both physical and mental health are essential for proper speech, and in those who have speech defects reeducation of the speech processes after anatomic defects have been corrected is the only sound procedure.

Effective therapy cannot be accomplished until accurate information concerning the patient's somatic condition is available. The Student Health Service and the School of Speech at Syracuse University have therefore combined facilities in an attempt to diagnose each student's actual difficulty. Only after such a procedure can correct treatment be instituted to provide the student handicapped by a speech defect with the best possible chance for improvement or cure.

The Student Health Service is adequately equipped for a complete diagnostic survey of each individual. Audiometric examinations and otolaryngologic studies are made as a routine on all students known to have defects of either speech or hearing. The resident in otolaryngology at the University Hospital makes these examinations, so that physical examination of the vocal tract and ears as well as hearing tests are made by a qualified physician.<sup>1</sup> In addition to this, records in the Student Health Office contain all the necessary information concerning each student's health and general physi-

cal condition. These records are of course available during the diagnostic survey and are useful in connection with the consideration of therapy.

Cases of early involvement observed during this study were called to our attention primarily by obvious difficulties in speech. A small number of persons with spasticity were discovered during the routine physical examination made at entrance. These were referred to the speech department for corrective attention. The speech department also picked out from its classes persons with dyslalia and referred them to the health service for examination. Though it is too early to give any detailed report of the examinations, some data have already accumulated which are interesting if not yet significant. One student insisted that he was "not very deaf" but showed more than 80 per cent loss in each ear. On the other hand a student who had been receiving corrective treatment over a period of three years for dyslalia and who constantly insisted that he had a great deal of difficulty in hearing teachers in class was found to have a hearing loss of only 12 per cent in one ear and of 15 per cent in the other.

Students with dysphonia are given a complete otolaryngologic diagnostic survey. Hearing tests are also performed in the routine manner. If the vocal defect is found to lack an anatomic basis it is considered as being of functional origin. In cases of functional dysphonia it is necessary only to apply an appropriate reeducational technic to remedy the difficulty. However, in cases of hysterical dysphonia psychiatric treatment is clearly indicated. When there is a definite pathologic basis for the dysphonia, anatomic correction may be necessary. Collateral reeducational therapy may or may not be indicated. When such therapy is indicated, the specialist in speech proceeds toward this under the immediate direction of the otolaryngologist.

To extend the effectiveness of this cooperative project the general health examination of this semester's entering class included complete

<sup>1</sup>From the School of Speech and the Student Health Service, Syracuse University.

<sup>2</sup>In some speech clinics examination of the larynx, nose and ears is made by a specialist in speech who may not be a qualified physician.

audiometric determinations and speech tests. The problems and defects disclosed by these tests are enabling the university to take the initiative in bringing to the attention of students thus handicapped the facilities for diagnostic and corrective measures within the Student

Health Service and the Department of Speech. The diagnostic surveys by the otolaryngologists are still being conducted. Any surgical treatment found indicated continues to be referred as in the past to qualified physicians in the appropriate fields.

## Comments and Reviews

### THE ART OF DIAGNOSIS

*Abridgment of a lecture by Frank Cook, Esq., F.R.C.S., published in Guy's Hospital Gazette, Oct. 22, 1938*

Since it falls to my lot to examine a large number of candidates in their finals, I wish to refer particularly to the clinical examinations to which I assure you considerable importance is attached. The average candidate, having examined the patient, starts off in this manner: "The patient's age is 25, she had measles as a child, she has not had scarlet fever, she has six teeth missing, her tonsils were removed at the age of 10, her last menstrual period was October 19," and so on. He fondly believes there is one answer and one answer only to the clinical problem before him. Therein lies a paradox: the more discursive the medical man of today, the more does he hope to find a brief and comprehensive label in the end. As if any one could sum up in words that infinitely complex organism a human being affected by pathologic processes, and place the whole in a nutshell. This is the main point of my discourse, but let us return to the candidate. To him I say: "You are conscientious, your teachers have taught you to be methodical and observant, and I am sure you were an excellent ward clerk, but on the morrow you may be a doctor, so will you kindly discard the irrelevant observations, bring out your main points and display a little inductive reasoning by putting two and two together." Often he then says: "I should like to have an x-ray examination, a blood count, a test meal, a bacteriologic investigation of the urine," and so on. That man is likely to remain a ward clerk throughout his life, the medical profession is full of such. Is it altogether his fault, or is it the fault of his teachers and examiners?

Every one knows that the examination system is defective. I wish that the whole stultifying outfit could be abolished. You will reply that examiners require a definite answer to each of their questions and that they expect each of the problems presented to you to be solved in a nutshell. They require nothing of the kind, there is nothing definite in medicine, which is not an exact science, diagnosis is inevitably a matter of probabilities and therein lies its fasci-

nation. It is true that a few examiners while masquerading as physicians are blessed or cursed with the mentality of schoolmasters, but the majority are well aware that our profession is called on to deal with the intangible complexities of human nature, they are out to discover how much you know rather than the gaps in your knowledge, above all they require evidence of a well trained mind and your ability to deal with a clinical situation.

### ESSENTIALS IN DIAGNOSIS

There are two great essentials in diagnosis—a sense of relative values and that inductive reasoning which threatens to become a lost art in medicine. We must never overlook the immeasurable importance of these essentials, otherwise we shall always miss the wood for the trees. Here is a great danger for which I am inclined to blame the system of piecemeal investigation imported from America and Germany under the blessed name of clinical research. I am not belittling genuine research. I am all for genuine thoroughness and accuracy of observation. But it should be obvious that many of those endless series of irrelevant and uninspired "clinical investigations" with which our laboratories and special departments are inundated indicate (a) that some one contemplates writing a paper or (b) that some one is hiding his lack of wits or courage under a cloak of pseudoscientific enterprise. I venture the opinion that 80 per cent of the work performed by the clinical laboratories and x-ray departments of today is more or less unnecessary, although it is conducted under the noble guise of team work. There is a worse feature than this: thousands of patients are continually becoming hospitalized. The saddest feature is that a new generation of medical men is being embarked with but the scantiest notion of diagnostic values. I cannot see the point in hospital practice where added burdens are imposed on all concerned without financial reward. Nor do I understand why our investigators fail to go the whole hog while they are at it, why not have every available body fluid examined with reference to every chemical constituent and micro-organism known to science? Why stop at hydrochloric acid and the Wassermann reaction?

Closely associated is the departmental danger. Patients today are fortunate if they happen to make first contact with the profession by consulting a really good clinician. Otherwise they are likely to gravitate toward a department or an enthusiastic specialist. Take for example the case of a neurasthenic female who is below par and likely to remain so unless some philanthropist endows her with £500 per annum free of income tax. She displays a multiplicity of symptoms and it is a matter of luck as to which department she reaches. If she goes to one, she will have a test meal, x-ray examinations and so on, if she goes to another she will have a cystoscopy, yet another will oblige her with a rectal examination and possibly sigmoidoscopy, or they might remove her appendix. If she comes to us, we are supposed to conduct a vaginal examination. I might tell her that she is tired out or advise her to take the air in the park. But she would think me a fool and I should be exposed to the criticism from medical onlookers of being frivolous and lacking in professional conscience. So one merely returns a negative diagnosis and makes an attempt to steer her clear of other departments. The onus is not on us but on the man who sent her to us, but we try to be human. You may gather that I assume the majority of patients nowadays to be psychoneurotic. That is true, they are, but beware of the underlying danger. Every neurotic must die of something some day, and it is at least debatable whether it is better to let one neurotic die undiagnosed than to diagnose and treat nonexistent organic conditions in the ninety-and-nine. The real difficulty arises when psychoneuroses and organic pathologic lesions coincide in the same individual, that demands clinical acumen.

#### IMPRESSIVE WORDS

On many occasions I have held forth on the danger of seeking an all embracing label to describe a complex clinical condition. For example, is it conceivable that any well informed individual would attempt to summarize in a word or sentence the infinitely complicated processes involved in normal menstruation, much less the abnormal? And yet we are assailed on every hand by a public which demands a simple nominal solution. Doctors and dressers say "Well, what is the answer?" Patients and their relations say "We insist on getting to the bottom of this, what is the cause?" Poor ignorant souls, they are very trying and often infuriating. What can their conception of a *primum mobile* be? I wish we could give them the answer they require—it seems far more important to them than treatment, but most of us have a streak of honesty which prevents our inventing an impressive word to meet the occasion. Do it if you wish, tell them that

they have the colitis, the acid, the anemia or the glands, but that way lies quackery. Leave it to the venders of "patent medicines" and to the appendicetomists, if we would save our professional souls we must keep the party clean. Some one must hold the fort of truth in a world that is hysterical, confused and seeking miracles. It is even better to say "I do not know."

#### THE SUPREME ARTIST

The supreme artist in clinical diagnosis regards the patient, not the disease, as an entity. He takes into account every relevant feature, general and local, physical, psychologic and environmental. He assesses the relative importance of these features and forms a mental picture or conception of the whole. This picture he can convey to others without any long rigmarole provided those others are intelligent clinicians rather than superannuated ward clerks. The great essentials are a sense of proportion, born of extensive experience or imagination, and a capacity to reason by induction. Generally a surgeon tends to be too quick in forming a judgment, since he is so frequently called on to be quick in action. A physician tends to be too slow and he often fails to reach a conclusion of any practical value. It has been part of my theme that conclusions are not always attainable in medicine.

In obtaining a clinical history, bear in mind that few patients are capable of making a plain statement of fact. Their observations are colored by their own interpretations, by what the other doctor said or by fortuitously coincident phenomena.

We have been taught to avoid any diagnosis that involves a "double pathology." This is bad and dangerous teaching. Do not be afraid to diagnose two, three or even twenty more or less independent pathologic conditions in one and the same individual.

Beware of the fixed idea in patients and colleagues alike. It is regrettable that some of the most eminent members of our profession are obsessed with fixed ideas which nothing will persuade them to discard. This implies that at some period of their career they have crammed up and pigeonholed some comprehensive subject, possibly with a thesis in view. These men are often excellent teachers—at any rate they are dogmatic but they have sacrificed one of our greatest diagnostic gifts, the open mind.

It is always helpful to see the patient's husband or wife. You may learn more from a brief acquaintance with him or her than you will from a whole series of investigations.

Diagnosis by elimination is a feeble mental process which is all too prevalent. I suppose we must blame in part that oft repeated question "Give the differential diagnosis." If a

woman has a pain in the right lower quadrant, and you have satisfied yourself that she is not suffering from appendicitis do not send her along to us labeled "salpingitis" when there is not a single feature in her history or physical condition to suggest that diagnosis. Call it a pain in the right side of unknown origin, salpingitis is a definite entity.

Diagnosis is largely a matter of probabilities. Keep your eyes open to every possibility but never despise the obvious.

#### IMPORTANCE OF CONCENTRATION

Finally, let me impress on you the supreme importance of concentration. We live in the midst of distractions of every kind, it is difficult to keep our heads clear. But when a patient consults you, that patient for the time being is entitled to the full use of every ounce of your gray matter whether you spend two minutes or two hours in making your diagnosis. Never mind the woman you delivered last night, the operations you performed yesterday or those you are going to perform tomorrow, never mind the patient you have just seen, never mind the telephone. In the practice of medicine you can do only one job at a time whether you are quick or slow. If the rest of the world seems to be pestering you with all its troubles, turn to it a blind eye and a deaf ear whenever you are applying your faculties to the art of diagnosis.

#### THE TRAINING OF SPECIALISTS IN OBSTETRICS AND GYNECOLOGY

*Abridgment of address by Dr. N. Sprout Heaney, Chicago, published in the American Journal of Obstetrics and Gynecology, November 1938.*

It may not be amiss for the president of the American Gynecological Society to express a few thoughts relative to the training of specialists in obstetrics and gynecology. From the large number of applications for residencies received everywhere it is apparent that great care must be taken if sufficient suitable positions are to be supplied. There are many hospitals which accept interns for their fifth year's work where the practice of the hospital is so specialized or the rotation of the internship is so restricted that the intern does not get a good general training. Six months' service in internal medicine and six months in general surgery are commonly accepted as a substitute for the required internship. This would not seem comprehensive enough for entering general practice in which so much of the practitioner's work has to do with obstetrics and the care of sick children, nor is it a sufficiently broad experience to use as the base on which to build a training in some specialty. Furthermore, when the service in internal medicine may be

limited to metabolic diseases and the surgical experience may be largely limited to abdominal work, the training the intern receives lacks much of what should be expected. It may be possible for an intern to get a better training on a rotating service in a less famous hospital in which the work is more general and less highly specialized. When the work offered an intern by any hospital is not general enough, the medical colleges should remove such an institution from their lists of hospitals approved for internship.

Special hospitals and teaching hospitals become available at once for the training of specialists by replacement of the fifth year internships with special internships and residencies. We are looking for methods of measurement to determine goals of achievement and are confronted by the fact that our measuring stick must be flexible instead of rigid. There is no inflexible standard for measuring professional ability. Self-made men may excel the products of long training, yet training is generally requisite for competence and a minimum standard seems advisable. The length of residency in an institution required for certification would vary with the opportunities offered but should not be longer than three years. To remain too long in one institution is a real danger for a young man. It is too likely to fix his ideas and limit his development. Too long a period of training in one institution produces the man anxious to tell of his institution's methods of treatment instead of the eager seeker after new methods for his own improvement. This residency period should be broad in its experience and active to the extreme. Contemplation does not develop diagnostic acumen, nor philosophic discussion surgical technique. Clinical material should be abundant and responsibility for its management developed. Thorough training in the anatomy and pathology of the specialty is of prime importance. Though a man expects to be an obstetrician he should during these years have enough training in gynecology so that he may be a safe operator in obstetrics when the occasion arises. Now that services in obstetrics and gynecology are commonly combined he should prepare himself for that possible contingency in his future and have a good basic training in gynecology. So should the aspirant in gynecology have, during these hospital years, a good training in obstetrics. The stamp of the obstetrician is seen in the character of every gynecologist's work who has been trained in both branches.

#### SEEK ANOTHER CONNECTION

After three years, sometimes sooner, he should leave the hospital of his special training and seek some other connection. Nothing is so illuminating as a change of chiefs. The next year he might well spend in travel and in taking

special courses to make up the deficiencies in his training. In one center he would find much to stimulate him in investigation, in another he would find an entirely new attitude toward clinical problems which had been satisfactorily settled as far as his previous training had led him to believe. An impressive teacher may so imbue a student with his beliefs and methods that the student feels no urge to seek further fields for truth, and inbreeding results. There seems something innate in the active surgical teacher which gives the impression that all truth rests in him. It might not be advisable to disabuse the minds of patients, nurses and secretaries regarding the fallacy of this created opinion, but we really owe it to our own assistants to rob them of this delusion, so that they in turn may not be bound by our own limitations. Many of us in charge of large clinics have discarded every operative procedure which we once employed and have established new technic, based on ideas picked up here and there while visiting elsewhere.

#### RESEARCH WORK

Or this fourth year might be spent in a research laboratory. There is a move on foot to require research work of every candidate for specialization. This is laudable if practicable. Progress in medicine can be expected only through investigation. The man with a research type of mind can best evaluate the clinical application of new discoveries, but shall we require this as a necessary qualification for licensure? What constitutes research work in gynecology and obstetrics? In our specialty much acclaim is given the one who works in physiology, chemistry or physics. Formerly reputations were established by research into the morphology of tissues. Not much credit is given to the student of histology today as being engaged in research work, yet the studies of Sampson on endometriosis has had far more effect on the practice of gynecology than any other single bit of research done during the same period in obstetrics and gynecology, whether test tube and guinea pig were used or not. So, before research is required, research must be defined. A great deal of self deception exists as to the real value of the research work we engage in. In his fourth year a young specialist should be full of problems demanding solution if he has a research mind, and a year under a recognized investigator will teach him exact methods. Research work must not be a fetish and should be an addition to adequate clinical and technical training. It should not be considered a substitute.

After the third hospital year, the aspirant may be taken into a specialist's office as an assistant for further training. This is not only

helpful to the chief but can be made of the greatest value in the training of younger men. In the hospital the resident has seen chiefly the seriously sick, or at least those requiring hospitalization. In an office or dispensary practice he sees, in addition, the beginnings of disease and finds that many applicants for medical relief need only the assurance that nothing ails them to obtain that relief.

#### ACCEPTING ASSISTANTS IN OFFICE

Years ago I became aware that if I were to train teachers for my staff at the college and hospital I would have to do it through accepting assistants in my office, for the teaching and clinical beds were too few to train the men in a reasonable time. I remodeled my office so that a large number of patients could be attended. Fixed fees were abandoned and all who wished attention were made welcome. As largely as possible the active care of patients was turned over to assistants and my attention was given to the supervision of their work and the treatment of the most exacting or complicated cases. Obstetric and gynecologic cases were handled alike and the fees of the poor and of persons with limited means were largely a matter of their own decision. The rich came along with the poor, were charged abundantly, and were happy in most instances to pay the fees exacted, because they had before them the visible reasons for variations in fees. Assistants were taken on for a period of three years. In order that the assistants' activities could be controlled and their time best occupied for their own advancement, flat salaries were paid for the disposition of all their time and efforts, and the salaries were increased for each year of service. The salaries were sufficiently ample so that at the end of three years the assistant could pay for a year's study abroad. When this calculation failed I lent them enough money to make up the deficiency. After returning from his foreign training the assistant goes into private practice on his own responsibility. He is allowed to notify such of my clientele as were earlier turned over to him for his attention that he is in practice for himself and he is given a position on the staff of the hospital and on the teaching staff of the medical college. Each of these graduates from my office is assured of a private practice in his specialty out of my own clientele, but this pruning has never injured the parent practice. In this way one may make up the deficiencies of insufficient institutional positions both to the progress of obstetrics and gynecology and to one's own satisfaction.

Surgery is an art, dexterity and proficiency in it come only through much training and hard application, and for the acquisition of this art there can be no substitute for a large experience.



We deal in human lives. Quick judgment may be based on temperament but its chief support is experience. Operative dexterity is an asset best appreciated when dealing with the poor operative risk. Many people die from operations who might live were the operator a little more skilful, a little more experienced. Why do we try to substitute something else for this indispensable attainment? In the last analysis examinations for licensure have not as yet been devised which will indicate a candidate's real ability.

### STUDENT WILLIAM BEAUMONT

Dr. William Beaumont, the pioneer American physiologist, accomplished under discouraging circumstances some of the most remarkable medical research of all time.<sup>1</sup> Born on a farm in Connecticut in 1785, Beaumont grew up in a puritanical atmosphere. With no particular destination in mind, he left home when 21 and drove northward in a sleigh, arriving in the spring at the village of Champlain, New York, where he taught school for three years and tended store. Here Beaumont manifested great interest in national affairs. He wrote his father that he planned to enter the army in case of war, which seemed near. On his way to Champlain he had met Dr. John Pomeroy of Burlington, a practitioner who later taught anatomy in the University of Vermont, and from him probably received the urge to study medicine. Having saved enough money to see him through the two years of medical apprenticeship, Beaumont crossed the lake to St. Albans and became an apprentice to Dr. Benjamin Chandler, an excellent teacher. At this stage in his career the qualities which were to make him famous were already evident. Every case history was an example of precision. His attitude during the apprenticeship is disclosed in a letter to his parents: "My situation affords a pleasant life, though it requires my utmost diligence and perseverance in the pursuit of a medical profession in which I hope to exhibit specimens of proficiency in an art which, in this enlightened age of reason and under the modern improvements of chemistry and physiology, bids fair to rise with healing on her wings. I am considerably in the habit of riding with my preceptor and have charge of many of his patients during his calls elsewhere, which are numerous and at a distance. He has just returned from a distant patient and is now gone twenty or thirty miles to perform an amputation."

Beaumont was licensed to practice in June 1812. Still intensely interested in his country's affairs, he went to Plattsburgh to enter the army and promptly became most deeply engaged in

the War of 1812. In his well kept diaries he wrote of the battle of Fort George. The British "devised the inhuman project of blowing up their Magazine (containing 300 Bbls powder), the explosion of which, shocking to mention, had almost totally destroyed our Army. Above 300 were wounded, and about sixty killed dead on the spot by stones of all dimensions falling like a shower of hail in the midst of our ranks."

A most distressing scene ensues in the Hospital—nothing but the Groans of the wounded and agonies of the Dying are to be heard. The Surgeons wading in blood, cutting off arms, legs and trepanning heads to rescue their fellow creatures from untimely deaths."

Beaumont resigned in 1815 and entered private practice at Plattsburgh. The minutes of the Clinton County Medical Society, which he joined in 1819, show that Beaumont was an active member. Although busy in private practice, Beaumont reentered the army in 1820. He was ordered to report at Fort Mackinac, Michigan. The journey from Plattsburgh through the canals, over the lakes and by stage, he vividly describes in a diary. Arriving at Mackinac, he took charge of the small army hospital.

### ALEXIS ST. MARTIN WOUNDED

John Jacob Astor had established the American Fur Company and Mackinac had become a center for collecting furs. The only physician within 300 miles was William Beaumont. Three thousand Indians and French-Canadian voyageurs brought furs to Mackinac in the summer, living in tents along the beach. On June 6, 1822, a shot gun was accidentally discharged in a store of the American Fur Company. Alexis St. Martin, standing less than three feet away, received the blast in his abdomen and chest, and an opening was made that would have admitted a fist. Beaumont took the young voyageur, helpless and destitute, into his home in the fort, where he nursed and sustained him for nearly two years. The record of St. Martin's case covers many pages of a large ledger, in which Beaumont made daily notations. On December 13, for example, he wrote: "To facilitate the closing of the puncture of the stomach, and remove the impediments to the granulations, which the constant pressure of compresses necessary to retain the food in the stomach from day to day cause, I made fast a piece of lint to a ligature, just large enough to pass through the orifice into the stomach, and then with the end of the probe pushed it on the inside, and suspended by the ligature, drew it up against the inside of the orifice, so as to stop the food from flowing out upon the inner side, and by this means suffering the granulations from the edges of the wound to contract nearer each other around the small ligature." When the wound

<sup>1</sup> Myer, Jesse S. Life and Letters of Dr. William Beaumont, St. Louis, C. V. Mosby Company, 1912. Dr. William Beaumont, Bull. Soc. M. Hist. Chicago 1, 150 (March) 1913.

healed there was still an opening into St Martin's stomach from which gastric juice could be collected and the process of digestion observed. Three years after the accident the idea occurred to Beaumont to undertake a series of experiments. These were scarcely started when Beaumont was ordered to Fort Niagara, however, he obtained leave of absence to take St Martin on a visit to scientists in the East. On this journey St Martin skipped out to Canada and Beaumont could get no trace of him. Four years after St Martin's disappearance the American Fur Company found him and brought him and his family to Beaumont, who then was stationed at Prairie du Chien. St Martin was in good health. The aperture into his stomach was still open and the experiments were continued. In 1831 a leave of absence was granted to take St Martin abroad to other scientists, but the Black Hawk Indian War started and Beaumont had to remain with the troops. When the war ended he took St Martin to Washington, where he began a third series of experiments and reviewed the literature on digestion. With bottles of gastric juice Beaumont visited Prof Benjamin Silliman of Yale University and Prof Robley Dunglison of the University of Virginia. Silliman suggested sending a specimen to Bertzelius in Sweden as the man to make the chemical analysis. A bottle of gastric juice was given to the Swedish consul in 1833, with a letter of introduction from Silliman. Beaumont was eager to learn from any source about that "great solvent in the gastric juice." The most disappointing of all his replies was from Bertzelius.

#### SCIENTIFIC SOCIETIES INTERESTED

With the fourth series of experiments completed, St Martin again went to Canada with the understanding that he would return and go with Beaumont to St Louis, to which city he had been ordered. Scientific societies now desired to study St Martin's case. Among those interested were the American Physiological Society, the British Medical Association and Claude Bernard in Paris. Sixty-five letters passed between St Martin and those endeavoring to bring him back. Beaumont finally sent his son to Canada, but St Martin refused to return. St Martin lived until 83 years of age. Although William Osler tried to obtain permission for a necropsy, offering the family a fair price for the stomach that it might be placed in the Army Medical Museum in Washington, the family resisted all requests. Beaumont's four series of experiments on St Martin numbered 238 in all, from which work he made fifty-one deductions. Many of his deductions are accepted today.

Beaumont's second resignation from the Army was accepted by the President effective Dec 31, 1839. He remained in St Louis in the practice of medicine until his death, April 25, 1853. To

his grave in Bellefontaine Cemetery the St Louis Medical Society makes an annual Pilgrimage on Beaumont's birthday.

#### A HARVARD CLASS AFTER TWENTY YEARS

The members of a class who were seniors at Harvard Medical School twenty-two years ago were asked to state what type of medical practice they had been most attracted to when they entered medical school and what they planned to do now. The record of these replies was recently found by Dr William H Barrow, who reviews them in the *Harvard Medical Alumni Bulletin* of October 1938. Sixty-two of the class of seventy-five are included in this study. The country went to war when most of the members of the class were serving their internships, and yet about 18 per cent of them have achieved the goals they set up for themselves on entering school. Another 3 per cent, although having different preferences in their first and fourth years, are now engaged in a specialty originally chosen. Another 21 per cent changed their preferences during their medical course but are now in the kind of practice chosen in the fourth year. Thus a total of 42 per cent of the sixty-two members of the class of 1916 have kept to the courses originally charted, in spite of the World War and the vicissitudes of practice. On the other hand, 27 per cent who throughout the school period pointed toward a chosen specialty are now in a different type of practice. The largest group, 31 per cent, comprises those whose first year choice, fourth year choice and present practice are all different.

While 27 per cent aspired to be surgeons in their senior year, only 5 per cent are now engaged exclusively in surgery. Eighteen per cent were attracted by internal medicine before graduation, but only 10 per cent now limit their practice to internal medicine alone. Gynecology and obstetrics fell from 11 to 6 per cent. Only 15 per cent of the class on graduation chose general practice, but those ranks have increased now to 30 per cent. The percentages of men engaged in other specialties than those mentioned are 8 per cent in orthopedics, 5 per cent each in public health, otolaryngology and neuropsychiatry, and 3 per cent each in ophthalmology, urology and medical administration. Physiology and pathology, radiology, physical therapy, anesthesia and the United States Army Medical Corps each claim one man from the class. The type of internship chosen by this class followed closely the intentions of the graduates at that time. About 37 per cent took straight surgical, 31 per cent straight medical and 16 per cent rotating internships.

An interesting fact brought out by this study was that only three of the sixty-two men have

died, a mortality rate far below the expected mortality. Furthermore, the professional "mortality" is 0, as all the living members are still engaged in the practice of medicine or in allied science. Thus medicine seems to have an appeal that holds "till death do us part" or, as Dr Barrow suggests, perhaps the training has so fashioned us that there is no avenue of escape.

### THE CONSISTENCY OF UNIVERSITY EXAMINATIONS

The reliability of examinations as a guide to the ability of the candidate and his fitness for further study is a controversial subject. An investigation was made by Dr W G Millar<sup>1</sup> into the correlation existing in grades recorded in certain medical subjects at the University of Edinburgh. The third year teaching and examining at this university are done differently than in most medical schools. In the school year 1928-1929 an important change was introduced and since then the teaching in pathology, bacteriology, pharmacology, therapeutics, medicine and surgery has been coordinated so that the student is taught all aspects of a particular disease at the same time. If the subject being taught in medicine is valvular heart disease, for example, the subject taught in pathology will be endocarditis, in bacteriology, streptococci and the bacteriology of acute rheumatism, and in pharmacology and therapeutics, the actions and uses of the digitalis group of drugs.

With this coordinated teaching, the examinations are also coordinated, being held in spring and summer. In each case the departments concerned are grouped together and share questions. A question may be asked on the pathology of pyelonephritis, the surgical treatment of renal calculus and the bacteriology of urinary infections, while medicine, and pharmacology and therapeutics might share a question on heart disease. Each part of the question is written in a separate book and marked by the department concerned. Before each examination the heads of the six departments and the lecturer meet to map out the questions, and they meet again after each examination to consider the results. The grades made by each candidate in each subject are set out on a schedule and the candidate's claim to a certificate, after having done the work of the class which admits him to the professional examination, is considered jointly by the six examiners. The borderline cases especially are fully considered. The general impression of all who have had to do with the joint examination is that a candidate's "form" from one subject to another is remarkably constant.

To confirm the impression of uniformity of performance, correlation coefficients were calculated between each of the six subjects for each year of a six year period. No repeaters were included in the study, and only the marks of those who attended the whole of each examination were taken.

#### THIRD AVERAGE MARK MADE

The second part of the analysis was an attempt to assess the prognostic value of the combined examination and to compare it with that of the preceding and succeeding professional examinations. The figures correlated consist in the average mark made in the respective examination as a whole. In the first professional examination were averaged the written and oral or practical in botany, physics, chemistry and zoology, and in the second likewise in physiology and anatomy, in the combined examination, the average of written papers in pathology, bacteriology, pharmacology, therapeutics, medicine and surgery, in the third professional examination, written and oral or practical in pathology and bacteriology and in pharmacology and therapeutics, in the final written and oral, forensic medicine and public health, midwifery and gynecology, medicine and surgery, clinical medicine and clinical surgery.

A tabulation shows the values of the correlation coefficient between the six subjects of the combined third year examination for the six years. The high values of the correlations coefficient obtained indicate that the performance of the candidate, even though judged in six different subjects and independently by three or four different examiners in each subject, remains very constant. Correlations were also calculated between the final and other professional examinations and the combined examination for a large group of students. These also showed a very high degree of correspondence. The results of the analysis of the data on the six subjects for the six years indicate that the examinations considered form a reliable guide to the students' academic capabilities.

### TO THOSE UNDERTAKING THE PRECLINICAL SCIENCES

By Dr P M F Bishop Slightly abridged from *Guy's Hospital Gazette*, Oct 22, 1938

The first three years in the life of the medical student are supposed to be the dullest. This is because the subjects studied in the preclinical period are considered by many to be purely academic and to have little bearing on the practical training of surgery, medicine or general practice.

Banish this idea completely from your mind when you enter the medical school. It is true

<sup>1</sup> Millar W Gilbert Consistency of University Examinations, Brit M J 2 1209 (Dec 12) 1936

that you will have to work to a syllabus and that the knowledge you acquire will be determined to a large extent by the requirements of those examinations which must be successfully negotiated before you can enter the wards, where at last you will be dealing with living and dying patients. But there is a reason for everything you will learn in your preclinical studies, and that reason is based fundamentally on the experiences of clinical medicine. The first action of many students when they pass the examinations in anatomy and physiology is to set fire to their notes and to try to get a decent secondhand price for their textbooks. Then they feel they can start afresh on a new life, the life of the wards. But though the medical school is separated from the medical and surgical wards by a spacious park, they are much more intimately united as far as their activities are concerned.

For example, the three subjects organic chemistry, chemical physiology and clinical chemistry, you will find, are so closely linked together that it has been found desirable for the chemistry department and the chemical physiology laboratory to work largely in conjunction with each other, while the methods taught in the course of chemical physiology are those which are used subsequently in the clinical chemistry which is practiced in the wards.

The preclinical sciences are designed as a careful preparation for the subsequent clinical work, and if this is fully realized a new interest will be awakened in biology, physics, chemistry, anatomy, physiology and pharmacology.

#### RELATIVE FREEDOM

Most of you will have come to Guy's straight from school, and when you arrive you will be impressed with the relative freedom with which you are endowed. A record of attendances at lectures and practical classes is kept, mainly for the purpose of qualifying you for the examinations. You must realize, however, that these classes are designed to assist you in your work and not to compel you to work. Your life is in your own hands now. If you wish to take an intelligent interest in the manifold activities of the medical school and of the life of the hospital, you will be amply repaid. If you abuse the freedom which is given you by escaping from these activities, no one will miss you and no one will care very much. Medicine is a hard training for those who have no inherent interest in it, and the time to develop and cultivate that interest is as soon as you enter the medical school.

Do not become onesided. Remember that as a doctor you will come in contact with all kinds and classes of men and women, and you will be expected to take an intelligent part in conver-

sation and to express a reasonable opinion on subjects not directly concerned with medicine. There is no one more boring and depressing than a doctor who has no outside interests, unless it is a group of doctors who are incapable of talking anything but "shop" to one another.

Finally, pay particular attention to taking regular exercise. This not only brings you in contact with your fellow students but is essential from the point of view of your health. The borough is not the most salubrious place to live or work in, and hospital life is strenuous. Try as far as possible to develop an immunity to disease while you are still in the medical school, by keeping fit and in training.

#### THE FINANCING OF UNIVERSITY EDUCATION

Returns from universities and colleges in Great Britain which receive treasury grants, reported by the University Grants Committee, show that there were nearly 50,000 full time and 13,000 part time students engaged in courses of instruction in the academic year 1936-1937. Some decrease in the number of entries has occurred since 1933-1934, while in the nine previous years there was an increase in the total number of students each year. The *Lancet*<sup>1</sup> points out that the present decrease in the number of full time students falls in the arts and pure science groups. The medical group, with 13,263 full time students, represented more than a quarter of the total and was the second largest group of all. Of the full time advanced students, that is, those taking a higher degree or engaged in research, only 6 per cent were in medicine, but of part time advanced students more than 25 per cent of the total were taking medical subjects. Of all subjects, chemistry attracts the largest number of male advanced students, followed by surgery, history, physics, medicine, law and economics. With women, the order of popularity for the higher degrees is research, history, education, English, psychology, botany and French.

The total income of the institutions concerned is nearly six and a half million pounds, 36 per cent of which was supplied by parliamentary grants, 85 per cent by grants from local authorities, 31 per cent by fees for tuition, examination and the like, 14.8 per cent by endowments and 2.4 per cent by donations and subscriptions. Of the fifty-nine institutions to which this report relates, ten balanced their accounts and thirty showed a surplus of income over expenditure, and of those which showed a deficit only nine exceeded £1,000.

<sup>1</sup> The Financing of University Education *Lancet* 1 1105 (June 18) 1938

## Medical College News

*Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items to be considered for publication in the Student Section*

### Examination for the Army Medical Corps

The War Department has announced an examination, March 20-24, for the purpose of qualifying candidates for appointment as first lieutenants in the medical corps, regular army, to fill vacancies occurring during the next calendar year. The examination is open to all male graduates of acceptable medical schools who have completed one year's internship in an approved hospital or who will complete such an internship June 30 and who will not be over 32 years of age at the time it will be possible to tender a commission. Those doctors who do not complete their internships until June 30 will not be eligible for appointment until July 1. The examination will be conducted by boards of medical officers convened throughout the United States and will consist of a physical examination, a written examination in professional subjects and a determination of the candidates' adaptability for military service. Full information and application blanks will be furnished on request addressed to the Adjutant General, War Department, Washington, D. C. Applications will not be considered after March 4.

### Examinations for Internships in Naval Hospitals

An examination is held in November each year for senior medical students of class A medical schools who desire to obtain an internship in one of the United States naval hospitals. Senior medical students who qualify for appointment to an internship will be appointed acting assistant surgeons with rank of Lieutenant (junior grade) for temporary service during the intern year. On satisfactory completion of the internship, the intern will be allowed to appear for competitive examination for appointment as assistant surgeon with the rank of Lieutenant (junior grade) in the medical corps of the navy. Should the intern desire to return to the practice of medicine in civil life, his appointment as an acting assistant surgeon will be terminated and he will be honorably discharged from the naval service. To be commissioned in the medical corps of the navy the candidate must be a citizen of the United States between 21 and 32 years of age and he must pass both professional and physical examinations. On accepting an appointment as acting assistant surgeon for internship, the officer will receive a compensation of \$2,699 a year if he has no dependents, and \$3,158 a year if he has dependents. Successful candidates for appointment as interns will be appointed in July and will be assigned for internship to a naval hospital either in Boston, New York, Philadelphia, Washington, D. C., Norfolk, Va., San Diego, Calif., or Mare Island, Calif. The period of internship is one year, is rotating and consists of about five months medical, five months surgical and two months laboratory duties. For additional information address the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

### Internships in the Marine Hospitals

The U. S. Public Health Service desires to receive applications for appointments as second year interns in the marine hospitals operated by the service. Applicants must not be over 30 years old, must have graduated from accredited medical schools and must have completed one year's internship at approved hospitals by next June. Second year internships at marine hospitals are similar to residencies in general hospitals.

Appointees will receive a gross pay of \$1,800 a year, from which a deduction of \$690 a year will be made if quarters, subsistence and laundry are furnished. Those assigned to the federal penal and correctional institutions will receive \$1,620 a year, from which \$240 will be deducted if quarters, subsistence and laundry are furnished. It is especially desired to receive applications from candidates who are interested in the service as a career, and appointments will be made with the understanding that opportunity will be afforded to take the next examination for appointment as assistant surgeon. The rank of assistant surgeon corresponds in pay and allowances to that of first lieutenant in the U. S. Army. Those who wish to make application should communicate at once with the Surgeon General, U. S. Public Health Service, Washington, D. C., stating definitely that they are interested in a second year internship and giving the earliest date of their availability.

### Dr. James B. Herrick Honored

At the 194th convocation of the University of Chicago the honorary doctorate of science was conferred on Dr. James B. Herrick, who for thirty-seven years was a member of the faculty of Rush Medical College. Dr. Herrick is internationally known for his work on coronary thrombosis. Born in Oak Park, Ill., in 1861, Dr. Herrick was educated at the University of Michigan and Rush Medical College, receiving his degree from the latter institution in 1888. He was a founder and the first president of the Chicago Society of Internal Medicine. Dr. Herrick has been president of the Institute of Medicine of Chicago, of the American Heart Association, of the Association of American Physicians and of the Congress of American Physicians and Surgeons. In 1930 he received the Kober Medal of the Association of American Physicians for research in scientific medicine. The University of Michigan conferred the honorary degree of doctor of laws on him in 1937.

### Annual Dinner and Students Clinic Day at Wayne University

The annual dinner of the faculty, students and alumni of Wayne University College of Medicine, Detroit, December 15, at the Detroit-Leland Hotel, was attended by more than 400 and was the climax of a day of clinics and discussions at the college, in which the students organized and carried through four sections of papers and discussions. Members of the faculty had no part in the preparation of papers and clinics but selected from all six that were considered the most excellent, and from these they decided on two for first and second prizes. The first prize was presented by Dr. Raymond B. Allen, dean of the college, to Dr. Kenneth Campbell, Toronto, for his paper on "Alterations in Gastrointestinal Motility, Following Increased Pressure in the Upper Urinary Tract." The prize was the Dr. Max Ballin memorial award medal and \$20, contributed by Drs. Robert C. Moehlig and Norman M. Allen, to which the college faculty added another \$10. The second prize was won by Charles Merckel for his paper on "Comparison of the Effects of Estrone and Testosterone," which was a faculty cash award of \$15.

The prize for the best clinic conducted by the students during the day was awarded, by vote of the

students, to the clinic on electrocardiography. The prize was the Dr. Walter I. Wilson I Memorial Medal and \$20, contributed by Dr. Walter J. Wilson Jr., to which the college faculty added \$10. The chairman of this clinic was Benjamin Jeffries, who was assisted in the demonstration by William F. Goins, Thaddeus S. Huminski, Melvin Silverman and Marvin Schwartz.

Dr. Arthur E. Hertzler, Holstead, Kansas, gave the after dinner address on "How to Get an Education in Spite of the Faculty." Dr. Hertzler is author of the recent best seller, "The Horse and Buggy Doctor."

#### Scholarship Award at Vanderbilt

An annual scholarship award of \$500 has been established by Dr. Ben Witt Key, New York, to some senior of the Vanderbilt School of Medicine, Nashville, Tenn. The award will be effective on the next graduation in June. The winner of the cash award will be that member of the graduating class who is adjudged the best scholar. A committee of three members of the faculty of the School of Medicine will be appointed yearly by the dean, who may also be a member of the committee. The committee is to be governed in its rating of the candidates on the basis of three qualifications: high scholastic rating for the entire period of enrollment in the school (fifth highest or better in the class), outstanding ability in understanding and employing scientific methods of work, the superior traits of character and personality.

Dr. Key received his degree of B.A. from Vanderbilt University in 1905 and graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1909.

#### National Board Questions in Bacteriology

Following are the questions used by the National Board of Medical Examiners in bacteriology and immunology in part one of the examination held Sept. 12-14, 1938.

Answer any five questions. 1. Describe the characteristics of Bacterium tularensis. How is this infection acquired by man? 2. What are the chief pathogenic organisms of the Rickettsia group? Name two diseases caused by them. 3. Outline the method of testing the bactericidal action of a phenoloid disinfectant. 4. What are the three main types of the tubercle bacillus? How is each type identified? 5. Describe echinococcus disease in man. State how the infection is transmitted. How is the diagnosis made? 6. Define the unit of diphtheria antitoxin. How is the potency of a sample of diphtheria antitoxin determined? 7. Describe a bacterial complement fixation test.

#### Fellowship for Women Physicians

The Women's Medical Association of the City of New York announces that the Mary Putnam Jacoby Fellowship of \$1,000 for one year is available for graduate work in the medical sciences. It is open to any woman graduate of an approved medical school, who must be endorsed by the head of the department in which her previous work has been done. The recipient must give full time to the study, which should preferably be made abroad or, if not resident in the United States, she should study in the United States. Applications for 1939-1940 should be filed with the chairman of the committee on or before April 1 and must be accompanied by statements as to health, educational qualifications, proposed problem for investigation and a photograph of the applicant. A report for publication will be required at the completion of the fellowship. The chairman of the committee is Dr. Annie S. Daniel, New York Infirmary, 321 East Fifteenth Street, New York.

#### Dr. Julius Bauer Comes to Louisiana

The dean of the Louisiana State University Medical Center, New Orleans, Dr. Joseph Rigney D'Aunoy, announced Dec. 8, 1938, the appointment of Dr. Julius Bauer of Vienna as clinical professor of medicine effective in January of this year. Dr. Bauer, a native of Bohemia, graduated in 1910 from the University of Vienna and later was appointed docent and professor of internal medicine. In the meantime he had served as demonstrator and assistant in the Neurologic Institute and in the medical clinics of Professors Strumpell and Neusser. He was also assistant in the university clinic at Innsbruck and in the general polyclinic of Vienna. In 1928 he was put in charge of the medical department, formerly directed by Professor Kaufmann. Dr. Bauer has more than 200 publications to his credit, and his five books have been translated into other languages. In 1928 Dr. Bauer delivered the convocation address at the meeting of the American College of Physicians in New Orleans. In 1932 he delivered the Harvey lecture in New York and he has lectured in many other cities. He is an honorary member of the St. Louis Medical Society.

#### Research on Experimental Neurotic Behavior

A prize of \$1,000, awarded annually by the American Association for the Advancement of Science for a scientific paper presented at the meeting, was given at Richmond, Va., to Norman R. F. Maier, Ph.D., professor of psychology at the University of Michigan, Ann Arbor, for his paper entitled "Experimentally Produced Neurotic Behavior in the Rat."

#### Loyola Students Participate in Symposium

The three honorary medical fraternities of Loyola University School of Medicine, Chicago, sponsored a symposium on peptic ulcer given at Mercy Hospital on the evening of Dec. 13, 1938. Introductory discussions on the pathology, physiology and anatomy of peptic ulcer were given by three senior medical students, Alfred H. Benson, representing Lambda Rho, who outlined the pathology, Louis J. Belniak, representing the Volini Society, who discussed the physiology, and Hobart H. Todd of the Moorhead Surgical Seminar, who reviewed the anatomy of peptic ulcer. Then Dr. Karl A. Meyer and Dr. Maximilian J. Hubeny, both of the Cook County Hospital, discussed the surgical and roentgenologic phases of the subject, and Dr. Fred M. Drennan, clinical professor of medicine of Loyola University, discussed the internist's point of view. Invitations were extended to the faculty, student body and members of the staff of the hospitals affiliated with Loyola. This symposium is the first of a series of three planned for this school year.

#### Scholarships at Michigan

On the recommendation of the Committee on Scholarships of the Executive Faculty of the University of Michigan School of Medicine, Ann Arbor, the annual scholarship awards were recently made. Nicholas Lentini received the Misses Armstrong Scholarship, Joseph Henry Kerzman, Miss Elizabeth J. Kitchen and John W. Warren Jr. were awarded the University Scholarships in Professional Schools, the Agnes C. Weaver Scholarships were granted to Malcolm Block and Warren Campbell Hastings, and Samuel Stearns received the Sally Curry Scholarship. The Walter R. Parker Fellowship in ophthalmology for the current year has been awarded to Dr. William J. Stellwagen, instructor in ophthalmology.



### Staff Members Appointed to Faculty

With the affiliation between New York University College of Medicine and the Queens General Hospital during the past year, more than twenty members of the hospital staff have been appointed to the faculty of the college of medicine. Among the appointments were

Dr. Carl Boettiger, clinical professor of medicine  
 Dr. Frank R. Mazzola, assistant clinical professor of medicine  
 Dr. Harry P. Muncken, clinical professor of obstetrics and gynecology  
 Dr. Walter C. A. Steffen, clinical professor of pediatrics  
 Dr. Henry A. Reisman, assistant clinical professor of pediatrics  
 Dr. Frank N. Dealy, clinical professor of surgery  
 Dr. Frederic G. Meynen, assistant clinical professor of surgery

In addition, Dr. Thomas K. Davis has been appointed clinical professor of neurology and the following have been promoted: Drs. Frank C. Combes, to assistant professor of dermatology and syphilology, Timothy J. Riordan, assistant clinical professor of dermatology and syphilology, and Evan W. Thomas, assistant professor of dermatology and syphilology.

### Entertain Women Interns and Senior Students

The senior medical students and the women interns of Chicago were entertained by the Medical Women's Club, the Council of Medical Women, and Branch two of the National Medical Women's Association at a dinner December 14, following which a program of entertainment was presented. Dr. Carroll C. L. Birch, assistant professor of medicine, University of Illinois College of Medicine, was chairman of the committees in charge.

### St. Louis University School of Medicine

Dr. Henry Pinkerton has been appointed director of the department of pathology at St. Louis University School of Medicine, St. Louis, to enter on his duties at the beginning of the new year. Dr. Pinkerton has been assistant professor of pathology at Harvard University School of Medicine, Boston. William Bruer has been appointed professor of dental pathology at St. Louis University, formerly he was director of the dental clinic at the University of Innsbruck, Germany.

### California Personal

Floyd DeEds, Ph.D., in charge of the pharmacology research unit, food research division, U.S. Department of Agriculture and research associate, department of pharmacology, Stanford University School of Medicine, San Francisco, has been promoted to principal pharmacologist.

### The Judd Lecture at Minnesota

Dr. Dallas B. Phemister of Chicago, professor of surgery at the University of Chicago, will give the sixth E. Starr Judd Lecture at the University of Minnesota, Minneapolis, in the Medical Science Amphitheater on Wednesday, February 1, at 8:15 p.m. The subject of Dr. Phemister's lecture is "Pathogenesis of Gallstones." The late Dr. Edward Starr Judd, an alumnus of the Medical School of the University of Minnesota, established this annual lectureship in surgery a few years before his death.

### Scholarship at Woman's Medical College

The Woman's Medical College of Pennsylvania, Philadelphia, announces that a tuition scholarship of the value of \$400 will become available to a student entering the first year of the medical course in September and will be awarded on the basis of a competitive oral and written examination, to be held

at the college April 1. The competition will be open only to students of superior premedical record who furnish convincing proof of need of this assistance. Candidates will be required to fill out a special form of application for admission to the examination. For further details apply to Assistant to the Dean, Woman's Medical College of Pennsylvania, East Falls, Philadelphia.

### Scholarship Awards at Temple

Four students in the Temple University School of Medicine, Philadelphia, recently received the scholarship merit award of the General Alumni Association. These students were John B. Roxby Jr., Swarthmore, Pa. (freshman), Maurice L. Brown, Philadelphia (sophomore), Norman Learner, Philadelphia (junior), and Henry T. Wycis, Leechburg, Pa. (senior).

### Harvard Awards Melvin Scholarships

The award of James C. Melvin scholarships to the following students at the Harvard Medical School, Boston, was recently announced: Bertrand E. Bennett, Newton, Mass.; Kenneth T. Bird, Watertown, Mass.; Tague C. Chisholm, Boston; Philip G. Creese, Danvers, Mass.; David Dove, South Sudbury, Mass.; Arthur R. Hartwig, Lawrence, Mass.; Lawrence Kilham, Boston; Julian Nieckoski, Deerfield, Mass.; Robert J. Tracy, Concord, Mass.; Paul F. Ware, Clinton, Mass.; and Earle H. Webster, Bridgewater, Mass.

### Pennsylvania State Board Questions

The following list of questions in gynecology and obstetrics was submitted by the Pennsylvania State Board of Medical Education and Licensure at the examination in Harrisburg, January 4.

1. Discuss the etiology, symptomatology and diagnosis for the various forms of vaginitis. Outline treatment of one of these conditions.
2. Discuss the differential diagnosis between early and incomplete abortion and tubal pregnancy.
  1. Give the arguments for and against the treatment of incomplete (partial or marginal) placenta previa by cesarean section.
  4. Describe the various methods of constructing an artificial vagina. Tell something of the advantages and disadvantages of each and describe one of these procedures in detail.
  5. Given a woman, age 66 years, who had a hysterectomy at the age of 30 and who in the past six months has developed a painless but marked distention of the abdomen, describe in detail the differential diagnosis and suggested procedure in treatment.
  6. Give the etiology, symptomatology and pathology of salpingitis. Give your method of treatment.
  7. Discuss the complications of labor which may develop by reason of a funnel (android) pelvis.
  8. Describe the various malpositions of the uterus. Tell the causes of each and describe the treatment for these various malpositions.
  9. In the case of a childless marriage, how would you investigate the male and the female for sterility? What treatment would you institute to try to induce the woman to become pregnant?
  10. How would you diagnose threatening endo uterine asphyxia of the fetus during labor? How would you manage such a case?

### Instruction on Tuberculosis at Tulane

Dr. Julius L. Wilson, associate professor of medicine at Tulane University School of Medicine, New Orleans, is now full time instructor at the school assigned in the field of tuberculosis and other diseases of the chest. State and parish tuberculosis organizations were instrumental in promoting this form of instruction for medical students and Dr. Wilson's services will be available to them for community campaign work. He graduated from Johns Hopkins University School of Medicine, Baltimore, in 1923 and comes to Tulane from the Yale University School of Medicine, New Haven, Conn., where he was assistant clinical professor and in charge of the tuberculosis division of the William Wirt Winchester Hospital.

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## THE ETIOLOGY AND PATHOGENESIS OF ALCOHOLIC CIRRHOSIS OF THE LIVER

CHARLES L CONNOR MD  
SAN FRANCISCO

In order to orient the subject of alcoholic cirrhosis and to understand the differences between it and other cirrhoses of the liver, it is necessary first to review briefly from an etiologic and anatomic point of view the types encountered, as nearly as this is possible at the present time. In a classification the terms Laennec's and atrophic cirrhosis must be abandoned. "Laennec's cirrhosis" means exactly nothing when a proper separation of types is attempted. To clinicians it may imply a symptom complex, but this can be imitated by so many conditions, such as syphilis or carcinoma of the liver, that even in that sense the term can be of but little value. "Atrophic cirrhosis" is more informative to the pathologist, as it occurs most commonly after large amounts of liver tissue have been destroyed, but "atrophic" is only a relative term, used differently by different observers and varying in significance with each. Its use tends only to confuse the subject.

Cirrhosis, originally meaning a color, has come to connote diffuse fibrosis of the liver affecting all lobes in about equal degree. Because of condensation of the fibrous tissue with resultant shrinkage and because of more or less regular lobular regeneration or over-regeneration of liver cells, the liver may become nodular or "hobnailed." Some livers may be markedly cirrhotic (fibrotic) without having this surface irregularity. The classification which follows explains some of the differences which may be recognized and is meant only to clarify this paper. It is essentially a modification of that used by Mallory<sup>1</sup> years ago.

1. Toxic cirrhosis is the cirrhosis following necrotizing lesions of the liver, which when severe are called acute or subacute yellow atrophy or hepatitis and when "chronic" are usually recurring attacks of the same condition. In this type there is loss of liver cells, which have been completely broken down, with the soluble

material absorbed and the insoluble phagocytized by small and large leukocytes. Collapse of the stroma follows, and, while fibroblastic proliferation may occur, much of the sclerosis is due to condensation of the pre-existing fibrous tissue and obliterated vascular framework. This produces the smallest and most irregular livers, depending on the degree of destruction and the amount of regenerated liver. Among the causes are phenylcinchoninic acid (cinchophen, atophan), arsenic compounds, severe thyrotoxicosis, so-called acute catarrhal jaundice and acute infectious jaundice (ictero-hemorrhagic leptospirosis, Weil's disease). Frequently the cause of the preceding necrosis is unknown. It occurs in children, women and men, alcoholic or non-alcoholic, indiscriminately.

2. Biliary cirrhosis is a type of portal cirrhosis, as the lesions begin in the portal areas around bile ducts. It is always associated with biliary obstruction, with or without infection. The common causes are therefore common duct stones, carcinoma of the head of the pancreas or the ampulla and a group of miscellaneous conditions such as adhesions around the common or hepatic ducts following infections. The liver is at first large, tense and green. It is nodular even in the early stages because of hepatic swelling and consequent bulging of the surface lobules. The lesion is inflammatory, manifested by accumulations of macrophages, lymphocytes and occasional polymorphonuclear cells, and accompanied by fibroblastic proliferation. While bile is dammed back to the centers of lobules, the irritating effect is produced where bile canaliculi normally join with bile ducts at the periphery. The severity depends on three variable factors: the degree of obstruction (partial or complete), the length of time the obstruction exists and the presence or absence of infection. On these factors also depends the end result, whether the liver returns functionally to normal if the obstruction can be relieved or whether it contracts sufficiently to cause permanent portal obstruction.

3. Pigment cirrhosis is another type of portal cirrhosis. It is most commonly associated with the accumulation of iron-containing pigments in the disease hemochromatosis. Milder degrees have been found with pernicious anemia, particularly after a large number of blood transfusions have been given. A similar condition has been produced by feeding copper to animals, mostly rabbits.<sup>2</sup> A few cases have been reported in workers with copper. The irritating pigments and metals collect around the periphery of lobules and cause a macrophage and fibroblastic proliferation from the periportal connective tissues. The liver is not generally decreased in size and has a relatively smooth surface.

From the Division of Pathology, University of California Medical School.

Read before the Section on Pathology and Physiology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

Material for this paper was collected for ten years from the University of California Hospital, the University of California Service of the San Francisco Hospital (Department of Public Health), the San Francisco coroner's office through the courtesy of Dr. T. B. W. Leland and the cooperation of Dr. Jesse L. Carr; information supplied by the late Dr. A. A. O'Neill, former city prison physician and experiments on the effects of alcohol on animals conducted in collaboration with I. L. Chaikoff (Connor, C. L. and Chaikoff, I. L., *The Development of Cirrhosis in Fatty Livers*, *Arch. Path.* 25: 761 [May] 1938). The paper is a condensation of a report to be published in greater detail later.

<sup>1</sup> Mallory, F. B., *Cirrhosis of the Liver: Five Different Types of Lesions from Which It May Arise*, *Bull. Johns Hopkins Hosp.* 12: 69, 1911.

<sup>2</sup> Mallory, F. B., Parker, F. Jr. and Nye, R. N., *Experimental Cirrhosis Due to Copper and Its Relation to Hemochromatosis*, *J. M. Research* 42: 461 (Oct-Dec) 1921.

<sup>3</sup> Footnote deleted on proof.

4 Fatty cirrhosis is a third type of portal cirrhosis, in which the lesions develop around lobules, joining the portal areas into continuous bands of fibrous tissue. It results from pressure atrophy of cells and hyaline and fatty degeneration of cells at the periphery of lobules followed by fibroblastic proliferation. It is caused most commonly by or is associated with long-continued alcohol poisoning and diabetes mellitus with which there has been a preceding fatty infiltration of the liver. It has been experimentally produced by feeding carbon tetrachloride<sup>4</sup> and phosphorus<sup>5</sup> and in depancreatized dogs<sup>6</sup>. Fatty infiltration and occasionally cirrhosis may occur in cases of hypothyroidism or lesions of the pituitary and midbrain as in cases of progressive lenticular degeneration (Wilson's disease). In all these there has been an alteration in lipid or carbohydrate metabolism or both.

This grouping does not include the scarred liver resulting from adventitious focal necroses, healed abscesses or healed syphilis. The effects of such lesions if any, depend on their position and extent. They are not progressive, are not uniform and usually are not diffuse, and symptoms resulting from them are due to accident of position. The diffuse fibrosis of healed congenital syphilis is a pathologic curiosity. I know of no specific type of cirrhosis associated with so-called Banti's disease.

It can be seen from the foregoing that the lumping of all types of diffuse fibrosis of the liver under the general term "cirrhosis" has no meaning. The often repeated assertion that alcohol cannot cause cirrhosis of the liver because women and children who have never drunk alcohol get cirrhosis seems more than a little absurd. Clinical differentiation on a basis of causation is frequently not easy, but until the attempt is made a rational understanding of the disease is not possible.

There can be little doubt now that alcohol and the habits induced by the consumption of large amounts of alcohol are the most important factors in the production of fatty liver, which passes on in some cases to cirrhosis. A careful review of 130 histories of cases in which cirrhosis or fatty liver or both were found revealed that the factor next in importance to alcohol is the abnormal diet which invariably accompanies severe chronic alcoholism. One can further reduce this to a specific lack of sufficient carbohydrate in the diet.

After the fact is established that chronic severe fatty infiltration of the liver would in time become cirrhosis, the search for etiologic agents narrows down to the condition which will produce the first stage. Fatty infiltration of the liver occurs with a large number of diseases and is incidental to poisoning by such substances as phosphorus, chloroform, carbon tetrachloride and alcohol. The most common spontaneous disease in man with which long-continued severe fatty infiltration is associated is diabetes. The same condition occurs in depancreatized dogs with diabetes, and if such dogs are kept alive long enough a cirrhosis of the liver develops which is indistinguishable from the fatty cirrhosis occurring in man<sup>6</sup>. Thus the occasional cirrhosis which has been noted for many years in diabetes mellitus has been explained. In this disease the fatty infiltration is due to the lack of proper sugar metabolism and the incomplete oxidation of fat. The storage of fat in the liver

is accompanied by a markedly reduced respiratory quotient. Himwich and Fazekas<sup>7</sup> have recently shown that the respiratory quotient of liver tissue itself in experimental diabetes becomes as low as 0.57, far below that found when fat alone is being consumed. With such a lowered carbon dioxide oxygen ratio it must be assumed that very little carbohydrate, if any, is being utilized. Two factors bring about the same physiologic condition in chronic alcoholism. Alcohol itself interferes with carbohydrate metabolism and fat oxidation because of its action as a cell and tissue toxin,<sup>8</sup> and because of starvation or lack of carbohydrate in the diet. Sugar is withheld from the metabolic cycle. According to Higgins<sup>9</sup> the respiratory quotient drops to 0.667 in alcoholic intoxication. In starvation it may be below 0.7. From experiments by Himwich,<sup>7</sup> and Elliott and Baker<sup>10</sup> it is evident that the respiratory quotient of liver tissue itself under such abnormal conditions is always lower than the respiratory quotient of the body as a whole. It seems evident then that when two factors are operating, alcohol and starvation or alcohol plus a protein fat diet, all of which cause a marked lowering of the respiratory quotient, the liver will accumulate unoxidizable fat and that liver cells will be deprived of oxygen and nutrition. The liver becomes an unnatural storehouse of fat and approaches, so far as oxygen carbon dioxide exchange is concerned, the normal fat storage tissues of the body, in which this is very low. There is then a complete depletion of glycogen from the liver, the absence of which renders it more susceptible to all poisons of this nature.

The usual effect of relative anoxia on cells in general pathologic processes seems to be enhanced in the liver. I refer to the type of cell degeneration which accompanies a decrease of oxygen in tissues below the amount necessary for normal function. This results, in whatever organ concerned, in a slow atrophy of cells, frequently manifested also by coagulation and hyaline degeneration of the cytoplasm. When more acute and more severe restriction of oxygen takes place, necrosis of cells, with or without fatty degeneration, occurs. In both cases fibrous tissue develops, partly as a direct result of relative anoxia and partly as a reparative process following death of cells. These processes occur in the liver when the physiologic condition just described is produced by alcoholic poisoning and the consequent restriction or inhibition of carbohydrate metabolism becomes severe (Connor<sup>10a</sup>).

By alcoholic poisoning and severe chronic alcoholism I mean the constant consumption of sufficient alcohol in any form to alter materially the normal carbohydrate fat metabolism or the consumption of large amounts so frequently that normal metabolism may not be reestablished in the intervals. To comprehend this the ordinary drinker must discard his somewhat naive and amateurish conception of what constitutes a "heavy drinker." One is astounded to learn, that a "two bottle man" means a 2 quart bottle man and not two pints a day and that men, and now very frequently women, may consume a gallon or more of sherry wine (from 20 to 22 per cent alcohol) in twenty-four hours, and one

4 Lamson P. D. and Wing R. Early Cirrhosis of the Liver Produced by Carbon Tetrachloride. *J. Pharmacol. & Exper. Therap.* 29: 191 (Oct.) 1926.

5 Mallory F. B. Phosphorus and Alcoholic Cirrhosis. *Am. J. Path.* 9: 557 (Sept.) 1933.

6 Chalkoff I. L., Connor C. L. and Biskind G. R. Fatty Infiltration and Cirrhosis of the Liver in Depancreatized Dogs Maintained with Insulin. *Am. J. Path.* 14: 101 (Jan.) 1938.

7 Himwich H. E. and Fazekas J. F. Respiratory Quotient of Diabetic Liver. *Proc. Soc. Exper. Biol. & Med.* 28: 137 (Feb.) 1934.

8 Peters J. P. and Van Slyke D. D. Quantitative Clinical Chemistry. Interpretations. Baltimore: Williams & Wilkins Company 1931.

9 Higgins H. L. Effect of Alcohol on the Respiration and Gaseous Metabolism in Man. *J. Pharmacol. & Exper. Therap.* 9: 431 (May) 1917.

10 Elliott K. A. C. and Baker Zelma. The Respiratory Quotients of Normal and Tumor Tissue. *Biochem. J.* 29: 2433 (Nov.) 1935.

10a Connor C. L. Fatty Infiltration of the Liver and the Development of Cirrhosis in Diabetes and Chronic Alcoholism. *Am. J. Path.* 14: 347 (May) 1938.

must keep in mind that most alcohol addicts, like morphine addicts become pathologic liars when questioned in routine history taking. They have acquired some degree of tolerance which must mean that their metabolism has become adjusted to the physiologic level at which alcohol burns, just as man may become adjusted to a diet of protein and fat alone with a permanently lowered carbon dioxide oxygen exchange. This tolerance is broken through when the liver becomes filled with fat, and the time comes when very small amounts of alcohol may cause a degree of lasting intoxication. This is so in experimental animals after a time smaller and smaller amounts of alcohol are needed to keep them in a constant state of semicomatose.

From the large number of cases studied composite pictures may be assembled to illustrate three phases of disease of the liver produced by alcohol. The three phases occur at the ages of about 40 to 45, from 50 to 55 and from 50 to 65, respectively, the ages overlapping as would be expected from the nature of the disease. When it is understood that the first acute stage may be reached in from six months to two years, the second in from one to five years and the third in from two to twenty years or more, it can be seen how unreliable age statistics are. The age is usually above 40, because men usually do not begin to drink the quantities of alcohol necessary to produce these changes until after that age.

1 The acute fatty liver of alcoholism develops after the prolonged use of very large amounts of alcohol during which little or no food is taken or the food consists of protein and fat only.<sup>11</sup> It is found in men picked up by the police who die shortly afterward in prison or in city hospitals. It is most common in the coroner's morgues in all large cities. When the patient lives long enough for clinical examination he may show signs of cirrhosis such as jaundice and some ascites but has a large liver. The liver is pale and greasy containing about 60 per cent fat. It may be lobulated because of the severe swelling but is usually smooth. Because of the swelling also there may be intrahepatic obstruction to bile ducts, giving a green coloration, and portal obstruction without fibrosis. Such livers are recognized by all medical examiners as due to alcohol and as being associated generally with poor nutrition. The patients who die in this stage represent the inevitable mortality during the experimental production of cirrhosis in man. The others pass on to the next stage.

2 The fatty liver in which there is early but definite and progressing perilobular fibrosis is the product of alcoholism which is less in degree than that causing the first phase but which is nevertheless severe. In the liver which survives drastic alcohol poisoning and partial starvation diets, a fibrous tissue stroma will develop in the course of time. The liver is large or normal in weight and moderately lobulated or smooth. It is sclerotic, may or may not be bile stained and produces classic early signs and symptoms of cirrhosis. The condition is the common fatty cirrhosis of the liver found in most classifications.

3 The liver in the third phase is likely to be somewhat reduced in size and to have a nodular surface and a thickened capsule. It never becomes as small as the liver of toxic cirrhosis, seldom weighing under 1,300 Gm. Fat may or may not be present. The condition follows the long-continued use of excessive amounts of alcohol by persons who have continued to eat a better

diet, but both as to alcohol and diet the habits have been abnormal. There may have been intermittent severe episodes of drinking lasting long enough to damage the liver permanently. To produce this condition requires much more than could be called a moderate use of alcohol, but it can be understood how by alternating the two primary factors involved, alcohol intake and diet, the process might be accelerated or retarded indefinitely. This phase forms the classic cirrhosis of the portal type and, because fat may be absent, is classified simply as Laennec's cirrhosis, with a helpless gesture of resignation when the question of causation arises. Fat disappears from the liver when the body fat is exhausted, and the liver becomes smaller after prolonged starvation, fat rapidly disappears when the consumption of alcohol is discontinued, and the resumption of a normal diet or the administration of dextrose solution causes a rapid disappearance of fat as the liver fills with glycogen. The presence or absence of fat, then, has little significance in this late stage.

While it may be impossible to assign degrees of importance to all factors involved in the production of alcoholic cirrhosis, the following summary gives an idea of some of the combinations possible. The one constant factor in all of them is the excessive consumption of alcohol. This does not preclude the possibility that other factors contribute to the metabolic condition produced in some cases. It is uncommon, however, to find any such conditions at autopsy.

1 Starvation or partial starvation and the continuous use of large amounts of alcohol. This produces fatty livers from which the patients may die before cirrhosis develops.

2 Diet restricted to protein and fat plus alcohol.

3 Diet containing some but an insufficient amount of carbohydrates and vitamins, plus large amounts of alcohol habitually. This diet may prolong the time of development of cirrhosis by years.

4 A sufficient diet plus alcohol, alternating with periods of severe alcoholism with an insufficient diet, these periods coming so close together that in the interim the liver has not had time to return to normal.

5 Diet adequate in protein, fat, carbohydrate and vitamins, that is, a balanced diet plus alcohol. Whether any one on such a diet will have alcoholic cirrhosis is very doubtful. A person eating three regular, balanced meals a day will probably not become a chronic alcohol addict in the sense that this term is used here, as long as this regularity continues. It has been demonstrated in both man and experimental animals that it is possible to maintain metabolic equilibrium within safe limits even when large amounts of alcohol are taken habitually.

#### ABSTRACT OF DISCUSSION

DR ERNEST M. HALL, Los Angeles. I believe Dr Connor is on the right track. Practitioners have been trying for years to produce cirrhosis of the liver experimentally and have succeeded by the use of copper but not by the use of alcohol. We became convinced recently that the reason for failure is that the animals have received an adequate diet. I have been teaching classes for some three years that the alcoholic type of cirrhosis is probably due to use of alcohol plus an inadequate diet. I am studying a group of cases from the Los Angeles County Hospital selecting sixty-eight on the basis of enlargement of the liver, which usually weighs from 2,000 to 5,000 Gm., and of the fact that microscopically the liver is still active—that is, necrosis is still going on in the hepatic cells and the connective tissue is relatively young and active, as Dr Connor has shown in his photomicrographs. There is considerable fat in a great many of the livers. In about one

11 The peculiar metabolic condition established in alcoholism which demands more alcohol or food as fat and protein which causes a respiratory exchange in tissues approaching that of alcohol needs to be investigated.

third of the cases comparatively little fat is seen. The history of the patients is interesting. Eighty per cent of them were definitely alcoholic. Of the twelve who had no record of alcoholism, eight were severely ill when they came into the hospital. One had lobar pneumonia, one confluent bronchopneumonia, two generalized peritonitis from ruptured appendix, and so on. It is not remarkable that no history of alcoholism was obtained in these eight cases. That leaves four cases in which there is no history of alcoholism or no reason for the omission. Only one person of the sixty-eight stated that he had not used alcohol. I believe with Dr Connor that these large quantities of alcohol affect the liver, especially when the person fails to take an adequate amount of food. Herter and Williams have shown in subjecting dogs to chloroform anesthesia that if they repeat the procedure every day for three or four weeks—not allowing the liver to recover between times—they produce definite cirrhosis of the liver, whereas Whipple and Sperry showed that, after two or three prolonged periods of anesthesia with chloroform necrosis of the centers of the lobules developed and yet cirrhosis of the liver failed to appear.

DR FRANK RAYMOND MINNI, Portland Ore. Dr Connor has opened an old controversial subject, which was made the subject of the International Association of Pathologists meeting several years ago. Their final conclusion was that while they could incriminate alcohol it has never been fully proved to be the logical factor. I recognize two types of cirrhosis with fatty changes in the liver. Dr Connor's sections show those types. In the first the peripheral fibrotic framework becomes more prevalent by virtue of the fat present. That is an atypical form of cirrhosis. Sometimes I hesitate to call it cirrhosis. The second is periportal fibrosis or cirrhosis in which there is also fatty change. It is difficult to separate the "wheat from the chaff" as to whether two independent processes might exist or as to whether cirrhosis might have occurred and then fatty infiltration or fatty manifestation. I agree that certain forms of consumption of alcohol in certain countries seem to bring forth an increased incidence of cirrhosis of the liver. Scotland notoriously having high consumption of alcohol, does not have as great an incidence of cirrhosis as some parts of India, where no alcohol is consumed. Other similar experiences have been brought to light. I with my associates recently had occasion to study twenty-two instances of acute methyl alcohol poisoning, which I have reported in the *Archives of Pathology* (26:77 [July] 1938). These men had for many years consumed denatured alcohol with all its by-products. They preferred it with at least 5 per cent methyl alcohol, if 5 per cent methyl alcohol was not present they didn't think they were getting a kick out of it. On one occasion, through an indiscreet sale of pure methyl alcohol they consumed varying quantities from 200 cc to a pint (475 cc). Fatty changes were present in all of the livers but in only one was there the slightest trace of cirrhosis, a typical periportal cirrhosis. Several years ago I had occasion to analyze the incidence of cirrhosis among 5,000 autopsies and similar facts were present.

DR A. J. CARLSON, Chicago. May I make a plea for more accuracy in presentations and discussions? The speaker referred several times to alcohol causing cirrhosis. That is an old question, but it obviously depends on the quantity of alcohol. When a speaker refers to experimental alcoholism in dogs or other animals, let him cite the quantity of alcohol in twenty-four hours, so that the members may have something to go by, not just a general term, as if a sniff of alcohol at a distance of a hundred feet will produce cirrhosis of the liver. I think it is incumbent on contributors to get quantitative relations, particularly if they publish their results, and it won't hurt them even when they talk.

DR CHARLES L. CONNOR, San Francisco. Of course I did not say that alcohol is the only thing which will cause cirrhosis, but exactly the opposite. I said that large amounts of alcohol are necessary, and the amount of alcohol that men can take varies greatly. Many men get a tolerance to alcohol, which I think means that they get accustomed to a lower respiratory quotient, just as a man may become accustomed to a protein and fat diet and get along well. Other things which I mentioned briefly will cause fatty cirrhosis of the liver

—among them diabetes and some of the poisons which are similar to alcohol in their action, a cirrhotic liver which has not been previously fat may become fatty toward the end. As patients do not eat during the last few days of their lives, fat will infiltrate into the liver. Frequently at postmortem examination persons are shown not to have eaten or assimilated food for the last three or four days. The fatty liver of that sort is of no importance. The men that Dr Menzie mentioned, who died without cirrhosis, represent the first group which I mentioned, they manifest the inevitable mortality of alcoholism during the experiment in man himself. Methyl alcohol, and perhaps even gasoline, which some of the patients here have been drinking, will cause similar fatty changes. Dogs die in that stage, or any other animal will die in that stage, and the experiment in dogs is attended by a high mortality. If they live long enough, however, they will get a fatty type of cirrhosis. The difficulty with man as well as with animals has been to have them live until they get the cirrhosis. I did not have time for details. I condensed a large amount of work into a short paper. Most of my data on the respiratory quotient of the liver came from physiologists who have published it in textbooks or papers. The amount of alcohol that the dogs got varied from 50 cc of 40 per cent alcohol downward. After the livers became fatty the dogs could take considerably less, and my object was to keep them saturated and at the same time to keep them alive, so that absolutely quantitative methods could not be followed.

## RESECTION OF SUPERIOR HYPO GASTRIC PLEXUS AND SACRAL SYMPATHETIC GANGLIONS

FOR THE RELIEF OF PAIN IN THE BLADDER

CARLISLE F. SCHROEDER, M.D.

AND

ROBERT E. CUMMING, M.D.

DETROIT

The present status of treatment of incurable tuberculous cystitis as well as pain arising in the bladder in general, and especially the rather discouraging opinions that can be gleaned from the literature with regard to its treatment by superior hypogastric (presacral) neurectomy, lead us to report our results in a series of cases of intractable painful cystitis in which relief was obtained by the use of pelvic sympathetic surgery.

The treatment of this distressing condition in the past has been only moderately successful and is used in only a relatively small number of the patients affected. The newer knowledge of the nerve pathways to and from the bladder, as well as recent concepts of the physiology of the bladder in man, has made it possible to relieve greatly not only pain arising in the bladder but also other symptoms, such as frequency and nocturia associated with it. All types of treatment of painful and tuberculous cystitis have been well covered in textbooks and the periodical literature.<sup>1</sup>

Dr. Cumming died June 22, 1938.

We acknowledge the help and courtesy of Dr. W. J. M. Scott of the University of Rochester School of Medicine.  
Read before the Section on Urology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.  
Owing to lack of space this article has been abbreviated for publication in *THE JOURNAL*. The complete article appears in the authors' reprints.  
1. Young, H. H., and Davis, D. M. *Practice of Urology*. Philadelphia: J. B. Lippincott Company, 1926.  
2. Ormond, J. K. *Division of the Ureter in Intractable and Incurable Vesical Tuberculosis*. *J. Urol.* 29:109 (Feb.) 1928.  
3. Caulk, J. R., and Everhardt, F. H. *Direct Internal Irradiation of Ultraviolet to the Bladder Arch. Phys. Therapy* 13:375 (June) 1932.  
4. Negley, J. C. *Cold Quartz Ultraviolet Light Therapy in Urology*. California & West Med. 39:226 (Oct.) 1933.  
5. Greenberg, R. E., Brodny, L. M., Davis, T. L., and Armstrong, Catherine. *Further Studies of Methylene Blue in Urinary Tuberculosis*. *J. Urol.* 33:168 (Feb.) 1935.  
6. Grant, F. C. *Chordotomy for Relief of Pain in Genito-Urinary Tract*. *J. Urol.* 25:551 (June) 1931.  
7. Hinman, Frank. *Surgical Treatment of Lower Tract Tuberculosis*. *J. Urol.* 20:521 (Nov.) 1928.  
8. Herman, Leon. *The Practice of Urology*. Philadelphia: W. B. Saunders Company, 1938.  
9. Hinman.<sup>22</sup>

Attempts to relieve pain arising in the pelvis by sympathetic surgery are not new. The work of Jaboulay<sup>2</sup> in 1898 toward this end is now being given due credit. Jaboulay, believing that pain from the pelvic viscera might reach the central nervous system through the sympathetic nerves, sought to cut the same communicantes of the sympathetic chain by a retrorectal approach. His operation was partially successful because of the lack of accurate knowledge of the pelvic nerve supply. Latarjet<sup>3</sup> in 1913 gave a more adequate description of the nerve supply of the pelvis and described further the "presacral nerve," which now often goes by his name. Winslow, however, is given credit for the first description of this group of nerves in 1732. It was not until 1921 that sympathetic surgery was again systematically directed toward the relief of pelvic pain. In that year Rochet<sup>4</sup> did perineurectal sympathectomies, believing that the pain in tuberculous cystitis was due to spasm originating in the lower ureters. He reported three cases, one with some relief of pain, but in all there was incontinence and the operation was abandoned. In spite of the earlier description of the "presacral nerve" (superior hypogastric plexus), it was not until 1925 that Cotte<sup>5</sup> first employed presacral neurectomy (Cotte's operation) for the relief of pelvic pain, reporting numerous gynecologic cases of pelvic pain since that time, in the large majority of which the patient was entirely relieved by the operation. One year later (1926) Pieri<sup>6</sup> used presacral neurectomy for the relief of pain in the bladder in tuberculous cystitis; he had, however, only mediocre results in his first case. He then added sectioning of the sacral rami communicantes and the dividing of the sacral sympathetic chains at the level of the first sacral segment. The results of the latter operation were far superior.

Learmonth<sup>7</sup> in 1930 applied Cotte's operation (resection of the presacral nerve only) to paralytic bladders. He proved on human beings subjected to this type of surgery definite physiologic facts on which the operation is based. By arranging cystoscopic examinations at the time of operation his colleagues observed the changes following stimulation and division of the nerves in question.

The anatomy of the pelvic sympathetic nerves, supplying the bladder and posterior urethra, is rather intricate and has been thoroughly described in the literature,<sup>8</sup> so that only a brief outline is in order here (fig 1).

The bladder and posterior urethra receive their nerve supply from three sources: somatic, sympathetic and parasympathetic (figs 2 and 3).

The somatic nerves carry both motor and sensory fibers to the bladder and posterior urethra by way of the pudic nerve, derived from the anterior division of the third and fourth sacral nerve roots.

The sympathetic nerve supply is derived from the thoracolumbar system and is divided into three groups as to location and source: right lateral, middle and left lateral plexus trunks derived from the celiac, renal, mesenteric and first four lateral lumbar sympathetic chain ganglions. The latter are preganglionic medullated fibers and represent more than half of the fibers of the superior hypogastric plexus, all the former being postganglionic nonmedullated fibers. These plexuses are "bottle necked" in the region of the last lumbar vertebral body to form the so-called presacral nerve (superior hypogastric plexus), which in turn divides into two definite hypogastric nerves that course through the hypogastric ganglions (two large flattened ganglions on the lateral aspects of the rectum) and hence to the

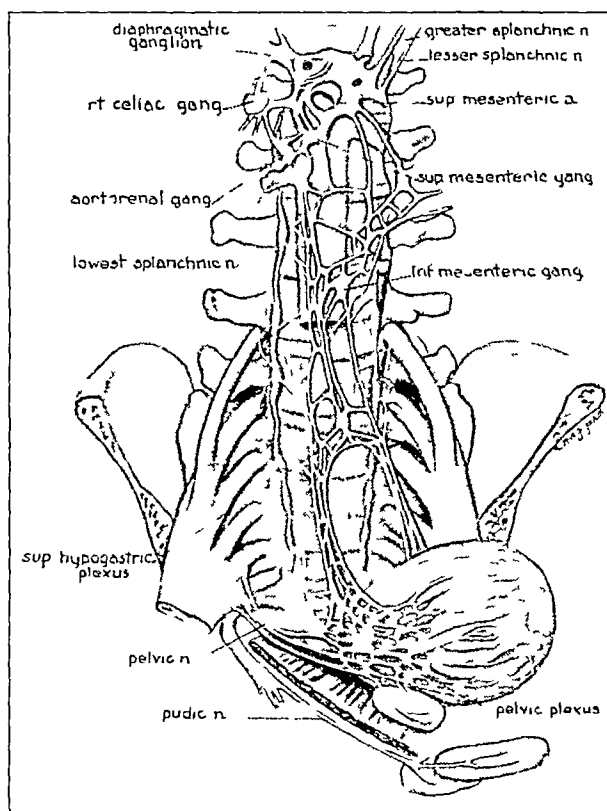


Fig. 1—Anatomy of the pelvic sympathetic nerves supplying the bladder and posterior urethra.

bladder. The superior hypogastric plexus has many variations.<sup>9</sup> It receives branches from other regions from the inferior mesenteric plexus, from the last ganglion from the lumbar chain<sup>10</sup> and from the first sacral ganglion as shown by Douglass.<sup>11</sup> Mueller<sup>12</sup> shows also several branches to the lateral sacral sympathetic chain at various levels. Our own dissections have shown these to be variable. Anatomists working with preserved cadavers in the dissection room have as a group shown the superior hypogastric plexus more as a conglomerate nerve, whereas surgeons and those working with live tissue, and our own work with fresh cadavers, reveal a plexiform group with several fine fibers to and from the lateral sacral chain. As shown

2. Jaboulay, M. Le traitement de la neuralgie pelvienne par la paralysie du sympathique sacré. *Lyon med* 90: 102, 1899.

3. Latarjet, A. and Bonnet, P. Le plexus hypogastric chez l'homme. *Lyon chir* 9: 619, 1913.

4. Rochet, V. Traitement chirurgical des cystites douloureuses. *Lyon chir* 18: 462, 1921.

5. Cotte, Gaston. La sympathectomie hypogastrique a-t-elle sa place dans la thérapeutique gynécologique? *Presse med* 33: 98 (Jan 24) 1925.

6. Pieri, G. Enervation ou Ramisection. *Presse med* 34: 72 (Sept 8) 1926.

7. Learmonth, J. R. Resection of Presacral Nerve for Cord Bladder. *Proc Staff Meet Mayo Clin* 5: 54 (Feb 26) 1930.

8. Pieri, G. Contributi clinici alla chirurgia del sistema nervoso vegetativo. *Arch ital di chir* 27: 454, 1930. Dobrzaniecki, W. and Serafini, A. Anatomical Study of Superior Hypogastric Plexus. *Ann Surg* 100: 30 (July) 1934. Dennig, Helmut. Untersuchungen über die Innervation der Harnblase und des Mastdarms. *Ztschr f Biol* 30: 239, 1924. Die Innervation der Harnblase. Berlin Julius Springer.

9. Kuntz, Albert. The Autonomic Nervous System. Philadelphia Lea & Febiger, 1929. Textbook of Neuro-Anatomy, ed. 2. Lea & Febiger, 1936. Coates, A. F. A Note on the Macroscopic Anatomy of the Nerves of the Bladder. *M J Australia* 2: 683 (Dec 3) 1932. Learmonth (foot notes 20 and 28).

Douglass<sup>11</sup>. Abbott and Pfaff. Elaut<sup>10</sup>.

9. Canavero, G. Contributo clinico-operativo alla resezione del cisti detto nervo presacrale. *Arch ital di chir* 30: 393, 1931.

10. Elaut, L. Surgical Anatomy of So-Called Presacral Nerve. *Surg Gynec & Obst* 55: 581 (Nov.) 1932.

11. Douglass, H. L. Excision of Presacral Nerve in Treatment of Intractable Interstitial Cystitis. *Am J Surg* 25: 249 (Aug) 1934.

12. Mueller, L. R. Die Blaseninnervation. *Deutsches Arch f klin Med* 128: 81, 106, 1918.



by Elaut,<sup>10</sup> it in most cases is not a "nerve" but a plexus and not presacral in location but opposite the fifth lumbar vertebral body. The presacral nerve, therefore, should rightfully be called the superior hypogastric plexus, which name has become standardized, although it has had numerous other names since its first description.<sup>13</sup>

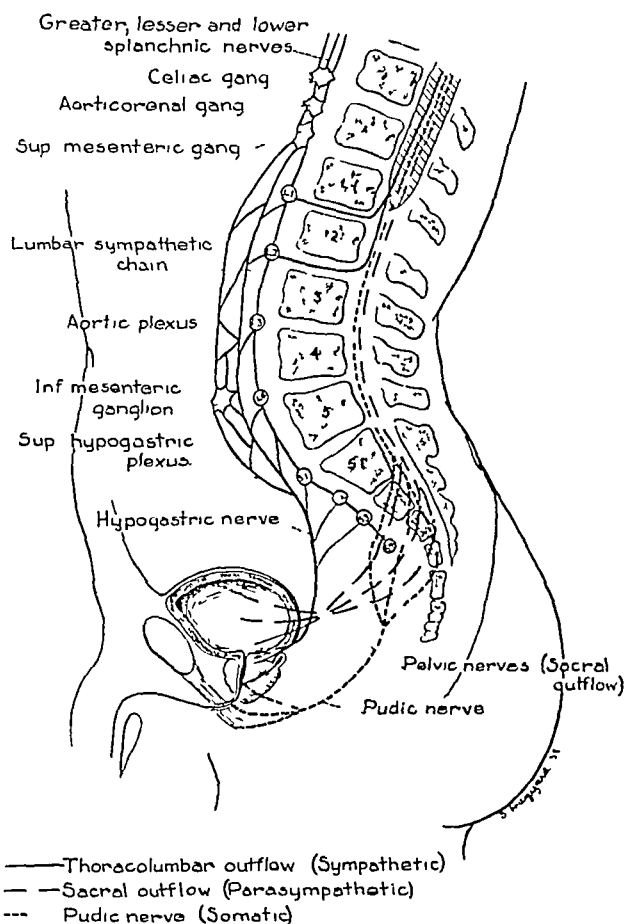


Fig 2—Diagram showing nerve supply of the bladder and posterior urethra

The parasympathetic fibers take their origin from the anterior primary divisions of the second, third and fourth sacral nerves.<sup>14</sup> They emerge as three roots and form the so-called pelvic nerves to the bladder, course to the hypogastric ganglions (which consists mostly of pelvic nerves as shown by degeneration experiments, and therefore would better be called pelvic plexus), finally lose their medullary sheaths and are divided into three roots as follows:

- 1 Upper root going to the fundus of the bladder
- 2 Middle root going to the midportion of the bladder
- 3 Lower root going to the lower aspect of the bladder, supplying the vesical neck and the first portion of the urethra

The basic physiology concerned with the nerve supply of the bladder, as with sympathetic physiology generally in man, lags behind the surgery of the system. Head,<sup>15</sup> Learmonth,<sup>16</sup> Aburel and Kapri<sup>17</sup> and McCrae

and McDonald<sup>18</sup> have probably done the most work clinically and experimentally along this line. Learmonth and Braasch found by simultaneous cystoscopy and laparotomy with exposure of the superior hypogastric plexus that the sympathetic nerves brought about closure of the ureterovesical orifices, contraction of the trigon, closure of the internal sphincter, contraction of the prostate, seminal vesicles and ducts, and inhibition of the expulsive power of the bladder, and that they carried afferent fibers for sensation in the bladder. It has been noted also that the parasympathetic system brought about initiation and augmentation of the contraction of the bladder and inhibition of the internal sphincter, afferent fibers of the micturition reflex and afferent fibers for the sensation of pain in the bladder.

Summarizing the motor relations, Rose<sup>19</sup> calls the sympathetic nerves the "nerves of accommodation of urine" and the parasympathetic the contracting or "emptying" nerves of the bladder. Jaboulay called the presacral nerve the "brain" of the pelvic sympathetics. Both systems, as pointed out, carry sensory fibers, the majority of which are carried by the parasympathetics, although sensory fibers also course through the sympathetic (superior hypogastric plexus) group, as shown by Learmonth<sup>20</sup> who cites a case of total paraplegia in which the patient had some sensation in the bladder. It has been further shown by Pi-Suñer and Raventos<sup>21</sup> that section of one system does not abolish sensibility in the bladder.

Recent work by many observers, especially McCrae and McDonald,<sup>18</sup> reveals doubt as to whether one system is exclusively excitator and the other inhibitor in

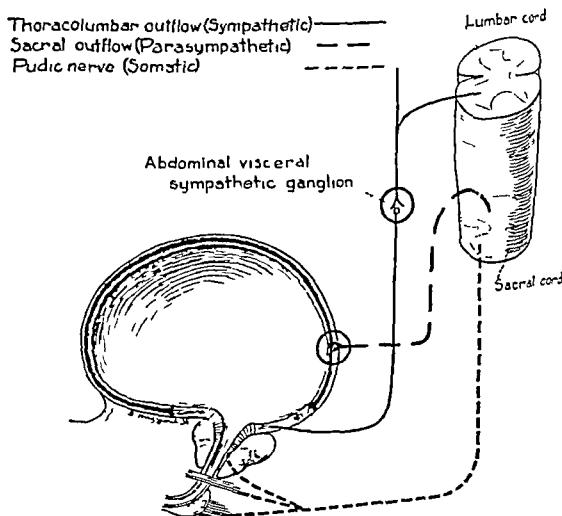


Fig 3—Schematic diagram showing nerve connections.

function or that they are antagonistic. They admit, however, that the sympathetic and parasympathetic nerves work together with the pudendal nerves in regulation of the bladder. Most observers agree that the parasympathetic nerves are the most important. McCaughan,<sup>22</sup> quoting Gruber, states "that the bladder

13 Davis, Albert. *Surgical Anatomy of the Presacral Nerve*. J. Obst. & Gynec. Brit. Emp. 41: 492-954 (Dec.) 1934.  
14 Gruber, C. M. *The Autonomic Innervation of the Genito-Urinary System*. Physiol. Rev. 13: 497-609 (Oct.) 1933.  
15 Head, H. and Riddoch, G. *Autonomic Bladder*. Brain 40: 188-263 1917.  
16 Learmonth, J. R. *Neurosurgery in Diseases of Urinary Bladder*. Am. J. Surg. 16: 270 (May) 1932.  
17 Aburel, E. and Kapri, M. *Recherches sur la sensibilité viscérale*. Compt. rend. Soc. de biol. 110: 812 (July 11) 1932.

18 McCrae, E. D. and McDonald, A. D. *Presacral Sympathectomy and the Urinary Bladder*. Brit. J. Urol. 3: 119 (June) 1934.  
19 Rose, D. K. *Interpretation of the Cystometrogram*. J. Urol. 2: 207 (Feb.) 1932.  
20 Learmonth, J. R. *Contributions to the Neurophysiology of the Urinary Bladder*. Brain 54: 147 (June) 1931.  
21 Pi-Suñer, A. and Raventos, J. *Sur les effets de la dilatation du rectum et de la vessie et leur conduction par les nerfs pelviens*. Compt. rend. Soc. de biol. 110: 224 (May 27) 1932.  
22 McCaughan, J. M. and Hershey, J. H. *Surgery of the Autonomic Nervous System*. Missouri M. A. J. 31: 417-421 (Nov.) 1934.

is enervated by the sympathetic and parasympathetic, each supplying both motor and inhibitory impulses, and that there is no difference between the effect of these two systems except the possibility that the parasympathetic nerves carry stronger impulses."

With these facts in mind, we attempted to perform a more radical sympathectomy than Cotte's presacral neurectomy and Pieri's division of the sacral sympathetic chain and rami communicantes. This we accomplished by doing an excision of the superior hypogastric plexus and, in addition, excision of the sacral sympathetic chains including the first second and third sacral ganglions with all their connections. The latter procedure is similar to the phrenico-exeresis of Felix,<sup>23</sup> which he proposed in 1924 for a more complete and lasting paralysis of the diaphragm. Felix's operation today is little used because of the permanence of diaphragmatic paralysis the very thing we are striving for in this type of operation. The combined operation itself, excision of the superior hypogastric plexus and

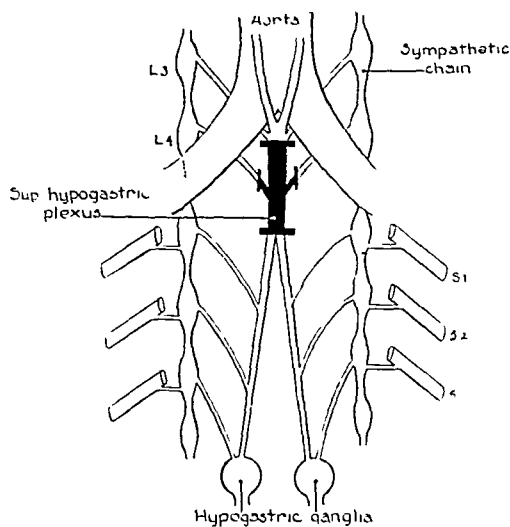


Fig 4—Simple excision of the superior hypogastric plexus (Cotte's operation)

lateral sacral ganglions, is only slightly more difficult, technically, than excision of the superior hypogastric plexus alone (figs 4, 5 and 6)

Also, having in mind the work of Jaboulay, Rochet and Pieri, the former two in human and the latter, as well as others, in animal experimentation which indicated that complete severance of the autonomic system to the bladder is followed by incontinence, we attempted a more radical sympathectomy by exeresis of the lateral sacral chain along with excision of the superior hypogastric plexus, thus endeavoring to obtain more lasting results. We still leave intact most of the parasympathetic fibers as well as the pudendal somatic supply. In order to remove the sensory fibers of both these groups and not the motor (which had always been done with nerve resections, resulting in incontinence) we have added, when necessary, the postoperative use of intrathecal alcohol, with careful exacting control of the subarachnoid dispersion (fig 7). This does not result in paralysis but does give relief of pain and cessation of frequency. The sensory fibers in the superior hypogastric plexus are diffused over a larger area in the cord and are not well adapted to intrathecal alcohol (renal, celiac, mesenteric and lumbar sympathetic

chain). These fibers are conveniently attacked by surgery, since they are "bottle necked" over the fifth lumbar vertebra in the form of the superior hypogastric plexus, as stated Dogliotti<sup>24</sup> first suggested and used subarachnoid alcohol for the relief of intol-

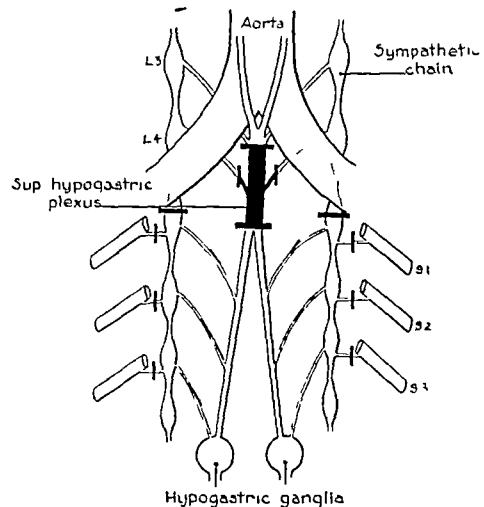


Fig 5—Excision of the superior hypogastric plexus section of sacral sympathetic chain and rami communicantes (Pieri's operation)

able pain and it has been suggested by others for the relief of pain resulting from tuberculosis of the kidneys and bladder.<sup>25</sup> Intrathecal injection of alcohol, although simple, is not without danger. Numerous accidents and sequelae have been recorded.<sup>26</sup>

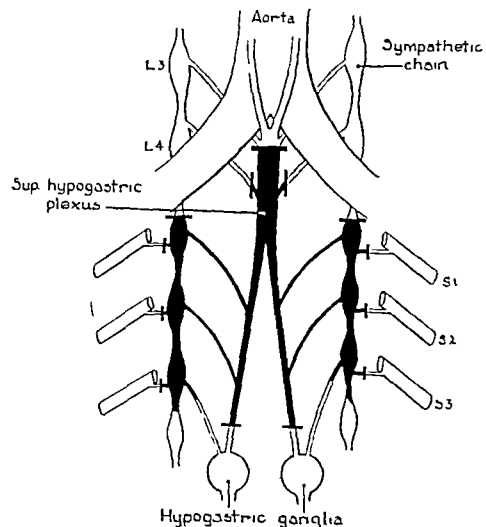


Fig 6—Excision of the superior hypogastric plexus exeresis of the sacral sympathetic chains

The technic of the injection of alcohol for this type of subarachnoid dispersion is as follows. A spinal tap is carried out as low down as possible in the spine

24 Dogliotti A M. Traitement des syndromes douloureux de la peripherie. Presse med 39 1249 1252 (Aug 22) 1931

25 Stern E L. Dangers of Intraspinal (Subarachnoid) Injection of Alcohol. Their Avoidance and Contraindications. Am J Surg 35 99 104 (Jan.) 1937 McKenna C M and Oldberg E. Intrathecal Absolute Alcohol for the Relief of Intractable Pain. Tr Am A Genito Urin Surgeons 28 391 395 1935

26 Poppen J L. Subarachnoid Alcohol Injection. Indications and Contraindications. Technic and Results. S Clin North America 16 1663 1668 (Dec.) 1936 Sloane Paul. Syndrome Referable to Cauda Equina Following the Intraspinal Injection of Alcohol for the Relief from Pain. Arch Neurol & Psychiat 34 1120 (Nov.) 1935 Tureen L L and Gitt J J. Cauda Equina Syndrome Following Subarachnoid Injection of Alcohol. J A M A 106 1535 (May 2) 1936 Abbott W D. Intraspinal Injection of Alcohol for Intractable Pain. Am J Surg 31 351 353 (Feb.) 1936 Stern

23 Felix Willy. Anatomische experimentelle und klinische Untersuchungen über den Phrenikus und über die Zwerchfellinnervation. Deutsche Zeitschr f Chir 171 283 1922

It is important to suffuse the most caudal continuation of the dural sac, since only the sacral nerves are to be necessarily affected by the injection Stern<sup>27</sup> has shown that injections in between the spinous processes of the second and third lumbar vertebrae are more apt to be followed by paresis of the bladder than injection

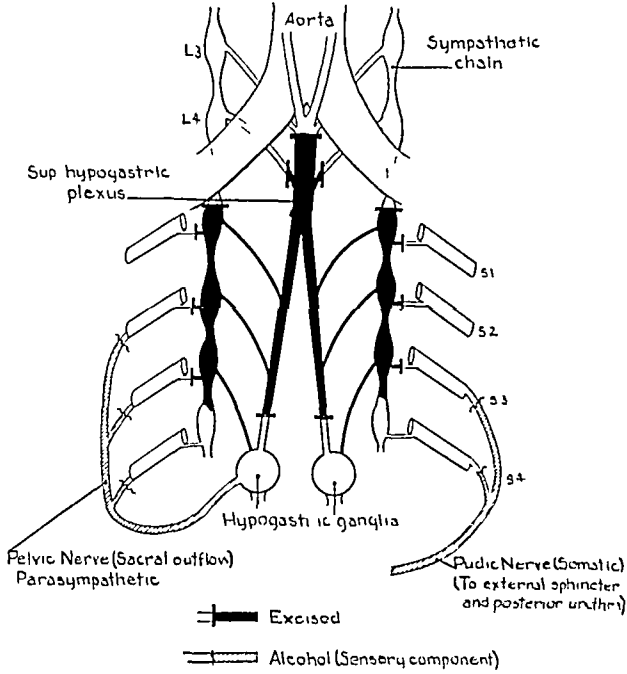


Fig 7—Excision of the superior hypogastric plexus excision of the sacral sympathetic chains followed by intraspinal alcohol

one level higher, when the lateral prone position is used We suggest, and have used in most cases, a lateral prone position with the buttocks high and the torso rotated anteriorly—an oblique position—and make the spinal tap as low as possible From 0.5 to 1 cc of absolute alcohol is used and the injection is given very slowly, the patient being kept in the exaggerated position described for three hours and then in a face down prone position for an additional three hours No vesical or rectal paralysis has resulted from these injections We have had patients with transient paralysis of the bladder and even transitory weakness of the leg by using a higher level and not keeping the patient in the exaggerated position with the torso rotated anteriorly

The technic of the combined operation is similar to that described by Pieri<sup>6</sup> and others,<sup>28</sup> except that the sympathetic chain is divided as in Pieri's operation, the proximal end of the distal segment is then grasped with a hemostat and the instrument is rotated, the nerve being wound on the clamp and at the same time the chain being gradually freed with a blunt instrument from all its attachments to or below the third sacral segment

This more radical denervation causes a significant change in the physiology, so that there has been slight disturbance of micturition with temporary postoperative incontinence but never retention requiring catheter-

ization as reported by other authors<sup>29</sup> Other effects, such as loss of ejaculation but retention of orgasm, in males correspond directly with other cases reported Although in all our female cases pregnancy is contra indicated, it has been shown experimentally by Rosselli<sup>30</sup> and clinically by Cotte and others that there is no disturbance in the female organs of reproduction There is a retention of the feeling of pleasure which normally accompanies evacuation of the bladder

COMMENT ON CASES REPORTED<sup>31</sup>

In the literature and in reviewing our own cases we were impressed with the following facts

1 Temporary results are reported, lasting only a short time, from simple excision of the superior hypogastric plexus alone

2 Results from simple resection of the superior hypogastric plexus are varied with regard to beneficial effect

3 Uniformly poor results in applying excision of the superior hypogastric plexus to relieve the symptom of interstitial cystitis are reported The results are relatively poor even with excision of the superior hypogastric plexus and the lateral sacral chains, as shown by case 8

We have purposely delayed reporting our own results until sufficient time has elapsed to show that the results are relatively permanent For example, in case 1 resection of the superior hypogastric plexus and lateral chains was performed July 1934, lacking approximately one month of being four years, and with lasting results Variations in results from excision of the superior hypogastric plexus alone, as reported in the literature, probably are due to differences in the anatomy of the plexus itself, not all fibers being excised, such as branches going from the lateral sacral chains and to the plexus of the inferior mesenteric artery, or its con

Case AG No 2178J						Female Age 26			
Preoperative		Postoperative		Common		Sensory and Pain Control		Bladder Control	
Bladder Capacity	Bladder Irritability	Bladder Capacity	Bladder Irritability	Bladder Capacity	Bladder Irritability	Bladder Capacity	Bladder Irritability	Bladder Capacity	Bladder Irritability
100cc	+++	100cc	+++	100cc	+++	100cc	+++	100cc	+++
100cc	+++	100cc	+++	100cc	+++	100cc	+++	100cc	+++
100cc	+++	100cc	+++	100cc	+++	100cc	+++	100cc	+++
100cc	+++	100cc	+++	100cc	+++	100cc	+++	100cc	+++
100cc	+++	100cc	+++	100cc	+++	100cc	+++	100cc	+++
100cc	+++	100cc	+++	100cc	+++	100cc	+++	100cc	+++
100cc	+++	100cc	+++	100cc	+++	100cc	+++	100cc	+++
100cc	+++	100cc	+++	100cc	+++	100cc	+++	100cc	+++
100cc	+++	100cc	+++	100cc	+++	100cc	+++	100cc	+++

Fig 8 (case 7)—Persistence of bladder symptoms eighteen months after nephrectomy for tuberculosis Permanent relief of pain increased bladder capacity and decreased bladder irritability followed resection and alcohol injection

tinuation, the superior hemorrhoidal, which are not divided with the simple excision operation These variations have been repeatedly shown in our dissections both on patients and on fresh cadavers The dis

27 Stern E L Chronic Painful Condition Amenable to Relief by Intraspinal (Subarachnoid) Injection of Alcohol Am J Surg 36 509 (May) 1937  
28 Cotte Gaston Resection du sympathique pelvien Gynec et obst 23 233 (March) 1931 Davis Albert Technic of Resection of Pre sacral Nerve Brit J Surg 20 516 (Jan) 1933 Learmonth J R Neurosurgery in Disease of Urinary Bladder J Urol 25 531 (June) 1931

29 Learmonth J R Neurosurgery in Diseases of Urinary Bladder J Urol 26 226 (July) 1931  
30 Rosselli G Esiti lontani della resezione del nervo presacrale Clin ostet 35 713 (Dec) 1933  
31 Report of eleven cases included in the original presentation is to be omitted from the text because of lack of space but is to be included in the reprinted article Two charts (figs 8 and 9) illustrate typical results

crepancy in results in cases of tuberculous cystitis, as compared to those of interstitial cystitis, can be explained on the following basis. In tuberculous cystitis the lesions are notoriously on the trigon and about the ureteral orifices, whereas in interstitial cystitis the visible lesions are found most frequently on the anterior wall, the position of the elusive ulcer of Hunner, or in almost any other part of the bladder. The trigon apparently never is involved, as stated by Hinman.<sup>32</sup> The nerve supply also varies as to the portion of the bladder supplied, the sympathetic (superior hypogastric plexus) group supplies the region of the trigon more exclusively with motor fibers (Macht [1918] with drugs and Learmonth [1931] with stimulation) and it is reasonable to suppose that the sensory distribution is similar, whereas the parasympathetic nerves are concerned more with detrusor stimulation in all parts of the bladder except the trigon and carry most of the pain fibers, so that, in lesions of the bladder not especially prominent on the trigon, section of the sympathetic group is not sufficient even when sympathectomy is more complete, as with the operation described (resection of the superior hypogastric plexus and lateral sacral chains).

This may shed light on a trophic or nervous origin of the lesions in interstitial cystitis. The pain of tuberculous cystitis may be on a basis of trigonal or ureteral spasm, and removal of the sympathetic supply may influence them and thus alleviate the pain by relaxation of the vesical orifice and trigon. Based on the foregoing facts, we have therefore used injection of alcohol intrathecally along with sympathectomy for controlling the sensory components of the parasympathetic and pudic nerves when lesions are present over the entire bladder or posterior urethra and not confined to the trigon or thereabouts. Intrathecal (intraspinous or subarachnoid) alcohol, as procaine and other anesthetics, shows a selected action for sensory nerve tissue. The effect of alcohol or any of the other nerve-paralyzing drugs is not without danger and should be used only in cases of intractable pain when an accurate diagnosis has been made and confirmed and when no other measures after long intensive use have given relief.

#### SUMMARY

We do not condemn simple excision of the superior hypogastric plexus for other conditions such as neurogenic imbalance. We, like Learmonth and Braasch,<sup>33</sup> have had good results with simple excision in these neurologic cases. It has also been reported used by Richer<sup>34</sup> for atony of the vesical neck and by Abbott<sup>35</sup> for atony of the bladder and intestine, as well as by others for interstitial cystitis,<sup>36</sup> chronically infected or contracted bladder,<sup>37</sup> cancer of the bladder<sup>38</sup> and spastic

irritable bladder,<sup>39</sup> with varying degrees of success. Cotte,<sup>40</sup> however, reports a case in which there was cystalgia accompanied by dysmenorrhea in which resection of the superior hypogastric plexus relieved the dysmenorrhea but the cystalgia persisted and was relieved only by denervation of the vesical neck. Ward<sup>41</sup> reports its use in hydro-ureters with good results. It

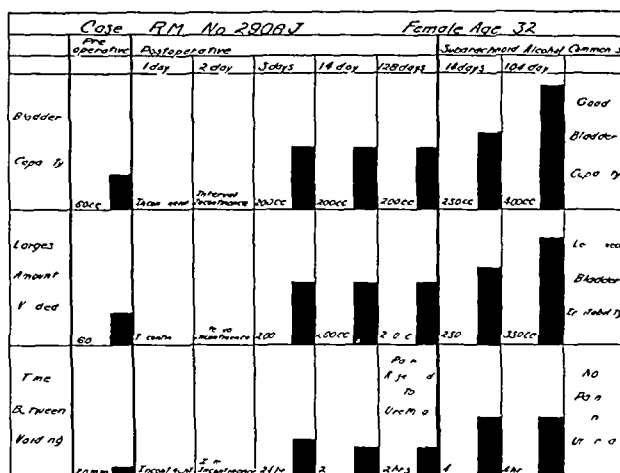


Fig 9 (case 10).—Recurrent symptoms of bladder tuberculous seven years after nephrectomy. Complete relief of pain and frequency followed resection and alcohol injection.

has also been advocated by Adson<sup>42</sup> and Craig<sup>43</sup> as an additional procedure in sympathectomy for Hirschsprung's disease. It has probably been used more widely in gynecologic conditions than in any other. Since Cotte<sup>5</sup> first advocated it he has done it in hundreds of cases with good results. Similar results have been obtained by many other operators for all types of gynecologic disorders including dysmenorrhea,<sup>44</sup> pelvic neuralgia,<sup>4</sup> obscure pelvic pain,<sup>45</sup> chronic pelvic inflammatory disease,<sup>46</sup> dysmenorrhea with severe bleeding,<sup>47</sup> kraurosis vulvae<sup>48</sup> and carcinoma of the uterus.<sup>49</sup> Likewise, in general surgery the pain arising

39 Braasch W F Spastic Irritable Bladder Controlled by Sympathectomy Proc Staff Meet Mayo Clin 9 393 (July 3) 1934

40 Cotte Gaston Resection du nerf presacre pour dysmenorrhée et cystalgie Lyon chir 29 616 (Sept Oct) 1932

41 Ward R O Symposium on Sympathectomy St Bartholomew's Hosp Rep 66 17 1933

42 Adson A W Value of Sympathectomy in Hirschsprung's Disease Cord Bladder and Dysmenorrhoea Northwest Med 38 276 (Aug) 1934

43 Craig V M Resection of Presacral Nerve Its Clinical Application S Clin North America 14 673 (June) 1934

44 Cotte Gaston Sur le traitement des dysmenorrhées rebelles par la resection du nerf presacre Lyon med 144 653 (Dec 1) 1929

45 Her mann L G Resection of Superior Hypogastric Plexus for Relief of Pelvic Pain J Med 14 291 (Aug) 1933 De Courcy J L Resection of Presacral Nerve for Dysmenorrhoea Am J Surg 23 408 (March) 1934

46 Michon L and Haour J Resultats éloignes des interventions sur le sympathique en gynécologie Gynec et obst 22 417 (Nov) 1930

47 Peterson E Neuf cas de resection du nerf presacre Progès med pp 721725 April 26 1930 Shaw R C Presacral Sympathectomy and Dysmenorrhoea Clin J 63 32 (Jan) 1934

48 Fontaine Rene and Hermann L G Clinical and Experimental Basis for Surgery of Sympathetic Nerves Surg Gynec & Obst 54 133 (Feb) 1932

49 Adson A W and Masson J C Resection of Presacral Nerve in Dysmenorrhoea J A M A 102 986 (March 31) 1934

Cotte Gaston Traitement de la dysmenorrhée par la resection du nerf presacre, Lyon med 149 29 (Jan 10) 1932 Wetterell F S Relief of Pelvic Pain by Sympathetic Neurectomy J A M A 101 1295 (Oct 31) 1933 Cotte<sup>51</sup> Cotte and Derhaume<sup>5</sup>

45 Meier V M Resection of Superior Hypogastric Plexus to Overcome Functional Disturbances of Female Pelvis Schweiz med Wchnsch 62 989 (Oct 22) 1932

46 Chianello C Contribution to Resection of Presacral Nerve Arch ital di chir 25 566 1930

47 Cannon D J Resection of Presacral Nerve for Intractable Dysmenorrhoea Complicated by Severe Bleeding Irish J M Sc April 1932 p 150

48 Cotte Gaston Kraurosis Vulvae with Vaginismus Treated by Resection of Presacral Nerve Lyon chir 31 56 (Jan Feb) 1934

49 Bombi G Resezione del n. presacrale Rev Osp 21 145 (June) 1931 Greenhill J P and Schmitz H E Sympathectomy for Intractable Pain in Cancer of Cervix J A M A 101 26 (July 1) 1933

Jiano J Moscou Tzava and Britanno Contribution a l'anatomie pathologique Ann anat path G 999 (Oct.) 1929

32 Hinman Frank Principles and Practice of Urology Philadelphia W B Saunders Company 1935

33 Learmonth J R and Braasch W F Resection of Presacral Nerve in Cord Bladder Surg Gynec & Obst 51 494 (Oct) 1930

34 Richer V Atony of Colovesicale Lyon chir 26 715 (Sept Oct) 1929

35 Abbott W D and Pfaff R O Neurogenic Imbalance of Pelvic Organs Am J Surg 22 426 (Dec) 1933

36 Douglass H L Indications for Excision of Superior Hypogastric Plexus in Dysfunction of the Bladder South Surgeon 3 149 (June) 1934

37 Quimby W C Resection of Presacral Nerve in Painful Bladder of Interstitial Cystitis Tr Am A Genito-Urin Surgeons 24 355 1931

38 Viannay C Du traitement des cystitis douloureuses arrivees au stade de cystalgie Arch franco belges de chir 30 229 (March) 1927

39 Petrescu G Surgical Handling of Chronic Obstinate and Painful Bladder Centraltbl f Chir 57 516 (March) 1930 Chauvin E Resection of Presacral Nerve in Rebelious Cystitis After Intravesical Injection of Glycerin J urol 30 201 (Aug) 1930

38 McConnell A A Vesical Pain Irish M J Sc May 1933 pp 209 211

Learmonth J R and Braasch W F Resection of Presacral Nerve in Diseases of the Bladder Tr A A Genito-Urin Surgeons 25 313 1932

from carcinoma of the rectum has been reported greatly relieved by its use.<sup>50</sup> Cotte<sup>51</sup> and Dechaume,<sup>52</sup> by careful microscopic studies of cases in which there was relief from dysmenorrhea and no other reason discernible to cause it, have found definite evidence of inflammation in and around the excised plexus throwing light on the etiology of so-called essential dysmenorrhea. Heitz<sup>53</sup> points out that resection of the superior hypogastric plexus for gynecologic pain usually is a benign operation giving relief with castration.

#### CONCLUSIONS

1 The literature is inclined to be slightly misleading with regard to the value of sympathetic surgery for the relief of pain in the bladder and frequency in incurable tuberculous cystitis and in other intractable and disabling conditions of the bladder.

2 Results of our operative cases show significant and lasting improvement.

3 The literature has shown that excision of the superior hypogastric plexus alone does not suffice in all cases, and the results of our operations have strengthened the hypothesis of this theory.

4 We therefore recommend excision of the superior hypogastric plexus and excision of the lateral sacral sympathetic chains.

5 Intrathecal (subarachnoid) injection of alcohol with controlled dispersion is a great adjunct to surgery and is probably related to the disruption of the parasympathetic and somatic pain fibers.

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#### ABSTRACT OF DISCUSSION

DR ALEXANDER B HEPLER, Seattle. For the relief of pain presacral neurectomy alone might be expected to fail in a large percentage of cases because only a portion of the afferent fibers are contained in the hypogastric nerves. Although removal of additional sensory pathways through the lateral sacral sympathetic chain may give improved results, it will still fall short of complete relief in many cases, because of the afferent fibers in the parasympathetic and the somatic pudic nerves. It is difficult and undesirable to sever the latter nerve pathways to the bladder, because they contain not only other afferent fibers that are important in reflex functions but also motor fibers. For this reason Drs Schroeder and Cumming, in an attempt to remove only the important sensory fibers in these roots, have injected alcohol to get a sensory paralysis without a motor paralysis. This is possible because alcohol will affect the sensory nerves before it will the motor, not because it has any special affinity for sensory nerves but because in the sacral roots the pain fibers are more peripherally located and less heavily myelinated, so that they will be affected first. The extensive procedure of Drs Schroeder and Cumming is based on sound principles. However, I want to emphasize that much of the uncertainty which surrounds operations on the sympathetic trunks of the bladder for pain can be removed by the simple diagnostic test, before operation, of anesthetizing the pathways that one proposes to interrupt, with procaine hydrochloride. In this way one can tell not only how extensive a sympathectomy is indicated but whether or not any will work. Into the superior hypogastric plexus and the presacral nerves is injected 10 cc of a 2 per cent solution of procaine hydrochloride, according to the method described by Flathow. The injection is made at the level of the fourth lumbar interspace, about 7 cm from the median line, the needle is passed in at an angle of about 45 degrees to the upper portion of the body of the fifth lumbar vertebra and is then

passed in for about 15 cm along the anterolateral surface of the body of the vertebra, and 10 cc of procaine hydrochloride is injected. This is done on both sides. If the diagnostic injection is made at the time the patient is experiencing pain and the pain is relieved, presacral neurectomy alone can be done with assurance that it will almost certainly give complete relief from pain. If this injection does not relieve pain, low spinal anesthesia is given at the same level as the proposed intrathecal injection of alcohol. This will anesthetize the parasympathetic fibers in the second, third and fourth sacral roots and the somatic fibers in the third and fourth. If this alone relieves pain, laparotomy should be unnecessary. It would seem that if a large portion of the afferent sensory fibers pass through the parasympathetic and somatic nerves, as the authors have contended, or at least if the impulses are stronger, an intrathecal injection of alcohol alone should suffice in a larger percentage of cases than presacral neurectomy alone or the combined operation. If the pain is not relieved by either of the injections alone but is relieved when they are combined, one at least has some assurance that the combined operation will be successful. If the combined injections do not relieve pain, the suspicion is aroused that the symptoms are psychogenic.

DR J C NEELEY, Glendale, Calif. I was hopeful that a large number of cases could be found in a urologic clinic which had 12,232 hospital admissions in ten years and a sanatorium for tuberculosis which had 9,200 patients in sixteen years. The eight cases I present are all that I found. Of the eight cases there were four of interstitial cystitis. The first patient, a woman aged 39, had pain, burning and frequency for four years. This patient had undergone sympathectomy, appendectomy and removal of a cystic ovary, with about 30 per cent relief two years after operation. The second patient, a woman aged 39, had pain, burning and nocturia for four years. She had about 40 per cent relief two years after operation, and then after a course of sulfanilamide her relief increased to about 80 per cent and her nocturia entirely disappeared. Of the two patients with tuberculous cystitis, one, a man aged 24, had pain and almost continuous voiding for a period of about eight months. He had about 30 per cent relief. He died three months later of rupture of the bladder. The other, a woman aged 32, had pain and frequency (voiding every thirty minutes) for about a year. She obtained about 40 per cent relief from her symptoms but died in eight months of acute miliary tuberculosis. All these patients had complete operations in that all the visible fibers were removed for an appropriate length and there was complete denudation of all the blood vessels for a considerable distance from the anatomic location of the nerve plexus. The object of any operation is cure of the abnormality or relief of distressing symptoms to approach as near to 100 per cent as possible. If more than 50 per cent relief cannot be offered by an elective operation, such operation, in my opinion, is unwarranted.

DR REED M NESBIT, Ann Arbor, Mich. At the University Hospital I have performed sympathectomy for relief of vesical pain in six cases. The types of vesical pain must be differentiated. Two patients had severe tuberculous cystitis and four had nontuberculous cystitis of long standing, at least five years for each, which was refractory to all other types of treatment. Three of the patients had the combined operation described by the authors, resection of the superior hypogastric plexus and excision of the lateral sacral sympathetic chains. Three had presacral sympathectomy alone. All patients had complete relief of vesical discomfort. All the nontuberculous patients showed clear urine a few weeks postoperatively without medication. I don't know why that happened. Cystometric examinations at least one month postoperatively in all six cases showed (1) normal control over micturition, (2) increase in capacity of the bladder, (3) normal sensation for temperature and filling and (4) the sensation of overdistention, produced by pain exactly as in normal subjects. Cystoscopic examinations of all patients performed at least one month postoperatively, showed slight improvement in the cystitis in cases of tuberculosis and remarkable improvement in the appearance of the mucosa in nontuberculous involvement. In one of these cases, that of a woman who had been in my hands for ten years for treatment of non-tuberculous cystitis, I myself had made cystoscopic examination during spinal anesthesia six different times and had never seen the ureteral orifices. One month postoperatively one of my

50 Ferey D. Nouvelles indications de la resection du nerf presacre Presse med 35 227 (Feb 19) 1927

51 Cotte Gaston Alterations du sympathique pelvien dans dysmenorhee Lyon chir 29 252 (March April) 1932

52 Cotte Gaston and Dechaume J. Les alterations du nerf presacre Lyon chir 28 208 (March April) 1931

53 Heitz J. Resection du nerf presacre Lyon med 144 530 (Nov 3) 1929

assistants observed a normal cystic mucosa and catheterized both ureters. Previous to that time the bladder looked like a piece of raw beefsteak. In all six cases there was normal tactile sensation in all parts of the bladder and electrical stimulation of all parts of the bladder produced pain, as it did in the normal subject. From these observations it is obvious that normal afferent components exist after sympathectomy. It would therefore appear that the relief of the spasmodic pain of cystitis which follows sympathectomy results from the interruption of vasoconstrictor fibers in the presacral nerves, allowing relief of muscular or vascular spasm in the bladder. If this is true, one would expect relief of pain in cases of cystitis, one would not expect it in cases of Hunner ulcer or of cancer of the bladder.

## UNDESCENDED TESTES

### PRESENT STATUS OF GLANDULAR TREATMENT

WILLARD O THOMPSON, M.D.

AND

NORRIS J HECKEL, M.D.

CHICAGO

In a recent communication to *THE JOURNAL* we<sup>1</sup> demonstrated that the anterior pituitary-like principle from the urine of pregnant women may produce such marked stimulation of genital growth in young boys that a syndrome resembling premature puberty results. The present paper is concerned with the influence of this material on undescended testes.

Since Schapiro's<sup>2</sup> report eight years ago, the anterior pituitary-like principle has been used extensively in the treatment of this condition. In spite of numerous observations in other clinics showing a high incidence of successful results, we have consistently been unable to produce descent in most instances of true cryptorchidism.<sup>3</sup> In order to explain this discrepancy a critical survey of the problem is desirable. An analysis of the results of other observers<sup>4</sup> is given in table 1.

From the Departments of Medicine and Surgery, Rush Medical College of the University of Chicago and the Presbyterian Hospital. Owing to lack of space this article has been abbreviated. The complete article appears in the authors' reprints.

Read before the Section on Practice of Medicine at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 17, 1938.

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2. Schapiro B. Kann Man mit Hypophysenvorderlappen den unteren wickelten männlichen Genitallapparat beim Menschen zum Wachstum bringen? *Deutsche med. Wochenschr.* **56**: 1605 (Sept. 19) 1930.

3. Thompson W. O., Bevan A. D., Heckel N. J., McCarthy E. R., and Thompson Phebe K. The Treatment of Undescended Testes with Anterior Pituitary-like Substance. *Endocrinology* **21**: 220 (March) 1937. Thompson W. O., Heckel N. J., Thompson Phebe K., and Dickie L. F. N. Further Observations on the Treatment of Hypogonadism and Undescended Testes with Special Reference to the Production of Premature Puberty. *ibid.* **22**: 59 (Jan.) 1938.

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It may be seen that there were 860 undescended testes in 579 patients. The condition was bilateral in 281 and unilateral in 298. Of all the undescended testes, 524, or 61 per cent, descended. These successful results may be divided according to the original position as follows: intra-abdominal, descent reported in eighty-three of 150 cases, or 55 per cent; inguinal, descent reported in 172 of 298 cases, or 58 per cent; in upper part of scrotum, descent reported in fifteen of seventeen cases, or 88 per cent; and location unstated, descent reported in 254 of 395 cases, or 64 per cent.

In our<sup>5</sup> series only 20 per cent of all the testes descended, and descent occurred in only 27 per cent of the patients under 16 years of age (table 2). The difference between the high percentage of successful results reported by most other observers and our own percentage may be attributed in part to our exclusion, except in the beginning of the study, of all testes of the migratory or retracted types.

### IMPORTANCE OF ACCURATE DIAGNOSIS

Migratory testes, namely those which move back and forth readily from the canal to the scrotum, are not true undescended testes and tend to remain in the scrotum after puberty. In studying patients referred to us for treatment, we have been impressed by the large number of testes of this type which were considered to be true undescended testes. In distinguishing between true cryptorchidism and pseudocryptorchidism it is important that the examiner have a thorough knowledge of the pathologic anatomy of undescended testes and that the testes be carefully manipulated on more than one occasion with the patient in the upright position. The location of an undescended testis cannot be determined accurately with the patient in the recumbent position, and a testis cannot be considered intra-abdominal unless it is impossible to palpate it by any method of examination. A testis which appears to be in the abdominal cavity in the recumbent position is often found in the inguinal canal in the erect position.

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5. We used A. P. L. of Ayerst, McKenna and Harrison and follutein of E. R. Squibb and Sons.



or after straining. It should also be pointed out that in any position of the body it may occasionally be impossible, because of retraction, to palpate testes that at other times can be palpated.

The testis is not uncommonly deflected in various abnormal positions, notably over the external oblique muscle, occasionally toward the base of the penis and rarely in the perineum. Such testes can usually be

who had effeminate features associated with bilateral failure of descent, the patients were all of approximately normal body contour except two, who were of the Frohlich type. When treatment was started, the condition was bilateral in twelve and unilateral in twenty-six. Five patients with bilateral failure of descent had had a unilateral orchidopexy before they came to us for treatment, but in two cases the operation

TABLE 1—Analysis of Published Reports on the Treatment of Undescended Testes with the Anterior Pituitary like Principle With and Without Other Therapy\*

Author	No. of Patients	Average Age Years	Total No. of Undescended Testes	Total No. Descended	Percentage Descended	Type		Location		Intra abdominal		Inguinal		Upper Part of Scrotum		Location Not Stated	
						Bilateral		Unilateral		No Before Treatment		No Before Treatment		No Before Treatment		No Before Treatment	
						No Before Treatment	No Descended	No Before Treatment	No Descended	No Before Treatment	No Descended	No Before Treatment	No Descended	No Before Treatment	No Descended	No Before Treatment	No Descended
						ment	scended	ment	scended	ment	scended	ment	scended	ment	scended	ment	scended
Totals previously published <sup>2a</sup>	103		148	106	72	90	66	8	40	29	20	30	22	6	4	8	20
Cramer	20	5-13	30	22	73	20	16	10	6	23	17	7	5	0	0	0	0
Rony	6	12-33	9	5	56	6	3	1	2	7	5	2	0	0	0	0	0
Werner and others	17	5-13	31	24	73	22	24	1	0	6	2	26	22	0	0	1	0
Denk	22	5-13	31	18	58	20	11	9	1	12	10	20	10	3	3	0	0
Gorodner and Rolan	6	8-26	9	6	67	6	5	3	1	0	0	9	6	0	0	0	0
Glaum	7	8-24	10	7	70	6	4	4	3	0	0	0	0	0	0	0	0
Farmer	12	4-13	41	22	54	18	13	27	9	7	3	6	4	0	0	0	0
Bigler and others	71	2-13	91	33	36	40	18	11	17	19	4	23	10	5	5	3	0
Mimpriss	20	5-15	29	11	38	18	10	11	1	72	29	0	0	0	0	0	0
Plum	3	10-14	6	4	67	6	4	0	0	2	0	26	10	1	1	0	0
Dorff	15	3-11	20	12	60	10	7	0	0	0	0	2	0	2	2	0	0
Hühner	1	29	1	1	100	0	0	10	5	0	4	11	8	0	0	0	0
Moffet	11	11-16	11	11	100	8	8	1	1	0	0	1	1	0	0	0	0
McEllan	25	1-10	37	22	59	24	16	13	6	0	0	0	0	0	0	10	11
Rubinstein	13	9-16	19	10	69	12	6	7	4	0	0	0	0	0	0	31	22
Sexton	19	0-40	26	19	73	14	11	12	8	10	4	9	6	0	0	0	0
Hess and Kunstadter	39	2-15	68	52	76	38	48	10	4	0	0	0	0	0	0	68	52
Allen and Stokes	1	11	2	2	100	2	2	0	0	2	2	0	0	0	0	0	0
Rapant and Navratil	11	12	16	6	38	10	3	6	2	0	0	0	0	0	0	16	6
van Gelderen	64	11	97	57	58	66	40	31	12	0	0	0	0	0	0	91	51
Hess, Kunstadter and Saphir	13	5-14	124	93	74	20	16	3	1	1	1	7	7	0	0	10	9
Types	7	6-11	7	2	29	0	0	7	2	0	0	7	2	0	0	0	0
Sand	1	10	2	2	100	2	2	0	0	2	2	0	0	0	0	0	0
Johnson	1	10	2	2	100	2	2	0	0	2	2	0	0	0	0	0	0
Bjerre	2	9-12	4	0	0	4	0	0	0	4	0	0	0	0	0	0	0
Goldman and others	11	9-21	19	10	53	16	11	3	2	4	1	15	14	0	0	0	0
Gordon	38	2-14	61	36	59	46	27	15	9	0	0	0	0	0	0	61	36
Total†	579		800	594	61	562	381	298	140	100	83	298	172	17	10	300	241

\* Unless otherwise noted, the references cited in this table are listed in footnote 4.

† The data of Dahl Iversen and Sturup Schapiro and Mimpriss (1935) are not recorded in a manner that makes it possible to incorporate them in this table. The first authors reported a high percentage of successful results from the use of several preparations and considered glandular treatment preferable to operation, while Mimpriss noted only four instances of descent in fourteen patients and was skeptical about the value of such treatment.

TABLE 2—Analysis of Our Results with the Anterior Pituitary like Principle

Age Years	No. of Patients	Total No. of Undescended Testes	Total No. Descended	Percentage Descended	Type		Location		Intra abdominal		Inguinal		Deflected Over Exterior Oblique Muscle		Deflected Over Rectus Sheath		Lateral to Scrotum	
					Bilateral		Unilateral		No Before Treatment		No Before Treatment		No Before Treatment		No Before Treatment		No Before Treatment	
					No Before Treatment	No Descended	No Before Treatment	No Descended	No Before Treatment	No Descended	No Before Treatment	No Descended	No Before Treatment	No Descended	No Before Treatment	No Descended	No Before Treatment	No Descended
					ment	scended	ment	scended	ment	scended	ment	scended	ment	scended	ment	scended	ment	scended
1½-37	38	50	10	20	26	4	24	6	20	0	21	9	7	0	1	0	1	1
1½-15	29	30	9	27	10	3	23	6	8	0	18	8	5	0	1	0	1	0
16-37	9	15	1	6	10	1	1	0	12	0	3	1	2	0	0	0	0	0

distinguished from those in the inguinal canal by the fact that they lie more superficially and can be moved readily under the skin. Those in the upper part of the canal can often be displaced into the abdominal cavity. It will be shown later that the location of the testis has an important bearing on the response to glandular treatment.

#### ANALYSIS OF OUR RESULTS

It may be seen from table 2 that the effect of treatment was observed in fifty undescended testes in thirty-eight patients. Except for a few of the older patients

was unsuccessful and the testis could not be palpated. Thus the condition was originally bilateral in fifteen of the thirty-eight patients and unilateral in twenty-three. In fourteen in whom the condition was unilateral to begin with, the undescended testis was on the right side, and in nine it was on the left. As a result of treatment with the anterior pituitary like principle from the urine of pregnant women, ten testes (five on each side) descended in nine patients (table 3). Thus the incidence of successful results was 20 per cent on the basis of the number of undescended testes and twenty-four per cent on the basis of the number

of patients. It appeared to be easier to produce descent before than after the age of puberty. In twenty-eight patients under 16 years of age descent occurred in nine of thirty-three undescended testes (27 per cent), whereas in ten patients 16 years of age and over it occurred in only one of seventeen undescended testes (6 per cent).

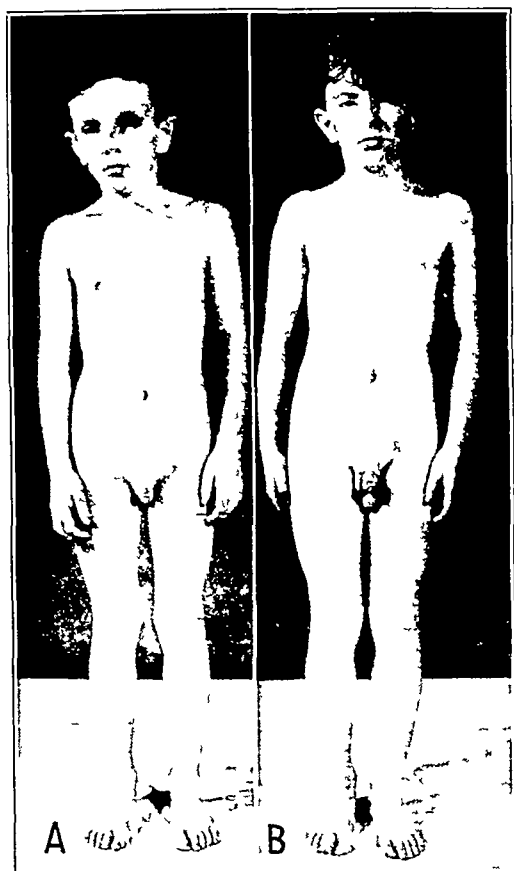


Fig 1 (H S)—Genital growth from the anterior pituitary like principle with descent of the right testis. No growth was observed until after the testis had reached the upper end of the scrotum. There was associated hypospadias. A taken Aug 24 1936 before treatment at the age of 7 years. B taken June 1 1937 after 7 600 rat units of follutein followed by 43 800 rat units of A P L had been given.

In three patients (R B, A V and W T) the testis could be displaced into the scrotum before treatment was started, and these patients really should not be included in this series. They were incorporated in our original report<sup>3</sup> to give the treatment the benefit of the doubt. Their exclusion would leave only seven instances of descent for forty-seven undescended testes (15 per cent).

Descent occurred in eight cases within two months after treatment was started and in the other two within four months and twenty-one months respectively. The patient who showed descent at the end of four months was 23 years old and at first was given a dose too small to produce genital growth. The patient (D B) requiring twenty-one months for descent was 10 years old and showed less susceptibility to the stimulus than many other patients. His left testis was in the fold of skin to the left of the scrotum, and it was not until genital growth had been produced by the administration of large doses that it appeared in the upper end of the scrotum.

The position of the testis appeared to be an important factor in determining the result of treatment.

Descent was produced in nine of twenty-one instances (43 per cent) in which the testis was in the inguinal canal, in only one of nine instances (11 per cent) in which it was deflected in an abnormal position outside the canal and in none of the twenty instances in which it was within the abdominal cavity. The only patient in whom descent was produced when the testis was deflected in an abnormal position was D B, previously referred to, in whom the testis was deflected in the fold of skin to the left of the scrotum. Descent was not produced in any instance in which the testis was deflected over the external oblique muscle or toward the base of the penis. In one boy 7½ years old we thought at first that we had caused both testes to move from the abdomen into the scrotum, because we did not feel them before treatment was started. Their descent within three weeks after treatment was started seemed so remarkable to us that we explored the matter further. On questioning his mother, we found that from the time of the child's birth she had frequently seen and felt both testes in the scrotum, while at other times they were not there. When we made our first examination the boy was greatly embarrassed and it is possible that the emotional reaction resulted in the retraction of the testes into the abdominal cavity. There can be little doubt that these testes were of the migratory type, and we have excluded them from this series. Our failure to produce descent in our cases of intra-abdominal testes is in striking contrast to the results of some other observers (table 1). In five of our ten successful cases the testis could either be pulled into the upper end of the scrotum or to a level between the lower end of the canal and the upper end of the scrotum before treatment was started. In other words, the testes were of the type that commonly descends at puberty. In the other five cases there could be little doubt of the influence of the treatment in causing descent.



Fig 2 (H S)—A taken Aug 24 1936 before treatment and B taken June 1 1937 after treatment.

More striking than descent of the testis was the production of genital growth in seventeen of thirty-one patients who received the medication for a long period. Growth without descent occurred in ten patients, while descent without measurable growth was noted in seven (figs 1 to 4). However, in three of these seven patients (H S, A V and W T) the genitalia grew later with continued medication.

In our unsuccessful cases the average dose was much greater than that in our successful cases. Thus failure to produce descent in a larger number of cases cannot be attributed to lack of adequate dosage. The production of genital growth without descent of the testis in ten patients is further proof of this point.

#### TREATMENT FOLLOWING UNSUCCESSFUL ATTEMPTS AT SURGICAL CORRECTION

The effect of treatment was observed in six boys from 7 to 13 years of age in whom it had not been possible to bring the testis to a sufficiently low level at the time of operation. In five boys the testis was

TABLE 3—Analysis of Successful Cases

Patient	Age Years	Position of Testes		Time Required for Descent	Genital Growth	Total Dose Required for Descent Rat Units
		Before Treatment	After Treatment			
A V	5½	Right, in scrotum Left in canal could be displaced easily to upper end of scrotum	Right in scrotum Left in scrotum	4 weeks	None until later	625 follutein
T D	6½	Right, at level of external ring associated with hernia could not be displaced downward	Right, at upper end of scrotum with hernial sac extending below Left in scrotum	7 weeks	Moderate (marked later)	1,570 follutein
H S	7 yr 11 mo	Left in scrotum Right in lower part of canal could not be displaced downward	Right, in upper end of scrotum Left in scrotum	9 weeks	None until later	4,400 follutein
O B	9	Right in inguinal canal Left in inguinal canal	Right in scrotum Left in inguinal canal	4 weeks	None or slight	2,125 follutein
R B	9	Right just inside external ring, could be displaced into scrotum Left in scrotum	Right in scrotum Left in scrotum	2 weeks	None	990 follutein
W T	10	Right just below external ring displaced into scrotum readily Left could be moved from level of internal ring to upper end of scrotum	Right, in scrotum Left, in scrotum	2 weeks 2 weeks	None until later	1,000 follutein
D B	10	Right, in scrotum Left in fold of skin beside scrotum could not be displaced into scrotum	Right in upper end of scrotum Left in scrotum	21 mo	Marked	14,400 follutein 6,100 A P L
F V	12	Right in scrotum previously undescended, but corrected by orchidopexy Left in inguinal canal could be displaced into abdominal cavity	Right in scrotum Left in scrotum	2 weeks	None	625 follutein
A B	23	Right not palpable (previous attempt at orchidopexy) Left in inguinal canal	Right not palpable Left in scrotum	4 mo	Moderate	5,000 A P L

TABLE 4—Observations at Operation in Eleven Unsuccessful Cases

Patient	Age Yrs at Beginning of Treatment	Position of Testes		Genital Growth	Total Dose Administered Rat Units	Observations at Operation
		Before Treatment	After Treatment			
R Bn	8	Right intra abdominal Left, in scrotum	No change No change	None	8,600 follutein in 3½ mo	Right testis just inside internal ring with peritoneal process protruding from external ring Left testis in canal bound down by fine connective tissue bands
M A	12	Right, in scrotum (right orchidopexy before treatment) Left intra abdominal	No change Left in upper part of inguinal canal	None	8,175 follutein in 4½ mo	Testis and peritoneal process deflected upward over external oblique muscle just lateral to ring
F G	8	Right, in scrotum Left deflected over external oblique muscle to a point 4.5 cm above base of penis	No change No change	None	4,900 follutein in 4½ mo	Testis just under external ring in the peritoneal pouch which extended downward and ended as a fibrous cord at neck of scrotum
L K	11	Left in scrotum Right in inguinal canal and could be displaced downward to opening above scrotum	No change No change	Marked	12,900 follutein in 8 mo	Testis in canal bound to peritoneal pouch and three fascial layers by connective tissue
C DIB	7	Left in scrotum Right in canal but could be displaced downward to upper part of scrotum	No change No change	Marked	5,440 follutein in 2 mo	Left testis in inguinal canal at external ring, peritoneal pouch lay over rectus sheath and extended to within 1.5 cm of neck of scrotum
P L	11	Right in scrotum (previous orchidopexy) Left in inguinal canal	No change No change	None	7,740 follutein in 3½ mo	Right testis and peritoneal process deflected upward on external oblique muscle
J D P	17	Left in scrotum Right at about level of midcanal	No change No change	None	7,200 antuitrin S in 1 mo	Peritoneal process extended downward to neck of scrotum but was deflected upward over external oblique muscle, the testis was deflected upward in this sac to its midpoint
A W	7	Left in scrotum Right deflected upward over external oblique muscle could be displaced downward to upper end of scrotum	No change No change	None	13,200 follutein in 10½ mo	Right testis in inguinal canal and in middle of hernial sac which extended almost down to pubic bone, sac and testis could not be displaced downward because of adhesions
J P	1½	Left in scrotum Right intra abdominal	No change Right in upper end of canal	Marked	20,615 follutein in 26 mo (13,200 of this in 6 mo)	Very poorly developed left testis in inguinal canal firmly bound down with adhesions and attached to a hernial sac
F S	13	Right in scrotum Left atrophic in opening above scrotum could barely be displaced to upper end of scrotum	No change Left not palpable possibly because so atrophic pubic hair appeared just before treatment started	Marked	30,500 A P L in 4 mo	Well developed left testis in abdomen attached to rather large hernial sac
G A	6½	Right in scrotum Left in inguinal canal could not be displaced into scrotum disappeared into abdomen in recumbent position	No change Intra abdominal	Marked	45,000 A P L in 3½ mo	

in the opening just above the scrotum and in one could not be palpated. In one the condition was bilateral, making a total of seven undescended testes in these six boys. As a result of treatment, four testes descended and five boys showed marked growth of the genitalia. No descent occurred without genital growth, but marked genital growth occurred without descent in two boys.

#### OBSERVATIONS AT OPERATION

Eleven patients who failed to show descent had an orchidopexy (table 4). In every instance anatomic factors were found which prevented descent, and these were not corrected by glandular treatment. These anatomic factors were (1) fibrous bands (all patients), (2) shortness of the structures to which the cord and testis were attached, namely the peritoneal process, the transversalis fascia, the intercolumnar fascia and the cremasteric muscle and fascia (all patients), (3) abnormal direction of the peritoneal process (four patients), which in three patients was turned upward on the external oblique muscle and in one lay over the rectus sheath, and (4) absence of the external ring (one patient). In some instances shortness of the blood vessels of the cord appeared to be a factor.

Our results indicate that operative procedures are necessary in about three fourths of all cases of true cryptorchidism. This does not mean that treatment with the anterior pituitary-like principle is not of value. Even when it does not produce descent it may aid subsequent operative procedures, apparently by enlarging the parts involved. In each of the eleven instances cited in table 4 it was possible to bring the testis into the scrotum without injury to its blood supply.

#### SIGNIFICANCE OF OBSERVATIONS

The high percentage of failures in the treatment of true cryptorchidism with the anterior pituitary-like principle from the urine of pregnant women naturally raises the question of the value of this form of treatment. It has been well established that the incidence of undescended testes is much less after than before puberty.<sup>6</sup> This apparently means that the hormonal changes incident to puberty produce descent in a large percentage of cases. The difference in incidence in the prepubertal and postpubertal periods may be accounted for in two ways: (1) the inclusion of a large number of testes of the migratory or retracted type, which remain in the scrotum after puberty, as true undescended testes and (2) the descent at puberty of testes not retained by mechanical factors.

It would be interesting to know what the difference in incidence in the prepubertal and postpubertal ages would be if migratory testes were excluded. It is possible that the percentage of patients showing descent spontaneously at the time of puberty would be about the same as with the anterior pituitary-like principle given before puberty. As a result of treatment with this principle, we may cause descent only of those testes which would descend normally about the time of puberty. Influences similar to those which we have introduced artificially come into play as the result of normal development and might be expected to result in

descent of the testes when no anatomic abnormality exists. If we accomplish no more with this treatment in young boys than is accomplished by natural processes at a later age, we must inquire whether the treatment is worth while. The crux of the problem is whether a testis made to descend at an early age with treatment is more likely to be normal than one which descends later without treatment. The consensus appears to be that in true cryptorchidism the testis should be brought into the scrotum at an early age, although there is some difference of opinion on this point. Treatment with this material, by distinguishing between those cases in which descent is prevented by anatomic factors and those in which it is not, makes it possible to tell

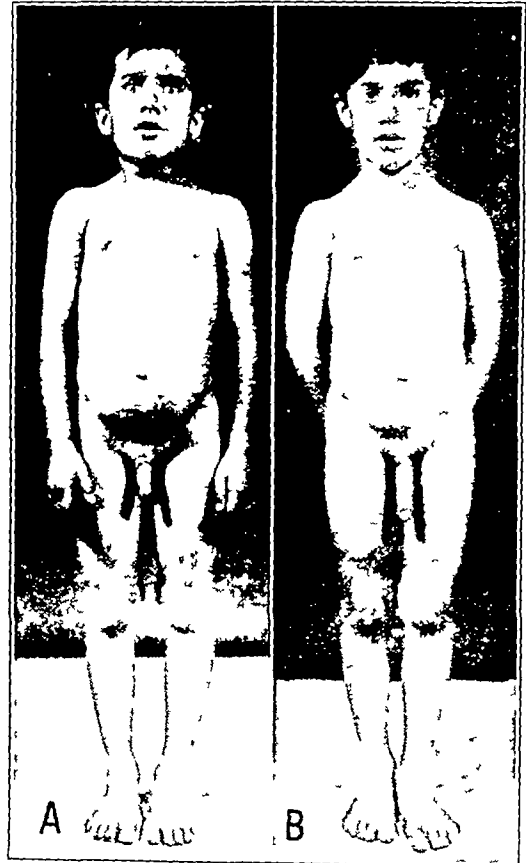


Fig 3 (G A)—Genital growth from the anterior pituitary-like principle without descent of the left testis. A taken Nov. 8 1937 before treatment at the age of 6½ years. B taken April 28 1938 after 45 500 rat units of A. P. L. had been given.

early what patients will require surgical intervention. However, it should be pointed out that little is known about the effect of premature stimulation with this material on the function of the testis after puberty.

#### PRESENT STATUS OF TREATMENT

In the light of these observations it is important to maintain an open mind on the treatment of undescended testes with the anterior pituitary-like principle. Many reports appear to be overenthusiastic. If the importance of bringing the testis into the scrotum at the earliest possible age has not been overestimated, perhaps the wisest course is to administer this material cautiously and carry out operative procedures if descent fails to occur. Susceptibility to the anterior pituitary-like principle varies markedly, so that dogmatic statements about the size of the dose and the duration of

<sup>6</sup> Williams Pearce. Incidence of Undescended Testes. *Lancet* 2 929 (Oct 17) 1936. Drake C B. Spontaneous Late Descent of the Testis. *J. A. M. A.* 102 759 (March 10) 1934. McCrea E d A. Treatment of the Undescended Testis. *Lancet* 2 753 (Oct 5) 1935. Spence A W and Scowen E F. The Use of the Gonadotropic Hormones in the Treatment of Imperfectly Migrated Testes. *Lancet* 2 1335 (Dec 14) 1935. Williams Pearce. The Imperfectly Migrated Testis. Some Statistical Data. *Lancet* 1 426 (Feb 22) 1936.

treatment cannot be made. As a rule, in successful cases descent of the testis occurs within two months after the daily administration of from 100 to 1,000 rat units is begun.

We have previously pointed out that genital growth produced by this material may be so marked that changes simulating premature puberty result,<sup>7</sup> and there can be little doubt that excessive genital growth should be avoided. It would be desirable to know what effect premature stimulation of testicular function by this material has on subsequent spermatogenesis, skeletal growth and social adjustment.

These considerations apply only to boys with uncomplicated cryptorchidism. When failure of descent of the testis is associated with hypogonadism, genital growth is to be desired and much larger doses may be administered over a much longer period.

#### SUMMARY

The effect of the anterior pituitary-like principle from the urine of pregnant women in the treatment of undescended testes appears to be exaggerated. With thirty-eight patients of all ages, descent was produced in only ten of fifty undescended testes, or in 20 per cent, compared with an average of 61 per cent of successful results reported in the literature. If only the twenty-eight patients under 16 years of age are considered, descent was produced in nine of thirty-three undescended testes, or in 27 per cent. Descent did not occur in any instance in which the testis was intra-abdominal or deflected over the external oblique muscle.

It follows that, in the majority of cases of true undescended testes, operative procedures are still necessary because of mechanical factors which prevent descent.

The administration of the anterior pituitary-like principle makes it possible at an early age to distinguish between those testes which require surgical intervention and those which do not. When the testis does not come down, the treatment may facilitate subsequent operative procedures by enlarging the parts involved.

The value of this form of treatment depends on the importance of getting the testis into the scrotum as early as possible. If early descent is important, the management of cases of undescended testes involves the intelligent combination of medical and surgical measures.

Treatment should be discontinued before genital growth becomes excessive.

In evaluating the effect of treatment it is important to exclude all cases of pseudocryptorchidism.

Many unsolved problems, such as the influence of premature stimulation of the testis on its function later in life, on skeletal growth and on social adjustment, make it necessary to preserve an open mind on the treatment of undescended testes with the anterior pituitary-like principle from the urine of pregnant women.

It is possible that this material causes descent only of those testes which would descend without treatment about the time of puberty.

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<sup>7</sup> Thompson W. O., Heckel N. J., Bevan A. D. and Thompson Phebe K. Premature Puberty from Treatment for Undescended Testes: Application to Hypogonadism. *Tr. A. Am. Physicians* 52: 137, 1937. Thompson and Heckel.<sup>1</sup>

#### ABSTRACT OF DISCUSSION

DR. HANS LISSER, San Francisco. Fully fifteen years ago in treating a number of boys with the Frohlich type of obesity by a reasonable regimen of weight reduction including the use of thyroid and whole pituitary combined in a coated capsule I noted descent of the testes every now and again. Of course the significance of it escaped me, because I never published a record of it, merely assuming that in the course of reduction and the taking away of the great pad of mons veneris in which the penis and tiny scrotum were concealed the testes came into view. In recent years I have used the gonadotropic principle to produce descent of the testes, but I find myself thinking in a different way than the authors. Rather than begin as early as possible, it seems to me much better to wait a reasonable time. But that I don't mean to wait until after puberty should normally have occurred, but I see no particular point in beginning the treatment until the boy has allowed nature to have a chance, namely until he is along about 12 or 14. Then I give the testes an impetus if they don't come down and stay down. I think that the authors are right in being conservative as regards statistics and calling attention to the many instances of migratory testes that are being classed as cases of cure. Of course, this matter of enthusiastic statistics is always the rule when something new comes along. I think it might be wise to wait until these boys get to be 12 or 14, and certainly the surgeon is not needed much before that. Furthermore, because of some of these extraordinary and convincing demonstrations of diminution I rather think sexual precocity might be avoided by waiting a little bit longer. Of course the authors, as they themselves stated, have used much larger doses than most observers, far more than I have used. I wonder perhaps whether some of the results might be attributed to a little too much of the substance.

DR. C. KOST SHIFTON, Los Angeles. The authors controlled their observations well, however I agree with Dr. Lissér wondering if it is rational to treat these patients early. I wonder what happens to the osseous development of such a child, and I should like to ask the authors if they have seen any definite advance in it. Epiphyseal closure is believed to depend somewhat on the sex elements. We know that the patient with spontaneous pubertas praecox is often an infantile giant, so to speak—an infant who grows more rapidly at that time and whose epiphyses close much earlier. They are also adult dwarfs, so to speak. It is possible that early treatment markedly alters the stature of the patient. I have never seen that occur, because I have never used doses as large as the authors have used. I have also felt that if these patients did not respond to a small dose of not more than from 1,000 to 1,500 rat units a week, of gonadotropic substance from the urine of pregnant women, over a reasonable period, I should not pursue the matter further. I have found, however, that the preparation will develop the penis apparently much better than it will produce descent of the testicles. I think the authors' statistics are about right, according to my series. It is well known that if one examines a patient on several occasions one frequently finds the testicles up at one time and down at another. I should like to ask whether the authors have ever found marked enlargement of the testicle intra-abdominally after administration of such large doses. I felt that the giving of large doses to patients with intra-abdominal testicles might produce actually such an enlargement that the testicles would not then later descend spontaneously. I have in a few instances seen a great deal of abdominal pain from this, and I feel that it has been due to the injections.

DR. WILLARD O. THOMPSON, Chicago. I am much obliged to Drs. Lissér and Shelton for bringing out points which we didn't have time to deal with in presenting the paper. Dr. Lissér raised the question whether it would not be wise to wait until a later age before starting treatment. As I understood him, he meant the age of 12 to 15 years. There are two reasons for that suggestion, one being that in some instances spontaneous descent occurs, and in some instances with the use of large doses of the substance changes simulating puberty occur. This question represents the crux of the problem. If it is true that we caused descent only of those testes which would descend

normally at the time of puberty, then the question arises as to whether there is any point in giving this treatment. If it is to be given, it should be given before the age of puberty, because at that time the changes which occur will cause descent if descent can be produced without operative intervention. The problem is how important it is to get the testes down at the earliest possible age. According to the results of Moore, it is important. We think there is some question about this and that a testicle which descends at puberty may perhaps be as well off as one which has been brought down at a much earlier age. If it is true that the testes should be brought down early, then the use of this material does make it possible to determine at an early age whether operative procedures will be necessary. It certainly is undesirable to produce changes simulating puberty in a boy anywhere from 3 to 7 years old. We presented examples of the powerful stimulus which this material exerts on the genitalia and examples of the fact that marked genital growth may occur without descent of the testes. This material may interfere with the function of the testes later in life. If it is true that treatment should be carried out early, it is also true, of course, that two thirds of the patients at least require surgical intervention, and it then becomes important to combine intelligently the administration of the substance with surgical procedures. Dr. Shelton raised the question of bony growth, the influence of premature sexual development on the epiphyseal closure. Our observations have been carried on for too short a time to allow us to answer that question. We have had the impression that boys showing marked genital growth have shown an increase in rate of osseous growth. What the eventual result will be we can determine only in the course of several more years. Dr. Shelton also raised the question of marked enlargement of intra-abdominal testes, preventing descent. By and large, we produced little increase in the size of testes in the patients we treated. If the testes were within the abdominal cavity, this material was much less effective in influencing either their function or their location than if they were in the canal or in the scrotum. We therefore think it improbable that the increase in size of a testicle within the abdomen from the use of this material would be great enough to prevent descent.

#### No Death from Dysentery in Africa in Italian Troops

—Dysentery has always been one of the worst scourges of armies in war time. During the great war the British Expeditionary Force in Gallipoli, consisting of 112,677 men and 4,161 officers, had during the campaign 29,728 cases of dysentery, with 811 deaths, more than a quarter of the whole force contracted the disease. During the Italo-Ethiopian War there was a total of 453 hospital cases of dysentery, with no death.

The great majority of cases were amebic. What prophylactic measures were taken? (a) Every effort was made to give the officers and men pure drinking water. Practically all the officers drank mineral waters bottled in Italy and shipped to Africa in gigantic quantity. I do not think there has been any war previously in which mineral waters have been used on so large a scale. Officers and men in warships and in hospital ships drank the noted Serino water, imported by cistern boats from Naples, where it is the normal city supply.

We could always get water by drilling wells deep enough. It was, of course, always boiled or chlorinated.

(b) The second prophylactic measure was this. The men were recommended to get into the habit of washing or disinfecting their hands with a 2 per cent solution of lysol or lysoform after visiting the latrine, and before having their meals. The lysol disinfection of the hands was strictly enforced on cooks and others working in the kitchens. In Somalia in many latrines and outside every kitchen was found a receptacle fixed to a post, containing a 2 per cent solution of lysol or lysoform.

No vaccines were used. With regard to dysentery oral vaccines, although my associates and I have worked on the subject for several years, I have not been able to convince myself that they are really efficacious—Castellani, Sir Aldo. Hygienic Measures and Hospital Organization of the Italian Expeditionary Forces During the Ethiopian War, 1935-1936, *J Roy Nat Med Serv* 24 304 (Oct) 1938.

## THE EFFECTS OF TUBERCULOPROTEIN

### A QUANTITATIVE STUDY

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AND

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More than most other diseases, tuberculosis may be justly classed the disease of striking quantitative relations. Animals may survive large amounts of bacilli for a long time, while extremely small numbers of highly virulent mammalian tubercle bacilli will lead to progressive disease in the normal animal. Besides the variegated pathogenicity, these complicated relations may designate tuberculosis a mosaic disease. On numerous occasions in the past, uncertain and erroneous deductions have resulted when the quantitative relations of so simple a single factor as tubercle bacilli and their products have not been carefully weighed. An obvious basis for the experimental study of tuberculosis appears to be (1) the viable bacilli, (2) products derived from the bacillary bodies and (3) metabolism products, or the substances given off by the bacilli during growth or spontaneous disintegration. Prior to the past decade, the literature was encumbered by conflicting observations as a result of the lack of knowledge of the tubercle bacillus and the inability to obtain large amounts of chemically pure bacillary products. Regarding the former, it was contended for years that allergic hypersensitiveness could not be produced by heat-killed tubercle bacilli, while in recent years there has appeared to be a unanimous opinion in favor of such production.<sup>1</sup> Koch presented old tuberculin in 1891 for diagnostic purposes, and it still has advocates even though it contains extraneous proteins. On the other hand, the active principle has been prepared by cultural and chemical methods as a chemically pure tuberculoprotein by Long and Seibert<sup>2</sup> and can be studied scientifically.

Although chemical disintegration methods have been utilized for studying the constitution and biologic action of products of the tubercle bacilli,<sup>3</sup> within the past few decades, it appeared that in studying specific immunology it would be better to obtain an action from a pure product naturally produced and not denatured and to follow this activity quantitatively to its simpler forms, much as Long and Seibert did in studying and isolating the active principle of tuberculin. By utilizing virulent and avirulent mammalian tubercle bacilli (*Mycobacterium nusquam phymatosis*),<sup>4</sup> it was found<sup>5</sup> that

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1 Petroff S A. Immunity in Tuberculosis, *J A M A* 89 285 293 (July 23) 1927. Petroff S A and Stewart F W. Immunological Studies in Tuberculosis. Allergic Reactions Obtained in Animals Sensitized with Killed Tubercle Bacilli, *J Immunol* 10 677 717 (July) 1925.

2 Long E R. A Study in Fundamentals of the Nutrition of the Tubercle Bacillus, *Am Rev Tuberc* 3 86 1920. A Review of Some Recent Studies on the Metabolism of the Tubercle Bacillus, *Tubercle* 6 128 (Dec) 1924. Long E R and Seibert Florence B. Tuberculin Chemical Composition of Active Principle and Nature of the Tuberculin Reaction, *J A M A* 85 650 (Aug 29) 1925.

3 Johnson Treat B. The Principles of Bacteriological Chemical Analysis and Their Application to the Tubercle Bacillus and the Chemical Study of Bacteria, *Am Rev Tuberc* 14 30 (July) 164 (Aug) 1926. Anderson R J. Chemistry of the Lipids of the Tubercle Bacillus, *Physiol Rev* 12 166 1932. Long E R. Ueber chemie der Tuberkelbakterien. Eine Uebersicht, *Ztschr f Tuberk* 64 78 1932.

4 Corper H J. An Interpretation of the Virulence (or Pathogenicity) of Tubercle Bacilli Based on Experimental Observations, *Mycobacterium Nusquam Phymatosis*, *J Infect Dis* 60 312 (May) 1937.

5 Corper H J, Cohn Maurice L and Damerow A P. Studies on the Behavior of Tubercle Bacilli within the Body, *Am Rev Tuberc* 33 679 694 701 709 and 721 (May) 1936.



appropriate previous injections of avirulent human or bovine tubercle bacilli (given intracutaneously, subcutaneously or intravenously, but not enterally) retard the development of subsequent infection with virulent human or bovine tubercle bacilli. The effect is evident in the retardation of the disease in the local intracutaneous lesions and the tributary glands and in the metastatic organic disease developed. The immune effect develops definitely at the point where local macroscopic tubercles are produced by the intracutaneous injection of the avirulent tubercle bacilli.<sup>6</sup> In a continuation of these studies to obtain a better understanding of the mechanism of immunity in tuberculosis it was noted<sup>7</sup> that two apparently paradoxical conditions in tuberculosis under certain circumstances coexist and can be defined by quantitative evaluation and by using avirulent and virulent human and bovine tubercle bacilli. One of these, a specific immunity, is effective in retarding tuberculosis after virulent infections, as previously noted. It is associated with a changed tissue reaction, which is evident when the bacilli are given in amounts above the threshold of tubercle formation. The second condition—a type of protein intoxication, does not

indirect, since only the Dale uterus method was used for test of the biologic reaction. Therefore no definite quantitative factors could be noted. In 1931 Lewis and Seibert<sup>9</sup> found that the proteins isolated from filtrates of acid-fast bacterial cultures on a synthetic medium are actively anaphylactogenic. At this time they considered 20 mg. of protein to be the maximum amount that could be injected intravenously into normal guinea pigs without causing acute symptoms or death within forty-eight hours. Shortly thereafter, in 1932, Seibert<sup>10</sup> further approached the problem of sensitization to tuberculo-protein with pure preparation, and more accurate methods than Zinsser and earlier investigators used, but her investigations were not quantitatively exhaustive. These investigations were made possible by growing tubercle bacilli on Long's nonprotein synthetic medium and obtaining a pure tuberculo-protein by chemical precipitation, or ultrafiltration methods. Specific cutaneous sensitization was produced in normal rabbits and guinea pigs, for the first time, by repeated injections of the highly purified, undenatured protein of tuberculin. The sensitization was claimed to be of as high degree and of the same type

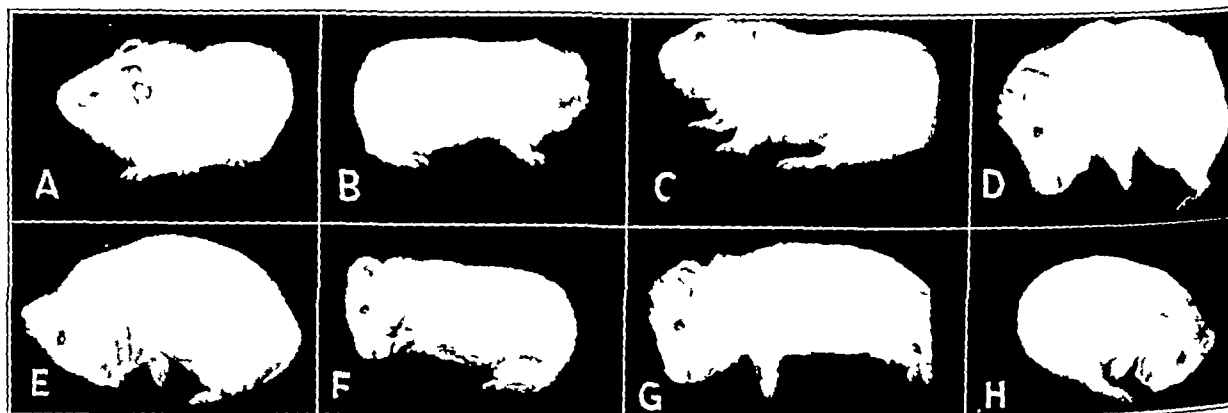


Fig 1—Anaphylactic shock resulting from the intravenous (ear vein) injection of 1 mg. of tuberculo-protein (the Seitz filtrate or the trichloroacetic acid precipitated protein from the growth of virulent human tubercle bacilli on a nonprotein synthetic medium) into a guinea pig previously given an intravenous or intraperitoneal injection of 2 mg. of the same material from ten days to nine months previously. The pictures were taken at twenty second intervals beginning with the normal animal (A) photographed before the second injection and ending with the death of the animal (H) which occurred in about two or two and one-half minutes. Such guinea pigs give no cutaneous (tuberculin) reaction with as much as 0.1 mg. of tuberculo-protein.

become evident until large amounts of tubercle bacilli are either injected or disseminated internally after a primary contact with viable tubercle bacilli. The provocative reaction is variable, depending on such factors as are instrumental in anaphylactic shock or reactions. Almost two decades ago, Zinsser<sup>8</sup> reviewed the literature extensively and reported the biologic protein reactions produced by extracts of the tubercle bacillus. He found that the reaction to tuberculin is independent of general anaphylaxis to tuberculo-protein. In its typical and extreme form, hypersensitiveness to tuberculin cannot be induced by dissolved extracts of the tubercle bacillus provided they are filtered through Berkefeld filters to remove formed particles, but it can be induced characteristically by infection with the living bacilli and by treatment with dead organisms (even when boiled). The criticism offered of this work was that it is not clear what organisms were used, that the extracts were relatively crude and that deductions were

as that produced by infection with live tubercle bacilli or by injection of dead bacilli. The most successful methods for preparing and purifying the protein of tuberculin in order to preserve its antigenic capacity were precipitation by means of ammonium sulfate or trichloroacetic acid and mere concentration and washing by means of ultrafiltration. Unfortunately the cutaneous tests were performed in all cases only with large amounts (10 mg., only two pigs having been tested with 0.2 and 0.1 mg. respectively) of tuberculo-protein, and Seibert offered her own criticism of this. Yet according to her as little as 0.000002 mg. of the purified protein will give a good positive reaction in a tuberculous guinea pig. It is noteworthy also that phenol is used as a preservative during the preparation of her tuberculo-protein and that a general lethal dose was found to be only from 12.6 to 17.3 mg. for normal guinea pigs.<sup>11</sup>

6 Corper H. J., Damerow A. P., Cohn M. L. and Vidal C. P. Vaccination Against Tuberculosis. Comparative Study in Man and Animals. *J. Infect. Dis.* 58: 158 (April) 1936.

7 Corper H. J., Cohn M. L. and Damerow A. P. Specific Artificial Immunity in Tuberculosis. *Am. J. Clin. Path.* 7: 360 (Sept.) 1937.

8 Zinsser Hans. Studies on the Tuberculin Reaction and on Specific Hypersensitiveness in Bacterial Infections. *J. Exper. Med.* 34: 495 (Nov.) 1921. Zinsser Hans and Tamiya Takeo. An Experimental Analysis of Bacterial Allergy. *ibid.* 44: 753 (Dec.) 1926.

9 Lewis Julian H., and Seibert F. B. The Chemical Composition of the Active Principle of Tuberculin. XIII. The Anaphylactogenic Action of the Protein from Filtrates of Acid Fast Bacteria. *J. Immunol.* 20: 201 (March) 1931.

10 Seibert Florence B. Chemical Composition of the Active Principle of Tuberculin. XIV. Local Cutaneous Sensitization (Arthus Phenomenon) Produced in Normal Rabbits and Guinea Pigs by the Protein of Tuberculin. *J. Infect. Dis.* 51: 383 (Nov. Dec.) 1932.

11 Seibert Florence B. The Chemical Composition of the Active Principle of Tuberculin. XI. An Improved and Simplified Method for Making a Standard Undenatured Tuberculin of Any Desired Strength and a Method of Chemical Assay. *J. Biol. Chem.* 78: 345 (July) 1924.

It is apparent also that at this time Seibert did not fully understand the significance of the virulence of her strains, since she noted that the guinea pigs "developed varying degrees of skin sensitiveness which roughly paralleled the virulence of the organism used"<sup>12</sup>

Our work was concerned primarily with specific immunity, and yet in view of the fact that allergy, or hypersensitiveness to tuberculoprotein, had been considered previously as an undissociable part of the immune reaction we had to concern ourselves both with the possibility of producing hypersensitiveness to tuberculoprotein and with correlating this with specific immunity. If pure tuberculoprotein would produce a sufficiently high grade hypersensitiveness and if hyper-

of high content, 0.7 mg per cubic centimeter (after longer incubation), was prepared in pure form by precipitation with trichloroacetic acid as well as by aseptic and antiseptic ultrafiltration.<sup>11</sup> In addition the protein was further concentrated by washing and ultrafiltration, so that 1 cc contained as high as 38 mg

*Toxicity of Seitz Filtrate and Purified Tuberculoprotein*—Because there appeared to be evidence that the filtrate from well grown cultures of tubercle bacilli contained a primary toxic material aside from the usual tuberculoprotein,<sup>11</sup> we resorted to ultradialysis through varying grades of cellulose acetate membranes but were unable to demonstrate any increase in toxicity over the original material when measured by tuberculoprotein

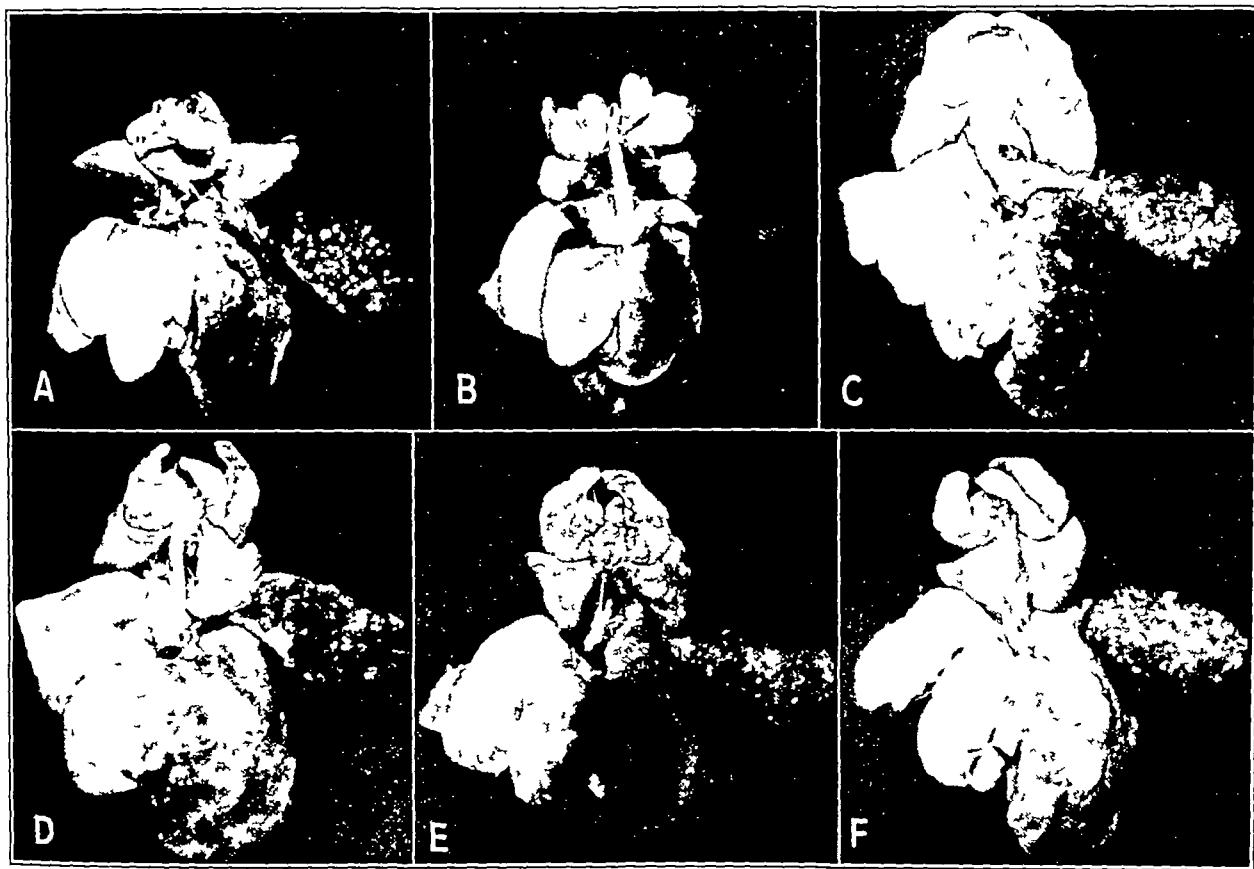


Fig 2—Organs of guinea pigs given injections of tuberculoprotein (from Seitz filtrate) in various forms. Note the absence of specific immunity to tuberculosis except when viable avirulent human tubercle bacilli (B) were used prior to virulent infection. A organs of a control animal given a subcutaneous injection of 0.0001 mg of virulent human tubercle bacilli (160) examined two months after infection. B specific immunity shown by the organs of an animal given a subcutaneous injection of 1 mg of viable avirulent human tubercle bacilli one month prior to infection. C organs of an animal treated one month prior to infection with repeated daily intravenous injections of Seitz filtrate (for four days 10 cc containing 0.6 mg of tuberculoprotein per cubic centimeter, a total of 24 mg). D organs of an animal treated one month prior to infection with a single intravenous injection of 5 cc of concentrated Seitz filtrate containing 20 mg of tuberculoprotein per cubic centimeter. E organs of an animal treated one month prior to infection with a single subcutaneous injection of 5 cc of potassium alum treated Seitz filtrate containing 3 mg of tuberculoprotein. F organs of an animal treated one month prior to infection with a single intravenous injection of 100 mg of trichloroacetic acid precipitated tuberculoprotein.

sensitiveness and specific immunity were synonymous, the pure tuberculoprotein should prove valuable for this purpose.

#### EXPERIMENTS

Human tubercle bacilli (virulent) were grown on a nonprotein synthetic medium of simple composition (Wong-Weinzirl<sup>13</sup>), and after from two to six months of incubation at 37 C the bacilli were removed by filtration through a Seitz filter. The tuberculoprotein

content. Our protein concentration in these experiments was approximately thirty times that in the original material, and the partial dialysate was finally concentrated about fifteen times according to the protein content. However, no toxic material other than the tuberculoprotein could be demonstrated in any partial dialysates. Because of the liquid content, the use of plain Seitz filtrates from cultures of tubercle bacilli on the Wong-Weinzirl medium did not prove sufficiently valuable to be continued without modification, but 10 cc (0.6 mg of tuberculoprotein per cubic centimeter) intravenously injected (ear vein) was about all that the guinea pig tolerated and that proved nontoxic to the normal animal. Likewise, one guinea pig given 50 cc

<sup>12</sup> Seibert Florence B and Morley Nelle. The Relationship of the Tuberculin Proteins of Different Acid Fast Bacilli to Sensitization as Indicated by Their Reactivity in Sensitized Animals. *J Immunol* 24: 149 (Feb.) 1933.

<sup>13</sup> Wong Sam and Weinzirl John. An Inexpensive Synthetic Medium for Growing *Mycobacterium Tuberculosis*. *Am Rev Tuberc* 33: 577 (April) 1936.

(30 mg total) at spaced intervals during twelve hours recovered without appreciable harm, and five guinea pigs each given daily intravenous injections of 10 cc (6 mg total) for four days showed no appreciable toxic symptoms. None of these pigs subsequently had a positive cutaneous reaction to a tuberculin test with purified protein derivative, second strength, or the Seitz filtrate itself diluted 1:10.

The tuberculoprotein in the Seitz filtrate was precipitated with 10 per cent trichloroacetic acid, the precipitate was separated by centrifugation, washed thoroughly with 10 per cent trichloroacetic acid solution and finally washed with ether to remove the acid. The resulting pure tuberculoprotein was suspended in saline solution and injected intravenously (ear vein) into guinea pigs in amounts as high as from 150 to 200 mg in one dose without appreciable toxicity. This tuberculoprotein was tested for tuberculin (skin) potency and found to be equivalent to the original Seitz filtrate and standard purified protein derivative (Parke, Davis & Co.) on the market.

**Toxicity of Concentrated Seitz Filtrates.**—Our first studies with concentrates were made by Seibert's method, using 0.5 per cent phenol, but the injection of

TABLE 1—Primary Intravenous Toxicity for Guinea Pigs of Seitz Filtrates Concentrated by Ultrafiltration

Preservative	Solution Injected,* Cc	Tuberculoprotein		Results
		Mg per Cc	Total	
Merthiolate 1:10,000	3.0	21.5	64.5	Alive
	4.0	27.0	108.4	Recovered
	5.0	32.3	161.5	Recovered
	7.0	21.5	140.5	Recovered
	7.0	21.5	150.5	Died in 24 hrs
	9.0	21.0	193.5	Died in 36 hrs
Aseptic	4.0	27.3	109.2	Alive
	5.0	27.3	136.5	Alive
	6.0	27.3	163.8	Died in 24 hrs
	7.0	27.3	191.1	Recovered
	7.0	27.3	191.1	Died in 24 hrs

\* All the guinea pigs used for tests in these experiments weighed from 500 to 700 Gm. Five cc amounts of 0.1 per cent merthiolate solution in saline solution were without toxicity when given intravenously in control tests on guinea pigs.

the material appeared to produce characteristic reactions to phenol, and we assumed that even washing with weak phenol solutions did not free the material from toxic amounts of phenol. Guinea pigs given intravenous injections died within two days when about 100 mg of tuberculoprotein had been given. Because of the reaction to phenol, we used merthiolate (1:10,000) as an antiseptic preservative<sup>14</sup> and later prepared our concentrates in a sterile closed system, aseptically. The results of illustrative toxicity tests with the aseptically prepared tuberculoprotein and that prepared with merthiolate as a preservative are given in table 1.

The results recorded in table 1 indicate a high grade of tolerance in normal guinea pigs for the tuberculoprotein found in the filtrate from cultures of virulent human tubercle bacilli grown on a nonprotein nutrient medium and given intravenously. Although as much as 150 mg is tolerated by a 500 to 700 Gm guinea pig by careful, slow injection into the ear vein, there are so many other factors aside from the primary toxicity of the protein concerned that it would be only fair to say that this amount is tolerated but may not be the maximum amount tolerated. This is especially so since the trichloroacetic acid precipitated tuberculoprotein

can be given intravenously in amounts as high as 200 mg, after which physical factors complicate the problem. It appears from these experiments that this tuberculoprotein is of low grade toxicity for normal guinea pigs although able to cause a reaction in tuberculous guinea pigs in very high dilution. Attempts to fractionate through dialysing membranes of different density did not prove that the primary toxicity of the protein for normal guinea pigs differed whether obtained in the residue or the dialysate. All the preparations proved of low grade toxicity. It is inferred from this and other experiments that there is no primary highly toxic material (for normal guinea pigs) present in the Seitz filtrate from the growth of virulent (or avirulent) human tubercle bacilli on the nonprotein synthetic medium of Wong and Weinzirl (an ammonium-malate-glycerol-dextrose medium).

**Relation to Anaphylaxis (or Allergy).**—However, when a guinea pig has previously received viable avirulent or virulent mammalian tubercle bacilli in an amount of or exceeding the local tubercle forming dose, tuberculoprotein in sufficient amount (heated or unheated) or very large amounts (about 100 mg) of nonviable (heat-killed) mammalian tubercle bacilli, a second intravenous injection of tuberculoprotein (after two weeks or more) results in acute anaphylactic shock, which is lethal in many cases. A few such results are recorded in table 2.

It is evident from the experiments illustrated in table 2 that viable avirulent and virulent mammalian tubercle bacilli injected into normal guinea pigs in amounts above the threshold of local tubercle formation sensitize such animals so that they give a positive cutaneous reaction to very small amounts of tuberculoprotein. Likewise, only large amounts of heat-killed mammalian tubercle bacilli may sensitize normal pigs so that they react to the ordinary amount of tuberculoprotein used in tests. On the other hand, large amounts of tuberculoprotein (100 mg) given intravenously to normal guinea pigs do not sensitize to a second intracutaneous injection of the same tuberculoprotein even when it is given in amounts as high as 0.1 mg. Yet the viable mammalian bacilli in small amounts, the heat-killed bacilli only in large amounts and the tuberculoprotein in relatively small amounts (about 2 mg) as well as in large amounts (100 mg) sensitize normal guinea pigs to a second provocative anaphylactic reaction to about 1 mg of tuberculoprotein given intravenously.

The foregoing experiments are in accord with the views of Lewis and Seibert that there is a protein in the filtrate of cultures of tubercle bacilli on nonprotein synthetic mediums which sensitizes to and provokes general anaphylaxis. They are also in accord with the work of Zimser, who contended that bacillary extracts in amounts producing hypersensitiveness to general anaphylaxis do not produce cutaneous hypersensitiveness, although our work was carried on with the tuberculoprotein in the filtrates from cultures on nonprotein mediums.

**The Cutaneous Reaction Resulting from Repeated Intracutaneous Injections of Tuberculoprotein (Seitz Filtrates).**—In a large series of guinea pigs given graded amounts (from 1 to 0.00000001 mg) of avirulent human and bovine tubercle bacilli subcutaneously and intracutaneously and including a large number of normal control animals, intracutaneous tests were made at intervals of from one week to one year, the tuberculoprotein in Seitz filtrates (about 0.6 mg of tuberculo-

<sup>14</sup> Jamieson, W. A. and Powell, H. M. Merthiolate as a Preservative for Biological Products. *Am. J. Hyg.* 14: 218 (July) 1931.

protein per cubic centimeter) in dilutions of from 1 1 and 1 10 to 1 10,000 with sterile saline solution being used. The interesting features of this experiment were that, while the guinea pigs that had received the avirulent human or bovine tubercle bacilli subcutaneously or intracutaneously in amounts exceeding 0.0001 mg revealed increasing reactions as the amount of bacilli was increased to 1 mg, a 1 10,000 dilution of the normal Seitz filtrate (0.000005 mg of tuberculoprotein or its equivalent in purified protein derivative) gave a definite positive intracutaneous reaction. On the other hand, repeated intracutaneous injections of the 1 1 dilution (about 0.25 mg per cubic centimeter) into normal guinea pigs never increased the reaction beyond a dilution of 1 10 (about 0.05 mg per cubic centimeter), and even this reaction appeared more or less atypical in its manifestations. It is probably the same reaction Seibert obtained but in lesser degree. Yet one wonders whether the reaction is due to other bacillary materials or extraneous substances when 100 mg of the tuberculoprotein given intravenously results in no sensitization to tuberculoprotein in the skin when reasonable amounts are used for the tests. It may be questioned whether the reaction seen is a true reaction to tuberculin.

*Attempts to Produce Specific Immunity with Tuberculoprotein*—In order to test the ability of various materials (in the Seitz filtrate from the growth of virulent human tubercle bacilli on the Wong-Weinzirl medium) to immunize specifically against infection with highly virulent human tubercle bacilli, various preparations from the Seitz filtrate were injected in various ways into normal guinea pigs. The guinea pigs were then infected subcutaneously with 0.0001 mg of a virulent strain of human tubercle bacilli (strain 160) capable of producing tuberculosis with 0.00000001 mg within two to three months. The substances used for the first injection were the normal Seitz filtrate of varying ages (cultures from two to six months old) up to maximum tolerated amounts totaling 40 cc (on repeated injections after short intervals), with a maximum tuberculoprotein content of from 0.6 to 0.7 mg per cubic centimeter, and to control this, filtrate heated at 100 C for thirty minutes, the purified trichloroacetic acid precipitated tuberculoprotein (100 mg maximum), the filtrate to which sterile potassium alum had been added,<sup>15</sup> injected intravenously and subcutaneously, and concentrated Seitz filtrate (with the equivalent of 100 mg of tuberculoprotein). In control we used guinea pigs that had been immunized with 1 mg of viable avirulent human tubercle bacilli<sup>16</sup> as well as normal guinea pigs. The animals were all tested with tuberculin before infection, and only the guinea pigs that received the viable avirulent human tubercle bacilli gave positive intracutaneous reactions. The animals were killed and examined about two and one-half months after infection with the virulent strain, and in no case, except with the viable avirulent human bacilli, was any retardation of the infection noted. In fact the disease appeared to be slightly aggravated with some of these materials used prior to infection.

Likewise a series of guinea pigs given intracutaneous and subcutaneous injections at weekly intervals (a total of ten injections of normal Seitz filtrate, containing about 0.7 mg per cubic centimeter of tuberculoprotein,

precipitable by trichloroacetic acid) showed a slight aggravation of the tuberculosis in contrast to normal guinea pigs. These injections were discontinued one month prior to infection with a virulent strain of human tubercle bacilli (0.0001 mg.), and the guinea pigs were examined two and one-half months after infection. However, in the guinea pigs given intracutaneous injections there was noted a slight increase in the zone

TABLE 2—General Anaphylaxis Resulting from the Intravenous Injection of Tuberculoprotein in Guinea Pigs Sensitized in Various Ways

Primary Injection	Interval Between 1st and 2d Injection	Cutaneous Reaction to Tuberculoprotein a Few Days Prior to 2d Injection	Provocative Intravenous Injection of Tuberculo protein	Results
5 cc normal Seitz filtrate (2 mg tuberculoprotein)	27 days	0*	1 cc normal Seitz filtrate 0.4 mg tuberculoprotein	Died in 2 minutes
Same as above heated to 100 C for 30 minutes	27 days	0	3 cc normal Seitz filtrate heated to 100 C for 30 minutes 1.2 mg tuberculoprotein	Died in 10 minutes
1 mg avirulent human tubercle bacilli given subcutaneously	2 months	+	3 mg tuberculo protein (Seitz concentrate)	Died over night
1 mg avirulent human tubercle bacilli given subcutaneously	2 months	3	10 mg tuberculo protein (Seitz concentrate)	Marked intoxication recovered
1 mg heat killed avirulent human tubercle bacilli given subcutaneously	2 months	0	10 mg tuberculo protein (Seitz concentrate)	Survived no symptoms
100 mg heat killed avirulent human tubercle bacilli given subcutaneously	2 months	3	10 mg tuberculo protein (Seitz concentrate)	Died in 1 minute
Same as above	2 months	3	Same as above	Marked intoxication survived
2 mg tuberculoprotein (Seitz concentrate)	13 days	0	1 mg tuberculo protein (normal Seitz filtrate)	Died in 2 minutes
Weekly intravenous injection of 13 mg tuberculoprotein	1 week from last injection	0	1 mg tuberculo protein end of 2d week	Died in 2 minutes
Weekly intravenous injection of 13 mg tuberculoprotein	10 days from last injection	0 (to 0.1 mg tuberculo protein)	2 mg tuberculo protein 17 days after 1st injection	Died in 2 minutes
100 mg tuberculoprotein (Seitz concentrate)	6 weeks	0	10 mg tuberculo protein (Seitz concentrate)	Died in 5 minutes

\* The intracutaneous injection of 0.1 cc of 0.005 mg of tuberculoprotein per cubic centimeter was used as a standard cutaneous test in the majority of the experiments since this amount gives a pronounced positive reaction in tuberculous guinea pigs or those given viable avirulent mammalian tubercle bacilli.

+ A 3 reaction is a pronounced reaction of approximately 1.5 cm of erythema with edema.

† Accentuated flare up of cutaneous reaction.

of reaction to this amount of tuberculoprotein, but it was not particularly striking nor did it occur with higher dilutions.

#### SUMMARY AND CONCLUSIONS

1 Specific immunity against infections with virulent human tubercle bacilli could not be produced by Seitz filtrates from cultures of virulent human tubercle bacilli, by highly concentrated (ultradialysis) filtrates or by the precipitated tuberculoprotein or alum-treated filtrates.

2 The highly concentrated filtrates, or precipitated tuberculoprotein, possess no appreciable primary toxicity for normal animals.

3 A primary intravenous injection of large amounts of normal Seitz filtrates, highly concentrated (by ultra-

15 Caulfield A H W Brown M H and Waters E T Concerning the Identity of the Antibody in Experimental Anaphylaxis and That Occurring in Man Naturally or Spontaneously Sensitized J Lab & Clin Med 22 657 (April) 1937 Alum as an Adjuvant in Sensitizing Guinea Pigs to Ragweed Pollen J Allergy 7 451 (July) 1936

16 Footnotes 5 6 and 7

dialysis) filtrates or precipitated tuberculo-protein from these filtrates does not sensitize to a second intracutaneous injection with a fairly large test dose (0.1 mg) of either filtrate or tuberculo-protein. A reaction to tuberculin can be obtained, however, in a tuberculous guinea pig with as little as 0.000005 mg of the same material.

4 A primary intravenous injection of about 2 mg of tuberculo-protein in any of the foregoing forms sensitizes guinea pigs to a lethal intravenous provocative dose (anaphylactically) of as little as about 1 mg of the tuberculo-protein in these forms. This confirms the studies of Zimsser, who worked only with large amounts of bacillary extracts and showed a striking difference between cutaneous and anaphylactic reactions.

5 To produce cutaneous hypersensitiveness to tuberculo-protein requires a small amount of avirulent human tubercle bacilli (a tubercle-forming dose), a large amount of heat-killed tubercle bacilli (around 100 mg) and very small amounts of virulent tubercle bacilli. With the latter, the factors of multiplication and tuberculous involvement complicate the picture.

6 There is a striking quantitative difference between the specific immune and the concomitant allergic or anaphylactic features of tuberculosis which will eventually have to be given independent consideration in the complete evaluation of tuberculosis in man, since one is protective and the other shows a peculiar type of still unsolved intoxication.

## TREATMENT OF MALIGNANT TUMORS OF THE KIDNEY IN CHILDREN

H. DABNEY KERR, M.D.

IOWA CITY

It is now generally recognized that adenocarcinoma of the kidney is one of the most common malignant neoplasms of childhood. Most authors place it next to tumor of the eye in frequency, although at the Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York,<sup>1</sup> it was exceeded in order of occurrence by peripheral sarcoma and bone tumor as well as by ocular neoplasms.

This brief report covers fourteen renal tumors in children seen at the State University of Iowa Hospitals between Jan. 1, 1931, and Jan. 1, 1938. The results in a series of this size are worth recording. While my associates and I make no claim of innovation in either diagnosis or treatment, I am sure that a discussion of both will not be without value.

The pathogenesis of these tumors has been admirably and adequately discussed by Dean and Pack,<sup>2</sup> Hinman and Kutzmann<sup>3</sup> and others. Therefore only a brief review is needed here. Birch-Hirschfeld in 1894 first described as "adenosarcoma" these not infrequent renal tumors of childhood and called the wolffian body the point of origin. In 1899 Wilms wrote his exhaustive monograph on the subject and claimed the origin to be the renal blastema or nephrotome, in this view he has been supported by many authors.

The nephrotome has the power of forming different types of cells but predominantly smooth muscle and tubular elements. However, if the tumor anlage separates earlier it has still greater potentialities for forming diverse types of cells and in such cases one finds tubules, muscle, cartilage and bone. There may also be complete separation of the tumor anlage from the future kidney, so that at operation or autopsy one sees a large Wilms tumor entirely separate from a compressed but otherwise normal kidney on the same side. Case 14 was an example of this. Histologically these tumors are composed of "isolated tubules of high cylindrical or cuboid cells with indistinct lumina surrounded by broad zones of indifferent spindle cells, on which is based the designation of adenosarcoma. Either tubules or spindle cells may be in excess, the tumor approaching embryonal adenosarcoma or sarcoma."<sup>4</sup> Scattered groups of embryonic glomeruli, smooth or striated muscle and occasionally cartilage, fat and myxomatous tissue may be found in the main mass of "indifferent spindle cells." Because of this some authors have preferred to designate these tumors as teratomas or mixed tumors.<sup>4</sup>

### SUMMARY OF CASES

*Age*—Of the series of fourteen patients thirteen were children from 10 months to 5 years old, inclusive, while the fourteenth was 6 years old on admission. The average was 3 1/4 years. These figures agree well with those of other authors.

*Sex*—Although there were nine boys and five girls in the series the experience of other authors<sup>6</sup> indicates that the disease is about equally divided between the two sexes.

*Site*—Reports in the literature<sup>7</sup> show about equal involvement of the two sides, with a small percentage of bilateral tumors. In our series eight tumors were on the right and five on the left, and one was bilateral.

*Symptoms*—All authors have stressed the insidious onset of these tumors and the fact that the first symptom is usually painless enlargement of the abdomen or the finding most frequently accidental, of a large mass in the upper part of the abdomen. This was true in twelve of our fourteen cases. There are occasionally other symptoms but they usually accompany the abdominal enlargement or the mass. These additional symptoms are pain, nausea, vomiting, constipation, diarrhea or general weakness and malaise. It is noteworthy that hematuria occurs infrequently as contrasted with its incidence with renal tumors of adults. Harrah<sup>8</sup> stated that it occurs in from 10 to 25 per cent. Two of our patients had hematuria in addition to the abdominal mass, but none had hematuria alone. Pain was the initial symptom in one case, while general weakness was complained of in the other case in which no mass was seen. Five of the patients had marked prominence of the superficial veins of the abdomen and the lower part of the thorax, indicating pressure on the inferior vena cava or portal vein. In four of these the tumor was on the right side. The duration of symptoms

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Read before the Section on Radiology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

<sup>1</sup> Dean, A. L. Jr. and Pack, G. T. Embryonal Adenosarcoma of the Kidney. *Tr. Sect. Urol. A. M. A.* 1931, pp. 273-297. *J. A. M. A.* 98: 10-17 (Jan. 2) 1932.

<sup>2</sup> Hinman, Frank, and Kutzmann, A. A. Malignant Tumors of the Kidney in Children. *Ann. Surg.* 80: 569-590 (Oct.) 1924.

<sup>3</sup> Ewing, James. *Neoplastic Diseases*, ed. 3. Philadelphia: W. B. Saunders Company, 1928, pp. 796-797.

<sup>4</sup> Kretschmer, H. L., and Hibbs, W. G. Mixed Tumors of the Kidney in Infancy and Childhood. *Surg., Gynec. & Obst.* 52: 1-24 (Jan.) 1931.

<sup>5</sup> Campbell, M. F. Primary Malignant Tumors of the Uroteric Tract in Infants and Children. *J. A. M. A.* 109: 1606-1611 (Nov. 13) 1937.

<sup>6</sup> Dean and Pack.<sup>1</sup> Hinman and Kutzmann.<sup>2</sup>

<sup>7</sup> Schippers, J. C. Renal Tumours in Children. *Acta Paediat.* 4: 141-157, 1925. Dean and Pack.<sup>1</sup>

<sup>8</sup> Harrah, F. W. Embryonal Sarcoma of the Kidney in Children with Report of Two Cases. *J. Urol.* 29: 445-473 (April) 1933.

varied greatly. The longest was two years while the shortest was seven days. The average was 4.4 months.

**Diagnosis**—On the finding of a mass in the upper part of the abdomen, usually painless, in a child 6 years old or younger, a presumptive diagnosis of Wilms tumor can be made. If this is accompanied by displacement and distortion of the renal pelvis and calices on one or both sides, as shown by excretory or retrograde pyelographic study, the diagnosis becomes more certain. Biopsy is not justified. There are, however, other conditions which must be considered. Tumors of the liver, adrenal glands and spleen, hydronephrosis, cysts of the kidney, retroperitoneal or mesenteric nodes and ovarian tumors have been mentioned by various

therefore that for completeness one must include the possibility of lymphangioma when one sees an abdominal mass in a child.

**Metastasis**—In our experience this occurs most frequently to the lungs. Two of our patients had pulmonary involvement when first seen, and in four others it developed during observation. Duration of symptoms and the age of the patient seem to bear no definite relation to the appearance of these metastases. Two patients had metastasis to bone—the first (case 3) eighteen months after admission and the other (case 4) forty-two months after she was first seen.

**Prognosis and Treatment**—All authors admit that the prognosis of Wilms tumor is exceedingly poor

#### Summary of Cases

Case	Age Years	Sex	Admitted	Duration of Symptoms	Side	Pyelo- gram	Urine	Metastases	Irradiation		Survival Mos	Comment
									Primary	Metastases		
1	3½	♂	4/ 2/31	1 mos	L	Unsatisfactory	Trace albumin	Cervix	1 course 1 000 r	1 course 1 000 r	9	Patient too sick to be given adequate treatment dilated superficial veins
2	2½ mos	♂	10/23/31	1 mo	R	+	Normal	Lungs	3 courses 9 000 r	3 courses to chest 9 000 r	28	Primary lesion remained healed patient died of metastases
3	6	♀	4/ 1/33	6 wks	R	+	Normal	Lungs pelvis	2 courses 5 200 r	Chest 8 000 r pelvis 3 200 r	26	Two regressions of primary tumor died of metastases to lungs and pelvis
4	2½	♀	7/ 3/33	1 mo	L	+	Trace albumin red blood cells +	Bones lungs	2 courses 4 200 r		47	First operative case survived 42 months before recurrence and metastases
5	4	♂	7/ 5/33	2 yrs	R	+	Normal	0	2 courses 5 800 r		59	Operation advised but refused patient alive and well 6/1/38
6	21 mos	♀	9/ 1/33	2 wks	L	+	Normal	Lungs	1 800 r	Chest 4 000 r	5	Regression of primary and pulmonary masses
7	2	♂	11/19/33	5 mos	R	+	Normal	0	2 courses 6 400 r		17	Had fishworm clots dilated superficial veins
8	3½	♂	11/20/33	1 mo	Both	+	Normal	0	2 courses 6 600 r		7	Bilateral involvement
9	4	♀	2/ 8/34	4 mos	R	+	Albumin ++	Lungs	2 courses 8 200 r	4 courses 8 500 r	52	Pelvic kidney on left pulmonary metastases disappeared twice with irradiation alive and well 6/1/38
10	10 mos	♂	3/21/34	1 wk	L	+	Normal	0	2 600 r		3½	
11	3	♂	8/19/34	2 mos	L	+	Normal	0	2 000 r		6	
12	5	♂	2/ 7/35	10 days	R	+	Normal	0	4 200 r		8½	Marked engorgement of superficial vessels
13	4	♀	6/18/35	1 mo	R	+	Normal	Lungs	2 courses 5 200 r	Chest 1 200 r	5	Dilatation of superficial veins
14	2½	♂	4/20/37	5 mos	R	+		0	3 200 r		4	Dilatation of superficial veins

writers as possible to confuse with renal tumors. In our experience neuroblastoma of the adrenal glands metastasizes so early to bone that practical differentiation is not difficult. Although it has been stressed by some writers<sup>9</sup> that polycystic kidney is always bilateral and therefore not to be confused with unilateral renal tumor, in one case in which the diagnosis of Wilms tumor was made excision showed one polycystic kidney, while the other kidney showed a normal pyelogram. From this experience, therefore, we feel that polycystic kidney cannot be excluded from consideration simply because of its unilaterality, as has been suggested by some authors. In the other case in which an incorrect diagnosis, of "urogenital ridge" tumor,<sup>10</sup> was made the mass proved to be retroperitoneal lymphangioma. This patient is living, almost six years later, without evident recurrence of the mass, which was incompletely excised. Roentgen irradiation was given postoperatively. We feel

and place the expected mortality at well over 90 per cent. Patients that live five years or more after the beginning of treatment are rare and are worth reporting. A few have survived that long after operation and enough also after irradiation to justify questioning the general statement that one or the other form of therapy alone is hopeless.<sup>11</sup> Operative mortality has been placed by some as high as 40 per cent, with an average of 25 per cent. One of our two patients coming to operation died as a result. For even a fair chance of cure operation must be done early, and because of the insidious onset this is almost never possible.

Most recent authors<sup>12</sup> have advocated the combination of irradiation and surgical measures, giving

<sup>11</sup> Mackenzie D. W. Malignant Tumors of the Kidney in Children in Cabot Hugh Modern Urology Philadelphia Lea & Febiger 1936 vol 2 pp 722-731 Hinman and Kutzmann

<sup>12</sup> Bothe A. E. The Effect of Roentgen Therapy upon Tumors of the Kidneys Am J Roentgenol 33 529-536 (April) 1935 Pohle E. A. and Ritchie Gorton Malignant Tumors of the Kidney in Children Radiology 24 193-205 (Feb.) 1935 Randall Alexander Advantages of Preoperative X-Ray in Kidney Tumors in Children Ann Surg 100 462-475 (Sept.) 1934 Dean and Pack.<sup>1</sup> Sinkoe.<sup>9</sup> Mackenzie.<sup>11</sup>

<sup>9</sup> Sinkoe S. J. Fowler M. F. and Berger Louis Wilms Tumor of the Kidney Am J Surg 25 163-169 (July) 1934 Dean and Pack.<sup>1</sup>  
<sup>10</sup> Hansmann G. H. and Budd J. W. Massive Unattached Retroperitoneal Tumors Am J Path 7 631-673 (Nov.) 1931



roentgen irradiation preoperatively, although some<sup>13</sup> have advocated roentgen therapy alone. I have felt all along that when no metastases were demonstrable irradiation to reduce the size of the tumor followed in about two months by surgical removal was the best procedure. Our experience does not bear out this theoretical conception of proper treatment, since in

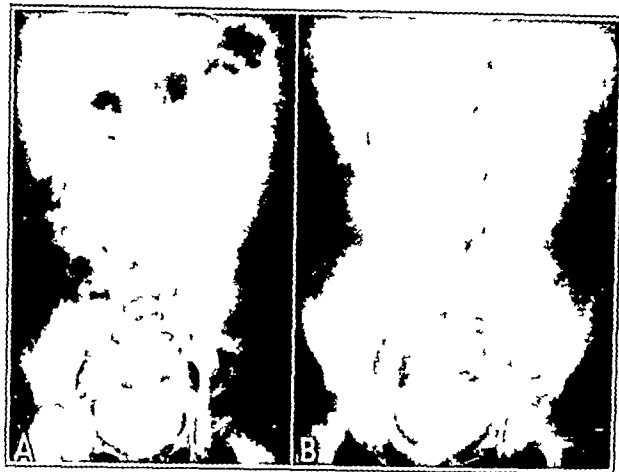


Fig 1 (case 4)—A excretory pyelogram showing mass of soft tissue and distortion of the left renal pelvis. B pyelogram showing reduction of the mass of soft tissue and more normal appearance of the area.

case 4 this method was followed and, although the patient lived forty-seven months, she died of generalized metastasis and recurrence in the region of the primary tumor. On the other hand a boy (case 5) admitted at the same time and treated by irradiation in the same way but for whom the parents refused operation is still living fifty-nine months after admission and eighty-three months after the onset of symptoms.<sup>14</sup> In spite of this adverse evidence, I still feel that this result was fortunate rather than logical and agree with those who advocate the combined treatment, rather than with those who suggest that the patients be carried along on irradiation<sup>13</sup> or with others<sup>15</sup> who

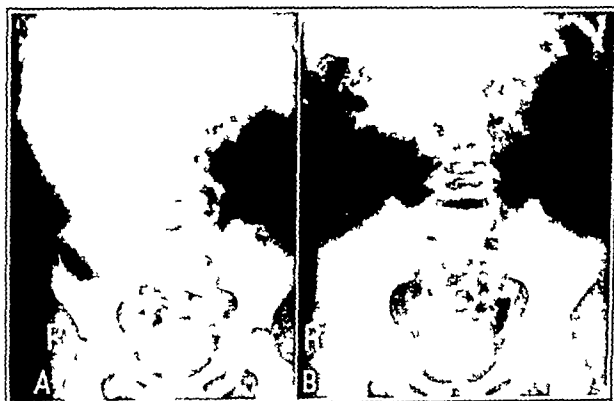


Fig 2 (case 5)—A large mass of soft tissue is seen on admission. B disappearance of the mass after irradiation.

have stated that operation alone is more valuable. In our two cases in which operation was done a definitely viable appearing tumor was found, and since these neoplasms always contain more than one type of tissue it is questionable whether the resistant portions, espe-

cially the tubules, can ever be sufficiently influenced to justify their being left in place. My opinion, therefore, based on theoretical considerations and my own experience with patients coming to operation, is that operation should always be used after irradiation when metastases cannot be found. I have found also that one can frequently influence local recurrences by further irradiation. The usual marked reduction in size is due to the response of the sensitive elements. Because individual tumors contain varying proportions of the different cellular elements, too much time should not be allowed to elapse before resorting to surgical measures. At any time beyond three weeks after the cessation of irradiation that the tumor does not continue to shrink, operation should immediately be done. My experience in case 14 illustrates the importance of careful observation following irradiation. The tumor in this case showed only moderate decrease in size following treatment, and the patient was to return in two months for observation. It was eleven weeks before he was seen, and at that time the mass was larger than it had been before treatment. He was operated on and a huge Wilms tumor removed, but he died as a result of the operation. If the tumor

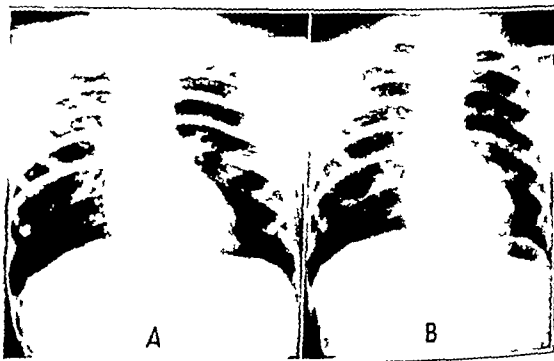


Fig 3 (case 9)—A pulmonary metastases. B disappearance after irradiation. The patient is without demonstrable disease fifty months after admission.

continues to shrink, operation may be deferred up to eight weeks after irradiation. I am not in accord with those<sup>16</sup> who have said that surgical measures should be delayed indefinitely. There is no definite indication that the operation is made more difficult or impossible.<sup>17</sup> Prophylactic irradiation for unproved metastases is not warranted. The average period of survival of our twelve diseased patients was 138 months after admission. The average survival of patients with dilated superficial veins was 54 months, and I feel that this sign indicates an especially poor prognosis.

**Irradiation Technic**—In general, we have used 200 kilovolts and 8 or 20 milliamperes, according to the available machine, Thoraeus filtration (effective wavelength 0.135 angstrom unit and half value layer 1.95 mm of copper) or 0.5 mm of copper (effective wavelength 0.16 angstrom unit half value layer and 0.95 mm of copper) with a distance of 50 cm and anterior and posterior 10 by 15 cm or 15 by 15 cm ports, depending on the size of the mass. A dose of 200 roentgens a day to each port is given till a total dose of from 3,000 to 4,000 roentgens, as measured in air, has been reached. When pressure of work has made the university's three 200 kilovolt machines

<sup>13</sup> Barringer B S. Radiosensitive Kidney Tumors. *J Urol* 38 114 (July) 1937. Portmann.<sup>10</sup>

<sup>14</sup> Since this paper was read this boy has returned showing a local recurrence. This emphasizes the importance of postirradiation removal of the tumor.

<sup>15</sup> Prather G C and Crabtree E G. Kidney Tumors in Children. *J Urol* 25 589 612 (June) 1931. Harrah.<sup>8</sup>

<sup>16</sup> Portmann U V. The Indications for Irradiation for the Various Malignant Neoplasms of the Kidney. *J Urol* 31 721 730 (May) 1934.

<sup>17</sup> Stewart F W. Radiosensitivity of Tumors. *Arch Surg* 27 979 1064 (Dec) 1933.

unavailable, we have not hesitated to use 135 kilovolts with filtration by 0.25 mm of copper and have found that regressions of the primary tumor have occurred as soon as when the higher voltage was used. For the two living patients (5 and 9) second courses of treatment were given to the primary area, but this is also true of six of the others. I am inclined to feel that this is worth while, remembering that damage to the skin may result. Pulmonary metastases should be treated, as indicated by case 9, in which three pulmonary nodules have disappeared after irradiation, and case 3, in which they disappeared but the patient succumbed to local recurrence and metastases to the bone. The former patient is still living, without evidence of neoplasm, fifty months after admission and fifty-four months since the onset of symptoms.

#### SUMMARY AND CONCLUSIONS

Fourteen cases of renal neoplasm in children were treated.

Two patients are still alive and without evidence of disease fifty-nine and fifty-two months after admission. One had previously shown pulmonary metastases.

The best treatment for this condition is a full course of roentgen irradiation followed by operation.

Operation should not be deferred beyond the time of continued regression of the tumor.

It is worth while to irradiate metastatic lesions and local recurrences intensively.

#### ABSTRACT OF DISCUSSION

DR MILEY B WESSON, San Francisco. Dr Kerr has carefully culled the literature and has laid before the members all that is known of the subject. Of particular interest is his observation of the behavior of metastasis under irradiation. It is generally agreed that patients in whom irradiation was followed by nephrectomy survived longer than those treated by operation or irradiation alone but the results are nothing to boast about. It is agreed that the time after irradiation for removing a tumor is important. Since no tests except the therapeutic will determine whether the tumor is radiosensitive, all large tumors in both adults and infants should be irradiated before operation. The radiosensitive embryonal Wilms tumors will shrink after comparatively small doses of roentgen rays, but some that have shrunk will regain their original size in six weeks. The rule is to continue irradiation until maximal regression is obtained and then operate. Roentgen therapy is ordinarily considered as only a means of preparation of the tumor for operation or as a palliative measure to hold in check a tumor which cannot be removed. B. S. Barringer has stated that irradiation alone in small doses continued over a long period would seem to be the method of choice in the control of these tumors. One of Kerr's patients treated by irradiation is alive at the end of seven years. Through all the writings of roentgenologists there runs a thread of doubt as to the specific curative value of the roentgen treatment of hypernephroma, but they appear optimistic that when the proper dose is determined the rays will prove to be a specific cure for neuroblastoma. This is interesting in the face of the fact that all patients treated with roentgen rays have died, while Lehman's patient, treated by operation alone, is alive and well after sixteen years. I should like to ask Dr Kerr what his experience has been with this type of tumor in infancy.

DR H. D. KERR, Iowa City. With regard to the treatment of neuroblastoma, my experience is confined to four cases. In none was the condition diagnosed until there was rather widespread metastasis, mainly to the skull and long bones. I did find, however, that these metastases were very radio-sensitive. One patient with involvement of the base of the skull, destruction of the sella turcica, invasion of the orbits and a marked degree of proptosis responded to a relatively

small amount of treatment, so that the mass was reduced, the proptosis entirely disappeared and the sella recalcified. This did not, however, in any way affect the ultimate result. My other patients have responded locally. Dr Wesson's remarks concerning the time of operation are pertinent. It is important to remove these tumors just as soon as they stop regressing, and that requires close observation. Under ordinary circumstances operation should not be delayed longer than six or eight weeks. Barringer feels that irradiation in small amounts continued over a long time may be the best type of treatment, but from my experience I do not feel that this is best. One of my patients had irradiation followed by operation but died forty-seven months after admission from local recurrence and extensive osseous metastases. My next patient is the one who is living eighty-four months after the onset of symptoms. I urged the parents to have the affected kidney removed, but they refused and the patient is living. I feel that this is fortunate rather than logical, because one cannot be certain that any of these tumors will contain only sensitive elements. These tumors are frequently called teratomas because they contain diverse types of cellular elements, and if they contain muscular and tubular elements and cartilage—and one doesn't know that they don't contain them—one cannot expect them to respond entirely to irradiation.

### MANAGEMENT OF 256 CASES OF INFECTION OF THE IMMATURE VAGINA

PRACTICAL DEDUCTIONS, WITH A STUDY  
OF THE USE OF SULFANILAMIDE  
IN TREATMENT

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Our material comprises a study of 256 patients over a period of nine years in private and clinic practice. An additional group of 261 cases is reported from a national questionnaire relative to the use of sulfanilamide.

#### DIAGNOSTIC METHODS

Smears by Gram stain have been studied in all cases. Occasional disagreements with regard to diagnosis have been finally settled on the basis of cultures. We have learned to rely very strongly on the Douglas chocolate agar method and are at present using it as a routine.

Criteria for cure have remained as formerly outlined—exactness in the extreme. Such a program has, we believe, been instrumental in our satisfactory final figure for cure and our low figure for late recurrence. We prefer to regard recurrence and even possible reinfection as relapse, which of course increases our figure for average time before cure.

#### METHODS OF TREATMENT

*Distention with Silver Nitrate Ointment*—Nineteen cases in which this treatment was used were reported in 1934.<sup>1</sup> The method was found highly satis-

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Read before the Section on Obstetrics and Gynecology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 17, 1938.

The names of those who contributed the unpublished data on sulfanilamide appear in table 9. The assistance of Miss Anna Murphy and the Department of Social Service of the Portland Free Dispensary has been invaluable.

<sup>1</sup> Schauflier, G. C., Duke, Ray, Crynes, S. F., and Schauflier, Caroline. Infection of the Immature Vagina. Observations and Results. A Study of 189 Patients. *West J. Surg., Obst. & Gynec.* 42: 669 (Dec) 1934.

factory with regard to final percentage of cures but was comparatively cumbersome and relatively slow in its results. We use it only as a variant to estrogen treatment at the present time.

**Theelin**—Our brief experience with the use of theelin by the hypodermic route was reported<sup>1</sup> in 1934. We treated five patients conscientiously with theelin in ethylene glycol, with unsatisfactory results. Only one patient was definitely and satisfactorily cured.

TABLE 1—Other Methods of Treatment

Treatment with Pyridium						
Number Records Clear	Number Cured	Per Cent	Number Not Cured	Per Cent	Number Improved	Per Cent
10	3	18	5*	2	11	57
Methods		Cases		Results		
Cold quartz light (official applicator)		7		Helpful as adjunct or variant		
Azochloramide in oil		5		Unsatisfactory		
Metaphen in suppositories		4		Unsatisfactory		
Acridavine (1:100) in suppositories		4		Unsatisfactory		

\* Four were later cured by other methods.

TABLE 2—Comparison of Results with Silver Nitrate, Amniotin and Sulfanilamide

Method	Cured	Per Cent	Not Cured	Per Cent
Silver nitrate ointment distention	82	87.8	17	17.2
Vaginal amniotin	18	78.3	5	21.7
Oral sulfanilamide†	81	43.1	107	6.0

\* Our series.

† Collected cases.

**Amniotin**—We have treated thirty-one patients<sup>2</sup> by the insertion of amniotin pearls or suppositories into the vagina. Our procedure and dosage are essentially those used by Te Linde.<sup>3</sup>

**Other Methods**—We have used a number of other methods of treatment tentatively, as shown in table 1, which we will not discuss at present.

**Sulfanilamide**—Material for the study with sulfanilamide was compiled by questionnaire and covers 261 cases so treated, only a few of which have been previously reported. These figures are not directly comparable to our own series but they will serve for general comparisons.

#### GENERAL COMPARISONS

The use of the vaginal application of amniotin has given 78.3 per cent cures as opposed to 82.8 per cent for the silver nitrate method and 43.1 per cent for sulfanilamide (table 2). In table 3 it will be noted that elimination of gonococci, relief of symptoms and the time until cure have been substantially less with amniotin than with silver nitrate ointment, as have also the number of visits to the office or clinic (ambulatory patients). Our more recent experience in the amniotin group indicates that increased familiarity with the method is definitely improving our results. It appears that our later cases will give results more nearly approaching those of Te Linde. Our experience with the distention method with silver nitrate ointment, on the other hand, has been sufficient (129 cases), it seems unlikely that we can improve our results in this category. Our report will show that sulfanilamide therapy has been unsatisfactory as used to date and that its use is subject to the

disadvantage of requiring hospitalization for meticulous check-up until all its potentialities are clearly established. We must therefore conclude with the majority of observers that at the present time treatment of this condition by vaginal application of estrogen is the least potentially harmful and the most effective and convenient of all available methods.

#### AMNIOTIN TREATMENT

It should be noted in table 5 that the time elapsed before cure by amniotin as charted is 55.4 days. This is higher than in many series reported. That we have frequently overtreated is indicated by the wide discrepancy between this figure (55.4 days) and the time before clinical evidence of cure—negative smears, 8.3 days, and relief of symptoms, 17.5 days (table 5). Later experience has proved that we might safely have charted a number of our cures sooner, and with less treatments (lower total unitage).

**Amniotin with Adjunct Treatment**—Early in this series nine patients were given supportive treatment with antiseptics on the days when amniotin was not used in the regular routine, that is to say, silver nitrate ointment or pyridium suppositories were used on alternate days after the first week or ten days. More patients (89 per cent) were cured in the mixed treatment group than in the straight amniotin group (70 per cent), but the characteristic vaginal reaction occurred later.

**Comment**—This is a small group of observations but since in the main it bears out the observations of Lewis,<sup>4</sup> Te Linde,<sup>3</sup> Reichert<sup>5</sup> and others it may be considered valid for use in a comparison with a number of different methods used by us. It indicates the following advantages for vaginal estrogen therapy: 1. It is in many cases curative. 2. Elimination of organisms (disinfection) and the disappearance of symptoms are comparatively rapid, i. e., the child is safe for normal contacts and normal living relatively early. 3. The

TABLE 3—Time Factors Under Silver Nitrate, Amniotin and Sulfanilamide

Method	Up to Negative Smears			Up to Relief of Symptoms			Up to Cure		
	Days	No of Treatments	No of Visits	Days	No of Treatments	No of Visits	Days	No of Treatments	No of Visits
Silver nitrate	61	18.5	6.2	20.9	8.2	8.2	81	1.9	17.9
Amniotin	18	8.5	2.9	17.9	16.1	5.7	50.4	37.6	12.3
Sulfanilamide	72			8.7			19.1		

TABLE 4—Results with Amniotin

Number of Records Clear	Number Cured	Per Cent Cured	Number Not Cured	Per Cent Not Cured
23	18	78.2	5	21.8

procedure is not difficult. Hospitalization is not necessary. Often it may be taught to parents or guardians and successfully used at home. 4. It is not cumbersome and not expensive. 5. It is apparently not dangerous.

**Disadvantages**—Te Linde's<sup>3</sup> recent extended report is reassuring in relation to possible unfavorable developments due to hormone activity. Our own observations:

4. Lewis, R. M. and Adler, Eleanor L. Gonorrheal Vaginitis: Results of Treatment with Estrogenic Substance. J. A. M. A. 106: 203 (June 13) 1936.  
5. Reichert, J. L., Epstein, J. M., Jung, Ruth and Colwell, Charlotte A. Infection of the Lower Part of the Genital Tract in Girls. Am. J. Dis. Child. 54: 459 (Sept.) 1937.

<sup>2</sup> Amniotin (E. R. Squibb & Sons, New York) was used as an adjunct treatment to sulfanilamide in a few cases not suitable for these records.  
<sup>3</sup> Te Linde, R. W. The Treatment of Gonococcal Vaginitis with the Estrogenic Hormone. J. A. M. A. 110: 1633 (May 14) 1938.

indicate that there is little or no danger. We have noted during five years' use of estrogen therapy that the changes produced in these children, even in those approaching puberty, are transient and apparently rather strictly subject to the influence of the artificially administered hormone. As a matter of fact, the too transient effect of our estrogen medication occasionally defeats the permanent objective of the treatment. Its use over

overcome the natural disadvantage imposed by the crypts and rugae. Furthermore, the mildly irritating and perhaps stimulating effects of certain antiseptics, particularly silver nitrate, may in themselves effect mucosal hypertrophy. Vaginal epithelial hypertrophy contingent on the use of floroquin<sup>6</sup> suppositories has recently been demonstrated by Te Linde. We believe that the advantage of vaginal administration over the hypodermic method is as much contingent on these factors as on a hypothetical local concentration of hormone. We have for years maintained that the creditable results achieved by distention with silver nitrate ointment (tables 2 and 3) are best explained on this basis.

TABLE 5—Time and Dosage Factors in Treatment with Amniotin

Number of Records Clear	Average Days Before Negative Smears	Average Days Before Symptomatic Relief	Average Days Before Cure	Av. Total Dosage Before Cure (International Units)
23	8.5*	17.5*	50.4	37,000
Largest total dosage			60,000 international units	
Smallest total dosage			12,000 international units	
Earliest cure			26 days	
Latest cure			111 days	

\* Number of days elapsed before anticipated vaginal wall and pH changes generally coincided with a mean between these two developments.

In our early experience we regarded the potential effect of estrogen on the endocervix with some concern. The possibility that the rudimentary cervical glandular structure which is seen in the specimen illustrated (fig 1) might assume the more potentially infectible adult status seemed feasible. If the endocervix were to be

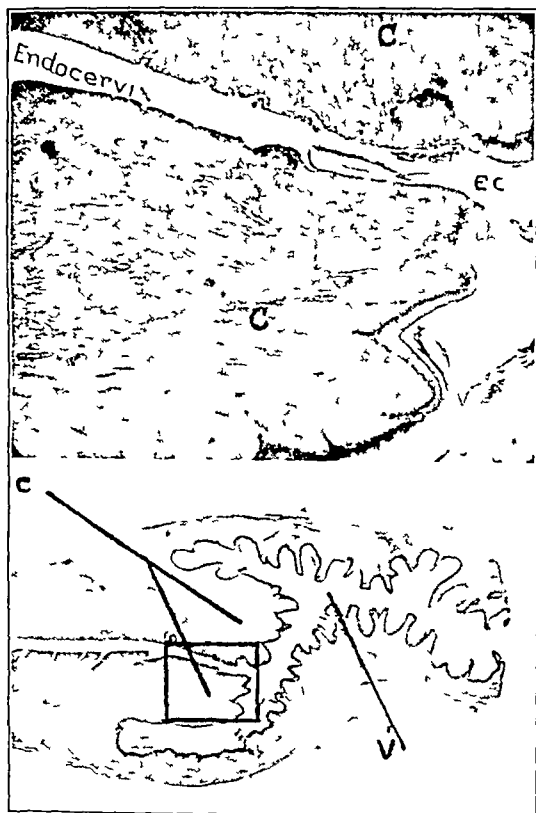


Fig 1—Below, block showing immature vagina (v) with cervix (c) and endocervix. Note plicae on vaginal cervix and absence of cervical glands also complicated cryptiform vagina. Above endocervix from specimen below. Note high persistence of stratified epithelium and rudimentary nature of glands.

longer periods, in our experience, seems to increase the percentage of permanent cures.

Even in children approaching puberty we have not noted abnormal development of sex characteristics and we have as often noted instances of premature growth of pubic hair, visible growth of labia and breast congestion under other types of treatment. In former communications, before we had used this treatment, we<sup>1</sup> called attention to a "visible thickening and toughening of the skin about the genital area and an early growth of fine hair over the mons with occasional visible development of the labia minora." Our experience in this respect with theelin and amniotin has not gone beyond the condition thus described, except in one instance in which a transient bloody vaginal discharge not accompanied by other demonstrable changes developed in a girl of 4.

At this point it may be permissible to offer a thought in connection with all types of treatment involving distention and manipulation of the immature vagina. It has always been our contention that the infantile vagina may be noted in the specimen illustrated, is anatomically and mechanically a "harbor of infection" (fig 1) and that local therapy by mechanical distention tends to

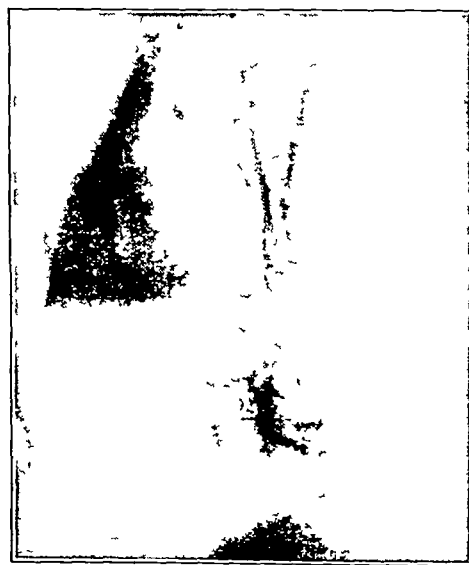


Fig 2—Nonspecific infection of Bartholin's gland in a 6 weeks old twin seropus exuding from incision.

unfavorably affected in this connection, such effects should certainly be more marked in the older children. However, in this series we have had better results in our older children (90 per cent cures over the age of 7).

6. Floroquin contains diodoquin, lactose, dextrose and boric acid—G. D. Searle & Co., Chicago.  
7. (a) Schauffler, G. C., "Persistent Vaginal Discharge in Infants and in Little Girls," *Am. J. Dis. Child.* 34: 644 (Oct.) 1927. (b) "A Simple Rational Treatment of Vaginal Infection in Infants and Little Girls," *Am. J. Dis. Child.* 43: 350 (Feb.) 1932. (c) Schauffler, G. C. and Kuhn, Clifford, "Information Regarding Gonorrhea in the Immature Female," *Am. J. Obst. & Gynec.* 25: 374 (March) 1933.

than in our younger children (67 per cent cures under the age of 7). Furthermore, routine careful vaginoscopic study of these cervixes with smears and cultures has not substantiated any such fears. Te Linde reports less favorable results in his older group, which is contrary to our experience.

#### SULFANILAMIDE

Our study of the use of sulfanilamide is based on personal communications and includes only five of our own cases. The material, comprising 261 cases, was

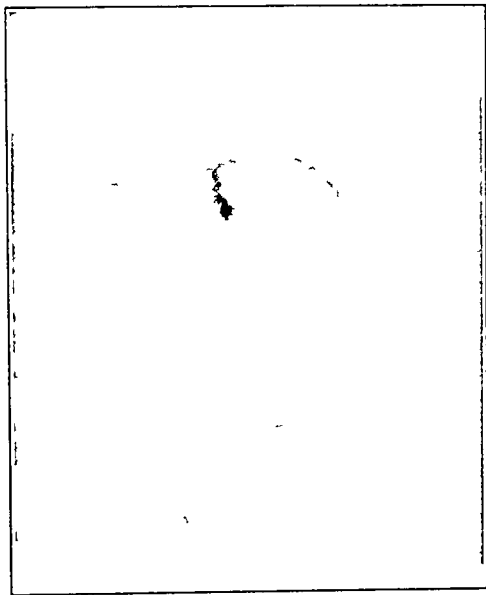


Fig. 3—Nonspecific infection of Bartholin's gland in a 6 weeks old twin before incision

generously offered from eighteen teaching institutions and ten individual observers. Only a few of these cases have been previously reported.<sup>8</sup> All the patients observed showed definitely positive smears and/or cultures for gonorrhea.

The proportion of cures (43.1 per cent) is obviously unsatisfactory, although the time factors are low. The time elapsing before smears are negative is 7.2 days

TABLE 6—Results with Sulfanilamide

Number of Records Clear	Number Cured	Per Cent	Number Not Cured	Per Cent
188	81	43.1	107	56.9 <sup>1</sup>

before there is relief of symptoms 8.7 days and before cure 19.1 days (table 7). Our study at once suggests that the reason for these poor results has been ineffective dosage. Table 8 is of significance in this connection.

Patients in this study were given an average of 0.54 gram per pound of body weight daily over an average total period of thirty days. This is less than one half the dosage per pound of body weight used for children (1.32 grains<sup>9</sup>) under treatment for serious infections. Blood concentrations when they have been recorded in this study have been low, as would be expected considering the per pound dosages. With very few exceptions they have remained well below 3 mg per hundred

<sup>8</sup> Abbreviated reports of thirty of these cases have been previously published (Hoffman, Carey and Hageman). Reports of forty-two others are awaiting publication (Holmes).

<sup>9</sup> This was the average daily dosage per pound to seventy-nine children treated by nine observers for conditions other than vaginitis. Tremendously larger individual doses were used in many cases without apparent harm.

cubic centimeters of blood. It is generally conceded that children eliminate sulfanilamide more rapidly and more efficiently than do adults. Therefore, in order to maintain an effective blood concentration, larger per pound dosages can and must be used. This being the case, it is interesting that sulfanilamide has been used more sparingly and apparently with greater concern in these patients than in patients debilitated by serious infections. No alarming reactions have been noted.

A further analysis of dosage factors reveals, interestingly enough, that inadequate dosage is apparently not the only important factor in poor results. For example, patients receiving larger doses (either total or per pound of body weight) have apparently not produced more or earlier cures than those less thoroughly treated. Furthermore, there appears to be no clear

TABLE 7—Time Factors with Sulfanilamide

Average Days Before Smears and Cultures Are Negative	Average Days Before Relief of Symptoms	Average Days Before Cure
7.2	8.7	19.1

relationship between the total time under treatment and the number of cures, and no more cures appear to result from prolonged treatment even under the larger doses.<sup>10</sup> The confusion in this series may be contingent on such consistent, ineffective doses or it may all point, by a process of elimination, to the fact that the administration of the drug has not been timed or dosed to maintain an effective blood concentration at all times. Increasing evidence indicates that constant administration of the drug, day and night, during the period of treatment is important and has not been emphasized in most of these cases. Scott and Winters, who maintained a constant blood concentration of from 2.3 to 5.2 mg per hundred cubic centimeters by medication every three to four hours, day and night, report five cures in five cases.

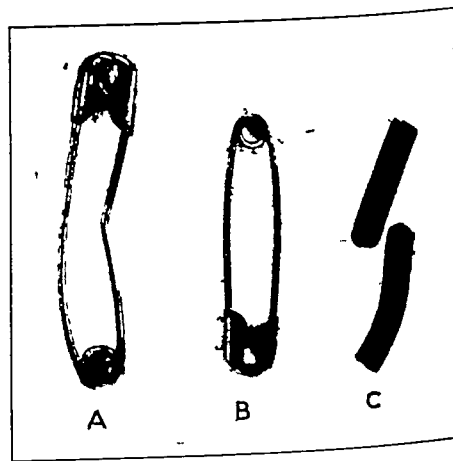


Fig. 4—Foreign bodies removed from vaginas of children of (A) 3 years (B) 6 years and (C) 5 years. The large safety pin A had been present in the vagina of the 3-year-old child for at least six weeks. The child had been examined and treated by two other physicians.

treated. It is now apparent that hospitalization is necessary to the effective conduct of this type of treatment. Continuous medication, rest, blood studies and careful observation will remain essential, at least until limits

<sup>10</sup> Hoffman's patients appear to be the only group who profited by repeated and prolonged medication. Others suggest a tolerance developed to the drug after a given period of administration. Local application by the suppositories (Holmes) and hypodermic administration (prontosil the disodium salt of 4-sulfamido-phenyl-2-azo-7-acetyl-amino-1-hydroxynaphthalene-3,6-disulfonic acid) has not been thought helpful.

of safety and effectiveness can be more clearly delineated. Since from all other angles institutionalization is definitely contraindicated, this must be considered a disadvantage.

acid reaction on the action of sulfanilamide should be considered. The notable effectiveness of sulfanilamide in gonorrheal ophthalmia is of interest in this connection, the reaction of the eye being mildly alkaline.

TABLE 8—Sulfanilamide Dosage

Observer	Number of Cases	Number of Records Clear	Average Daily Dosage Grams				Average Amount per Pound Body Weight per Day Grams				Total Days Treated Average	Blood Concentration	Total Amount Drug (Grains) Given Average	Cured	
			Course 1	Course 2	Course 3	Average for All Courses	Course 1	Course 2	Course 3	Average for All Courses				Yes	No
Reichert	2	12									28 to 42			12	13
Hoffman	2	25									63 or 84			18	7
McIntosh	3	1									22 0	80 micro grams per 100 cc		2	1
Lawler	1		10 0			10 0					84 0	10 mg + 20 25 nees		1	0
Kuhn	20													0	20
Casparis and Burton	9	5	41 0	24 0	12 0	33 6					9 2		276 0	3	2
Burpee and Torpin	2	2	30 9	19 2	23 6	22 8	1 005	0 508	0 690	0 614	18 1		409 7	9	11
Holmes	42	0	9 grains per 20 pounds							0 450		9 mg per 100 cc			
Brown and Hazard	16	0	31 8			31 8					12 6	1 to 5 mg per 100 cc	404 3	10	6
Hamilton	1	1	23 0	25 0							24 0		505 0	0	1
Reading	4		0 75 grain per pound							0 750					
Harris	13									0 75+	14 0	5 to 10 mg high			
Lyon	13		22 5			22 5									
Young	8	4	18 3	12 0	18 5	18 3					7 8		104 6		
Schaffler et al	5	4	19 0	14 0	30 0	19 2	0 442	0 357	0 425	0 334	14 5		257 0	3	2
Hageman	3	0												1	2
Carey	2	0	64 5	32 2	60 0	40 3					14 0		718 5	1	1
Beach	6	0	20 0			20 0					17 5		341 8	4	2
Scott and Winters	5	1	46 2	00 0	40 0	43 7					6 1	2.3 to 5 3 mg	284 2	5	0
Total average	230	81	32 9	21 2	23 9	26 2	0 695	0 497	0 672	0 543	22 9		355 9		

TABLE 9—Observer's Opinion

Observer	University City or Hospital	Number of Cases		Cures (A)			Other Criteria					Observer's Comparison with Other Methods	Digest of Opinion (Scored in Per Cent Based on (A) (B) (C) (D) (L))
				Number Cured	Number Not Cured	Per Cent Cured	(B) Reaction to Drug per Cent*	(C) Effect on Symptoms per Cent†	(D) Effect on Smears and Culture per Cent‡	(E) Decision to Continue or Discontinue per Cent§			
		Total	Records Clear								Number Cured		
Reichert	Univ. of Chicago	2	12	12	1*	48	50	4	45	100	Equal	57 6	
Hoffman	Cook County Hosp	2	25	18	7	72	99	75	75	100	Superior	82 4	
McIntosh	N Y Babies Hosp Colum	3	1	2	1	66	60	100	100	100		85 2	
Lawler	Loyola Univ Chicago	1	1	1	0	100	100	0	0	0		40 0	
Kuhn	Oklahoma Univ Oklahoma City	20	20	0	20	0	60	30	30	50	Inferior	38 0	
Casparis and Burton	Vanderbilt Univ Nashville	9	5	3	2	60	100	5	45	70	Equal	66 0	
Burpee and Torpin	Georgia Univ Augusta	2	20	9	11	36	92	45	40	90	Inferior	66 4	
Brown and Hazard	Univ of Toronto	10	16	10	6	63	94	78	78	100		82 6	
Hamilton	Univ of Nebraska Omaha	1	1	0	1	0	100	30	0	0		26 0	
Jerns	Univ of Iowa Iowa City	1	0				100	75	75		Equal	83 3	
Beach	Charlestown S C	1	0	4	2	66	85	66	66		Equal	70 7	
Zahorsky	St Louis	1	0	1	2	33	100	32	33			49 7	
Schlutz	Univ of Chicago	1	0	1	2	33		33	33			38 3	
Rataer	Children's Memorial Hospital Montreal	20	0				80	30	30	70%	Equal	57 5	
Harris	Duke Univ Durham N C	15	0				85	60	60		Equal	68 3	
Galvin	Medical Coll Richmond Va	8	0				35			0	Inferior	17 5	
Cushlog	Montreal	1	0				35			0	Inferior	17 5	
Lyon	Univ of Cincinnati	13	0				75	60	60		Equal	67 0	
Young	Oklahoma Univ Oklahoma City	8	4	2	1	66	65	70	60	100	Equal	72 2	
Schaffler et al	Univ of Oregon Portland	3	4	3	2	60	85	80	65	65	Equal	71 0	
Hageman	Yale Medical School	3	0	1	2	33	60					18 6	
Carey	Harvard Medical School	2	0	1	1	50	50					40 0	
Holmes	Philadelphia General Ho p	4	0	8	34	19	100					2 6	
Scott and Winters	Univ of Indiana Indianapolis	5	5	5	0	100	100	100	100	100		100 0	
Totals		261	124	81	107	50 2	78 3	55 7	57 2	63 0	{Equal 5 Superior 1 Inferior 4}	55 1	

\* Bad indifferent good

† No effect moderate late eradicated prompt effect

‡ No effect late negative early negative

§ Abandoned continued in selected cases adopted

# With larger dose

Note—Per cent scores calculated from 1 to 100 according to preceding footnotes

The opinions of all observers have been analyzed in table 9. The total consensus is only 55.1 per cent favorable. It is regarded as inferior to other methods by the majority, and nearly half will discontinue its use in this connection. Low dosage and failure to maintain the blood concentration may be responsible. The possibility of a connection between the desired acid reaction of the vagina and the unfavorable effect of an

## SOME GENERAL CONSIDERATIONS

**Endocervix.**—We agree with Te Linde that infection of the endocervix is seldom a factor of importance and have been disputing the matter since 1927. An early misconception was created by misquotations from Hess, who examined four infected children post mortem and determined that in every case there was infection of the cervix which, however, did not extend beyond



or in some cases even to the external os. Hess has been repeatedly and mistakenly quoted as having demonstrated true endocervical infection. As far as we can determine, it has never been demonstrated in the smaller children. To be sure, positive smears from the cervix may frequently be contaminated by material from the region of the external os, but the cervix itself is seldom if ever infected—in fact scarcely infectible except in older girls—because of its negligible gland structure (fig 1). The vaginal cervix, on the other hand, is in many instances more deeply rugose than the vaginal wall and its involvement is quite another matter, a definite entity, and fortunately amenable to measures that affect the vaginal wall in general.

**Proctitis**—We believe that proctitis accompanying gonorrheal vaginitis is not infrequent and that by attention to this possibility we have cut down our incidence of recurrent vaginitis. Smears and cultures are seldom helpful, but we have noted, accompanying frank vaginal gonorrhea, a definite purulent discharge from the rectum, associated occasionally with bleeding always with painful defecation. Treatment by nightly rectal instillations of a 1:500 water solution of merthiolate and more recently with an oily solution<sup>11</sup> of azo-chloranil has been apparently helpful.

**Bartholin's Gland**—Our histologic study of Bartholin's gland areas post mortem has revealed underdeveloped rudimentary gland structures,<sup>12</sup> and clinical experience indicates rare involvement. We have seen, however, two instances of undoubted Bartholin's infection—both nonspecific. Figures 2 and 3 show the right Bartholin's area in a twin girl aged 6 weeks weighing 6½ pounds (2,948 Gm.), who had no vaginitis. Thin seropus drained after incision, and healing was complete.

**Urethra**—We have taken urethral smears and cultures only in stubborn cases. We have never noted a positive result in a case in which there was not also a frank vaginitis. It appears that infection seldom if ever occurs in the urethra as a primary or persistent process. We have examined the periurethral glands in postmortem specimens from uninfected infants. They are definitely present and in some instances quite well developed and intricate, not being restricted to the glands of Skene.

**Trichomonas Vaginalis**—Moist vaginal secretions have been examined for trichomonads in practically every case showing a discharge not demonstrably gonorrheal. We have found active trichomonads in only one instance, this patient being an older girl of about 13. We believe that the trichomonad is a rare, almost negligible, factor in this connection.

**Foreign Bodies**—We have removed three foreign bodies—two safety pins and a red crayon. The metallic objects both caused a bloody discharge, all three objects caused painful urination. Two patients were treated by physicians for suspected gonorrhea, one for four weeks, before we removed the foreign body.

**Pinworms**—Pinworms were found in four patients, three with nonspecific and one with gonorrheal vaginitis. In one patient a worm was detected invading the vagina, in another a worm was detected within the vagina.

**Pelvic Infection**—This has been noted definitely in four instances. A diagnosis of a ruptured appendix was missed by the surgeons because of a past history of vaginal discharge.

## SUMMARY

1 A critical evaluation of our experience with distention with silver nitrate ointment in ninety nine cases, amniotin by vaginal application in thirty one case, pyridium suppositories in nineteen cases and various other methods in smaller series leads to the conclusion that amniotin by vaginal application is the most satisfactory method of management we have used to date.

2 This study includes 261 cases in which sulfanilamide was used orally. Only a few of these cases have been reported elsewhere. The results and opinions indicate that the method is unsatisfactory as used to date. The reason may be inadequate or inconstant administration of the drug. The desired low  $pH$  of the vagina may be important in relation to the ineffectiveness of sulfanilamide. Meticulous care during treatment requires hospitalization—a disadvantage. The method is used thus far apparently does not compare favorably with other available methods.

3 Evidence from a rather painstaking study indicates that the endocervix is seldom an important factor in relation to these infections—practically never so in younger children.

1020 Southwest Taylor Street

## ABSTRACT OF DISCUSSION

DR C F FLUHMANN, San Francisco. In discussing this paper it is important to remember that the authors have made a study of the problem of vulvovaginitis in children for many years and their opinions therefore deserve all the more consideration. In the Stanford clinic my associates and I have had too limited experience with children to warrant a statistical study of results, but our general impression coincides with that of the authors. The two methods of treating this disease which are now exciting major interest are the local application of estrogenic substances and the administration of sulfanilamide. The authors have given figures comparing the efficacy of the two procedures and it appears that estrogenic treatment is the method of choice. A fundamental consideration in the evaluation of new therapeutic measures must always be that of possible harmful complications. It is known that sulfanilamide must be handled with great care. The patient must always be under close supervision. Blood counts must be made frequently, and in spite of all precautions a number of unfortunate adverse effects make their appearance. With estrogenic therapy it is not known yet whether really serious consequences may occur. Some students of the problem have drawn attention to an abnormal development of the breast and pelvic organs, and it has even been suggested that this treatment may lead to the development of cancer. Recently there have been reports of overgrowth of the accessory genital organs of boys treated with the chorionic hormone. It is conceivable that in time complications also may be observed to follow hormone therapy of vaginitis in young girls. However, our present knowledge of the action of estrogenic substances and its conservative interpretation renders the probability of any real harm remote. The suggestion of cancer in children treated with therapeutic doses, I feel, merely represents a phobia. The development of the accessory genital organs and the breasts should not lead to permanent damage. I feel certain that estrogenic therapy conducted with due care and with therapeutic doses for limited periods is safe, but there may be real danger in prolonged treatment.

DR H CIOSE HESSELTINE, Chicago. I do not mean to discourage unnecessarily the use of sulfanilamide in treatment. However, I should like to ask whether the authors have demonstrated the presence of sulfanilamide in the vagina of the child, and if so in what concentration it was found. One reason for this question is that in the paper to follow it is noted that sulfanilamide has not been found in probable bactericidal concentration in the adult vagina. If it appears in

11 One to twenty dilution in oil of triacetin (1:500) solution

a pronounced concentration, that would explain its action but if it does not appear in bactericidal or bacteriostatic concentrations an explanation is needed for its accredited therapeutic action

DR GOODRICH C SCHLAUFLER Portland Ore In relation to Dr Hesseltine's question, I must answer by inference. I have it in mind that determinations have been made of the concentration of sulfanilamide in the vagina of these treated patients, and my impression is that the concentration is consistently lower than the concentration in the blood of the same patient. This is my inference, and I think the point is important. It is interesting that sulfanilamide has been used locally in the vagina by J W Holmes at the Philadelphia General Hospital in five cases, and in four cases a severe bloody discharge occurred with definitely unpleasant reactions and the treatment had to be discontinued. I am deeply interested in Dr Lohmann's comments. It occurs to me that Dr Fluhmann, before the estrogenic treatment was adopted in this connection, made observations in relation to leukocytic infiltration in the adnexal tissues in patients under treatment with estrogenic substances. His study of the possibility of a favorable reaction to the use of estrogenic substances in connection with genital infections was one of the earliest contributions to this problem.

## THE STUDY AND SUPERINTENDENCE OF HOSPITAL PROCEDURES

SUGGESTING THE CREATION OF A SPECIAL COMMITTEE  
OF THE MEDICAL STAFF AND ADMINISTRATIVE  
OFFICERS FOR THE PURPOSE

J J GOLUB, MD  
Director Hospital for Joint Diseases  
NEW YORK

The medical staff and administrative officers of a hospital must concern themselves alike with its interior composition and outer conditions. A hospital, like a patient, has an inside which must be studied with the purpose of altering and discovering theory and practice of its healthy service and development. In a healthy smoothly functioning hospital

- 1 Physicians and surgeons have every facility and encouragement to diagnose and treat disease
- 2 Patients can rest in comfort and as individuals be understood and reasonably satisfied
- 3 Professional and administrative methods and procedures can be continuously watched over, controlled and qualitatively analyzed
- 4 Patients can be instructed in the simple practices of hygiene and the special measures to be carried out at home such as dieting, exercise and prevention of disease
- 5 The condition of discharged patients can be observed by periodic follow-up service
- 6 Physicians and nurses can learn and teach
- 7 Medical students and student nurses can learn
- 8 Clinical and laboratory research work can be pursued

In this paper I wish to discuss the third point in the list, namely the creation of conditions within the hospital which would permit continuous study and constant control of professional and administrative practices and procedures. The purpose, however, is not to minimize the progress made by physicians and hospitals in the many effective and well directed procedures but to point out the significance and size of the unfinished task.

If it is true that 'nothing is so stale as yesterday's newspaper,' it is not less true that, in the hospital today's practice may be obsolete tomorrow. Nothing is so ineffectual and wasteful as "routine" of long standing the efficacy of which no one questions or

undertakes to check periodically. Repetition of motions and steps which have been standardized without constantly checking their effectiveness and without comparison with the improved methods that the ever changing phases of hospital and medical care bring in, is good neither for the patient nor for the hospital. Such heedlessness rests on precedent, habit and laziness.

When the patient arrives, the machinery of the hospital is set in motion—orders and procedures are set in motion and focused on him as if he were the only patient to be considered. Between the time of the patient's admission and his discharge from the hospital, about sixteen major administrative and professional departments of the hospital serve him directly and indirectly. The extent of the service the average patient requires can be better understood by recalling the fact that general hospitals have about one and a half to two and a half employees for every occupied bed. This, of itself, requires repeated examination of the usefulness of hospital procedures, jointly and severally, as wholes and in their constituent parts. It should enhance the comfort of the patient and keep standards of service and economy high. It should eliminate techniques and hazards which may have ill effects on patients, and it should lessen litigation as a result of malpractice claims. To accomplish this calls for special attention to

(a) The control and supervision of all matters pertaining to administrative and professional practices and procedures

(b) The observation and study of existing practices and procedures, by making repeated qualitative analyses of their merits, efficacy and hazards. This would include continuous research and experiment within the hospital

(c) The observation and study of new practices and procedures as developed elsewhere, with a view to their introduction into the hospital

(d) Recommendation to the hospital authorities of modification, substitution and elimination of practices and procedures as indicated by controlled observation and study, and by current scientific advances

But who shall pay this attention, the administrative or the medical staff?

It would be difficult to designate certain practices and procedures as belonging solely to one group or another or to one of the usual departmental committees of the hospital. It is not difficult, however, to see that they belong to the hospital as a whole and are the responsibility of the hospital, that is, the joint responsibility of the two staffs. Both staffs, it follows, should find a workable way of assuming this responsibility.

Here one way is suggested. The medical staff (say through its medical board) should appoint a committee to be known as the Committee on Hospital Practices and Procedures. This committee should be functional in character in contradistinction to a departmental committee, which confines its activities to one of the usual hospital departments. The committee should, as far as possible, consist of the director of laboratories, the roentgenologist, the anesthetist, the physical therapist, the transfusionist, a surgeon, a physician and the executive director (in a large hospital one of his assistants). When a matter relating to a particular department is under consideration, the committee would invite a representative of the department to participate in its deliberations. Thus it might call in, as the occasion required, the supervisor of nurses, the supervisor of the surgical operating suite, the nurse-anesthetist, the senior house staff member, the dietitian,

the supervisor of social service, the supervisor of the outpatient department and other department heads

In a large hospital the committee might find it advisable to engage a full-time research assistant—one endowed with curiosity as well as with research qualities. He would devote himself to the activities outlined for the committee.

A complete discussion of all hospital practices and procedures that would come continuously under the watchful eye of this committee could not be given within the limits of this paper. The few discussed represent a fair sample of a much longer list. They are different enough and numerous enough to show how needful is the critical examination of hospital procedures, especially those likely to be outmoded and become inconsistent with high standards of service for the sick.

The eight to be discussed are

- 1 Preoperative and anesthesia precautions
- 2 Surgical operating rooms—policies and technics
- 3 Postoperative precautions and infections
- 4 Cross infection in occupied wards and control of contagious disease
- 5 Blood transfusions and intravenous infusions
- 6 Patients without visitors
- 7 Hospital admissions
- 8 The fate of the discharged patient

#### PREOPERATIVE AND ANESTHESIA PRECAUTIONS

The committee would undertake a critical study of what is done with the patient prior to operation with the purpose of establishing well grounded rules of procedure. For example, it would establish a policy regarding surgery during an influenza epidemic and on very hot and humid days, and regarding what person should be empowered to cancel scheduled operations on such days.

It would study both the various standing preoperative orders and those given by the surgeon, and evaluate them. It would determine the efficacy of blood agglutination tests before tonsillectomy, whether children shall receive the usual preoperative dose of morphine, whether, when and where the surgical area shall be shaved, cleansed and painted with iodine—the night before or immediately before operation in the patient's bed or in the operating room. Who shall check whether the patient signed the usual permission slip consenting to submit to surgery? Who shall control the unusual and often unjustifiably long time patients are held on the operating room floor before operation and how shall he control it? Who shall mark the exact part where the operation is to be performed to avoid operation on the wrong part? Whose duty shall it be to identify the patient—the surgeon's, the anesthetist's or the nurse's—one or all—before anesthesia is administered so as to make sure that the right patient will undergo the indicated operation? Of what shall the identification consist?

#### SURGICAL OPERATING ROOM POLICIES AND TECHNIQS

Rules and regulations governing operating room policies and technics also require periodic revision. Ways should be designated of bringing them regularly to the attention of the surgical staff and the personnel of the operating suite. In formulating them the following questions among many others should be considered.

In scheduling patients for operation, what are the roles respectively of the operating room supervisor, the house surgeon, the anesthetist and the admitting officer?

How shall constant asepsis be maintained?

Who is responsible for insuring the complete sterilization of all materials?

Shall the laboratory or the supervisor of nurse be held responsible for the regularity of periodic bacteriologic examinations of sterile materials, water and surgeon's hands? How often shall such examinations be made and by what criteria shall the sterility be measured?

What shall the practice be with regard to the "scrubbing" of hands? Shall surgeons and nurses be required to "rescrub" their hands when going from one operation to another or merely change their gloves and gowns?

Who is responsible—the surgeon or the nurse—for the accurate count of sponges and how shall it be controlled?

Who shall instruct the house staff and nurses in the use of the resuscitation apparatus?

Who shall check the ever readiness of emergency trays for the usual operating room emergencies?

What shall be done to eliminate the dangers of electrical and gas ignition of anesthetics?

What shall the safeguards be to avoid the breaking of needles in spinal and other injections?

#### POSTOPERATIVE PRECAUTIONS AND INFECTIONS

The practices and procedures discussed under the title of postoperative precautions and infections have two aspects.

One is the general postoperative care which begins the instant the surgeon completes his work. Regarding this the questions are: Who shall issue postoperative orders, what shall they be and to whom shall they be issued? Who shall accompany the patient from the operating room to his bed—the house surgeon, the anesthetist, the orderly or the nurse? Who shall check the condition of the room to which the patient is being returned from the standpoint of drafts, heat, quiet and watching until the patient has completely reacted to the anesthetic?

The other envisages procedures of precaution against postoperative infections of the surgical or obstetric area. The questions here are: What are the practices in dressing of wounds? Is strict asepsis observed in all the steps taken? How and when are patients catheterized? What restrictions govern prepartum examinations so as to prevent postpartum infections? What are the practices and procedures with relation to the care of the newborn? What is the policy concerning medical and surgical patients occupying beds in one ward or room?

#### CROSS INFECTION IN OCCUPIED WARDS AND CONTROL OF CONTAGIOUS DISEASE

The study of the field of cross infection in occupied wards and the control of contagious disease raises the following questions. What is the hospital policy concerning admissible and inadmissible diseases? For example, are patients with erysipels or active gonorrheal urethritis or pulmonary tuberculosis to be permitted to occupy beds in rooms or wards occupied by other patients? What are the known theories and facts concerning the transmission of disease? Which diseases are transmitted through air, droplets, water and food? Which diseases are transmitted through direct contact? Is there a relationship between the area and cubic content of a ward or room and the number of occupied beds? Does crowding influence cross infection, and how? What knowledge and experience are

available regarding the relationship of ventilation, filtered and washed air and air conditioning to cross infection?

#### BLOOD TRANSFUSIONS AND INTRAVENOUS INFUSIONS

Some of the questions to be considered under the heading of blood transfusions and intravenous infusions are

In busy hospitals where many transfusions follow one another, what shall be the practice in identifying the right donor for the right patient after both have been typed so as to avoid the fatal error of transfusing blood from one blood-type donor to another blood-type patient? What shall be the safeguards against the transfusion of blood from donors infected with syphilis or malaria? Who shall be responsible for this vital check—the transfusionist, the hematologist or the operating room nurse? What are the causes of chill and fever reactions after transfusion or any intravenous infusion—the rubber tubing, the temperature of the blood or solution, the speed of the flow, the volume, the degree of concentration, the age of the solution, the faulty distillation of the water or what?

#### PATIENTS WITHOUT VISITORS

Medical social service supplements medical care. Its work should aim to make the patients in poor circumstances more comfortable mentally at ease, physically stronger, and economically easier either directly or through other relief agencies. Social service should enable the hospital better to understand the patient and the patient better to understand his medical and social problems, and thus to cooperate more willingly in their solution. Yet often when much or all of this is done the patient without visitors is forgotten. Who is he and why is he friendless? Where is he going when he leaves the hospital? Social service may evade the function of becoming a collecting or rate adjusting agency of the hospital but many of the practices and procedures which it does accept require study and supervision. It is legitimate social service to befriend lonely patients. There should be no clash between the emerging profession of social service and humane acts of this sort which are not usually described in the textbooks dealing with that discipline. They have been known even to hasten the recovery of patients.

#### HOSPITAL ADMISSIONS

The "routine" of hospital admissions rarely includes consideration of the mental attitude of the patient who has been taken from the familiarity of home and family to the strange atmosphere and strange personnel of the hospital. Usually the only person he knows is his physician, who visits him once or twice a day or once every other day. During all other hours the patient is served and watched by a nurse who is a stranger to him and whose time and attention may have to be divided with one or more other patients.

It is not sufficient to try to cure physical disease. The hospital must guard against conditions during such treatment which hurt the mind of the patient. The patient's reaction to unfamiliar hospital sights and people, talk or silence, fears and complacency may not be ignored. This is a task in our present day complex hospital setting that requires at least no less thought, no less planning and no less expenditure than does, say, the hospital's bookkeeping department.

Shall not the ways and practices of the admitting officer and of the nurses and house staff members as

they relate to newly admitted patients be examined? What can be done to insure the patient's mental comfort and elimination of anxiety which often eclipse his physical improvement? To find suitable answers to these questions would be an important assignment of the committee.

#### THE FATE OF THE DISCHARGED PATIENT

It is easy to agree with Lincoln Steffens "that nothing is done finally and right" and "that nothing is known positively and completely." Many timely and needed changes are yet to be made in hospital administration, hospital service, and hospital planning and construction. These changes are possible because it is hard to recall another period when public interest in the hospital was greater than it is today. It is also hard to recall another period when the hospital as an integral institution of the community was more acceptable to the people, its services more essential to their well being and its progress of greater concern. To retain these qualities the hospital must increasingly realize that its responsibility to the patient discharged as "improved" and especially to the patient discharged as "unimproved" does not end when the patient leaves its doors. In this connection the committee should seek answers to the questions: What are the instructions issued to patients on leaving the hospital? To what sort of homes are they returning? What is the responsibility of the hospital in providing facilities for convalescent care? What are the aims of "follow-up" service? How is it conducted and what efforts are made to have the patient return for "check-up"? In a word, what hospital practice should be set in motion to insure lasting cure and to find a way of improving the condition of the patient discharged as "unimproved"?

#### THE HOSPITAL'S RESPONSIBILITY

It might be suggested that all practices and procedures are the responsibility of the respective committees of the medical staff already formed to deal with them, that they are the responsibility of the heads of the clinical divisions or of the hospital administrative department heads. Preoperative and postoperative precautions are the business of the surgeon, the anesthetist and the Committee on the Surgical Operating Room and Anesthesia. Surgical operating room policies and techniques are the responsibility of the operating room nurse and surgeon and the same committee, blood transfusions of the transfusionists and a corresponding committee, and so on. But there usually is more than one surgeon and often more than one transfusionist. Whose duty is it to handle cross infection hazards? Who shall investigate sudden deaths in the operating room or in the ward and what are the lessons that could be learned from such investigations? And who shall observe, seek explanation and indicate measures of control over the frequency of orders for x-ray and laboratory examinations which are unusually high for ward patients as compared with private patients with the same conditions? These and many other activities that make up today's highly complex hospital do not belong exclusively to one controlling source. Many practices and procedures involve more than one hospital service and more than one of the regular medical staff committees. There is overlapping and much divided responsibility. These difficulties indicate the value of one central study and advisory group to evaluate, discriminate, disseminate and supervise practices and pro-

cedures of the scores of professional and administrative workers who directly and indirectly serve patients.

There is much to appreciate in the modern American hospital. Its evolution from the old types of buildings to new functional interiors, complete in equipment, that are also beautiful and brightly furnished and easy to operate is a matter of pride. Should not hospital organization seek parallel improvement in service, directed toward the welfare, comfort and cure of the patient? This is what a joint committee of representatives of the medical staff and administration, devoting itself to matters pertaining to professional and administrative practices and procedures could seek and find. The medical board of the hospital would review its conclusions and recommendations and see that those accepted and approved become (after ratification by the board of trustees of the hospital) the practices and procedures of the hospital until again changed or eliminated.

1919 Madison Avenue

## RELATIONSHIP BETWEEN NICOTINIC ACID AND A CODEHYDROGENASE (COZYMASE)

IN BLOOD OF PELLAGRINS AND NORMAL PERSONS

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CINCINNATI

Growth factor V for bacilli of the influenza group has recently been identified as a codehydrogenase (cozymase or coferment).<sup>1</sup> The Lwoffs<sup>2a</sup> have shown that bacilli of this group which require the factor cannot synthesize it from its components, nicotinic acid amide, adenylic acid, ribose and phosphoric acid. Because of the well known importance of nicotinic acid and nicotinic acid amide in the treatment of human pellagra,<sup>2</sup> it seemed important to investigate the content of factor V in the blood of pellagrins for the cozymase of von Euler<sup>3</sup> and the coferment of Warburg<sup>4</sup> are the only two known active biologic substances in which nicotinic acid amide is found. We have shown that *B. influenzae* can be used to measure accurately the cozymase content of the blood in normal persons and in pellagrins. Furthermore, prolonged treatment of several hundred pellagrins with nicotinic acid has shown that in most cases there is an immediate increase in sense of well-being and vigor and a prompt relief of

the symptoms of acute pellagra.<sup>5</sup> In a rather high percentage of the pellagrins, however, it is necessary to increase the dosage from time to time in order to keep them free from recurrences. In two instances as much as 1,000 mg. of nicotinic acid a day was required.<sup>6</sup>

Manifestations of vitamin B<sub>1</sub> deficiency often appear in the endemic pellagrins who subsists on his usual diet and ingests large amounts of nicotinic acid each day.<sup>7</sup> This vitamin B<sub>1</sub> deficiency can be prevented, at least for a considerable period of time, by the addition of 10 mg. of crystalline vitamin B<sub>1</sub> to this diet. Likewise, while pellagrins show definite improvement following the administration of nicotinic acid and vitamin B<sub>1</sub>, if the patient remains on a deficient diet certain symptoms will again develop in some of the patients. This suggests that even though two essential substances, nicotinic acid and vitamin B<sub>1</sub>, are supplied, the diet usually ingested by these patients must be deficient in still another substance or substances.

During the past five years we have attempted to determine the role of riboflavin in human nutrition, but we were not able to demonstrate a clearcut usefulness for this substance as a therapeutic agent in the treatment of deficiency states in human beings. Therefore four endemic pellagrins were selected for preliminary study in Birmingham, Ala. These pellagrins were maintained on a pellagra-producing diet and were treated by administering from 100 to 400 mg. of synthetic nicotinic acid and 10 mg. of synthetic vitamin B<sub>1</sub> each day as supplements to the diet. Within twenty-four to forty-eight hours after the administration of these substances was begun, great improvement in the patients occurred. They continued to eat the pellagra-producing diet and supplements of nicotinic acid and vitamin B<sub>1</sub> were given each day, but within one to two months the patients began to lose appetite and weight, and very mild dermatitis appeared. Past experience had shown that by administering still larger amounts of nicotinic acid another period of improvement could be induced, but we decided to keep the intake of food, nicotinic acid and vitamin B<sub>1</sub> constant. The general clinical condition of these patients remained essentially the same during the subsequent ten months. In order to rule out the effect of any psychotherapy, we gave, in addition to nicotinic acid and vitamin B<sub>1</sub>, sodium bicarbonate and acetylsalicylic acid to each patient for three days. No subjective or objective improvement occurred. Since some of the patients experienced a recurrence of certain symptoms even though nicotinic acid and vitamin B<sub>1</sub> were given, and in view of our belief that riboflavin is involved in the metabolism of nicotinic acid or substances acting similarly, either as a complementary therapeutic agent to form a conjugate within the body or as a constituent of the diet essential in itself, we administered 50 mg. of riboflavin to each patient. On the second day an additional 50 mg. was given. Within forty-eight hours each patient showed improvement in sense of well being, improvement in the cutaneous lesions (the dermatitis in these four patients did not go through a period of erythematous change and, in general, appeared much more chronic than the characteristic pellagrous dermatitis) and increased vigor. Thus, we feel supports our

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1 Lwoff, Andre and Lwoff, Marguerite. (a) Studies on Codehydrogenases. I. Nature of Growth Factor V. *Proc. Roy. Soc. London* s. B **122**: 352 (May 1) 1937. (b) II. Physiological Function of Growth Factor V. *ibid.* **122**: 360 (May 1) 1937. (c) Sur la nature du facteur V. *Compt. rend. Acad. d. sc.* **203**: 520 1936.

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6 Spies, T. D., Grant, J. M., Stone, R. E. and McLester, J. B. Recent Observations on the Treatment of Six Hundred Pellagrins with Special Emphasis on the Use of Nicotinic Acid in Prophylaxis. *South. M. J.* **31**: 1231 (Dec.) 1938.

belief that riboflavin does have some function as a therapeutic agent in the treatment of certain deficiency states in human beings<sup>6a</sup>

These observations suggest that nicotinic acid is probably not used as such by the body but more likely is used as a component of some enzyme system, and that riboflavin is also beneficial to certain pellagrins in

TABLE 1—Growth of *B. Influenzae* in Dilutions of Blood\*

Control Cases	1 1 000	1 2 000	1 4 000	1 8 000	1 12 000
R B	++++	+++	++	+	±
R W V	++++	+++	++	+	±
I F	++++	+++	++	+	±
R G	++++	+++	+	±	—

\* The extent of growth was interpreted as follows: ++++ = very heavy; +++ = heavy; ++ = moderately dense; + = light; ± = just perceptible; — = no growth

relapse. The present report is concerned with the therapeutic effect of nicotinic acid as demonstrated by an increase in the quantity of these active enzymes in the blood. The growth of influenza bacilli in serial dilutions of human blood has been used as a measure of the amount of this specific growth factor present in blood.

#### METHOD

Five cultures of *Bacillus influenzae* and *B. parainfluenzae* were obtained, carried on chocolate agar slants and studied in broth subcultures. The broth was prepared with 2 per cent Difco proteose-peptone, 0.6 per cent salt and 2 per cent human blood. This medium, pH 7.6, was heated to 95 C and filtered. Then a portion was sterilized by filtration through a Seitz filter and another portion was autoclaved. As was expected, the portion of autoclaved medium was found not to support growth of those members of the influenza group studied, since cozymase, factor V, is destroyed by autoclaving. The unautoclaved medium, in contrast, provided luxuriant growth of these organisms, as has been shown previously by Davis<sup>8</sup> and by Thjotta and Avery.<sup>9</sup>

The procedure was as follows: One cc of venous blood was added to 19 cc of sterile distilled water and heated in a water bath to 85 C until the solution became brown. The solution was cooled and, after the addition of one or two drops of sterile tenth normal hydrochloric acid, was centrifuged. The supernatant fluid was then added to tubes of autoclaved peptone broth so that the final dilutions of blood added to the prepared medium represented volume ratios of 1 1,000, 1 2,000, 1 4,000, 1 8,000 and 1 12,000. The blood was heated to 85 C so that the proteins could be centrifuged out and the labile inhibitory substance in the serum described by Rivers and Leuschner<sup>10</sup> would be partially or totally destroyed.

#### SELECTION OF CASES

A series of blood studies were made on four healthy, well nourished persons and three patients with mild attacks of pellagra who were admitted to the Cincinnati

General Hospital. Of the pellagrins, H J entered in relapse and, after recovery, was maintained on a pellagra-producing diet for two months (Dr W B Bean and Miss Jean Grant contributed in the dietary control of this patient and in the therapy of the other pellagrins). F H and W S entered with mild lesions which healed after rest in bed, although the patients were maintained on a pellagra-producing diet.<sup>11</sup>

#### OBSERVATIONS

The blood of normal persons was found to support growth up to dilutions in peptone of 1 12,000 when the procedure outlined was used with loop transfers of a twelve to eighteen hour culture of *B. influenzae* as the inoculum (table 1). In contrast, the blood of the three pellagrins supported growth poorly and only in the lower blood dilutions, i. e. 1 2,000 (table 2). They contained therefore, much less factor V than normal. The blood of these pellagrins, however, after nicotinic acid therapy, supported the growth of *B. influenzae* almost as well as the blood of the normal persons studied. Patient H J was maintained six days on the pellagra-producing diet before the administration of nicotinic acid. Then, while still on this diet, he was treated for a week with oral doses of nicotinic acid, which varied from 100 to 500 mg a day. On the seventh day of treatment a sample of his blood permitted a more luxuriant growth of the organism and supported the growth with greater dilutions of blood than previously (tables 1 and 2). The growth of *B. influenzae* in the blood of the two other pellagrins was studied over a period of days. The blood of F H supported growth luxuriously twelve hours after a gram of nicotinic acid was given on one day in five oral 200 mg doses. The blood from the third patient, twelve hours after the same amount of nicotinic acid was given, supported growth well at 1 4,000 dilution and slightly at 1 8,000. Tables 1 and 2 show the amount of growth in the blood of the two groups of persons, but the plus symbols used are arbitrary and minimize the striking differences observed.

#### CONCLUSIONS

1. The present study shows that the blood of normal persons on well balanced diets supports growth of *B. influenzae* to a much greater extent than the blood of

TABLE 2—Growth of *B. Influenzae* in Dilutions of Blood

Pellagrins	1 1 000	1 2 000	1 4 000	1 8 000	1 12 000
H J (before treatment)†	+++	++	—	—	—
H J (after treatment)	++++	+++	++	+	—
F H (before treatment)	++	+	—	—	—
F H (after treatment)	++++	+++	++	±	—
W S (before treatment)	+++	+	±	—	—
W S (after treatment)	+++	+++	++	±	—

† Treatment refers to the administration of nicotinic acid obtained from Merck & Co.

The controls of the culture in autoclaved mediums without added blood were negative in each case. The sterility of the blood that was added was also established.

pellagrins on diets deficient in the pellagra-preventive factor. After nicotinic acid therapy, however, the blood of these pellagrins increased to normal growth-promoting activity. This shows that after nicotinic acid therapy cozymase (or coferment) is significantly increased in the blood of these patients.

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6a. Since submission of this manuscript Dr W H Sebrell and Dr R E Butler have reported in a preliminary study that riboflavin is important in human nutrition (Pub Health Rep 53 2282 [Dec 30] 1938).

7. The authors are indebted to the American Type Culture Collection Dr J R Pothergill Dr Linda B Lange Dr Josephine B Neal and Mr T L Snyder for cultures of *B. influenzae* and *B. parainfluenzae*.

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2 These observations, plus the observation that prolonged treatment of several hundred pellagrins with nicotinic acid has shown that in many instances the dose must be increased from time to time to prevent recurrences of acute symptoms, support the tentative hypothesis that the therapeutic value of nicotinic acid depends on the synthesis of nicotinic acid nucleotide and finally coenzyme in the body

3 These studies show that the administration of riboflavin is beneficial to certain pellagrins in relapse. Since so many of these specific deficiencies occurring from water-soluble vitamins seem so interrelated, could not the same general biochemical system or systems be involved?

4 From these observations and those previously reported, we continue to recommend large quantities of a liberal and well balanced diet in the treatment of pellagra

#### SUPPLEMENTARY REPORT

Since submitting the preceding for publication, our observations have been extended in several ways. The cozymase content of the blood of a pellagrin with mental symptoms was so low that it would not support growth of the influenza bacillus. However, following the administration of 500 mg. of nicotinic acid daily for two days the influenza bacillus grew in the blood dilutions of 1:4,000 and the symptoms of pellagra disappeared promptly. In three cases of diabetes mellitus in severe acidosis the cozymase content was abnormally low but returned to normal following therapy with diet or insulin or following the administration of nicotinic acid. (We do not imply that nicotinic acid should replace insulin and dietary management in the treatment of diabetes mellitus.) At the suggestion of Dr. John W. Spies, determinations of the cozymase content of the blood of two patients with chronic lymphatic leukemia, three patients with malignant tumors and one patient with Hodgkin's disease were made. The blood from the two patients with leukemia, both of whom had been given roentgen therapy, did not support the growth of the influenza bacillus beyond the 1:1,000 dilution, whereas the blood from the patients with malignant tumors and from the patient with Hodgkin's disease supported growth of these bacilli better than the average. The blood from the patients with leukemia still would not support the growth of the influenza bacillus following the administration of 500 mg. of nicotinic acid daily for two days. The patients with malignant tumors and the normal persons selected for controlled study all appeared in good nutritional state. In contrast to the patients with leukemia, a patient with pernicious anemia in relapse showed normal cozymase concentration in the blood as evidenced by visible growth of the influenza bacillus in dilutions of 1:8,000.

The presence of the V growth factor for *B. influenzae* was also demonstrated in the normal urine studied. "Sterile" normal urine supports growth of the organism in dilutions of 1:10, 1:100 and 1:1,000 in the same autoclaved peptone-blood broth.

**Save the Juices, Peelings and Leaves**—The best kitchens are those in which almost nothing is thrown away, for it is the juices, peelings and leaves which contain the accessory factors necessary for human health. The fuller the garbage pail the poorer the health. Stinginess in the kitchen is one of the greatest virtues—Furnas, C. C., and Furnas, S. M. *Man, Bread and Destiny*, New York: Reynal & Hitchcock, 1937.

## Clinical Notes, Suggestions and New Instruments

### TRAUMATIC TRIPE INTUSSUSCEPTION OF THE ILEUM IN A CHILD

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In view of the scarcity of reports in the literature of traumatic intussusception, the following case is presented.

P. N., a schoolboy aged 9 years, was admitted to the hospital with a diagnosis of internal injury. One half hour before admission two wheels of an automobile truck had run over the lower part of the child's abdomen.

On physical examination the temperature was 98 F, the respiration rate 24 and the blood pressure 108 systolic, 76 diastolic. The patient was crying and complained of generalized abdominal pain. The physical changes found at examination were confined to the abdomen which was voluntarily rigid. Over the lower part of the abdomen were numerous cutaneous burns and abrasions.

Laboratory work consisting of urinalysis and roentgenograms of the abdomen, spine and pelvis, offered nothing of positive diagnostic importance.

Since a competent eye witness had seen the child's abdomen run over by two wheels of a motor truck, it was considered advisable to open the abdomen without delay because of probable visceral damage. This was done through a mid right rectus incision under ether anesthesia. The solid viscera and bladder were intact. When the gastrointestinal tract was examined about the middle part of the ileum, the small intestine was found to be intussuscepted in three places at intervals of approximately 20 cm. The intussusceptions were pointed in an abdominal direction and the segments were from 2 to 2.5 cm. long. There was no evidence of obstruction. The segments were easily reduced by gentle traction since no pathologic changes had yet taken place in the intestinal wall. The operation was completed within three hours of the injury and recovery was uneventful.

In reviewing the literature I could find only three cases of traumatic intussusception. The first was reported in 1908 by Stewart<sup>1</sup> of Philadelphia. His patient, a man aged 30, was struck just above the crest of the left ilium by a heavy steel beam. Shortly after the injury he was admitted to the hospital in profound shock. Vomiting, generalized abdominal rigidity and pain, and bloody urine developed and twenty hours later he was operated on. The abdominal muscles were found to be torn from the left iliac crest and a large extraperitoneal hematoma extended into the bladder wall. No viscera were ruptured. There were numerous spastic areas throughout the small intestine. In one place the spastic intestine had passed into a relaxed segment for a distance of 2 inches (5 cm.). The intussusception was reduced and the patient died four hours later in shock.

Le Conte, in commenting on Stewart's experience, described a case he had seen eight years previously of a 9 year old boy who had been stabbed in the left side of the abdomen. When the abdomen was explored under ether anesthesia a direct intussusception about 1 inch (2.5 cm.) long was found in the middle of the small intestine. About 2 feet (60 cm.) distal to the first intussusception two more were found, one direct and the other retrograde. Each was about three fourths inch (2 cm.) long while the sheath or intussusciens covering them was probably 2 inches in length. No signs of inflammation, congestion or change of color of the intestine were present, and reduction was accomplished by very light traction.

Kennedy<sup>2</sup> of London in 1920 reported a case in which a bad injury to the chest was caused by a motor lorry. The patient was admitted to the hospital with subcutaneous emphysema and a rigid abdomen. Within three hours he had vomited three times and appeared very ill. Four and one half hours after the injury the abdomen was opened. An intussusception 1 inch long

From the Department of Surgery, University of Louisville School of Medicine, Louisville, Ky.  
1 Stewart, F. T. Traumatic Intussusception. *Tr. Philadelphia Acad. Surg.* 9: 56, 1906.  
2 Kennedy, C. M. Ileal Intussusception Following Severe Trauma. *Lancet* 1: 1008 (May 8) 1920.

was found in the midileum. The proximal intestine was dilated and the ileum distal to the lesion was collapsed. The intussusception was easily reduced and the intestine showed no evidence of injury.

In 1908 Fitzwilliams<sup>3</sup> of London reported a series of 1,000 cases of intussusception, none of which were of traumatic origin. Perrin and Lindsay<sup>4</sup> in 1921 reported a series of 400 cases collected from London hospital records in the eighteen year period between 1903 and 1920. There are no cases of traumatic origin in this series.

Numerous examples of multiple intussusception appear in the literature. Twelve of the thousand cases of Fitzwilliams' presented multiple intussusception. A quintuple intussusception is reported by Baron<sup>5</sup> in a 2 year old boy whose onset was that of severe epigastric pain and cramps with vomiting. At operation five intussusceptions which averaged 13 cm in length, were found in the jejunum within 25 cm. The cause was not evident.

According to Obadalek<sup>6</sup> of Germany, sudden increase in intra abdominal pressure is an important cause of intussusception in children. He reports two cases. Intussusception developed in a girl aged 8 years involving the terminal 40 cm of ileum cecum and ascending colon following a severe paroxysm of coughing. In the second case an intussusception developed in a 4 year old boy while straining at stool. At operation polyps were found in the small intestine. The author states that he failed to produce intussusception experimentally in animals.

#### SUMMARY

1 Traumatic triple intussusception of the small bowel was found at operation in a child whose abdomen was run over by an automobile truck.

2 Three previous cases of traumatic intussusception have been reported. Numerous references of multiple intussusceptions appear in the literature.

3 Increased intra-abdominal pressure is suggested as an etiologic factor in intussusception.

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#### POSSIBILITY OF FAULTY DIAGNOSIS OF DIABETES IN PATIENTS TAKING THIAMIN CHLORIDE

RUTH S. HART, M.D. AND LOUIS E. WISE, PH.D.  
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The first morning specimen of urine collected from the patient, Mr. L. W., showed very marked reduction of Benedict's solution. The following morning the fasting blood sugar content was determined and found to be 90 mg per hundred cubic centimeters. The following day after a breakfast high in carbohydrates the urine was again examined and showed no reduction. At intervals thereafter, with a continued daily dose of 4 mg of thiamin chloride, the urine either showed traces of reducing substances or no reduction whatever. The medication of the patient, begun a month prior to the first urine examination, was two tablets of thiamin chloride prior to each meal (i.e. 6 mg a day) three 1½ grain (0.1 Gm.) tablets of theophylline with ethylenediamine and 3 grams (0.2 Gm.) of phenobarbital daily. Neither theophylline with ethylenediamine nor phenobarbital reduces Benedict's solution.

On the other hand 10 mg of pure thiamin chloride in 1 cc of distilled water reduced Benedict's solution only slightly giving an atypical yellow precipitate.

Whether or not thiamin chloride alone was responsible for the reducing substance found in the urine originally examined still is problematic.

Morning specimens from three other patients who were on at least 6 mg of thiamin chloride daily were examined and showed no reduction of Benedict's solution. Of these one patient was taking in addition to thiamin chloride an uncertain

amount of morphine. One other was taking 40 grains (2.6 Gm.) of acetylsalicylic acid daily.

The following possibilities in this case must be considered:

(a) Storage of thiamin chloride, with marked elimination at intervals.

(b) Elimination of oxidizable degradation products of thiamin chloride.

(c) Elimination of oxidizable degradation products of theophylline with ethylenediamine or phenobarbital or both.

(d) Lowering of the renal threshold to dextrose through the agency of thiamin chloride.

The question arises of the accuracy of Benedict's test for measuring dosage of insulin with patients taking thiamin chloride.

#### CONCLUSIONS

1 Pure thiamin chloride will reduce Benedict's solution in vitro.

2 Urine of one patient receiving 6 mg daily of thiamin chloride reduced Benedict's solution despite a blood sugar of 90 mg per hundred cubic centimeters of blood.

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#### CALCANEAL SPURS

SIMPLIFIED METHOD OF TREATMENT

JAMES R. REGAN, M.D., MILWAUKEE

Painful heels have for purposes of treatment been classified into those cases in which a calcaneal spur can be demonstrated roentgenographically and those in which no spur is present. In most cases in which no spur is demonstrable, relief is obtained by the use of well fitting supports applied to the plantar area of the foot which relax the structures. In those cases in which a calcaneal spur can be demonstrated and in which there is pain (many cases of calcaneal spurs cause no symptoms) treatment has been both conservative and radical. The conservative treatment consists of avoidance of weight bearing as well as the use of certain types of heels, shoe correction and the use of soft insoles. The radical treatment is concerned with either the surgical removal of the spur or some other method designed to remove weight bearing on the point of the spur, such as the rotation osteotomy as practiced by Steindler and Smith.<sup>1</sup> The latter procedure is, in the words of the authors, "too radical a procedure to be used in any but the most recalcitrant type of case." I have long since discontinued the use of the simple removal by chisel of the spur, since in these cases a very painful periostitis develops soon after the operation which is of a more disabling degree than the spur itself.

Based on work performed on the obliterative therapy in varicose veins and the like, a simple and effective treatment has been evolved and is being reported here. It was found in those cases in which operation was done that at the tip of the spur a bursa had formed. It seems reasonable to believe that a bursa formed in an unnatural place, the result of irritation, being the causative factor for the pain in calcaneal spurs. Many calcaneal spurs cause no symptoms whatever and are found purely by accident.

For the past five years in those cases of calcaneal spurs which were painful and which did not respond to the use of well fitting supports, felt pads, shoe correction and the like the following procedure was carried out. At the point of greatest tenderness an ordinary hypodermic needle was thrust through the skin on the plantar area of the os calcis until osseous tissue was reached. Then a few drops of 2 per cent procaine hydrochloride was injected followed in a few moments by 0.5 cc of sodium morrhuate in 5 per cent benzyl alcohol. The relief from the symptoms was rapid as well as fairly well prolonged. Up to the present time thirty-three patients with painful heels due to a calcaneal spur have been treated in this manner and of the thirty-three only two failed to obtain relief following the first injection. It was necessary in one case to perform four subsequent injections before relief was obtained. One patient has had no relief from this treatment. The relief obtained usually lasts for between two and three years after which another injection may be given.

<sup>3</sup> Fitzwilliams, D. C. L. Series of 1000 Cases of Intussusception. *Lancet* 1: 628 (Feb. 29) 1908.

<sup>4</sup> Perrin, W. S. and Lindsay, E. C. Four Hundred Cases of Intussusception. *Brit. J. Surg.* 9: 4671 (July) 1921.

<sup>5</sup> Baron, Charles. A Case of Multiple Intussusception. *Kentucky M. J.* 30: 406-407 (July) 1932.

<sup>6</sup> Obadalek, Walter. Darmeinwulstung und intraperitonealer Druck im Kindesalter. *Deutsche Z. klin. Chir.* 159: 160 1934. *abstr. J. A. M. A.* 102: 14-4 (April 28) 1934.

<sup>1</sup> Steindler, A. F. and Smith, A. R. Spurs of the Os Calcis. *Surg. Gynec. & Obst.* 66: 663 (6) (March) 1938.

The use of this solution has not resulted in any bad effects. I would not presume to be able to inject the material into the small bursa at the tip of the spur, as this is not necessary. If the solution is injected in the peribursal tissues, obliteration with organization of the bursa takes place. The irritation of the chemical injected causes an inflammatory process to be set up, which eventuates in the organization of the resultant into fibrous tissue. There is some slight pain after injection, which usually passes away within twenty-four hours.

#### SUMMARY AND CONCLUSIONS

1 A simple and effective method for the treatment of painful heels due to calcaneal spurs was used in thirty-three cases with thirty-one excellent results, in one case four injections were necessary and in one case there was no relief whatever.

2 The period of relief usually lasts from two to three years.

3 Only those cases in which the painful heel was due to calcaneal spur are included.

4 Sodium morrhuate in 5 per cent benzyl alcohol is used to obliterate the bursa at the tip of the spur.

5 It is my opinion that removal of the spur does not promise the relief that more conservative measures do; also the rotation osteotomy is very radical and a difficult procedure.

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### Special Clinical Article

#### THE PERENNIAL DISPUTE IN THE TREATMENT OF PROSTATISM

CLINICAL LECTURE AT SAN FRANCISCO  
SESSION

FRANK HINMAN, M.D.  
SAN FRANCISCO

Prostatism is caused by one of three conditions: median bar, hyperplasia or cancer. It is treated by one of three routes: the transurethral, the suprapubic or the perineal. This triebleness of kind and approach is confusing and a cause of contention. To differentiate a median bar from hyperplasia, either of which may be associated with cancer, and to recognize cancer when it occurs alone as well as when it is so associated is the problem of diagnosis. None of the three conditions can be cured without surgical intervention. To treat each kind of prostatism therefore by a transurethral, a suprapubic or a perineal operation is the choice of surgery, at least in theory. This reasoning may be false, since it is not followed in every practice. Some surgeons never choose a twofold or threefold plan of treatment but fit one method to all conditions. It follows that the diagnostic problem weighs lightly with them. These surgeons, however, are not crsuits. They are just as honest and sincere as those who elect a method which in theory may fit the condition better. They either believe the one method to be adequate for all three kinds of prostatism or admitting the logic of choice in treatment, have discovered by practical experience that sticking to this one method for all conditions gives them better results than using other methods. The skill which they have acquired in this one way of treatment overbalances the theoretical advantages of the other ways, in which they have been found by sweet and sorrow to be unskilled. Patients with prostatism ask their medical advisers

and these in turn search the medical literature and quiz their urologic confreres for an answer to the questions: Are these differences in urologic practice insignificant? Is the method of resection really adequate for all conditions? Does skill of performance outweigh the theoretical advantages? A simple comparison of results seems all that is needed in answer, but, just as a close or tied score does not tell the full story of the game, so such a comparison fails to reveal the truth about prostatism. It is not so simple. Much depends on the point of view acquired by training and experience. As the points of view differ, so will the answers differ. Perhaps a glimpse of the truth, so easily obscured in practice, may be caught by an open consideration of the three points of view. As true an insight into the problem, therefore, as is possible at present may be given by drawing up three declarations showing, for each way of approach, the pleas and replies, the reasons for and the arguments against and the evidence and counterevidence. In order to make such a presentation clear and simple, the diagnostic and clinical differences between the three common conditions producing prostatism should be known. Conceding that the surgeon's knowledge of these differences is ample, certain points of differentiation are worth emphasizing.

#### DIAGNOSIS OF THE CONDITION WHICH CAUSES PROSTATISM

The median bar or contracture at the vesical neck occurs in men under 50 about as frequently as does hyperplasia or enlargement of the prostate in men over 50. Long before the advent of electrical resection the bar was recognized as an entity distinct and different from hyperplasia and was treated successfully by the transurethral punch of Young or by suprapubic excision. Such bars are fibrous and glandular (fig. 1). They usually form a single joist from wall to wall, but they may be of ring type and encircle the neck, forming a contracture. Fibrous bars and contractures occur in women as well as in men. In men the glandular type of bar is similar pathologically to hyperplasia (fig. 2). Size and position distinguish the two. Single posterior enlargements of the prostate may be median in position, subcervical (beneath the neck) or subtrigonal (beneath the trigon). Such enlargements are called commissural when they connect coexisting lateral enlargements. Any of these may form a rounded mass which projects into the urethra or the bladder, producing a ball valve type of obstruction, and when small they are usually grouped with the median bars. A localized enlargement of the anterior lobe sometimes acts similarly as a ball valve. Enlargements also may be localized to the median or to the right or left lateral position. Such single isolated lobes are rare and belong with the hyperplasias. Median bars produce some of the most marked changes of back pressure, more even than hyperplasia does (such as large vesical diverticula, hydro-ureters and hydro-nephroses).

Enlargement of the prostate, or hyperplasia, is distinctly periurethral and supramontane. The glands surrounding the portion of the urethra between the level of the verumontanum and the bladder undergo this change (fig. 3). By their enlargement the surrounding and outer glands of the prostate, which never undergo such change to any marked degree, are compressed into the form of a glandular covering or layer

familiar to surgeons using the suprapubic and the perineal approach as the false capsule which is left after enucleation of the enlargement (fig 4) Enlargements of any size are compact and removable in one piece A trilobed bilateral-commissural combination is

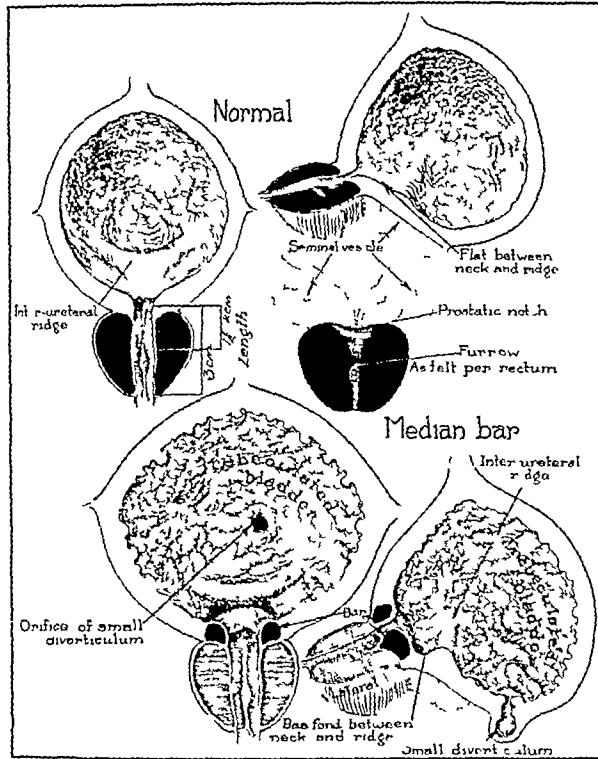


Fig 1—Changes from normal with median bar

the common form, though all sorts of combinations occur Enlargements distort and elongate the supramontane portion of the urethra or protrude into the bladder, dilating the sphincter

The median bar is easily recognized with the cystoscope, which shows a bas-fond or sulcus between bar and interurethral ridge and trabeculations cellules and other evidence of back pressure Recto-urethral thickening is absent, but there is a distinct overriding of the bar by the beak with a jump when the cystoscope with the beak turned down is drawn back into the urethra, and when the operator attempts to push the beak back into the bladder it usually catches on the bar This is best demonstrated with a finger in the rectum pressing on the vesical neck

Isolated lobes and true hyperplasia are recognized by means of touch, sight and measure Rectally in hyperplasia the median prostatic furrow and notch are filled in and obliterated and the lateral sulci are deepened Cystoscopically in addition to the changes of back pressure in the bladder sulci between lobes indicate the type of intravesical enlargement (fig 5), and when the cystoscope is withdrawn into the urethra the extent of encroachment of the prostatic urethra by lateral and median lobes is visible The extent to which the enlargement has lengthened the supramontane portion can be measured by marking on a ruler held parallel to the cystoscope the point opposite the water vent at which the extreme intravesical projection is in view, when the outer intraprostatic limits are brought to view (usually at the level of the verumontanum) as the cystoscope is pulled out this second point is marked

on the ruler The distance between these two points measures roughly the length of the enlargement (fig 6) Rectal and recto-urethral palpation indicates its width or thickness

Cancer of the prostate is a common form of malignant process As a cause of death it stands for men well above cancer of the uterus for women Sufferers under the age of 50 are the exception, the majority are over 60 (fig 7) Cancer of the prostate gives no early manifestation but creeps in silently and insidiously and as a rule is well advanced before being suspected The disturbance of urination, the common cause of the examination which reveals the cancer results from an associated median bar or, oftener, from hyperplasia (in 20 per cent of cases), either of which usually is coincidental Occasionally when carcinoma occurs without these other changes the prostatism, bleeding, pain or other complaints have arisen only after extension of the cancer into the urethra or the neck of the bladder or around local nerve trunks Metastases even at a distance have been found without local symptoms or signs This symptomless, hidden nature of the disease largely accounts for the failure to make early diagnoses The slogan "early diagnosis and radical removal" is barely audible in this branch of surgical practice Many urologists are outspoken in their belief that cancer of the prostate is always fatal, they know for a fact that they have never cured a patient Pessimism of this kind accounts for the other failures to make an early diagnosis This "what's the use" attitude

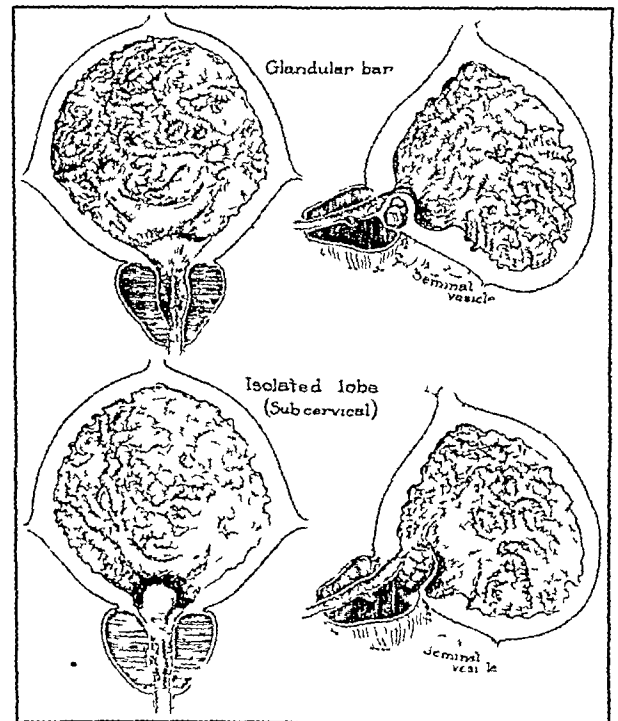


Fig 2—Similarity of glandular bar and subcervical lobe which acts as a ball valve

loses its fatalism with the thought that complete removal will cure cancer that it will has been proved repeatedly, although by only a few urologists The truth thus indisputably established warrants an effort both to improve the dismal record of early diagnosis and to take advantage of such diagnosis by prompt and radical surgical intervention

One form of cancer of the prostate, the common form (probably nine in ten) starts in the posterior portion. From this area it grows by extension to involve seminal vesicles, vasa the neck of the bladder and the hyperplasia when coexistent, or it spreads to a distance through the lymph or blood streams, causing

cancer and hyperplasia the primary lesion was peripheral, with invasion of the hyperplasia, and in how many it was central, with extension from the hyperplasia. A diagnosis made after such extension is not an early diagnosis.

The clinical diagnosis of carcinoma of the prostate is at all definite only when the lesion is advanced and incurable. An early lesion may be suspected clinically but is proved only with the microscope. Suspicion is aroused by the finding, on rectal palpation, of an area of stony hardness, which must be distinguished from inflammatory induration and calcification. Not all carcinomas are scirrhus and stony hard. Medullary and glandular types may be soft or even semifluctuant and are suspected because of the absence of the usual causes of these changes. The uncommon

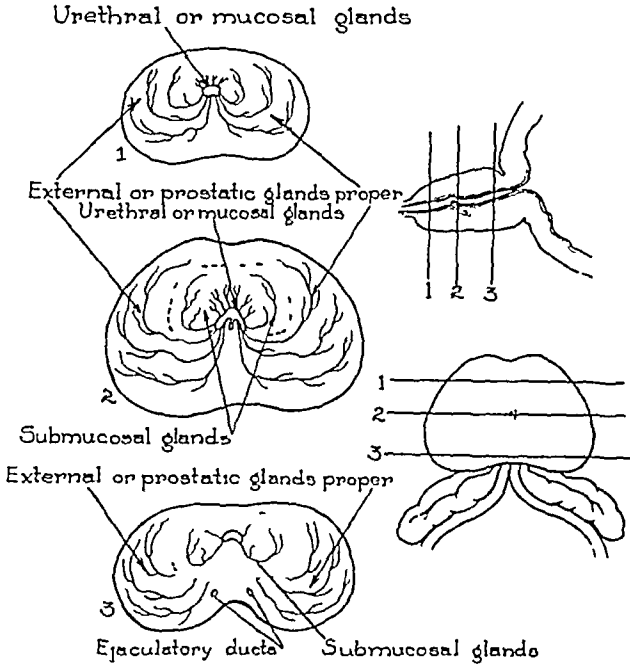


Fig. 3—The probable origin of hyperplasia from periurethral and submucosal glands or from primary myoma invaded later by the ducts of these glands (Denning)

metastases, the most frequent being perineural, in lymph glands and in bones, particularly the vertebral and pelvic. A diagnosis made after such extension or metastasis is not an early diagnosis (fig. 8).

Another form of prostatic cancer (probably one in ten) starts within hyperplasia as a form of malignant degeneration and, with growth, extends into surrounding structures or metastasizes, just as the common form does. When advanced it cannot be distinguished

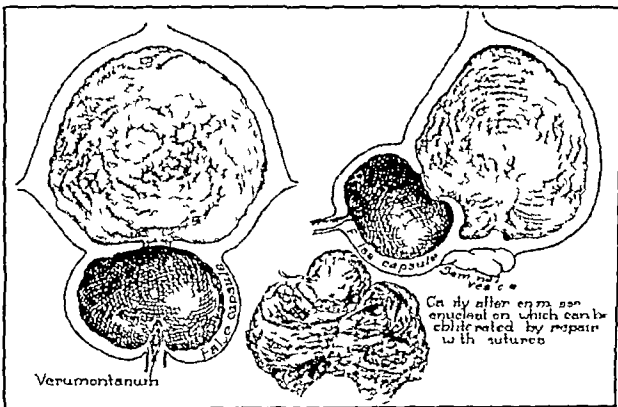


Fig. 4—Cavity with its false capsule after enucleation en masse of bilateral and commissural enlargement the common type

from the late stages of the ordinary form associated with hyperplasia. Serial sections of enlarged prostates removed suprapubically or perineally and wholly unsuspected of cancer will show early lesions of a malignant process of this type in about 5 per cent of cases. It is impossible to know in how many cases of advanced

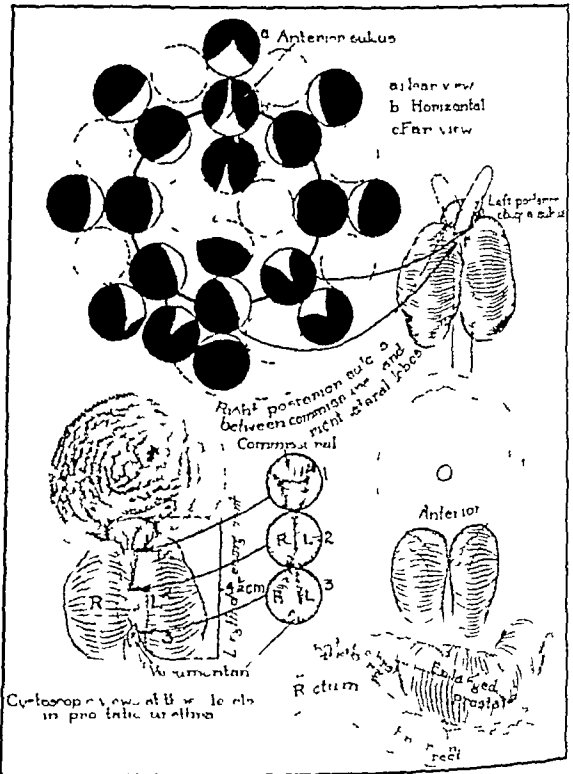


Fig. 5—The method of exact diagnosis of the type and size of enlargement

lesion, which begins as a form of degeneration within hyperplasia, is never recognized early by palpation and even in an advanced form—after local extension and distant metastasis—may be missed entirely by the examining finger in the rectum. Early recognition even of the common form which causes stony hardness is rare. When first seen, therefore, most cancers are in an advanced stage. Cancer creeps in with the patient unaware, and one may well ask: Who is to blame for its late discovery? In how many cases would it have been diagnosed earlier had the patient when he reached the age of 50 adopted the practice of having a complete physical check-up twice a year? Should family physicians keep a record and remind patients of the time for examination, as dentists do? Are the teeth the only part of the body for which "a stitch in time saves nine"? Even though rectal examinations were made regularly, it is safe to say that not all cancers would be recognized early, none of those which start within hyperplasia would be discovered, and many of

the common forms which start in the outer glands would be missed at first or suspected lightly and allowed to progress until too late for cure. As already stated, the clinical diagnosis of an early cancer of the prostate is always merely on suspicion. Only the microscope can be definite. This uncertainty of early diagnosis leads to wrong-doing in two ways. Procrastination, putting off a decision when in doubt, is a natural fault, and of course mechanical injury from repeated manipulation and massage follows because of this doubt. The one, by delay, causes loss of opportunity, the other, by spreading cancer, destroys all hope of a cure. What can be done? Vigorous massage of inflammatory indurations causes their disappearance, which disproves cancer. If cancer exists, however, all manipulations should be gentle. No surgeon mauls and squeezes a malignant process elsewhere. An experienced finger learns to distinguish fairly accurately the induration of lesser degree caused by inflammation from the extreme induration of cancer. An immediate biopsy is always in order on the first suspicion. When the surgeon is reasonably sure of the diagnosis, biopsy can be performed after the patient has been prepared for radical

of the urethra or at the vesical neck which looks infiltrated, hard and nodular. This can be done at the time of cystoscopic examination. However, as in biopsy with needles, a negative report is not conclusive.

The three conditions—median bar, enlargement and cancer—are not always unitary and distinct. As previously explained, cancer commonly occurs with bars and

TABLE 1—Causes of Prostatism

1 Median bar	5 Inflammation
2 Hyperplasia	Non-specific
3 Neoplasm	Acute
Carcinoma	Chronic
Sarcoma	Suppurative (abscess)
Leiomyoma	Specific
4 Cysts	Tuberculous
	Actinomycosis
	6 Calculi

enlargements, and this association is usually coincidental. Other conditions also complicate bars and enlargements, and their neglect or recognition in the surgeon's plan of treatment makes his standard of cure low or high. Sometimes one of these other conditions is the sole cause of the patient's urinary difficulties. Table 1 shows the need of differential diagnosis and the conditions to be considered. Inflammation is the most troublesome condition and is often aggravated by calculi. It alone may cause prostatism, even to complete retention. Commonly, however, it occurs with and complicates the three common causes of prostatism, particularly enlargement. When inflammation is a complication, no method of removal gives a high standard of cure if infection persists and causes a continuation of the burning and frequency. The amount of residual urine measures the degree of relief from obstruction, but this is surely not the only evidence of cure.

#### ATTRIBUTES OF THE METHODS OF TREATMENT

Knowledge of the clinical differences between median bar, hyperplasia and cancer, of the variability in size and position of hyperplasia and of the two types of cancer which has been briefly outlined, is only the first step toward justice and truth in the dispute as to treatment. The technical difficulties, the risks involved and the benefits derived from each of the three

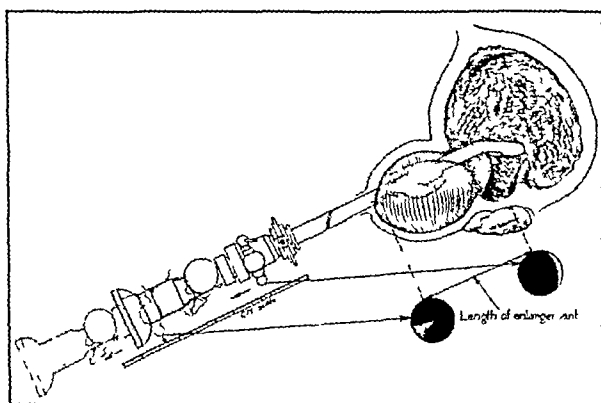


Fig 6—How the length of the enlargement can be measured

operation by perineal exposure, on microscopic confirmation the radical operation can be completed or, if the diagnosis is disproved, the wound can be closed and no harm is done. If the surgeon is not sufficiently sure of the diagnosis, needling of the area of induration may provide a piece of tissue which shows cancer on microscopic study, and then radical operation can be advised with confidence and done as soon as convenient. However, a suspicious area into which needles have been thrust by way of the perineum should not be forgotten if biopsy had a negative result. The method of biopsy with needles is too uncertain to be taken seriously if the result is negative. Of course such biopsy can be repeated but, if cancer is really present repeated puncture by needles cannot be harmless. The patient should be followed closely and reexamined regularly but gently. Should suspicion persist or be increased by local changes, there should be no hesitancy in placing the facts before the patient and advising an exploratory operation with the plan that if the pathologist finds cancer radical removal will be undertaken at once. If cancer is not found, the relief to the patient and his surgeon offsets all the trouble, this is the only result, since there is no risk in perineal exposure and simple biopsy. A third method of biopsy when cancer is suspected is by removal with the resectoscope of a cylinder of tissue from the area in the prostatic portion

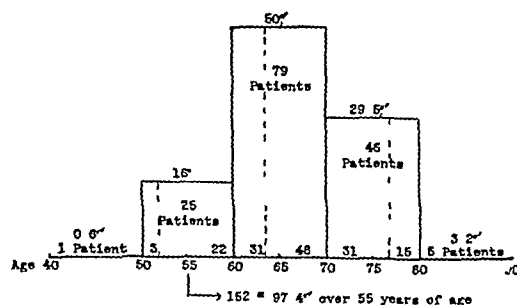


Fig 7—Age incidence of cancer of the prostate

surgical approaches must also be considered. Even if equal skill in their use is assumed for the purpose of comparison differences of opinion will remain for the simple reason that the majority of disputants are very one-sided. Their opinions are biased. They operate by the method which best suits them, too often the only method of which they have any practical knowledge. Naturally they are vigorous in defense of this practice. Skill in any of these approaches is not



acquired by reading and observation. It requires practice. The average surgeon of today lacks the opportunity of learning more than one method. Educated in a center in which only the perineal approach is used, he may never have done a suprapubic enucleation or even have seen one, and vice versa, although both camps do resections. Trained by a resectionist his knowledge of perineal and suprapubic operations of the prostate may be nil. This is no exaggeration. Recently a young man from a great medical center, on the usual tour before entering urologic practice, told me that he had never seen a perineal prostatectomy. Limitation of training and the one-sided outlook which follows cannot be disregarded when it comes to drawing up declarations for or against a method.

I shall disregard for the moment this warp and bias and, without partisanship or prejudice, make an honest attempt to enumerate truthfully the difficulties of performance, the risks involved and the benefits derived.

ever before. It can be mastered only by trial and error, and few medical centers provide an opportunity for this. The modern method of suture and closure controls hemorrhage, thus lessening the risk, and shortens the stay in the hospital to an average of twenty-one days. The surgical risk is low, the mortality being from 1 to 8 per cent, with an average of 3 per cent. The functional risk in the hands of the expert surgeon is high. The fear of impotence, of incontinence and of fecal fistula is overcome only with complete mastery of the details of technique. The functional results are equal to those obtained with the suprapubic approach and superior in many ways to those achieved with transurethral resection. The greatest advantage of the perineal method is in the treatment of cancer, for it is the only method which cures cancer. It is the only method which permits exposure for biopsy when cancer is suspected, and, furthermore, its use in a modified form often gives a higher degree of relief than does any other form of treatment to the

patient with a cancer which cannot be radically removed. Several modifications of technique are in use both for hyperplasia and for cancer. The modern method for the treatment of hyperplasia, cauterization *en masse*, structural repair by suture and closure without packs or drains, is an improvement in technique unknown and unappreciated by surgeons who have never used it.

The transurethral approach is the most popular, and its greatest fault lies in its very popularity. The reputed ease of performance, the supposed safety, the high pressure advertising of instrument makers and the enthusiastic adoption for trial by practicing urologists everywhere at first deceived the profession and

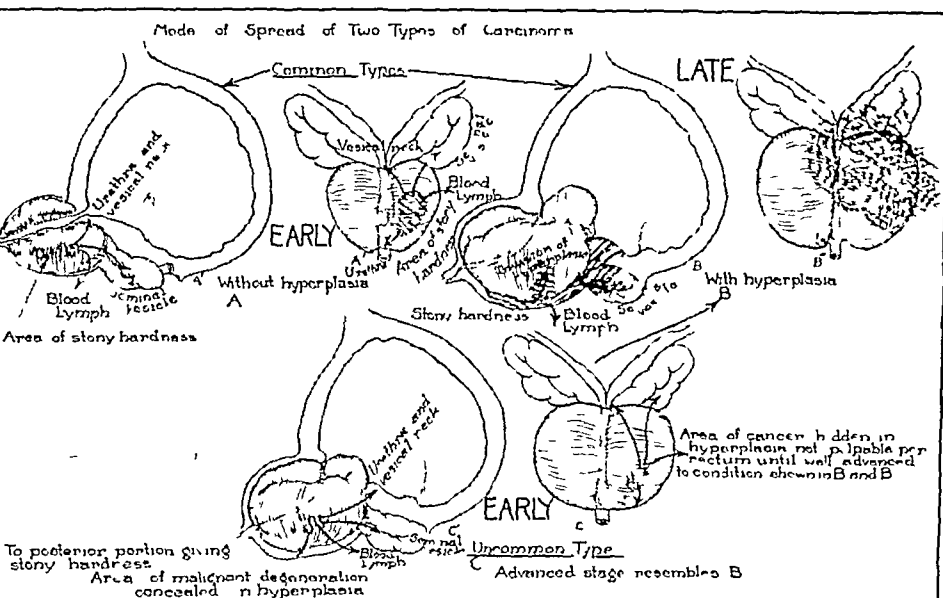


Fig. 8—The difference and similarity in the way the two types of cancer may spread from the primary place of origin.

The suprapubic approach is suitable for hyperplasia and is rarely if ever used for the removal of a median lobe or for cancer, except unintentionally when the neoplasm is concealed within hyperplasia. There are three chief modifications of technique, the one stage operation, the two stage operation and the more modern operation, which may be in one or two stages, with repair by suture and closure. The difficulties of technique, except when closure is attempted are not great. Failure to remove all the hyperplasia, which is not infrequent, usually arises from inexperience. The surgical risk is high, the mortality being from 4 to 20 per cent, with an average of 8 per cent. The period in the hospital is long, averaging from thirty to forty days, but is shortened considerably when the modern method of closure is used successfully. A persistent urinary fistula is uncommon. Structural defects also are rare. As a rule the functional results are both good and permanent.

The perineal approach is difficult to master and should never be attempted unless it is mastered. The operation, however, is performed more generally today than

the public. General practitioners and surgeons bought instruments and tried out their use even as an office procedure, patients soon began to demand the "electrical method," so that surgeons sometimes attempted it for this reason rather than for the fitness of the condition to the method or of themselves to perform it. Fortunately this burst of enthusiasm for transurethral resection has spent itself. The method does have some disadvantages, and the public has paid a heavy price for this knowledge. Let me review it briefly. Transurethral resection requires no particular surgical training, it is true but it does require a high degree of cystoscopic skill and experience. It is neither a simple nor a benign procedure and can be mastered only by trial and error. With the procedure in the hands of an expert the risk of death may be 1 per cent or less but the figure has reached 30 per cent or over, for example in some county hospitals. The average mortality throughout the country is probably about 4 per cent. This is no supersafety, and the figures quoted are of only relative value because the various series of cases on which they are based are not comparable.

to series reported by surgeons using the suprapubic or the perineal approach whose statistics, however, are themselves comparable. Is this criticism unjust? Resectionists have reported several of the largest series on record, consisting of thousands of patients operated on in one decade, a number which no surgeon has

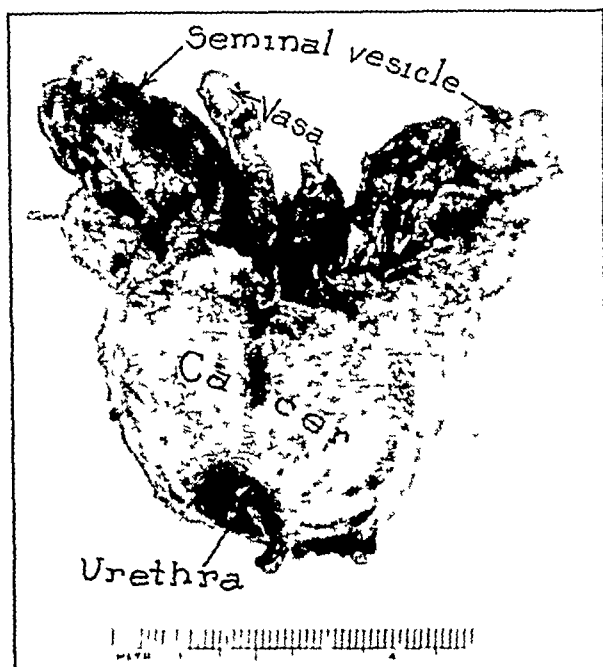


Fig 9—Specimen after radical prostatectomy and vesiculectomy (an expected cure)

equaled in two or three decades when operating suprapubically and perineally. Either there has been a decided increase in the incidence of enlarged prostates since the advent of the resectoscope, which seems absurd, or the large series reported by the resectionists include patients with median bars, isolated enlargements and small hyperplasias never cut with the knife by the surgeon. Almost all such patients are good risks, and when they are included in a large series the mortality should be much reduced.

An undisputed advantage of resection is the short period of disability. Exclusive of the preparation by catheter or otherwise often omitted nowadays, a week or ten days in the hospital is the average. This means a considerable saving of time and money. Patients who require more than one resection, however, as those with large prostates usually do, and patients who return in a few years for another resection gain little by avoiding operation.

The disadvantages of resection, even when well done, are the frequency of a recurrence of the prostatism, the unsatisfactory results obtained with hyperplasia complicated by infection with or without prostatic calculi, and the total absence of cure when cancer of either type is present. Furthermore, resection has its own functional risks. The journey afterward is not always smooth and uncomplicated. Incontinence, for example, is just as frequent after resection with poor workmanship as after unskilful removal through the perineum, the enormous sale of penile clamps in recent years suggests that it is more frequent.

No true estimate of the number of patients who have a return of prostatism after resection is possible at

present. The likelihood of return will vary with the thoroughness of the original removal. The experience of surgeons who use the suprapubic and perineal approach teaches that hyperplastic areas and nodules left behind at operation will grow and in time reach a size which causes obstruction. The need of complete removal, best secured by enucleation *en masse*, is the lesson learned by these surgeons. One is constrained to question the ability to resect completely enlargements of large size, and few resectionists have complete resection in mind even for smaller glands, therefore a high rate of recurrence is inevitable.

Infection of the prostate, particularly when there are stones in the gland, greatly reduces the efficiency of resection. Most patients, even with a channel bored through the hyperplastic glands which enables them to empty their bladders freely and completely, still carry the burden of urinary frequency and sepsis. In theory the enlarged prostate full of stones and infection is best treated perineally, sometimes by radical removal. A word is in order in this connection on the resection of



Fig 10—Specimen after a partial radical operation for cancer which had invaded the vas deferens beyond the reach of removal. Most patients after this operation are comfortable urologically for the remainder of life.

the small hyperplasia, the beginning enlargement which as yet causes little and variable obstruction. Patients with this condition were treated by massage and prostatic massage before, and many got along comfortably without ever requiring operation. The gain by resection is questionable so far as actual comfort and prolongation of life are concerned. Often resection may not have been needed. When the condition of early enlargement is complicated by infection with or without stones, this

infection may be the cause of symptoms which will disappear under treatment. Should not prophylactic resection, the removal of an early enlargement before it causes trouble, therefore be done advisedly?

The futility of resection for cancer of the prostate is a real disadvantage. Untaunted in perineal operations, the hands most skillful in transurethral resection are

TABLE 2—The Three Methods of Treatment

	Suprapubic Operation	Perineal Operation	Transurethral Resection
Mortality % extremes	4 to 20	1 to 5	—1 to 30 (of only relative value in comparison)
Average	8	3	4
Technic	Requires surgical training but is not technically difficult	Is difficult requiring accurate anatomic dissection	Is difficult requiring patience and cystoscopic skill; surgical training unnecessary
Modifications*	1 One stage 2 Two stage 3 Surgical repair and closure	1 Conservative 2 Surgical repair 3 Radical removal 4 Partial radical removal	1 Use of dilator my loop 2 Use of cautery punch
Period in the hospital, including preparation	From 15 to 40 days	From 15 to 40 days; average 21 days	From 10 to 20 days; may require two or three sessions which double or treble the time
Technical complications	Hemorrhage Infection Urinary fistula Incontinence	Hemorrhage Infection Fecal fistula Urinary fistula Incontinence	Hemorrhage Infection Incontinence

tied and helpless. Palliative resection in the late stages of malignant disease is the only service possible for the large group of patients with cancer of the prostate, and the little benefit derived may be short lived. Recurrent hemorrhages and obstruction necessitating repeated resections until death delivers the victim from misery. Surgeons now know the limitations of roentgen therapy and of the use of radium and that cure is assured only by radical removal. Unattainable as radical removal is for surgeons not trained to do it, there is no need for an early diagnosis of cancer. To such practitioners of urology, palliative measures as their need arises are just as satisfactory as the radical method, of which they have heard but have no first hand knowledge. They believe that early diagnosis is so rare and a cure so infrequent as hardly to be worth considering. Is this reasoning valid? Is this a sound argument?

The truth of the matter remains that likelihood of recurrence, poor results when infections and calculi coexist and total unfitness for the cure of cancer form objections to the method of resection aside from all slips and mishaps of technic.

The attributes of the three methods of treatment are summarized in table 2.

#### CHOICE OF METHOD

Obviously the query in the minds of nonparticipants cannot be answered satisfactorily at present. Knowledge of the marked differences in the three common conditions causing prostatism and of the chief attributes of the three methods of treatment is common. The picture of truth envisioned out of this knowledge by each individual will be colored by his particular bent of mind. Persons of a mind with me see logic in the choice of method to suit conditions and since the facts fail to establish the adequacy of one method for treat-

ing the three types, lack of logic in fitting one method to all conditions. Describing practice for theory, one would make the choice somewhat according to table 3.

#### CONCLUSION

Presupposing skillful performance, in theory the transurethral method is most suitable for fibrous and glandular bars and for certain of the smaller hyperplasias producing prostatism. The perineal method, with its low risk and absence of recurrence, is preferable for larger glands, many of which harbor cancer. Its more general use on suspicion will increase the number of early diagnoses and cures of cancer. The suprapubic method carries the greatest surgical risk and is applicable only to benign enlargements. On the other hand, in practice the suprapubic method is easiest to learn and carries much less risk of functional disaster if the patient survives. The perineal method, while safe surgically, is highly technical and difficult to perform and is followed in fear of the sphincter and dread of the rectum because injury of either means odium to the surgeon and misery to the patient. Such injury, however, has been exaggerated. Both rectum and sphincter at rare need can be repaired and need of perineal repair has not been infrequent for certain transurethral mishaps. Thus so-called nonsurgical

TABLE 3—Suitability of the Methods, When Skillfully Performed to the Conditions

Clinical Condition	1 Suprapubic	2 Perineal	3 Transurethral
A Median bar	+		+++
(a) Complicated (stone—infection)		++ (partial radical)	++
B Hyperplasia			
(a) Isolated lobes (ball valve in type and usually grouped with median bars)	+	+	+++ (if complete)
(b) Small			
1 Causing little if any trouble	(The majority are much better off if left alone)		
2 With prostatism	+	+	+++ (if complete)
3 Complicated (stone—infection) if it does not respond to ordinary treatment		++ (partial radical)	++
(c) Medium and large	++	+++	+
C Cancer			
(a) Common form			
1 Early (curable)		+++ (radical)	
2 Late (incurable)			
(a) Without prostatism		(x rays and radium)	+
(b) With prostatism	+	+++ (partial radical)	+++ (palliative temporarily)
(b) Uncommon form			
1 Early (concealed in hyperplasia)	++	+++	
2 Late (same as common cancer with prostatism)	+	+++ (partial radical)	+++ (palliative temporarily)

\* May fail to remove cancer concealed in hyperplasia if incomplete.

method requires a prolonged apprenticeship of trial and error before mastery. It is not always curative even for median bars. Sometimes infection persists. Some patients dribble afterward, and some complain of an ejaculatory backfire. Against the questionable element of safety and the saving of time in its favor is a method of treatment for hyperplasia must be set the disadvantage of recurrence and the poor results with complicating infections, and as a method of cure of cancer it is futile.

## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION  
OF THE FOLLOWING REPORT

HOWARD A CARTER Secretary

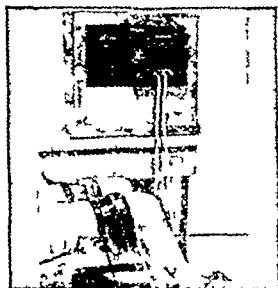
### COLLWIL INTERMITTENT VENOUS OCCLUSION APPARATUS ACCEPTABLE

Manufacturer U M A, Inc, 111 Greene Street, New York

The Collwil (Collens-Wilensky) Intermittent Venous Occlusion Apparatus is designed for the treatment of peripheral vascular diseases of the extremities. A pneumatic cuff is applied to the proximal part of the extremity, supplying intermittent interruptions to the venous return.

The appliance consists of a motor driven pump which supplies air to a pneumatic cuff. Compression is regulated by a pressure measuring indicator. Any desired variable pressure of from 20 to 110 mm of mercury is imposed on the proximal portion of the diseased extremity and restricts the return of venous blood. It is claimed that sufficient pressure is applied to constrict veins but not enough to interfere with arterial filling.

A suitable timing mechanism is incorporated in the device, which maintains a pressure for a given period of minutes, after which a release valve, actuated electrically, causes an automatic deflation of the cuff. It is claimed that during the release period an increased arterial flow through the extremities occurs as a reactive hyperemia giving rise to the following effects in the treatment of organic peripheral vascular obstruction, for example (1) relief of pain, (2) increase of skin temperature of the extremity and (3) increase in vascularity, permitting amputation at lower levels.



Collwil Intermittent Venous  
Occlusion Apparatus

In the opinion of the Council, this device is comparable in effect to other passive vascular exercise units already accepted. Some of the indications for the use of this apparatus appear to be acute vascular occlusion, frost bite, vascular diseases with major involvement of the large blood vessels and thrombo-angitis obliterans without extreme capillary stasis. Contraindications appear to be thrombophlebitis, cellulitis or lymphangitis (acute or subacute), extensive destruction of the arteriolar or capillary vessels, advanced thrombo-angitis obliterans with capillary stasis and venous thrombosis.

The results of the investigation conducted by the Council appeared to substantiate the foregoing indications and contraindications. In the opinion of the Council, the performance of this unit is satisfactory from a mechanical standpoint. The duration and the amount of pressure are controlled automatically and may be adjusted to the requirements of the individual patient. During three months of constant use the machine did not require any repair or adjustment.

From the physiologic standpoint, the production of the intermittent venous hyperemia to increase peripheral circulation seems sound and tests performed indicate that both surface temperatures and the oscillometric curves increase after the application of this method. During venous occlusion there is a filling and stretching of the venocapillary bed while during release a reactive hyperemia takes place, bringing about vasodilatation. There is, however, no provision made in this type of treatment to empty the vascular bed effectively and for this reason a certain amount of continuous venous stasis exists.

In the opinion of the Council this device has a limited therapeutic usefulness and the Council reiterates that this is only a form of physical therapy to be used in conjunction with other methods of treatment in peripheral vascular diseases.

In view of the foregoing report the Council voted to accept the Collwil (Collens-Wilensky) Intermittent Venous Occlusion Apparatus for inclusion in its list of accepted devices.

## Council on Pharmacy and Chemistry

### REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING  
REPORT

PAUL NICHOLAS LEECH Secretary

### PRESENT STATUS OF PICROTOXIN IN POISONING BY THE BARBITURATES

During the past seven years reports have accumulated in the literature concerning the use of picrotoxin as an antidote to poisoning by the barbiturates. Attention was first called to this matter in a study by Maloney, Fitch and Tatum<sup>1</sup> in 1931. This and subsequent reports have established the fact that animals survive otherwise fatal doses of the various barbiturates when treated with picrotoxin.<sup>2</sup> Linegar, Dille and Koppány,<sup>3</sup> by the use of divided doses of barbiturates, secured recovery from as much as four times the fatal dose of barbital sodium by treatment with picrotoxin. It appears that picrotoxin is not as efficacious in the case of some of the barbiturates as in that of others.<sup>4</sup> The doses of picrotoxin required in this treatment are many times those which are fatal in the normal animal. Nevertheless, no structural or functional damage appears to have resulted from this treatment in animals.

The details of events in the course of animal experiments show that it is necessary to poison the animal with picrotoxin in order to elicit the antagonism. What results when the two drugs are given together is not a direct reversal of the depressed state but a combined form of poisoning by picrotoxin and the barbiturate with a mixture of depression and stimulation, from which within a given range of doses the animal ultimately recovers. Rapid restoration of consciousness by the picrotoxin is not possible except during mild barbiturate depression. During severe poisoning, even doses of picrotoxin that induce convulsions fail to reestablish consciousness directly, although in the end the recovery from the barbiturate appears to be faster than without picrotoxin.<sup>5</sup> Picrotoxin raises the oxygen consumption (rat) which has been depressed by the barbiturate, although Krantz, Carr and Beck<sup>6</sup> have shown that this is not the direct mechanism by which the depression of the nerve centers is abolished. The picrotoxin appears to exert its influence against barbiturate depression partly by cortical stimulation but chiefly by stimulation of medullary centers assisting in the maintenance of adequate respiration and circulation.<sup>7</sup>

Sporadic attempts have been made to treat human beings with barbiturate poisoning by means of picrotoxin. Six reports dealing with this subject were available for this report, these describe twenty-seven cases of barbiturate poisoning in some detail. Very large doses of picrotoxin were used. Rovenstine<sup>8</sup> administered total amounts of from 60 to 1820 mg (about 1 to 30 grains) during the course of treatment in different cases in which recovery occurred. These doses, it is indicated, produce signs of stimulation—muscle twitching, convulsive movements and increased respiration—but in severe poisoning, even after convulsive doses, consciousness remains in abeyance for several hours.

1 Maloney A H, Fitch R H and Tatum A L. Picrotoxin as an Antidote in Poisoning by the Shorter Acting Barbiturates. *J Pharmacol & Exper Therap* 41: 465 (April) 1931.

2 Maloney A H and Tatum A L. Picrotoxin as an Antidote in Acute Poisoning by the Longer Acting Barbiturates. *J Pharmacol & Exper Therap* 44: 337 (May) 1932. Maloney.

3 Linegar C R, Dille J M and Koppány, Theodore. Antidotal Action of Picrotoxin in Extreme Cases of Experimental Barbiturate Poisoning. *Proc Soc Exper Biol & Med* 33: 396 (Dec) 1935.

4 Maloney A H, Linegar C R and Koppány, Theodore.

5 Maloney A H. Comparative Study of Antidotal Action of Picrotoxin, Strichnine and Cocaine in Acute Intoxication by the Barbiturates. *J Pharmacol & Exper Therap* 49: 133 (Oct) 1933.

6 Krantz I C, Carr C J and Beck F F. A Further Study of Barbiturate Picrotoxin Antagonism. *J Pharmacol & Exper Therap* 61: 153 (Oct) 1937.

7 Marshall F K, Jr, Walz F M and LeMoussier D H. Picrotoxin as a Respiratory Stimulant. *J Pharmacol & Exper Therap* 60: 472 (Aug) 1937. Linegar C R, Dille J M and Koppány, Theodore. Nature of the Barbiturate Picrotoxin Antagonism. *Science* 82: 376 (Oct 18) 1935.

8 Rovenstine E A. Antidotal Action of Picrotoxin in Acute Intoxication by the Barbiturates. Manuscript submitted to the Council on Pharmacy and Chemistry.

In all these reports the authors have expressed the belief that treatment by picrotoxin was responsible for the fact that the patients did not take longer to recover or that they recovered at all. It is well known that strictly comparable controls are difficult to obtain in clinical poisoning because of the great diversity of factors over which, under the conditions of human poisoning, there can be no control. Nevertheless, it is possible to compare the course of events in a series of treated with untreated cases at a sufficient number of points to obtain reasonable support for inference. The most direct objective

*Nonfatal Cases of Barbiturate Poisoning Treated with Picrotoxin Compared with Controls*

Barbiturate	Dose (Grains)		Interval Between Taking Drug and Regaining Consciousness		Author
	Picrotoxin Cases	Control Cases	Picrotoxin Cases	Control Cases	
Unknown	?		54 hrs		Rovenstine <sup>8</sup>
Unknown			?		Wood <sup>9</sup>
Barbital	120 ?		11 hrs		Rovenstine <sup>8</sup>
Barbital and pentobarbital	100/10		20 hrs		Kohn, Platt and Saltman <sup>9</sup>
Barbital		22, 300		5 days	Legers <sup>9</sup>
Barbital sodium		210		5 days	Chang and Tainter <sup>9</sup>
Amytal	4,		24 hrs		Kline, Bigg and Whitney <sup>11</sup>
Amytal sodium	90		22 hrs		Rovenstine <sup>8</sup>
Amytal sodium	100 ?		31 hrs		Rovenstine <sup>8</sup>
Amytal sodium	114		43 hrs		Rovenstine <sup>8</sup>
Amytal sodium	117		40 hrs		Burstein and Rovenstine <sup>9</sup>
Amytal sodium	144		42 hrs +		Rovenstine <sup>8</sup>
Amytal sodium		4, (vein)		46 hrs	Lundy <sup>10</sup>
Amytal		87		8 hrs	Communication to author <sup>11</sup>
Amytal sodium		100			Lundy <sup>10</sup>
Dial	115		28 hrs +		Rovenstine <sup>8</sup>
Dial (cases)		90			Leschke <sup>10</sup>
Phenobarbital	75 ?		36 hrs		Rovenstine <sup>8</sup>
Phenobarbital and amytal ?	70		7 hrs		Rovenstine <sup>8</sup>
Phenobarbital	90		36 hrs		Rovenstine <sup>8</sup>
Phenobarbital sodium	75		15.59 hrs		Rovenstine <sup>8</sup>
Phenobarbital and amytal	60/15		59.13 hrs		Cohen and Kohn <sup>9</sup>
Phenobarbital ?	?		6 days		Kohn, Platt and Saltman <sup>9</sup>
Phenobarbital		6,		72 hrs	Oettel <sup>10</sup>
Phenobarbital		7,		74 hrs	Hering <sup>13</sup>
Phenobarbital		90		7 days	Direktorowitsch <sup>9</sup>
Phenobarbital		105			Sollmann <sup>9</sup>
Pentobarbital sodium	72		41 hrs		Rovenstine <sup>8</sup>
Pentobarbital sodium and alcohol	60		33 hrs		Rovenstine <sup>8</sup>
Pentobarbital sodium	?		8 hrs +		Kohn, Platt and Saltman <sup>9</sup>
Pentobarbital sodium and gin	90		20 hrs		Rovenstine <sup>8</sup>
Sedormid	40 120		32 hrs +		Wood <sup>9</sup>
Pentothal*	3.5 (vein)		24 hrs		Wood <sup>9</sup>
Veronal		125		81 hrs	Purves Stewart and Wilcox <sup>12</sup>
Iprral	one	150			
Allonal	patient	125			
Quadrone		75			

\* Depression in this case was never severe and possibility of a psychic affair was considered by the author

indications concerning the clinical value of the antidote in cases of barbiturate poisoning should be supplied by a comparison of (1) the doses of the barbiturates, (2) the severity of the symptoms of poisoning, (3) the speed of recovery and (4) the mortality rates.

It would indicate that the antidote was effective if several subjects recovered from doses of barbiturates which exceeded considerably the largest doses known to have been survived without picrotoxin, if the symptoms of barbiturate poisoning in the treated cases that recovered were of such kind or severity as are seen only in otherwise fatal cases, if the duration of the poisoning was considerably shorter in the treated cases or if the mortality rate from barbiturate poisoning began to fall off since the use of picrotoxin has been popularized.

The twenty-seven cases of barbiturate poisoning treated with picrotoxin have been analyzed with the foregoing points in

view. Among these there were five deaths: one after 500 grains (32 Gm) of barbital and in one after an unknown dose of phenobarbital, in two cases neither the dose nor the kind of barbiturate was known. The fifth fatal case (possibly due to hemorrhage and surgical shock) was that of a patient who received 3 grains (0.2 Gm) of nembutal (pentobarbital sodium) in the evening without untoward effects, and 1½ grains (0.1 Gm) the following morning shortly before an operation with general anesthesia. There was marked delay in regaining consciousness and picrotoxin appeared to have influenced temporarily the degree of depression, but there seems to be no apparent reason for considering this case of barbiturate poisoning. There remain, therefore, twenty-two cases in which recovery occurred from barbiturate poisoning during the use of picrotoxin. The essential facts are summarized in the accompanying table.<sup>9</sup>

#### DOSES

The doses of the barbiturate from which these patients recovered were very large, amytal sodium from 90 to 144 grains (6 to 9 Gm), phenobarbital or its sodium salt, from 75 to 90 grains (5 to 6 Gm), barbital, about 120 grains (8 Gm), pentobarbital or its sodium salt from 60 to 90 grains, dial, 115 grains (7.4 Gm), pentothal sodium (sodium ethyl [1 methyl butyl] thiobarbiturate) intravenously, 38 grains (0.25 Gm). These doses (except that of pentothal) are considerably larger than the average ones known to prove fatal in barbiturate poisoning. The dividing line between fatal and nonfatal doses of barbiturates in human poisoning is, however, too broad to be of use in judging the dose in individual cases. Since this group of picrotoxin-treated patients is composed of isolated instances of recovery from very large doses, it seemed more appropriate to compare their doses with the very large doses from which patients have recovered without picrotoxin (see table). The study of the literature has not been exhaustive but a sufficient number of cases of severe poisoning with large doses of barbiturates has been found to serve the purpose. While it is not possible to match treated cases with identical cases in the group not treated with picrotoxin, the data presented in the table suffice to indicate that patients may recover, with the prevailing forms of supportive treatment, from doses of barbiturates within the general range of those in which picrotoxin was held responsible for the survival.

Some of the individual cases merit special consideration. Lundy<sup>10</sup> gave as much as 50 mg of sodium amytal per kilo gram of body weight by intravenous injection for surgical anesthesia. He cited one case in which a total dose of 45 grains (44 mg per kilogram) was given in this way without untoward effects, the patient regaining consciousness on the third day. He cited another case in which a child received 50 mg per kilogram intravenously and had recovered sufficiently to be able to speak twelve hours later. Lundy classifies doses as high as 100 grains (6.5 Gm) of sodium amytal by intravenous injection as those from which patients may occasionally recover (prefatal). Kline, Bigg and Whitney,<sup>11</sup> on the other hand, treated a patient as having amytal poisoning when he consumed 45 grains (3 Gm) of amytal and consid-

<sup>9</sup> These include Wood P M. Five cases reported to the Council on Pharmacy and Chemistry. Kohn R, Platt S and Saltman S. Picrotoxin Barbiturate Antagonism. Manuscript submitted to the Council on Pharmacy and Chemistry. Eggers P. Eine schwere Veronal Vergiftung. Samml v Vergiftungs-fällen 9 31 (March) 1938. Ching D K and Tainter M L. Unusual Case of Barbital Poisoning with Recovery. J A M A 106 1386 (April 18) 1936. Burstein C L and Rovenstine E A. Clinical Experiences with Newer Analeptics. Anesth & Analg 16 151 (May June) 1937. Cohen S J and Kohn Richard. The Use of Picrotoxin as an Antidote for Luminal Poisoning. J Pharmacol & Exper Therap 60 102 (June) 1937. Oettel H. Luminal Vergiftung und Luminalnachweis. Samml v Vergiftungs-fällen G 43 1935. Direktorowitsch quoted by Leschke<sup>10</sup> p 164. Sollmann Torald. A Manual of Pharmacology ed 5 Philadelphia W B Saunders Company p 737. Lundy J S. Intravenous Anesthesia. Particularly Hypnotic Anesthesia and Toxic Effects of Certain New Derivatives of Barbituric Acid. Anesth & Analg 9 210 (Sept Oct) 1930. Kline E M, Bigg Edward and Whitney H A K. Picrotoxin in the Treatment of Barbiturate Poisoning. J A M A 109 328 (July 31) 1937.

ered that picrotoxin had played an important role in speeding up the recovery, although from the details of the account it appears that it took about twenty-four hours from the time the drug was taken for the patient to regain consciousness. The largest amount of barbiturate from which a patient recovered was in the case of Purves-Stewart and Wilcox,<sup>12</sup> in the control group. This patient (see the table) consumed the equivalent of more than 700 grains (45 Gm) of barbital and after profound depression recovered in about three and one-half days. Reference has already been made to a case reported by Roventime<sup>8</sup> in which the patient died on the eighth day after 500 grains of barbital sodium, although he was treated vigorously with picrotoxin receiving a total of 2,134 mg.

#### SYMPTOMS OF POISONING

In judging the value of picrotoxin, authors have placed considerable emphasis on the severity of the symptoms of poisoning at the time the treatment was started. There appears to be, however, no single symptom or combination of symptoms short of circulatory or respiratory paralysis, which, in barbiturate poisoning, would indicate a fatal outcome with certainty. The accounts of the symptoms and signs in the picrotoxin-treated cases are indistinguishable from those in the control group. In animal experiments, average fatal doses of barbiturates cause deep narcosis, loss of all reflexes, fall or rise in temperature and extreme grades of vascular and respiratory depression, among these, two animals in which these symptoms may be entirely indistinguishable may take opposing courses, the one going on to recovery and the other to death. The same applies to human cases. Profound respiratory depression, cyanosis, extremely low blood pressure and pulmonary edema have been stressed in some of the clinical cases as indications that the outcome would have been fatal had it not been for the picrotoxin. Hering<sup>13</sup> in 1922 reported a case of poisoning with 75 grains (5 Gm) of phenobarbital in which there was deep narcosis with loss of reflexes, miosis, cardiac weakness, fall of blood pressure, hypothermia and Cheyne-Stokes respiration. Treated with stimulants (kind not stated), warmth and atropine, the patient made an uneventful recovery and was discharged from the hospital within twenty-four hours. Some of the most menacing circulatory and respiratory symptoms (cyanosis, pulmonary edema) in barbiturate poisoning are due in part to mechanical obstruction to respiration by mucus or the relaxed tongue. Attention to these factors and artificial respiration may bring about a reversal of the trend in what at first seems like a hopeless case. Such was the situation in one of the cases<sup>14</sup> in the table in which the patient had regained consciousness eight hours after 86 grains (5.6 Gm) of amytal had been taken although no picrotoxin or other powerful stimulants had been used. Such treatment has also been applied in the cases in which picrotoxin was employed.

#### SPEED OF RECOVERY

Bleckwenn, Masten and Tatum<sup>15</sup> reported that they had made controlled observations in several clinical cases of barbiturate poisoning, from which they concluded that picrotoxin is more effective than other drugs in accelerating recovery from hypnosis and narcosis. The details are not given in the report. In Roventime's<sup>8</sup> report from three to forty-eight hours elapsed after the picrotoxin treatment was started before the patients regained consciousness and treatment was continued for from three to six days. The case reports (see table) were examined for data concerning the duration of narcosis considered as the interval between the time the drug was taken and the time consciousness was restored. In the picrotoxin-treated cases, by and large the approximate interval of unconsciousness ranged from seven hours to six days, in the controls from eight hours to seven days. The control cases were selected for the largest doses of barbiturate rather than

for the shortest duration of unconsciousness, and it is not improbable that instances with shorter periods of unconsciousness in untreated cases exist. It is not necessary to point out here the shortcomings of the data which are being compared, since they apply to most problems of clinical poisoning and are well known. The data are presented for what they are worth. Although suggestive instances may be seen, evidence of a conspicuous increase in the speed of recovery in the picrotoxin-treated cases does not emerge from a comparison of picrotoxin-treated cases with comparable control cases of very severe barbiturate poisoning.

#### MORTALITY RATE

The mortality rate in barbiturate poisoning varies greatly. Leschke<sup>16</sup> states that among 131 cases of phenobarbital poisoning in one series there were ten deaths (about 7.6 per cent), and that for barbital poisoning the mortality reached about 25 per cent. Among the twenty-six cases (excluding the fifth fatal case already discussed) of barbiturate poisoning treated with picrotoxin, there were four deaths (15.4 per cent). The numbers are not sufficient for final conclusions regarding the effect of picrotoxin on the mortality rate. This is all there is, however, and as far as it goes the mortality rate does not appear to have been strongly influenced. One author<sup>8</sup> stated he had treated more than thirty-four patients in over two years but did not present a comparison of the mortality in his group with that of the experience in the same hospital prior to the use of picrotoxin. A more satisfactory comparison of mortality rates cannot be made at this time, although it appears that in the five-year period in which picrotoxin has been used, a sufficient number of patients have been treated to provide a better indication of the trend.

#### COMMENT

As matters stand, there seems to be no room for doubt that picrotoxin causes signs of stimulation in human cases of severe barbiturate poisoning. Although there are indications that picrotoxin may enable a patient to survive during barbiturate poisoning that might result fatally with the customary supportive treatment alone, proof that this is so cannot yet be said to have been supplied by the prevailing reports. In the literature there are cases of barbiturate poisoning in which picrotoxin was not used, which are comparable to the picrotoxin-treated cases with respect to the dose of the barbiturate, the severity of the poisoning, the duration of unconsciousness and the mortality rate. An analysis of the objective factors by which treated and control cases can be compared reveals, therefore, no conspicuous advantage in the picrotoxin treatment. However, the experimental basis for the efficacy of picrotoxin in barbiturate poisoning is fairly strong and since the objective criteria are not adequate for a final conclusion, the favorable impressions obtained by various authors in individual cases merit consideration. The cautious use of picrotoxin in barbiturate poisoning would, therefore, seem justifiable in cases which can be carefully studied, with the view that they may supply sufficient accurate data from which the proper place of picrotoxin as an antidote may be established. In addition to the customary supportive measures, the general practice is to use doses of from 1 to 10 mg of picrotoxin by intramuscular or intravenous injection at intervals of from one to thirty minutes until signs of stimulation occur, and to maintain this state by appropriate repetition of similar or smaller doses as long as indicated by the state of depression. Not enough is known to establish a routine technique. Each case requires expert supervision and critical evaluation of signs and symptoms during the course of the treatment as well as continuous observation over periods of many hours or days. The pharmacology of the very large doses of picrotoxin such as are used in this treatment, is for the most part unexplored, such as the rate and mode of elimination, side effects and the influence of disease on its toxicity. There still remains much to be learned, therefore, regarding the behavior of picrotoxin before it can be used with assurance of safety in the liberal doses that appear to be necessary.

12 Purves-Stewart James and Wilcox W H. Poisoning by Barbitone and Allied Drugs. Its Treatment by Lumbar and Cisternal Drainage. *Lancet*, 1, 6 (Jan. 6) 1934.

13 Hering Akute Luminalvergiftung. *Klin. Wchnschr.* 1, 1077 1922.

14 Confidential personal communication to the author.

15 Bleckwenn W J, Masten M G and Tatum A L. A Clinical Study of the Picrotoxin-Barbiturate Antagonism. *J. Pharmacol. & Exper. Therap.* 60, 99 (June) 1937.

16 Lechke, Erich. Die wichtigsten Vergiftungen. Munich, J. F. Lehmann Verlag, 1933, p. 16.



# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, FEBRUARY 4 1939

## SENILE OSTEOPOROSIS

Protracted mineral starvation may well be the principal cause of disability associated with the general osteoporosis commonly present in elderly persons. The basic dietary requirements for minerals of infants, and to a slightly lesser degree of older children and adolescents, have been established with reasonable accuracy. Little scientific interest has been shown in the problem of vitamin or mineral nutrition for the adult. The theory that protracted deficiencies in basic nutrition resulting from poor dietary habits may impair the health of the adult and contribute to the factors which produce disabilities commonly attributed to "old age" has rarely been postulated. Orthopedic surgeons have long been aware that many older patients show extreme degrees of demineralization of the skeleton as demonstrated by the roentgenogram. Many adults develop this osteoporosis before they are 50 years of age. A still higher percentage show this skeletal deficiency by or before the age of 60 years. Symptoms produced by moderately advanced generalized osteoporosis may be so indefinite that the skeletal demineralization is unrecognized as a cause of the patient's lack of vigor or premature senescence. Ghormley, Sutherland and Pollock<sup>1</sup> indicated recently that an increased number of patients are entering the clinics of the country with severe disability produced by pathologic fractures of vertebral bodies which weakened by the loss of their lime salts, were not able to withstand the stresses and strains of the ordinary day's activity.

Gradual demineralization of the skeleton over a period of many years may result in pathologic changes in the kidneys or other vital organs and hence affect unfavorably the general health of the patient. It is sometimes forgotten that the bones are alive, that there is a constant interchange of the mineral salts in the bones of all living vertebrates. Generalized osteoporosis in the adult can be explained only on a basis

of chronic or intermittent negative mineral balance over a period of many years.

Maxwell<sup>2</sup> has shown that acute calcium-vitamin D starvation in the adult is the etiologic factor in osteomalacia. Generalized osteoporosis, which produces varying degrees of disability in the aged, may therefore well be merely a chronic, insidious and often subclinical form of osteomalacia. Some evidence has been offered which indicates that adults who live in civilized countries and who eat foods that are specially prepared and refined may not have in their diet the basic requirements of calcium or of vitamin D.

Among the possible explanations of what appears to be a population-wide progressive demineralization without the appearances of a true osteomalacia are first, and most likely, an inadequate amount of calcium in the diet of the average adult. Bernheim<sup>3</sup> has contributed evidence to show that the average adult requires about 0.7 Gm of calcium in the diet daily in order to maintain the mineral balance and she has further indicated that the diet of civilized persons constantly or intermittently lacks that amount of this mineral. Second, the diet of some adults does not contain a sufficient amount of vitamin D to make available most effectively the calcium salts that are present in the food intake. Third, as the patient grows older his ability to absorb mineral salts from the intestinal tract becomes less. This increasing tendency to reject these lime salts may be due to the previously mentioned deficiency of vitamin D in the diet.

Bussabarger, Freeman and Ivy<sup>4</sup> have shown the great importance of the gastric function in promoting normal mineral metabolism. They demonstrated gross skeletal deficiencies in puppies following gastric resection. A gradual decrease in the hydrochloric acid content of the gastric juices of older persons may result in poor absorption of calcium salts and hence constitute one factor in the production of generalized osteoporosis.

The problem of adult nutrition is a challenge to physicians and nutritionists. Complete studies of mineral metabolism should be made on normal or average persons in different age groups. Such studies may reveal that any one of three or more conditions, or a combination of all these factors, in addition to the known effect of endocrine dysfunctions, may be responsible for the protracted or intermittent negative phosphorus-calcium balance leading to skeletal demineralization. Varying degrees of morbidity which we have been accustomed to accept as an inevitable accompaniment of advancing years and have made too little effort to understand or prevent may thus be explained.

<sup>2</sup> Maxwell J. Preston. Osteomalacia and Diet. Nutrition Abstr. & Rev. 4:1 (July) 1934.

<sup>3</sup> Bernheim Alice R. Calcium Need and Calcium Utilization. J. A. M. A. 100:1001 (April 1) 1933.

<sup>4</sup> Bussabarger R. A. Freeman Smith and Ivy A. C. The Experimental Production of Severe Homogeneous Osteoporosis by Gastrectomy in Puppies. Am. J. Physiol. 121:137 (Jan) 1935.

<sup>1</sup> Ghormley Ralph K. Sutherland Charles C. and Pollock George A. Pathologic Fractures. J. A. M. A. 109:2111 (Dec 25) 1937.

### "WE ARE ADVERTISED BY OUR LOVING FRIENDS"

The illegitimate, unethical and peculiar forces which have been arrayed against the advancement of scientific medicine for a quarter of a century seem suddenly to have felt a new stimulus. Like a snarling, vagrant yapping pack at the heels of some great mastiff they cry today to the public the wails of their envy and their discontent. Thus they believe is their long awaited opportunity to destroy the American Medical Association. Almost since the day when the propaganda leading to the indictment of the Association began to appear, the radio, the mails and the commercialized press have occasionally carried this material. Now comes an editorial by Bernarr Macfadden, publisher of *Liberty*, in the current issue of that publication. Says Mr. Macfadden, "doctors—whether they be allopaths, homeopaths or any other kind of 'paths'—after having spent from six to ten years studying their profession, should be guaranteed a decent living by the government. Capable doctors of all kinds should be paid by the government." Indeed, he proposes a competition between all sorts of peculiar healers with regular physicians each having certain sections of the community assigned to them, the mortality and health records of such communities being compared year by year and prizes being offered to the quacks who develop the best records. Moreover, Mr. Macfadden feels that many of the measures for the cure of disease which he has promoted in the past have not had a suitable trial. He wants to cure syphilis by fasting followed by an exclusive milk diet. He wants to cure gonorrhea with water treatments. He wants to replace drugs with artificial fever and apparently thinks an exclusive grape diet will cure cancer.

Perhaps some of the forces within the practice of medicine who have been doing their utmost to disrupt medical organization in recent years will welcome this ally to their cause. Yet if this is not sufficient we offer Dr. John R. Binkley, once of Kansas, now of Arkansas, whose suave tones pervade the midnight atmosphere, reviling the American Medical Association and welcoming with glee the attacks that are being made on it, for it has hindered him in his exploits.

And if Dr. Binkley is not sufficient there is Mr. Norman Baker, who also pollutes the nocturnal air. And if Mr. Baker is insufficient, there is the Medical Section of the Communist Party, which recently issued a manifesto in Philadelphia urging all communists to support the Committee of 430 and to demand salaries for all physicians who have given freely of their service in the past to public institutions and for the care of the indigent sick. Then comes the *West Coast Druggist*, hailing with happiness the experiments recently announced by the Vicks Company, which studied the effects of Va-tro-nol and Vapo-Rub (as reported elsewhere in this issue) on 17,357 volunteers, of whom

several thousand were school children—and "without the sanction of the American Medical Association."

It is a strange assemblage of allies that the times have developed. There is evidence that Henry J. Schireson, plastic surgeon, once of Chicago, is giving aid and comfort to Mr. Morris A. Bealle, editor of *Plain Talk* and now promoter of a scandalous volume entitled "Medical Mussolini."

As the campfires are lighted appear the tents of the makers of innumerable nostrums and panaceas, of many cosmetics promoted with false and fraudulent claims, of strange glandular mixtures and vitamin capsules—all united to batter at the walls within which honest medicine has been reared and nurtured. Now the American people can observe the nature of those who are endeavoring to disrupt, destroy and ruin the standards of scientific medicine. Under a free American government our profession has reached a peak never before reached in any other country—a peak which scientific medicine proudly inhabits and which it will defend to its utmost. In the end, science and truth and honesty and ethics must prevail.

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### CLINICAL LABORATORIES AND THE AMERICAN CHEMICAL SOCIETY

In the Organization Section of *THE JOURNAL* this week is an abstract together with some comments on a broadside from the American Chemical Society relative to the work of clinical laboratories. This ill tempered pronouncement has furnished the public with the unedifying spectacle of one professional society of high standing accusing another body of attempting to procure a monopoly. Since the question concerns what is principally a commercial problem ancillary to the practice of medicine, no one involved—either accuser or accused—can benefit in the eyes of the public by the methods employed in the attack.

In essence, the American Chemical Society maintains that the American Medical Association is attempting to obtain a monopoly in the field of diagnostic laboratory work by approving only those clinical laboratories which are directed by one holding an M.D. degree and by urging physicians to patronize only such laboratories. There is no allegation that the American Medical Association discourages the employment of qualified chemists, bacteriologists and others in some of the work of those laboratories. The complaint and the charge of monopoly by this society rest on the alleged advice given by the Council on Medical Education and Hospitals of the American Medical Association that the directors of laboratories doing tests for practicing physicians involving as they must clinical diagnosis should be physicians especially qualified in this field, and that therefore chemists would be discouraged from forming and directing such laboratories.

The interest of the American Medical Association in clinical laboratories as such is based on the desire that patients, through their physicians, receive the best and most authoritative supplementary diagnostic assistance which the clinical laboratory can supply. In this it is well recognized that only one well trained and qualified in chemistry can suitably carry through certain tests now frequently required of the clinical laboratory although no standards for chemists doing this work have been devised or enforced by the Chemical Society. A similar situation exists with regard to other special tests often required of such laboratories. In the pursuit of this problem and in its role as adviser, the Council on Medical Education and Hospitals found it necessary to discontinue approving clinical laboratories principally because the personnel and often the location changed too rapidly. It was therefore felt that the interests of the profession in this respect could be best served by approving the qualifications of clinical pathologists engaged in this type of work. Such qualifications were less likely to be suddenly changed and such action lay in a field more immediately related to the other activities of the American Medical Association. None of these reasons for the position of the American Medical Association in this matter were referred to in the broadside that was released by the American Chemical Society.

The true nature of the problem is important and should receive more detailed study. The first prerequisite would seem to be a definition of the term clinical laboratory. Further, it will be necessary to determine exactly how far an independent laboratory worker is acting as a consultant in clinical practice. The part which the clinical laboratory plays in suggesting diagnosis, prognosis or treatment must determine the decision whether or not the laboratory is actually engaged in the practice of medicine and must therefore be under the direct supervision of one who is licensed so to practice. Certainly no one can deny that many such institutions do actually function in this manner. Thus it is claimed by the State Board of Medical Education and Licensure of the Commonwealth of Pennsylvania (and this seems undoubtedly to have been the precipitating factor in the action of the American Chemical Society) that clinical laboratories in that state were actually engaged in a phase of the practice of medicine and therefore could legally be directed only by a licensed physician. If the law in Pennsylvania is unwise or its interpretation is mistaken, correction should be made. The controversy between the State Board of Medical Education and Licensure of the Commonwealth of Pennsylvania and the American Chemical Society served no doubt as the precipitating factor in this attempt of the American Chemical Society to becloud the issue by attacking the American Medical Association and shrieking "Monopoly."

## Current Comment

### BLOOD PLATELETS IN ALLERGY

In a preliminary study recently reported by Thiberge,<sup>1</sup> blood platelet counts were made on twenty-seven patients with various types of allergic disorders both during an attack and in convalescence. In the five cases of hay fever there was an average rise in the platelet count of 55,600 after subsidence of the attack, in the fifteen cases of asthma there was an average rise of about 17,000 in the platelet count and, in the three cases which failed to show a rise, one was complicated with sinusitis and two with tuberculosis. The platelet counts in the six cases of cutaneous allergy during and after an attack were, however, variable. The author reaches the tentative conclusion that improvement in uncomplicated asthma and hay fever is always indicated by a rise in the number of platelets.

### MITOTIC RHYTHM IN HUMAN TISSUES

The rate of cell division in normal human tissues shows a well defined diurnal rhythm, which presumably has a bearing on numerous clinical phenomena. Botanists have long recognized that the rate of normal cell division undergoes rhythmic variations in plants.<sup>1</sup> A similar rhythm has been recently demonstrated in the thyroid glands and other internal tissues of smaller laboratory animals.<sup>2</sup> In order to determine whether or not the same rhythm exists in human tissues, Cooper and Schiff,<sup>3</sup> of the Barnard Free Skin and Cancer Hospital, St. Louis, studied the skins of eight day infants removed at routine circumcision. The specimens were obtained at various hours throughout the day and night and were placed immediately in 1 per cent acetic acid. After twenty-four hour maceration in this fluid it was possible to separate completely the layer of epidermis from the underlying dermis. These epidermal specimens were stained with hematoxylin, dehydrated, cleared, mounted and studied under the oil immersion lens. Five thousand epidermal cells were counted in each specimen and the number of mitotic figures recorded. In six specimens removed between 7:30 and 10:30 a.m. the number of mitotic cells varied from seven to sixteen per specimen, an average of twelve mitotic figures to 5,000 cells. In six night circumcisions (8:45 p.m. to 12:45 a.m.) the mitotic number varied from twenty-three to thirty-five per specimen, an average of twenty-seven mitotic cells in 5,000. The average night rate of epidermal cell division therefore is 2.25 times the forenoon average in eight day infants. Whether or not a similar rhythmic periodicity of proliferation is shown by cancer cells is now under investigation, as well as a study of the effects of various hormones and therapeutic agents on both rate and rhythm.

<sup>1</sup> Thiberge, N. F. The Thrombocyte in Allergy. A Preliminary Report. New Orleans M. & S. J. **91**, 372 (Jan.) 1939.  
<sup>2</sup> Karsten, George. Ztschr. f. Bot. **7**, 1915, **10**, 1918.  
<sup>3</sup> Carleton, Alice. J. Anat. **68**, 231 (Jan.) 1933.  
<sup>3</sup> Cooper, Zola K. and Schiff, Alice. Proc. Soc. Exper. Biol. & Med. **39**, 323 (Nov.) 1938.

# ORGANIZATION SECTION

## AMERICAN MEDICAL ASSOCIATION COMMITTEE CONFERS WITH INTERDEPARTMENTAL COMMITTEE AND THE PRESIDENT

On Sunday January 15 the special committee of the House of Delegates of the American Medical Association conferred in Washington with the Interdepartmental Committee to Coordinate the Health and Welfare Activities of the United States Government. Those present included Drs. Vest, Carey, Donaldson, Luce, Rankin, Sondern, West and Abell, with the addition of Dr. Woodward. The Interdepartmental Committee was represented by Chairman Josephine Roche, Mr. Altmeyer, Dr. Parran, Mr. Perrott and the members of the Technical Committee on Medical Care, Drs. Martha Elliott, J. W. Mountin and C. E. Waller and Messrs. I. S. Falk and G. H. J. Perrott. Opportunity was given for extended discussion of the various recommendations in the National Health Program. The committee representing the American Medical Association

presented the point of view of the House of Delegates. It was apparent that the Technical Committee had not receded in its attitude in favor of compulsory sickness insurance.

On Monday January 16 the special committee of the House of Delegates, together with Miss Roche and Dr. Parran, were received by the President. Dr. Abell briefly stated the attitude of the American Medical Association and repeated the offer that had been made by the American Medical Association to aid in working out the problem.

Obviously the conferences with the Interdepartmental Committee in no wise changed its attitude. Its report, as sent to Congress by the President, is in all particulars approximately the same as presented to the National Health Conference in July 1938.

## THE MEDICAL CARE OF THE POOR AND UNEMPLOYED

CHARLES V. CRASTER, M.D., D.P.H.

Health Officer  
NEWARK, N. J.

The city of Newark may be taken as a typical setup for the medical care of the poor by the municipal government. For the last fifty years and more this city has maintained a free dispensary service with a staff of district physicians for visiting the bedridden poor. The cost of this service was borne by the health department and its supervision by means of a dispensary medical board cooperating with the health officer.

Medical services are maintained for the poor families on the relief rolls but also include service for families who, by reason of low wages, are unable to pay for medical, surgical or hospital care.

### TYPE OF MEDICAL SERVICES

The city dispensary provides all types of medical and surgical services as well as dental facilities for adults and children. The medical staff is composed of volunteer physicians together with part-time physicians who receive an annual salary of \$600 for six hours of work a week. The usual plan is for three days of service a week or two hours a day. It was long ago found to be impossible to maintain regular efficient clinics without paid physicians.

The medical staff is supervised by a medical board which makes all recommendations for the type of service rendered. Clinics for all types of medical service are carried on including medical, surgical, pediatric, genito-urinary, gynecologic, dermatologic, proctologic, orthopedic, hernia, antepartum, cardiac, neuropsychiatric, metabolic, gastro-enterologic, varicose vein, dental, venereal disease, asthma, hay fever, tuberculosis, pneumothorax and occupational clinics.

Besides the routine medical services there has evolved a need for certain expensive medications. For instance, the dispensary gives free insulin for indigent diabetic patients. The cost of this medication alone amounts

to more than \$9,000 a year. Free distribution of cod liver oil for undernourished children has also been added. The cost of this averages \$5,000 a year.

The city is thus faced with a demand for medical services which would under more normal conditions of prosperity, be borne by the individual wage earner to the advantage of the rank and file of the medical and dental profession. The incomes of physicians and dentists have in many cases shrunk to the vanishing point because a large group of the public has no money to pay a physician, especially at the old scale of pay, although the need for medical care remains the same.

### THE SICK IN THE HOME

The indigent sick in the home are taken care of by a staff of twelve district physicians who are assigned to specified districts in the city and each receives a salary of \$1,000 a year, with an allowance of \$25 for each emergency obstetric patient they may take care of. There is also a night physician who works from the City Hospital and who responds to night calls between 11 p. m. and 8 a. m. The work of the district physician is supervised by a medical receiving officer at \$2,500 a year.

### THE PHYSICIAN'S ATTITUDE

The physician apparently realizes that some form of free medical service is inevitable and necessary for the indigent poor. What he is quite sure of is that the physician giving such service under municipal government salaries is usually inadequately paid to such a degree that the quality of the service is below the standard maintained for paid services to the private patient.

At the present time, with social security in the offing, some form of medical relief must be considered not only for the poor and the employed poor but also for all employees whose wages are low.

The physician's opinion with regard to how this service may be built up within the framework of ethical medicine must be given its due consideration.

#### THE MEDICAL ASSOCIATION'S ATTITUDE

At the discussion on medical insurance plans for relief before the House of Delegates of the American Medical Association in Chicago, Nov. 18, 1932, Dr. A. R. Mitchell declared on behalf of the Board of Trustees that in any plan for organized medical relief "the first dictum shall be free choice of hospitals and free choice of physicians. The second dictum is that

TABLE 1—Families and Individuals on Relief

Total estimated population of Newark, from 442,000 to 458,000		
December	Families on Relief	Persons on Relief
1930	5,484	24,129
1931	7,180	30,592
1932	14,331	58,564
1933	21,902	90,989
1934	14,393	61,094
1935 (FRA)	18,885	82,700
1936	12,488	37,622
1937	12,676	37,190
1938	16,756	19,171

the prevailing charge shall be paid by the insurance company or the group of doctors who are going to be responsible for the administration of this service. The next dictum is that there shall be no profit to the organization, that the profit shall consist of the fee to the doctor and the service to the participants in the plan." So much for the ethics of any plan in which organized medicine is concerned. The present position of the American Medical Association is fundamentally the same as the opinion outlined in 1932.

#### THE IMMENSITY OF THE MEDICAL RELIEF PROBLEM

Some idea of the army of persons requiring medical care who are at present on relief rolls of municipalities may be envisaged by the figures for Newark. Table 1 shows the number of families and persons on relief in Newark during the nine years 1930-1938.

During these nine years the demand for medical care of the indigent poor, as well as the poor not on the relief rolls but unable to pay for medical services, has been an increasing load on the municipality. Table 2 shows the number of treatments given in the clinics of the city dispensary, the number of free prescriptions filled and the number of calls made by the district physicians in 1929 and 1930 compared with the years 1935, 1936 and 1937.

The curtailment of family incomes and the greatly increased number of indigent poor have brought about since 1929 greater demands for free medical and surgical services. Prior to 1929 the city dispensary treatments averaged slightly less than 100,000 a year, with an equal number of prescriptions dispensed. The calls for medical service in the homes increased from 5,370 visits in 1929 to 18,242 in 1937, more than a 200 per cent increase in eight years.

#### THE COST OF MEDICAL CARE IN NEWARK

Table 3 shows the annual cost of medical care in Newark for 1929 and 1930 compared with 1935-1937.

#### THE COMBINED COST OF MEDICAL CARE

In addition to the amount of \$178,000 spent for the ambulant home medical care in 1937 there were of course additional items of hospital care. These are shown in table 4.

This total amount of course does not include the cost of free medical and surgical care rendered by the private hospitals and physicians of the city. The combined tax paid medical bill amounts to 5 2/3 per cent of the combined city operating expense for all purposes and a per capita cost of \$3.66 for all the residents of Newark. There are undoubtedly many other tax items for medical care which are difficult to compile, for instance public school dental clinics and infirmaries in the jail and other institutions. In addition to the tax paid medical care, the Community Chest also gives approximately \$200,000 a year to charity hospitals, or an additional 43 cents per capita.

Up to April 11, 1933, the medical care of the poor, including those on the relief rolls, was entirely carried on by the health department clinics. From that date until April 16, 1936, this medical service for actual relief cases was administered by the Federal Emergency Relief Administration (ERA) with a local staff unit setup. All applicants for medical relief during this period who applied for treatment to the city dispensary, both ambulant and at home who were on the relief rolls were referred to the ERA, the exceptions being patients with tuberculosis or a venereal disease as well as many special patients who needed light treatment and the like.

It is remarkable to note therefore, that in spite of the absence of most of those on relief from our clinics there was a continuous demand for free medical service in the dispensary and for district calls.

Apparently between these dates the treatment load carried by the dispensary was changed little if any, and only in one year (1935) was there any decrease in the calls for the visiting physicians. Who are these people, then, who crowd the free clinics and yet are not the indigent poor? The answer is contained in the report of our investigation department. All persons who apply for free medical treatment are carefully questioned by the admitting staff, and whenever doubts exist or treatment and medication is more than trivial the applicant is checked up by "follow-up investigation." In few of these cases can fraud be brought home to the applicant. The majority are of the low wage group, persons unable to pay for any form of medical care at existing rates. In this group we had

TABLE 2—Increase of Demand for Medical Care in Nine Years

Year	Free Treatments	Free Prescriptions	District Physician Calls
1929	110,721	114,557	5,370
1930	139,816	168,956	9,763
1935	281,615	158,616	4,819
1936	274,066	92,980	10,340
1937	268,947	116,940	18,242

to place all workers employed under WPA projects, whose wage scale is so manifestly low as to make impossible the ordinary payment for medical care.

#### MEDICAL RELIEF UNDER THE ERA

From April 12, 1933, to April 16, 1936, as stated, medical care of the indigent poor was under the Federal Emergency Relief Administration.

Under this plan all physicians wishing to volunteer for relief service were asked to register their names with a medical board appointed from the county medical society. This board submitted the names of such physicians to the ERA and also advised on the medical problems arising from this service. The scale of payment adopted and approved by the medical societies

was a flat rate of \$2 for a home call and \$1 for an office visit. The patients had a free choice of physician and there were at first no restrictions on the number of calls made on any one patient. A fee of \$25 was allowed for all maternity patients delivered in the home. This fee included all antepartum and postpartum care.

In the beginning there was no limit as to the amount of fees collected by any one physician under this plan.

TABLE 3—*Annual Cost of Medical Care in Newark*

Year	Cost of City Dispensary	Pay for District Physicians
1929	\$ 61 000	\$ 6 546
1930	81 000	7 600
1935	138 000	6 800
1936	163 000	11 000
1937	160 000	18 000*

\* District physicians were paid for ten months at \$1 500 a year by the Outdoor Poor Relief Department instead of \$1 000 a year in the health department. The cost figures for 1937 approximate about 50 cents per clinic treatment and 25 cents for each prescription. The cost of the calls made by district physicians would average approximately \$1 a visit.

TABLE 4—*Additional Items of Hospital Care*

City dispensary and district physicians (1937)	\$ 178 000
City hospital 750 beds (annually)	960 000
Convalescent hospital 155 beds (annually)	86 000
Free beds in private hospitals (paid by city annually)	10 000
County isolation hospitals 400 beds Newark pays 55% amounting to	175 000
County Tuberculosis hospital at Verona 447 beds Newark pays 55% amounting to	275 000
Total medical care paid by city taxes	\$1 687 000

When the costs of this service began to mount, however, a limit of \$200 was established for the earnings of any one physician in one month. All bills had to be submitted to the county office of the ERA on or before the 10th of the following month.

In order to obtain the services of a physician, the patient or any member of the family was required to obtain an authorization from the local relief office. This authorization was limited to not more than three visits. If more than three visits were required, further authorization slips were needed.

For emergency calls after office hours, the physician was supplied with a book of blank emergency authorization slips. This was particularly used for night calls. Medical prescriptions were made out on forms supplied to the physician and were compounded by pharmacists, the cost being paid by the ERA.

#### THE FRAMEWORK OF MEDICAL SERVICE UNDER THE ERA

The plan for medical service under the state emergency Relief Administration apparently met the conditions laid down by the American Medical Association. There was freedom of choice of physicians, and there was a flat fee of \$2 a visit and \$1 for an office call which was agreed on by the county medical society. The quality of medical services rendered and the various problems that arose thereto were supervised by a medical committee appointed by the county medical society. Although this service was at first limited to families on the relief rolls, it was broadened later to include families of the low wage groups.

It can be said in favor of this plan that there was every incentive to give medical service of a high standard, for the reverse would mean a loss of patients to the physician so complained of.

Apparently the service offered, particularly the home visiting, was taken advantage of by a greater number of the poor than was that offered by the city under

the paid district physician plan, although the demand for the city service was little diminished during the ERA period of medical relief. The principal difference between these two services was that of the cost, that for the ERA plan being much in excess of the cost of the dispensary and city physicians as maintained by the municipality.

#### THE COST OF THE STATE ERA PLAN FOR MEDICAL CARE IN NEWARK

Table 5 is a summary of the cost of medical care under the Emergency Relief Administration for the two and one-fourth years, from January 1934 up to April 1936, in the city of Newark. For the year 1933 the cost figures were incomplete.

For 1936, ERA figures were separated into services of the physician and the dental and nursing services. Since no separation was made for 1934 and 1935, table 5 was made by using the same proportions as for 1936. The total costs for medical care under the city plan and the ERA setup are not comparable, since the services rendered were apparently for two different groups of the poor. The ERA was for the indigent poor or persons on the relief rolls and the city dispensary and district physicians were for the low wage family not essentially indigent. The cost for these two services for the year 1935 are given in table 6.

Had the prevailing rate for medical care as in force for the state emergency relief been applied to the city service, the cost would have been \$370,561, as summarized in table 7 for the year 1935, instead of \$144,800.

#### SUMMARY

1 The low wage family naturally demands free medical service to the same degree as that given the indigent poor yet resents being placed in the indigent class or having to apply for medical service through the relief agencies.

2 Shall municipalities contemplate building more free dispensaries with larger staffs of visiting physicians on salaries or on a fee basis?

TABLE 5—*Cost of Medical Care Under Emergency Relief Administration*

Year	Total Medical Services	Dental and Nursing Services	Physician
1934	\$150 018 08	\$30 018 08	\$120 000 00
1935	259 521 47	51 521 47	208 000 00
1936 (1st quarter)	49 088 50	9 931 00	39 157 50

TABLE 6—*Cost of the Two Services for Medical Care*

City dispensary and district physicians	\$144 800 00
State emergency relief medical care	259 521 47
Total cost	\$404 321 47

3 For fifty years the city of Newark has maintained a free dispensary and free district physician service.

4 Expensive medication is supplied, for example insulin for indigent diabetic patients at \$9,000 a year.

5 The present setup in Newark does not meet the standards established by the American Medical Association as to free choice of physician by the patient or as to the fee for physicians.

6 The extent of indigence in Newark shows 49,371 persons on relief in 1938 (more than one person in every ten). If WPA workers and the low wage group and their families are added, the number eligible for free medical care approximates one in four.



7 In 1937, 268,947 treatments and 116,940 prescriptions were given at the Newark City Dispensary and 18,242 physician calls were made by district physicians, as compared with 110,721 treatments and 5,370 home visits in 1929. Prior to 1929 the city dispensary treatments averaged less than 100,000 yearly.

8 The cost of medical care increased 100 per cent between 1929 and 1937 in the city of Newark. The total tax paid cost for medical care, hospital and ambulatory, in the city of Newark is now \$1,687,000 a year, added to another \$200,000 for hospitals given by the Community Chest.

9 The cost of the health department dispensary and medical care in the home amounts to \$178,000 a year. Emergency relief during 1933-1936 did not reduce to any great extent the medical cost to the health department.

TABLE 7—Hypothetic Cost of City Service Based on Charges for State Emergency Relief Medical Care

281 615 dispensary clinic visits at \$1	281 615
158 616 prescriptions filled at 50 cents	79 308
4 819 physician calls at \$2	9 638
	\$ 70 561

10 The emergency relief plan was satisfactory in providing free choice of physicians and a flat medical fee agreeable to the medical societies. The cost of medical dental and nursing services for 1935 in Newark under the ERA amounted to \$259,521.47. Had the city of Newark medical service been paid for at the same rate as the ERA service, the cost for 1935 would have been \$370,561 instead of \$144,800, the actual cost during that year.

11 The salary of Newark district physicians is \$1,000 annually as compared with a maximum earning capacity of \$2,400 a year under the ERA.

#### CONCLUSION

Under the free dispensary and district physician plan the cost of service is kept at a low figure, the average for a physician call is between 90 cents and a dollar and clinic treatments average 25 cents. This service does not allow any choice of physician, and the quality

of service rendered has a tendency to deterioration. With very few exceptions the reaction to a paid salary is to minimize as far as possible the extent of the service rendered. This can be understood when one considers the excessive calls for medical treatment that are made on salaried physicians at certain seasons of the year. The "off" period, when service calls are infrequent, are too soon forgotten by the salaried man.

Another serious objection to the salaried physician is the attitude of the public. The term "poor doctor" has not been forgotten, and frequently discourtesy, unfriendliness and actual hostility of the patient's family awaits the visit of the district physician. This attitude is not so prevalent when the physician demands and receives a fee for each attendance, which is much more in conformity with medical practice.

The free choice of physician is in my opinion essential for a proper relationship between the doctor and the patient. Whatever framework is set up for the medical care of the employed and the unemployed, it should meet the following conditions:

1. A service of reasonable cost to the community in which the physician should be willing to receive a fair standard fee for his services.

2. Free choice of physician.

3. Creation of a division of medical care in all health departments with an advisory committee appointed by the local county medical society.

4. All dispensary services to be standardized, with physicians paid for actual services instead of annual salaries.

5. A medical advisory board appointed by the county medical society to advise and correlate dispensary services.

6. A pharmaceutical board appointed by the state pharmaceutical society to standardize and correlate the cost of medical prescriptions given to private pharmacies.

7. The creation of a position of director of medical care who could be a physician or layman of exceptional ability to supervise and coordinate all the various branches and specialties of medical care and to advise on problems affecting hospital care.

### THREE TRIBUTES

Eloquent testimony to the places which physicians hold in the hearts of the people of this country was presented recently in three notes published in local newspapers as editorial comment on the deaths of physicians. The Jackson, Miss., *News* says of Dr. John K. Bullock:

The age of 39 is quite too young for a good and useful man to die, but such was the cruel fate of Dr. John K. Bullock, one of Jackson's ablest physicians.

Dr. Bullock loved little children, and it was this love that prompted him to select pediatrics—child diseases—as his specialty in the field of medicine. Lots of little folks in this state cried bitterly when they heard of his death for he had straightened their crippled limbs, put them erect on their feet, and thus gave them a fair fighting chance in life's battle. It was Dr. Bullock's fondest hope and dream to some day establish a hospital for crippled children in Jackson where little ones afflicted with malformations could obtain free treatment.

The friendly, lovable, kind-hearted nature of Dr. Bullock drew people irresistibly to him and inspired confidence in his medical skill. He had built up a splendid practice that extended

to many other places in the state and was earning a reputation for orthopedic surgery akin to that achieved in world medicine by Dr. Willis Campbell in his great clinic at Memphis.

In Wilmington, N. C., the *News* writes of Dr. Julius Arthur Doshier:

Dr. Doshier of Southport, who died yesterday, was one of the leading surgeons of the South if not of the entire country, and had he elected to remove to a large center his reputation would have been world wide.

But like many of the great men of his profession, Dr. Doshier preferred the neighborly friendliness of his own people as an atmosphere for his work, and while this decision denied him fame and perhaps fortune, it did not detract from his real greatness.

And in Bristol, R. I., the *Phoenix* said, in part, concerning Dr. Alfred Mitchell Merriman:

Was there any one in Bristol who did not feel a sense of personal loss when they heard over the radio Monday morning the word that Dr. Merriman had died Sunday night in the Jane Brown Hospital? He had gone for a two weeks rest

and then his heart gave out and he was taken to the hospital in Providence, where he lived only two weeks more.

What can we do without him? He was our mainstay, our rock of defense in every trouble. In every accident, every sudden illness, the first thought was to send for Dr. Merriman and he never failed us.

When he made his last evening call he would say to the anxious family, "Don't hesitate to send for me if you think you need me in the night," and when the telephone rang he appeared in no time with his hypodermic syringe. To his paralysis patient who lay helpless in bed for weary months his last call was a gay good-bye and the parting word, "Remember, I am coming to take you for a drive next week."

It is not only his skill as a physician and surgeon that we remember, but his generosity and kindness.

He was, moreover, a most generous citizen, giving to every public cause. We all know of his work with the Y M C A, the Soldiers' Home and countless other causes. The Merriman house was ever the center of hospitality.

The Doctor was a great lover of music and the Bristol Train of Artillery, of which he was Commanding Officer, was his delight. Many a night, after a long day's work and a busy evening with office calls, he would dash up to the Armory to hear his band practice. Six years ago, in the time of the depression, he realized that the morale of the town was running low. He therefore thought of community concerts in the open air.

We were his guests. He paid all the expenses.

Dr. Merriman was a splendid man. He was our friend—our "Beloved Physician."

## THE PRESIDENT'S HEALTH PROGRAM

[The Providence, R. I. Journal, Jan. 24, 1939]

We note that President Roosevelt, in submitting his proposal for a permanent system of federal-state compulsory health insurance, asked Congress to give the program its "careful study." This is putting it extremely mildly, since the program involves so many vital economic and professional issues that Congress cannot expect to act wisely without the most searching consideration of every phase of the plan over a period long enough to inform the public thoroughly.

This is no matter to undertake quickly or emotionally, despite the fact that there is an admitted lack of adequate medical care for a large portion of the population in some sections of the country. Yet up to the moment it has been handled in just that manner. The President's interdepartmental committee's report and recommendations, which he transmitted with his message, is based upon the theory that only the United States government, with the cooperation of the states, can meet those needs.

The American Medical Association believes, as the President and his committee do, that there is a serious need for an extension of medical services on a basis that will enable all groups to possess them at a cost that is not too burdensome. The Association now acknowledges that its problem is to make American medical standards, which are the highest in the world, available to all the people, and it is facing it, not without some success, here and there. In Rhode Island, for example, the profession is presently seeking enabling legislation which will permit the organization of group hospital service, which is akin, perhaps preparatory, to the formation of some group medical service on a voluntary basis.

The President informs Congress that the committee's recommendations are based upon reports prepared by its technical experts, and that both recommendations and reports were discussed at the National Health Conference held in Washington last June under government aegis. He says that at that conference attended by many representatives of the medical profession and local health departments, there was agreement on these two fundamental points: first, the lack of adequate medical care for many groups, and, second, the failure to make full application of the growing powers of medical science to prevent or control disease disability.

This is dissembling, since it fails to take account of the fact that the Health Conference was wholly a governmental affair; its program prepared long before it was held. Since, too, it makes no mention of the fact that the medical profession after agreeing to the two fundamental points disagreed wholly with the major proposal, which was to set up a system of federal-state insurance.

That disagreement was based on the belief that such a system would mean the complete socialization of medicine, controlled and directed by the government with concomitant losses in the lowering of medical standards and the evils that flow from political control. That still is the American Medical Association's position, just as it is of not a small part of the nation's population.

The President declares that no elaborate extension of the federal government's health service is planned. The program is to be administered by the states and localities, with the aid of federal money (presumably, 50 per cent of the funds). Such a program has obvious advantages, but it has so many disadvantages and presents so many evils that these are likely to destroy the advantages.

Let us assume that administration is to be decentralized on state lines. Does that eliminate the danger of politics or government control? Not at all, for each state must appropriate its share of the funds, and that means both political and social

### EXAMINE BEFORE YOU BUY



From the Providence Journal Jan. 24, 1939

consideration of the problem each year. It means a state department, which must perpetuate itself in office by a steady flow of state and federal funds and that means political maneuvering. If any one doubts this, let him consider the persistency and thoroughness with which county agricultural agents in many of the states play politics today, not only to keep in office, but to make sure that the government's system of crop control paid for by cash benefits is continued.

And of course, it means a considerable measure of control from Washington. It means a new federal bureaucracy, in time no doubt a new department of the government and thus a political instrument of the administration in power.

Consider, too, the cost. The President's plan, in time, will mean an expenditure by the government and the states of \$850,000,000 every year. This is an additional burden on the taxpayers, no matter how the money is raised.

If it is a pay roll tax, about which there seems to be some doubt, it means that the wage earners' purchasing power is to be correspondingly lowered, not only because a portion of his wages is withheld every week but because his employer also must contribute, and that means an increase in costs of production, with further assessments on profits and, therefore, upon the employer's ability to pay his workers.

Such a tax certainly would make the scheme compulsory, and that would constitute compulsory health insurance at its worst. Despite any protestations to the contrary, it would mean the loss of freedom of selection in the matter of medical care.

The state administration ultimately would be forced to engage doctors for the work, and only the poorer and ill equipped

type would be available. That has been the history of compulsory health insurance in nearly every country which has tried it.

It would mean a lowering of medical standards and a weakening of medical science, since the keen competition among private practitioners would be stifled. Medical treatment would be on a political basis, and any such medical practice is bound to become cold and inefficient. And here, again, the individual would suffer.

There are many phases to the issue which the President has raised. They should be considered thoroughly and at length. Let Congress adopt a program so impractical, so unwise, so political as to destroy much of the great progress which science has made in this country.

Extension of medical service to low income groups is one thing. Government domination of medical practice is quite another. By all means, let us all "Stop, Look and Listen" before we commit ourselves to any plan of this sort.

## THE AMERICAN CHEMICAL SOCIETY AND CLINICAL LABORATORIES

In the January 20 issue of *Industrial and Engineering Chemistry News Edition* appears a voluminous discussion over the signature of Charles L. Parsons, secretary of the American Chemical Society, entitled "Chemical Laboratories: A Monopoly Proposed for the Medical Profession." This discussion inspired an article in the *Washington Evening Star* for January 23 headed "Chemical Society Says A. M. A. is seeking Monopoly" and in the *Washington Herald* for the same date headlined "D. C. Chemists Unit Joins in A. M. A. Monopoly Charge." What are the circumstances leading to the publication of this material?

According to *Industrial and Engineering Chemistry* publication was authorized "in order that members of the American Chemical Society may be fully informed, that physicians may have full knowledge of the situation that exists and that material may be available for use in any proposed legislation that may be found necessary to conserve the public health by ensuring that chemical work in clinical laboratories, in public health organizations, in hospitals, and in similar institutions shall be performed by, or under the immediate direction of, an adequately trained chemist or by an individual whose qualifications to practice chemistry are beyond peradventure. The basis of the American Chemical Society's allegations concerning the American Medical Association rests on an alleged violation of the letter and spirit of the report of a joint committee of the American Chemical Society, the American Medical Association and the American Association of Pathologists and Bacteriologists in 1924, on the subject of Clinical Laboratories. This report was adopted by the House of Delegates of the American Medical Association in the same year. The report is adopted follows:

In proposing the following specific recommendations concerning the regulation of clinical laboratories the joint committee of the American Medical Association, the American Chemical Society and the American Association of Pathologists and Bacteriologists wishes to emphasize the importance of encouraging and ensuring the adequate education of every laboratory worker in the fundamental sciences which he applies. A clinical laboratory, as that term is used by the committee, is an institution organized for the practical application of one or more of the fundamental sciences by the use of specialized apparatus, equipment and methods for the purpose of ascertaining the presence, progress and source of disease.

It is the unanimous judgment of the committee:

(1) That it should be illegal for any person not licensed by law so to do as to assume the responsibility of making the diagnosis or of deciding on the progress or source of disease on the basis of any results of a chemical, pathological, serologic, bacteriologic, radiologic or microscopic observation or other laboratory examinations undertaken and that where laws do not now restrict diagnosis or the clinical interpretation of laboratory examinations to licensed classes of medical practitioners laws should be enacted to effect that end.

(2) That any law providing for the licensing of professional workers in laboratories devoted to ascertaining the present progress or source of disease should provide for the examination of members of each profession by competent authorities belonging to the same profession.

(3) That as long as an organization or individual engaged in examinations to ascertain the presence, source or progress of disease refrains from all diagnostic and prognostic interpretation of the results of such laboratory tests as provided for in paragraph 1 any effort to force such

organization or individual to place itself under the direction of a representative of any other profession is to be deprecated.

(4) That the American Chemical Society, the American Medical Association and the American Association of Pathologists and Bacteriologists should cooperate to establish the principles enumerated in the foregoing resolution whenever legislation in this field may be proposed, and that the cooperation of other national bodies should be solicited.

(5) That clinical laboratories be standardized in accordance with the principles laid down in the preceding paragraphs and legislation should be enacted to ensure competent personnel and suitable equipment.

This has been modified only so far as the House of Delegates has adopted subsequent reports of the Council on Medical Education and Hospitals affecting this problem.

The American Chemical Society in this report quotes from reports of the Council on Medical Education and Hospitals at various times as presented in *THE JOURNAL*, such items as appear to be at variance with the report previously mentioned. It calls attention to the fact that for several years the Council on Medical Education and Hospitals published the "Essentials of an Approved Clinical Laboratory" but that in 1929 the list formerly headed "Approved Clinical Laboratories" was changed to read "Pathologists Conducting Approved Clinical Laboratories" and that both lists were limited to laboratories headed by men holding the M.D. degree. Finally the report complains that in 1933 the heading was again changed, this time to "Physicians Specializing in Pathology and Clinical Pathology."

In quoting from statements of the Council on Medical Education and Hospitals as presented in *THE JOURNAL*, the American Chemical Society evidently takes exception to such statements as the following: "Many physicians in the past, not appreciating fully the importance of medical supervision over their work, had patronized lay laboratories. The patient should be given the benefit of the most accurate analysis with regard to the source, nature and progress of the disease. In order that this may be assured, physicians should have their work carried out in laboratories under the supervision of capable physician pathologists." And "Through the activities of nonmedical clinical laboratories the interests of the patient are jeopardized and frequently the true source, nature and progress of the disease are not ascertained." In the report of the Council on Medical Education and Hospitals adopted by the House of Delegates at the annual session in 1932, the following comments and recommendations are made:

"Essentials of an Approved Clinical Laboratory" were adopted by the Council in compliance with instruction received from the House of Delegates in 1923. The rating of laboratories has been found to be in some instances misleading because of changes in personnel. The Council has found it more practical to emphasize the qualifications of the pathologist than of the place in which he works and to this end at its February meeting adopted a statement of the Essentials for the Listing of Physicians Specializing in Clinical Laboratory Work and Pathology.

In the chemical society's report no mention is made of any reason for the recommendations of the Council on Medical Education and Hospitals and one would be led to believe that there were no reasons other than self interest.

Perhaps the acute situation which the American Chemical Society believes has arisen lies in a controversy now going on in Pennsylvania between the Chemical Society and the State Board of Medical Education and Licensure. According to the reprinted letter written by Dr I D Metzger, chairman of the State Board of Medical Education and Licensure, "There has been no law recently passed in respect to clinical laboratories as such specifically. Act 417 passed in 1935 and effective September first of that year provides that all persons doing any medical work that enters into the welfare of patients must be licensed to practice medicine or a branch thereof. Clinical laboratories do enter into the welfare of patients, inasmuch as reports from them are requested and secured by physicians only because of their aid in the diagnosis and treatment of cases. It is obvious, therefore, that all such reports should be made by licensed physicians who may be legally responsible for them." In essence, therefore, the Pennsylvania situation is one which involves the American Chemical Society and the state of Pennsylvania, and it is irrelevant to draw the American Medical Association into the picture. If the law or its interpretation in Pennsylvania is unsatisfactory, this matter should be taken up with the state authorities rather than by any attempt to charge another professional organization with those measures which are purely state enactments.

Further correspondence is quoted between the American Chemical Society and the American Society of Clinical Pathologists. On these issues the American Medical Association has taken no official action. Finally, the report closes with a charge headed 'Monopoly for Physicians Boycott of Nonmedical Directors,' in which the chemical society protests against 'the unsurpassed arrogance of the assumption that the findings of other learned professions, before being accepted by the physician, must be made sacrosanct by the seal of an M.D.' Certainly there is no evidence that any such claim has ever been made.

The report closes with a brief statement on the position of the American Chemical Society, reiterating its readiness to participate with the American Medical Association and other

interested national societies in establishing standards for laboratory directors in accordance with the resolution. The society maintains that "every director of a clinical laboratory should be well educated and thoroughly competent in chemistry, pathology or bacteriology, but that no degree, in itself, is a guaranty of specific knowledge and efficiency in this branch of endeavor."

This lamentable controversy, initiated by a professional society which might well have foreseen the nature of the attendant publicity, can only be deprecated by all who have the interest of the public or of their respective professions at heart. Certainly one might expect from the American Chemical Society more scientific and professional approach to a problem which affects not only those professionally involved but also the health of the people.

In accordance with the report of the joint committee which the American Chemical Society appears to regard as a Bill of Rights, "it should be illegal for any person not licensed by law so to do as to assume the responsibility of making the diagnosis or deciding on the progress or source of disease on the basis of any results of a chemical, pathological, serologic, bacteriologic, radiologic or microscopic observation, or other laboratory examinations undertaken, and that where laws do not now restrict diagnosis or the clinical interpretation of laboratory examinations to licensed classes of medical practitioners, laws should be enacted to effect that end. Hence any clinical laboratory which goes beyond the stage of supplying purely factual information on the results of laboratory procedures must necessarily be under the direction of a qualified physician in order to comply with the recommendations of this report. It may of course be left to the practicing physician whether he desires a simple laboratory report without any interpretation."

The interest of the patient is paramount. The apparent misinterpretation of the attitude of the medical profession by a sister professional society is unfortunate. Still more unfortunate is the use of the material that is being made by the enemies of all science.

## CRITICISM OF THE REPORT OF THE TECHNICAL COMMITTEE ON MEDICAL CARE

A very valuable analysis and criticism of the report of the Technical Committee on Medical Care on "The Need for a National Health Program" by Dr Herman H Riecker of the faculty of the University of Michigan Medical School appears in *Public Health Reviews* (8 25 [Jan 15] 1939), issued by the staff of the Division of Hygiene and Public Health of that university. The following includes the more significant portions of this review.

This evaluation of the report calls attention to but two points. (1) That to some readers it may reflect an unwarranted optimism toward the possibilities of national public health measures in the control of many phases of disabling disease, and (2) that its medical interpretations of statistical survey findings are often difficult to reconcile with current scientific conception.

The most striking lack of understanding of the problem of the prevention of illness by the committee is illustrated by the statement. The committee finds that the essential lack (in the national burden of illness) consists not of inadequate knowledge but of inadequate funds. It would seem however that cognizance of the lack of health education on the part of the people, the lack of orderly continuous educational opportunities for the physician, the extension of hospital and laboratory facilities and the need for further research in all fields of medical science would merit more serious consideration in planning for future betterment of health and medical service.

In considering the need for expansion of maternal and child health services the committee writes that the conservation of maternal and child life is especially imperative if we are to maintain in the future the proportion of persons in the productive ages necessary to an economically progressive nation.

adding that today there is a great and unnecessary waste of maternal and infant life, and that 'impairment of health is widespread among mothers and children.' It is quite possible that the increased life span has been the result of the application of increasingly effective control measures to certain communicable diseases of childhood, permitting more children to reach adult life. Particularly is this true of tuberculosis, typhoid fever, diarrheal diseases and diphtheria. It is not necessarily true that through public health procedures the life span will increase sufficiently to be a disadvantage to the nation economically or will cause a decline in the number of children, as the pamphlet implies. That impairment of physical health is 'widespread' among women and children would seem to deserve qualification because unweighted figures could scarcely give sufficient data to enable one to judge their significance from an 'economic' standpoint.

The pamphlet states that the maternal mortality for the United States was 57 per 10,000 live births in 1936, more than twice that of Sweden. It is true that there is an inadequacy of maternal and infant care in many sections of the country, but the fact that only 14 per cent of the births in rural areas occur in hospitals in itself could scarcely be accepted as importantly affecting the mortality rate. The use of newer procedures in obstetrics is attended by a very considerable hazard when employed by those not familiar with them. We would wish that the committee might analyze the difference in provision for maternal care in Sweden and the United States and proceed with recommendations from such an analysis. While prenatal care is essential and helpful in many instances an improvement in the actual technique and judgment at delivery will save more maternal lives than all other factors combined. The essential problem then with relation to maternal mortality is a recognition of the fact that most teaching institutions,

are inadequately supplied with clinical obstetrical material for both undergraduate and postgraduate teaching, that prenatal instruction to mothers is lacking, and that economic conditions enter significantly in the total reckoning.

With respect to the "special needs of childhood," the committee deplores the fact that "in 10 per cent of respiratory diseases pneumonia results, and that 18 per cent of the deaths resulting from diseases such as influenza, pneumonia, colds and tonsillitis are due to pneumonia among preschool children." The proper care of minor respiratory diseases is of the greatest importance in the prevention of complications and the problem of keeping sick children in bed at rest is a difficult task for any parent. In their prevention by a national health program doubtless there will be included provision for further research in the virus and streptococcal diseases, because we do not have a general preventive for influenza, colds and tonsillitis, and nothing but scientific research will provide one. May not the prevention of these infections and their complications depend more upon sound health education than upon the development of agencies which the public has not learned to use? In other words, should not greater stress be placed upon education?

The report further states "in the northern part of the country about 1 per cent of all school children suffer from rheumatic heart disease. Appropriate treatment of children with rheumatic disease will restore 60 per cent to normal life, 15 per cent to a life of restricted activity." Rheumatic fever has a predilection for certain families in a community and prevention of the attacks, probably by immunological procedures to be based on future research results is perhaps the goal of our hopes. However, from the medical standpoint, children with rheumatic heart disease have never been "restored to normal life" in more than 15 per cent of the cases, and these were usually cases with only a mild degree of aortic or mitral insufficiency. Clinical experience would seem to indicate that here again is somewhat undue optimism.

It would be interesting to know the sources of information for the statement that the maladjustments in the environment of the child will be corrected by tonsillectomy, the eradication of dental defects, or that these procedures save children from further illness and maladjustment, as stated on page 10 of the report.

In the advocacy of a national health program little is gained by the statement that upper respiratory infections are more common in a child of 9 than in an adult of 65 years. On page 11 the committee finds that the frequency of tonsillectomy and adenectomy among persons under the age of 20 years is only two-thirds as high in rural areas as in the large cities, and that filling and extraction of teeth are only one half that of children in cities of 100,000 population and over. The report possibly seems to favor the universal removal of tonsils and adenoids in children, a viewpoint for which further substantiation might be advisable, particularly in consideration of the belief now quite generally held that the hereditary allergic state plays a rather conspicuous part in upper respiratory infection.

With respect to cancer, the committee estimates that there are 400,000 persons suffering from cancer in the United States and that a large majority should be hospitalized when they cannot pay for the high cost of specialized and expensive service. The committee no doubt recognizes that education of the individual about cancer, and of the physician regarding the recognition and eradication of precancerous lesions, will probably continue to be the most important factor in cancer control.

Under the topic of diabetes, the committee states that the mortality from diabetes in young persons can be reduced by 90 per cent, and in persons over 60 by 37 per cent through the administration of insulin. It is, of course, well recognized by the medical profession that the control of obesity is fundamental to any decrease in the death rate from the degenerative diseases of the circulatory system and diabetes, and that the older "diabetics" do not die because there is sugar in the urine but from the arterial complications peculiar to their constitutional make-up. As a rule, diabetes is an incident, not a disease in the obese elderly person. It is suggested to the committee that if arterial degeneration is a public health

problem its amelioration might follow by public health methods applied to the overweight individual. Here again education rather than medical care would seem to be of primary importance.

With respect to the diseases of the heart, blood vessels and kidneys, without long clinical experience it is difficult to evaluate methods and possibilities of control of these conditions. There is no doubt that "much can be done through prevention and treatment to avoid needless cases of apoplexy, diseases of the kidney and circulatory diseases, to reduce suffering and premature disability and death and to minimize the economic and emotional distress caused by these diseases." The committee could scarcely be expected to recognize that emotional and hereditary factors often play a dominant part in the causes of the degenerative diseases (arteriosclerosis), and that coronary disease, apoplexy and hypertension are not commonly caused by poverty. A more hopeful prognosis is offered by wider application of the periodic physical examination by means of which vascular accidents in susceptible persons may be anticipated. Even so, the widely noted increase in the average life span should not be too eagerly interpreted to mean that immortality is within reach.

The committee believes that among the known means of reducing the disability due to chronic rheumatism are the care and removal of foci of infection, such as diseased tonsils and teeth, the treatment of gonorrheal infection, dietary supervision, specialized therapy, and surgery in some of the severe cases of arthritis. The committee believes that "90 per cent of these cases will recover or be definitely improved by careful and prolonged treatment." While the medical profession confidently hopes that research will find an effective treatment of rheumatoid arthritis, no such distinct optimism has been manifested in the literature, nor has it been shown that the removal of foci of infection such as diseased tonsils and teeth, has any curative and in many instances but little preventive effect upon the disease. In addition, any program of prevention of arthritis should take into consideration the important factor of individual susceptibility. Gonorrheal arthritis, however, is not a common condition in comparison to the incidence of gonorrhea, and is readily remedied at any stage.

That the Public Health Service should now expand in the field of mental disease is commendable for the reason that, while the care of mental disease has been a function of the state for several centuries of all the branches of medicine, research upon which prevention is based, has been most retarded in this field. It is hoped that a program in this field contemplates provision for accelerating the research problems incident to it. It would be interesting to determine whether behavior problems, dependency, delinquency and crime, as well as dementia praecox, the traumatic psychoses and abnormalities in behavior of childhood are largely preventable by public health measures. Biological factors involved in these conditions would need very careful appraisal by the committee before a general policy is adopted and in any plan substantial support of psychiatric research would be advisable.

There is general agreement with the committee that industrial hygiene programs should include the broad subject of the health of the worker. Experience indicates that a great many industrial workers are not interested in maintaining their health to the exclusion of certain other privileges they now enjoy, for instance, that of living in a city, the use of tobacco or alcohol, the cinema, the lack of sleep, and the use of available funds for gasoline rather than for vitamins. Health education and a solution of the problems of recreation on an individual basis would seem to be worth further discussion in promoting health consciousness among the low income group.

The report rightly emphasizes the relation of sickness to low income, and sickness with lack of employment. We must not fail, however, to associate sickness with ignorance concerning the cause of illness with inborn emotional maladaptations, disregard for the ordinary rules of health, and the accidents of ordinary life. We recognize that many sick people of the low income industrial groups do not have sufficient mental capacity or incentive to avoid illness. Even with munificent appropriations for public health, individual discretion nurtured by education might still be necessary in the avoidance of certain of the

common illnesses. The inexorable law of survival of the fittest is more difficult to suspend in people than in domestic animals for a number of reasons. In some instances even science must be content to provide an adaptation of the patient to his illness because prevention and cure are as yet impossible. If 60 per cent of the physician's practice is composed of neuroses which frequently are disabling, what public health measures should we employ to aid the physician in this field? There is no recognized method available at present by which social, economic, constitutional hereditary and environmental causes of human illness can be separately dealt with in its successful prevention.

In planning to extend the scope of curative medicine, the technical committee has no doubt given thoughtful consideration to the extension of preventive services, an analysis of the causes of illness susceptible to public health supervision, wide opportunity for the training of public health personnel, and a gradual

coordination and expansion of existing public health agencies as they fit into the picture. An improved quality of service by the doctor and a better appreciation of good medical service by the people are goals also worthy of attention.

Above all, technical minds should realize that while expansion and improvement of the public health and curative service in the nation are long overdue, the individual has some responsibility for his health and that of his family. There is a possibility that medical science is being pressed too hard for cures of hereditary, constitutional and neglected disease. A health program based on the philosophy of chattelizing the industrial lower income group in order to fulfill its ideal is open to question in view of the marked advance now being made by proven but inadequately applied alternate methods. We must not lose faith in the ability of ourselves individually to accomplish some measure of betterment in social and health matters if given the enlightened guidance of education.

## OFFICIAL NOTES

### ANNUAL CONGRESS ON INDUSTRIAL HEALTH

*First Annual Meeting held in Chicago Jan. 9 and 10 1939*

DR STANLEY J SEEGER, Milwaukee, in the Chair  
JANUARY 9—MORNING

#### Report of the Council on Industrial Health

DR STANLEY J SEEGER, Milwaukee. At the Atlantic City session of the House of Delegates in 1937 authorization was given the Board of Trustees of the American Medical Association to proceed with the organization of a Council on Industrial Health as a standing committee of the Board. This Council held its first meeting in December 1937. The plans of the Council include an investigation of present activities in the field of industrial health, the objective of this study being to outline problems of health in industry and to indicate what, at present, is being done about them. This conference represents one phase of this activity.

Industrial health as a field of special medical interest is relatively young. The implication of the development of industry and the change in the practice of medicine effected by workmen's compensation laws has not been sufficiently emphasized. That the leaders of organized medicine in this country realize the importance of these problems is evidenced by the fact that in 1915 the Section on Preventive Medicine and Public Health of the American Medical Association conducted a symposium on industrial sanitation, and in every succeeding meeting similar material has been presented. An exhaustive review of the possible effects of the then new workmen's compensation laws on the practice of medicine was presented to the House of Delegates of the American Medical Association in 1915 by the Judicial Council, who visualized the new social conditions which would be faced by medical men in connection with workmen's compensation in accident and in sickness. The tendency today to a wide extension of benefits under workmen's compensation acts illustrates the vision of those who analyzed the future effects of these laws at that early date.

The American Medical Association, because of its long standing interest in industrial health is cognizant of the excellent work which has been done in this field by various public health agencies and by private agencies as well.

According to the last Federal census there were about forty-nine million gainfully occupied persons of whom nearly fifteen million were found in the industrial establishments where a large percentage of our occupational diseases and accidents occur. The majority of these workers are employed in small plants. Of the more than eight million persons employed in manufacturing plants alone, about one half are found in factories with less than 250 workers. These men and their employers must of necessity look to the practicing profession for leadership in the field of industrial hygiene. This statement is made with a full realization of the important part which public health administrators have played in the past and must play in the future in the development of programs of industrial hygiene.

The terms "industrial health," "industrial medicine," and "industrial hygiene" are today greatly in need of clarification to the entire medical profession. The ambiguous and varied use and interpretation of these terms lead to a lack of understanding regarding the points under discussion and also of the purposes of programs which may be initiated by governmental agencies, by industry or by the organized medical profession. The connotations of the words "occupational" and "industrial" in relation to disease are further evidence of the necessity of a careful analysis of the terms used. The term "industrial medicine" has frequently been identified with industrial hygiene, industrial medical service, contract practice, insurance medicine and welfare work. The Council has recognized the necessity for clarifying the confusion and chaos which exist today in the minds of physicians concerning the limitations and objectives of industrial medicine. The introduction and improvement of industrial medical service open a vast complexity of problems. The relationship between industrial physician and management and the place of the physician in the factory await exact definition, as does the basis of relationship between the general practitioner and the industrial medical officer.

The practicing physician, whose interest in industrial health is obvious, must attempt to orient himself in this vast field, he must study the objectives and the accomplishments of the important agencies at work on industrial health problems, he must attempt to understand the point of view of those in government, in the labor movement and in industry who have sought to improve the health of the worker. The position of the full-time physician in industry must be defined and the ethical relationships which his work engenders must be reviewed, and definitions of terms used to designate various entities and practices must be formulated. The obvious dependence of the practicing physician on the industrial hygienist and the public health worker should be frankly stated and the efforts of these groups with a common objective should be correlated. In a similar spirit and in order to accomplish their professed objectives, public health workers both in industry and in governmental services must make a genuine effort to aid in the development of industrial health services through the agencies of organization of the private physician.

The deliberations of this conference should serve to outline the problems in this field and aid materially in their solution.

### SYMPOSIUM ON INDUSTRIAL RELATIONSHIPS

#### The Physician in Industry and Organized Medicine

DR IRVIN ABELL, Louisville, Ky. Organized medicine has throughout its existence considered that the preventive and curative health needs of all the people are best controlled by two agencies—public health administration and the private practice of medicine. In the opinion of the majority of physicians there has been as yet no incontrovertible evidence that industrial medicine should not conform to this basic pattern. Public health administration has devoted a growing segment of its resources and interest to the control of industrial hazards for more than



a quarter of a century. The broadening nature of its present proposals, particularly the recent rapid extension of industrial hygiene bureaus into the state departments of health and the difficulties which have been encountered, are therefore viewed with uncommon interest. It is important to all practitioners that they become well acquainted with these bureaus not only as sources of information and assistance but because full usefulness can never be attained by these agencies unless confidence and support are enlisted from all elements in the profession.

Medical relationships in industry, as far as the individual physician is concerned, differ from ordinary practice in that the preventive aspects by reason of their clinical and technical complexity are more sharply set apart. In comparison, it can almost be said that industry has produced few new problems on the curative side. Nevertheless, so long as plants and workmen in good majority depend on part-time medical personnel, many physicians will be obliged to administer industrial hygiene on the one hand and continue their customary management of individual patients derived from industry on the other. These dual responsibilities are of first importance and not always realized even in professional circles. For some time to come, any movement to improve or extend industrial health must acknowledge first of all that in speaking of industrial hygiene and physical rehabilitation we are describing the several functions of the same set of practitioners. Indeed on occasion these functions may overlap yet there is no incompatibility that suitable training and ethical behavior cannot overcome.

*The Objectives of Industrial Medicine*—It became apparent early that certain basic precepts must govern the attitude of organized medicine toward the modern industrial health movement. One of the earliest convictions to assume shape in our collective professional thinking was that the true domain of industrial medicine could be defined and that organized medicine had an obligation to see that such boundaries and limitations as were erected are well known and observed. To quote from an editorial in THE JOURNAL of some years ago, the objectives of industrial medicine should be: 1 To fit every person to types and quantities of work according to his ability to perform such work continually without undue impairment without injury to himself or his fellow workmen and with profit to himself and his employer. 2 To procure and maintain fitness for work through efforts applied to the worker as an individual, to groups of workers and to the work environment. 3 To educate the worker to a comprehension of the value and significance of physical and mental well being and in particular of personal hygiene and accident prevention. 4 To reduce all loss of time, absenteeism and short work spans in industry the cause of which may be related in any way to health. These frequently quoted principles are widely acceptable as a general statement of policy not only to private practitioners but to most industrial physicians as well. Few have expressed disagreement with the contention that the functions of industrial medicine should be—beyond specific legal requirements—confined to preventive practice within the working place. Furthermore, all concede that no real progress will ever be made until the worker himself is led to assume an intelligent personal interest in his own physical welfare and the conditions of his working environment. Any aloofness which individual physicians may have demonstrated toward industrial practice and which has communicated itself to organized medical groups has arisen from the variety of conditions under which industrial health control has escaped from this definite framework. If one accepts these stated qualifications as marking the attributes of acceptable industrial medicine, it becomes clear that many activities which by long association have come to be considered as functions of industrial health programs are not so at all. The needs of certain industrial localities may have given rise to extended medical care community wide in scope and with the family as a unit. Such an arrangement may or may not have been necessary or adequate—in any case, it is not industrial medicine. Similarly, the physician in an industrial community may supply a degree of management to individual cases arising out of industry which leaves nothing to be desired, yet by *our definition* he meets only partially the demands of a satisfactory industrial health program. To the extent that the physician in industry has been guided by these principles, to that same degree has he commanded a position of worth and respect in the eyes of the profession at large.

*Elevation of Standards*—Organized medicine has an obligation to stimulate a widespread genuine interest in elevating standards of industrial practice. No other agency has in any approximate sense the opportunity to bring to the individual physician a real awareness of his place in the industrial setting. The whole background of enforcement of standards in other fields of medical interest provides easy transition to and concentration on the clinical content in occupational diseases and injury. The entire fabric of the ethical code takes on unusual significance in its adaptations to the health control of the working population. The condemnation of quackery and cultism is as important in industry as elsewhere. The provision of sound medical literature and the regular evaluation of clinical experience and investigation are needed in industrial medicine quite as much as if not more than in other fields. Industrial health has benefited from every advance made by organized medicine in the direction of its own self improvement by controlled undergraduate instruction by adequate standards of licensure, by supervised internships, residencies and fellowships, and by the appraisal of results based on clinical records, laboratory investigation, autopsy performance and hospital staff conferences. The industrial physician can expect to profit to the same extent as others by the upsurge of interest in postgraduate medical education and the development of standards for specialty practice out of which the public is constantly receiving improved medical service both in industry and out of it. It is recognized, of course, that the profession has not been uniformly well trained to a full comprehension of its preventive functions in industry. If medical men are to maintain leadership in industrial health, much more attention will have to be directed toward a reasonable degree of preparation in the fundamentals of industrial hygiene. To overcome this lack of information is, as I visualize it, one of the primary objectives of the Council on Industrial Health. There is in organized medicine the immense advantage of structure. The community of interest which exists between national, state, county and local medical groups exerts a profound influence on the individual membership in his medical society meetings committee activities and personal associations. The formation of committees on industrial health which are being developed in the state medical societies and by predictable extension into the counties provides a machinery for cooperative enterprise the ultimate accomplishments of which are incalculable. As this arrangement perfects itself, working relationships will be established between all agencies having a legitimate interest in industrial health. Few physicians then will be able to complain of poor or absent sources of information for the solution of industrial problems and very few outside the profession that proper medical interest is not ably and intelligently represented. Organized medicine reaffirms its conviction that no industrial health system can ever be considered worthy of that name unless the worker himself is constantly upheld as the central object of all effort, all planning and all reform. As long as this attitude prevails and reflects a single minded purpose, then can labor, management the government and all elements within the medical profession meet on common and substantial ground.

#### The Physician in Industry and the Employer

DR C. D. SELBY, Detroit. The physician was first employed by industry to treat occupational injuries. Although the employer was the responsible party and the physician acted as his agent, the relationship was principally that of doctor to patient and as such it did not differ from the relationships which characterize private practice. The doctor was not an integral part of the employer's organization. Out of this original arrangement has been evolved a working plan which integrates the doctor with industry and also utilizes his abilities in the field of preventive medicine something new in principle and practice to both medicine and industry.

For complete understanding, it is necessary that the employer's medical needs be considered.

*1 Medical and Surgical Care*—The ordinary surgical and medical functions of the doctor in industry may be dismissed as not differing from those of private practice. The physician furnishes the services either directly or through consultants. From this point on, industrial medicine diverges from private practice and assumes an individuality peculiar to industry which determines the relations of doctor to employer.

**2 Control of Exposures**—Employers do not wish to see workmen harmed through occupational conditions, and they are willing to furnish reasonable protection by way of mechanical safeguards, exhaust systems, changes in processes, and so on. The physician is in a position to observe the results of failure of protective measures and is called on to treat the resulting conditions occurring among the exposed workmen.

**3 Physical Supervision**—This is the term commonly applied to physical examinations of workmen. No one but a plant physician can adequately render this service.

**4 Records**—For the fair evaluation of compensation claims and the maintenance of the health of employees, fairly complete records of each workman's contacts with the doctor are essential. The employer expects him to keep such records. The employer looks to the doctor for guidance in making his plant safe and healthy and depends on him for safe placement of new workmen, the continued safe employment of all workmen, prompt and effective treatment of occupational injuries and diseases and unbiased opinions as to the validity of claims for compensation.

For managerial purposes the health service is usually placed in the personnel department. An able personnel manager can be very helpful to the doctor. He pleads with the employer for him, he supports his decisions and he correlates the medical with the other personnel functions. In a small plant the doctor should report directly to the employer. To merge the medical with the employment function is likely to circumscribe the medical and make the employment features of the service dominant. Likewise to merge it with a compensation department has a similar effect except that it then becomes chiefly an accessory in the settlement of claims.

For the broad application of medical knowledge to the benefit of employee health, it is necessary for the doctor to be high enough in the management structure to avoid the influence of special but limited interests. For determination of the medical functions that have a useful application in industry the employer is dependent on the doctor, but his acceptance of the doctor's recommendations is influenced by his confidence in him. To gain the employer's confidence he must demonstrate his worthiness as a physician and evidence sufficient knowledge and interest in the employer's primary objective to justify confidence. The employer's primary objective is the maintenance of a productive working force at a cost that permits profitable manufacturing, and he knows that industrial medicine is capable of making a considerable contribution toward that end.

### The Industrial Physician and the Employee

DR LOYAL A. SHOUPE, Bethlehem, Pa. There is a difference between the physician who spends his full time in an industry and the one who spends an hour or two a day or week and the rest of the hours in private practice. There is a difference between the physician who spends his full time in the industry and the physician who sets up a so-called industrial clinic giving his time mostly to the minor surgical needs of the various industries in that district. In some industries the force will be entirely male in others predominantly female, and in others there may be an equality of the sexes, but the broad principle of relationship between the industrial physician and the employee remains the same. We who have been in this work for twenty or more years have seen a shifting of emphasis from the curative stages of medical care to preventive work and health education. We have seen the trend from the surgical phase, then the medical phase, the job placement phase, the supervision, the cooperation with the engineering group, the control of exposures, and all to the end that better working conditions shall prevail.

I should like to discuss my idea of the type of physician who should be in industry. The practice of medicine is an art and if there is any phase of medicine which requires an artist it is the industrial phase. Unless a man has a real calling for the work, real love for his fellow man, he should not enter this field. A man presenting himself for examination for a job has a right to expect that he will be given every consideration, that he will be allowed to work and that if found unfit for one job he will be recommended for other work for which he is physically and mentally fit. He has a right to expect a thorough examination to know the results and to believe and to know that this communication is privileged.

Physical examinations of the men and women who apply for jobs should be conducted in a pleasant, courteous and friendly manner. The doctor at this time has an opportunity to impress on the man the necessity for keeping himself in good health and to point out any dangers that may be connected with the job. He should tell that man, if he deems it necessary, to report for reexamination or check-up. It is his duty to see that no man is placed in a job where he will be a danger to himself or to others. Medical service must be confined to accidents while on duty and occupational sicknesses or any emergency treatment of the illness occurring on duty. The employee may receive a periodic examination at any time, and any condition found in such an examination should be reported to the physician of his choice, so that he may receive proper treatment. An employee should be assured that the results of examination are confidential and returned in that manner by the industrial physician and he should receive the same consideration and attention as he would receive in the private office of his own physician. There should be no preference given to any class of employee, office or shop, labor or supervisor. The extent to which this is carried out will become a large factor in an employee-physician relationship, and the attitude of an employer relative to the physical well-being of his employees is directly reflected by the physician in his daily contact with the employees. As a member of a personnel organization, the physician must train himself to feel that he is definitely a part of the industrial machine—a member of the same dinner-pail carrying gang that makes the wheels go round. He alone of all the management machinery is best entitled with the exception of the immediate superior, to call employees by their first names, and this aura of familiarity can be penetrated with no loss of dignity provided it is rightly done. Sometimes the employee expects too much, in that he expects the physician to care for ills which are not directly connected with the industry or to treat him for an accident which had no connection with his job. At times this presents a difficult situation, but the medical department of any industry should establish the fact that it is there only for the conditions arising in and out of the industry and if a man becomes ill on the job from another cause and it is necessary for him to leave the job, he should by all means be referred to his family physician and the physician in industry should cooperate with the family physician.

The problems are many, varied and interesting. There is no place where one comes in such close contact with the working man as in the plant clinic and it is here that the greatest lessons in health can be put over. The all-day clinic is a great melting pot for human experience. Sometimes a man is unhappy. Relations with the men about him or with his foreman are a constant source of irritation. The right mental conditions are as important to the welfare and efficiency of workers and have as much to do with output and profits as do physical conditions. I know there are men who can always find some new ache or pain and are willing to swear that the job they are doing is the cause. The doctor must carefully examine the man and guard against permitting such men to blind him to the real ills of the honest man and the employee has the right to appeal to the industrial physician through his sickness to continue on the job and to appeal to him for a change if found necessary. I believe that to no other man is given as great an opportunity to promote a better mutual understanding and relationship between the employer and employee as is given the doctor. He should understand the workings of the plant and must at all times work in harmony and cooperation with the various departments. Mental ailments need treatment. Harsh words, sarcasm from a superintendent gives to the doctor his hardest job. Fears of all kinds, discontent, lack of a living wage, worry of sickness, trouble at home, a love affair, bad habits and innumerable other things undermine the health of employees and it is as essential to remove these conditions as it is to tie up a cut finger. Perhaps you will say that these are not industrial problems, nevertheless they are problems in the day's work. I feel that the personal relations between the doctor and the employee are of great value. An employee wants to feel that the physician in the industry is what we call a good doctor, that the physi-

cian has his well-being at heart, that the physician understands him and his job, that the physician is fair in all his dealings with all the men, that the medical clinic is the place where he can turn when in trouble. While not all of this is a function of medicine, listening to other people's troubles has become an obligation to physicians, whether in the home or in the factory. It is a tribute that the whole world pays to the physician. The plant doctor should betray no confidences. He must at all times be fair. His position as adviser to the employer and big brother to the employee, although delicate, has opportunities which he must recognize in order to succeed as a plant doctor. Things may break badly for the lowest man in the plant the same as for any one else. There are times when a cheerful word means more to a man than you can tell. If a corporation has no soul, it is the physician's duty to put a soul into it.

#### Industrial Health and the Private Practitioner

DR ROSCOE L. SENSLEIGH, South Bend, Ind. It has been reported that 98 per cent of American industries employ less than 500 men each. In the ninth largest industrial state there are 3,964 industrial plants, of which 85 per cent employ less than 100 workers each. All these groups have problems of industrial health. The manner in which their medical and surgical needs are served varies accordingly. The larger organizations employ physicians and surgeons on a full-time basis for a fixed compensation. The actual number of physicians occupying such positions is not available, but the American Medical Directory records only 345 who reported that they were limiting their work to this field. Industrial medicine and surgery was reported by 1,054 physicians as their special interest. For additional income these physicians are permitted to carry on such private practice as time not required in the company service will permit. However, the company service is the major commitment to this group of physicians. Lesser industries are served in the main by modifications of private practice. Individual surgeons or professional partnerships of surgeons frequently maintain headquarters manned at all times for emergency service. These serve a number of establishments on varied types of contractual or fee schedule bases. Practitioners whose major practice is private are called or consulted by prearrangement as needs develop in certain establishments. Other private practitioners may be less closely related in that they are designated by insurance companies as ones who may be called in emergencies and have no part in safety or preventive medicine. Such services as are required are generally paid in accordance with a fee schedule previously fixed by the employer or insurance company.

From the foregoing study it is apparent that the contact of physicians with industrial health varies from one of major interest and livelihood to that of minor interest and more or less accidental employment because of immediate availability in an emergency, for which they are paid on a fee basis. The fee basis is generally fixed at a level below the standard for private practice. This classification is obviously according to the financial plan of employment. In professional qualifications this may represent the difference between a carefully selected and thoroughly capable man and one less capable, whose selection has been determined at least in part by his willingness to serve according to the terms of a fee schedule on a basis not generally acceptable.

The medical service provided varies from the highest type, embracing research in the physiology of work and the influence of varying conditions under which the work is carried on, preventive medicine, instruction in hygiene, and safety measures. Diagnosis and care of disease conditions and injuries arising from employment are carried on under the direction of capable medical men. The other extreme may include only the minimum of medical and surgical service required by law and given by men of less training, having no special interest in industrial health, employed only when called. Even with these variations it is evident that there is nothing incompatible between the medical and surgical service of industrial health and private practice. The private practitioner has more often treated the major-interest industrial surgeon with what has been described as a noticeable "aloofness." Less frequently he

has been openly critical of the industrial surgeon's attitude toward company employees or of his personal business practices. The industrial surgeon in turn has generally assumed a position of belligerent defense toward his critics, or frequently, if on part-time private practice, he has aggressively used all the advantages of his industrial connection in a drive for personal medical gain.

It is to be regretted that, with some employers, willingness of some medical men to accept contracts for a low salary has been too highly rated as a qualification for employment as industrial health surgeons, and character of service has suffered. A better appreciation of the value of good medical supervision and service to industry should rapidly correct this condition. Society requires that the employee shall be protected against unnecessary hazard and that he shall be given medical care and compensation in the event that he suffers illness or injury by reason of that employment. The law requires that the employer give evidence of his financial ability to carry out legal requirements as to medical care and compensation or that he carry insurance with a responsible insurance company. The financial motive directs that it is advantageous to the employer to require at least some measure of examination to determine the physical and mental condition of the prospective employee before assuming contractual relations of responsibility for what may happen in the event of his employment.

The employer may entertain an interest in the well being of his employees. However, the insurance company is a step further removed from the employee than the employer and is concerned in preventive measures only so far as they diminish the chances of losses which may be sustained because of compensable conditions resulting from employment. It is not a producer of things but is dependent for its profits on the satisfactory adjustment of claims for injuries or disease resulting from employment. Finally, and of paramount importance, are the health interests and financial interests of the employee for whose protection all these provisions have been set up. It is presumably in his interests that the industrial physician is employed. The extent to which his interests are given consideration and the fairness of established policies are questioned at times by representatives of employees. It is at this point that the industrial physician and the private practitioner most often meet.

The industrial physician serves both the employer and the employee in all his efforts in disease and accident prevention. The physician is obviously interested in protecting his employer against malingers and against unwarranted claims by employees. Concerning the latter, there may be grounds for difference of opinion. The treatment given an employee may not be satisfactory to the employee or his family. This position of the industrial physician is difficult in that in some states the employee must accept the services of the physician named by the employer or, if he seeks other medical care, the employer is not liable for the fees. Finally, in compensable conditions the industrial physician may be placed in a position in which he is supposed to represent two parties whose interests may be directly opposed. Therefore, if the employer and the industrial physician do not offer the consultation service of a neutral consultant, the employee is forced to employ a physician in private practice to present medical evidence before legal adjudicating boards. Many times the private practitioner presents opinions at variance with those presented by the industrial physician.

It has been charged that the private practitioner too frequently appears as the advocate of the employee in exaggerated claims. The private physician may have little or no experience in the condition under question and therefore he has been described as having a tendency to testify according to such theories as he may develop rather than according to knowledge generally accepted by those of greater experience. On the other hand, there is complaint of failure of industrial physicians to utilize the services of specialists in private practice in the diagnosis or treatment of conditions for which they have not had training or experience comparable to specialists in their community. Present methods of fixing responsibility and determining degree of disability as a result of conditions

of industrial employment tend to emphasize any difference of opinion and accentuate this suggested divergence of interest between the industrial physician and the private practitioner. Private practitioners point out that the part-time contract industrial physician who spends the remaining time in private practice is placed in an advantageous position with the employees of his company to obtain private practice. Private practitioners point out that the industrial physician is attached to both the welfare and personnel departments generally and passes on physical fitness for employment. The implication follows that it is advantageous to court the friendship of the industrial doctor. Complaint has been made of the utilization of plant x-ray or other laboratories, installed primarily for employment examinations and care of minor conditions resulting from employment, in the diagnosis or care of conditions not related to employment. It is said that in some instances these facilities are used by industrial physicians in private practice in competition with private practitioners. Systems of group insurance medical service are said to have been established and are carried on by the industrial physician in competition with private practice. Obviously, there is no mystical formula which can be applied to adjust so many and varied points of contact. However, a general view of the matter suggests that the principal causes of tension might be eliminated by action directed along the following lines:

1. Improvement of the medical standards of industrial health activities. Provision should be made for better education in industrial health. There would seem to be ample ground for a certain degree of specialization if study and control of conditions of labor, light, ventilation, noise, posture, character of effort required, fatigue, exposure to deleterious substances and relation of trauma to disease are given adequate study. Recognition of specialization in this field to such an extent as may be logical and helpful may be suggested. On the other hand, there should be greater utilization of the established specialties in other fields of medicine, in consultation and care of certain diseases developing in industry. Specialization might seem to be inconsistent with compensation laws in various states which now permit employees to select their own surgeons for treatment of industrial injuries. However, experience in specialization in other lines suggests that recognition by the public that special training in a field tends to attain better results prompts the selection of better trained men in each specialty by those who choose to select their own surgeon. Further study should be made of the experience in those states in which free selection of surgeons in industrial cases is now permitted. Perhaps some modification of these plans would be helpful. Industrial physicians should not assume at company expense treatment of conditions not properly belonging to industrial health.

2. Cooperation in the creation of such intraprofessional machinery as will provide examination by neutral consultative groups of employees presenting claims for adjudication. When legally admissible, the reports of their conclusions should be submitted to industrial boards or courts. This would tend to avoid the presentation of conflicting material concerning claim cases before legal boards composed of laymen who are forced to make conclusions and awards from this basis. It would tend to discourage the overemphasis of minor observations and presentation of unfounded claims for conditions alleged to be the result of employment. The relationship between industry and the private practitioner is becoming more complicated because of recent dissatisfaction on the part of labor. Requirements for employment, discharge for physical incapacity and the like have been opposed. In some instances labor unions have hospitalized employees having claims, under physicians employed by the unions. Evidence thus obtained has then been presented by the physicians and lawyers employed by the unions. Acceptance of employees having minor impairments to employment for selected duties would necessitate a much closer contact and cooperation between industrial physicians and private practitioners. The Wayne County Medical Society, Detroit, has just completed the organization of means to adjust differences between attending physicians and insurance companies in matters of question between them. This is a very valuable step in the right direction.

3. Cooperation of industrial physicians and private practitioners in exploration and determination of boundaries of industrial health and private practice. The employer, the employee, the industrial physician and surgeon, and the private practitioner need more knowledge about the problems of individual health in industry. Industrial medicine may contribute much to medical knowledge in preventive medicine through research, by reason of the opportunity to observe the effects of labor on large groups under conditions approximating those of controlled experimentation. New techniques in treatment of industrial diseases may be developed because of the opportunity to observe large groups. On the other hand, because of the limitations to which specialization may be developed within the field of industrial medicine and the restricted scope of treatment properly belonging to industrial medicine, it must always be dependent on the clinical research and broader clinical experience of private medical practice for basic medical information. Medical and surgical conditions require the same treatment regardless of the cause, in industry or out of industry, and it is evident that such differences as have been apparent between industrial medicine and private practice are the result of the financial and legal factors which influence employment and industrial practice. However, private practice has always operated as a check against harmful tendencies and a balance against destructive economic practice. So long as private practice is free from control it will continue to do this. Industrial medicine will be respected in proportion as it will apply itself to the advancement of accident prevention and the maintenance of the health of the worker within the boundaries of industry, provided the material interests of industry are not permitted to introduce between the industrial surgeon and his employee patient elements prejudicial to the best interests of the employee and inconsistent with the ideals set up for private practice.

#### DISCUSSION ON INDUSTRIAL RELATIONSHIPS

DR. A. S. LEVEN, Chicago. It is fitting that the first Annual Congress on Industrial Health by the American Medical Association has been opened with a symposium on the relationship of organized medicine toward the physician in industry and the relationship of the industrial surgeon to the private practitioner. The introduction of medical service into industry has been a laborious task. Although industry deals with machinery, materials and labor, it does not regard all three in the same category. Many industrialists have as yet failed to realize the full importance of the fact that a healthy worker steadily employed or a sick worker quickly restored to health means more profits for industry. Many industrialists have failed to realize that the maintenance of the worker's health is of more importance than the maintenance of machines. Many industrialists still regard the worker as of secondary importance. Industry itself has been an obstacle in the introduction of medical service into industry. Only in recent years, owing to pressure of labor groups, social agencies, governmental and legislative bodies, and persistent educational procedures on the part of organized industrial medicine, has the health of the worker and his working environment been considerably improved. The medical profession especially organized medicine, has also been an obstacle to the introduction of medical service into industry. Had the medical profession as a whole taken a more active part in educating industry to the tangible value of medical service, to the health of the workers and to healthful working conditions, this attitude might have been changed long ago. But the medical profession until recently looked down on industrial medicine. Because of these facts, industrial medicine and surgery has had in previous years a slumberous career. Only recently has the American Public Health Association seen fit to establish a Committee on Standards of Practices in the problems of compensation and of industrial diseases. Only recently has the American College of Surgeons seen fit to put forth a program of the American College of Surgeons in industry. Where has organized medicine been with reference to the problems of the physician in industry? During these times industrial physicians have organized and today industrial medicine and sur-

gery has become a unified body and finds expression in such national organizations as the American Association of Industrial Physicians and Surgeons, the Association for the Advancement of Industrial Medicine and Surgery, and various local and state industrial medical specialty societies. Slowly, but surely, industrial medicine has become a penetrating influence in the world of industry and in the medical profession as a whole. Industry is beginning to give the industrial surgeon the respect and the acknowledgment which he deserves. Organized industrial medicine and surgery has disseminated accurate medical knowledge with reference to the diagnosis and latest methods of treatment and evaluation of all conditions arising in the course of employment. Today our social, political and economic standards are rapidly changing to new forms, and as physicians and as citizens we are greatly affected by these changes. Organized industrial medicine will help the entire medical profession to progress. In addition to his actual professional knowledge, the industrial surgeon must have contact with and knowledge of medicolegal, medico-engineering and socio-economic problems, which are rarely encountered in the routine of the private practice of medicine. Testimony on questions of permanent injuries and evaluation of disabilities involve the industrial surgeon in a proposition that is not the usual sphere of the average practitioner. There is only one common ground on which medical analysis of a physical handicap can stand, and that is the status of function. Only the physician trained or experienced in industrial medicine and surgery, or the orthopedist or traumatic surgeon, is capable of determining fitness through analysis of function. By giving industrial medicine the recognition it deserves, organized industrial medicine will be stimulated toward greater efforts and efficiency and will be able to attract other competent physicians and surgeons to this special branch of medicine.

Dr. AUSTIN HAYDEN, Chicago. According to the last speaker, organized medicine is behind the times. Here in Chicago I have known industrial surgeons for a long time and they have been conspicuous by their absence in the councils of the Chicago Medical Society and the American Medical Association. In the Board of Trustees where this Council originated at the time it was being originated I took occasion to look back through the files of *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* for five years and I came to the conclusion that at least a third of the articles were quite obviously connected with industrial medicine in one phase or another. The American Medical Association is delighted to have this gathering here this morning. We look forward to the development of every phase of industrial medicine as it has to do with private practitioners and practitioners who limit their activities to industrial medicine and, far from being asleep, I think the march of medicine in industry in the United States has been as great as the march of medicine itself has been in this country compared to the march of medicine elsewhere in the world. After all, doctors have to do with human beings. The American Medical Association has been called "the family physician of the American people," and the industrial surgeon is an important part of that. Within the last two months I have been engaged in the determination of the deterioration of hearing in industry where workers were subject to a large amount of noise. The object of that was for the company's protection as well as for the worker's protection. It is simply an extension of the general physical examination which most companies require of their employees, and we found to our amazement that men who had been subject to 105 decibels of steady noise—which is a very heavy noise, up to, under some circumstances, 125 decibels, which is about equal to the explosion of a small cannon, within a period of months—showed, without exception, a reduction in the upper scale of the hearing range. It seems to me that men with imperfect ears, if they desire to be placed in that particular department of this corporation, should know when they go in that there is a risk. The company is anxious that they know they are encountering this risk. They should know what amount of hearing they go in with and what amount of hearing they come out with, and that should be a responsibility mutually between the employer and the employee. It is the

beginning, in industrial medicine, of the conservation of human beings and the safeguarding of the interests of the employer.

Dr. JOHN N. HOLCOMB, Grand Rapids, Mich. In the chairman's introductory remarks it was of interest to me to hear of those on full time, those under part time, those under contractual arrangements and those who were free lance. There was also brought out the question as to the number of organizations. If that percentage follows through, it is evident that a substantial amount of this work is being done by men perhaps like myself, who are free lance, so to speak. The question came with regard to the financial returns. It has been my particular observation that good companies are looking for service rather than price. The question of examination enters into the picture. So far as preemployment examination and continued employment examination are concerned, that must be classed definitely as an instructive type of examination. The type of examination directed toward the elimination of the employee should be decidedly discouraged and unknown in the field. The surgeons in general are very much in harmony with that thought. We must not adopt standards so high as to bar from employment the average man who wants to work. A highly important thing is that legislation should be so made, so built up, that it gives men an opportunity to work without undue discrimination or undue expense to the particular employer. For those of us who are located in smaller towns which have no industry large enough to support a man independently, it is necessary from an economic standpoint that a man be not limited to carry on with one single company. With that in mind we must recognize that there are none of us who probably are capable of handling all the particular situations that come up. It seems evident that a man doing good, constructive work of this type is certainly going to call on those men who specialize in that particular field.

Mr. MARSHALL DAWSON, Washington, D. C. The United States Bureau of Labor Statistics has recently completed a survey of workmen's compensation administration which is, geographically, probably the widest thing that has ever been done, because it has covered the United States, Canada and Puerto Rico. If industrial physicians, becoming acquainted with such situations as have been pointed out by Dr. Hayden, would route that information into some central clearinghouse interested in labor, either the United States agency for promoting vocational rehabilitation or the United States Bureau of Labor Statistics, a great deal of good might be done. The agency charged with the task of vocational rehabilitation may be anxious to place certain deaf persons, for instance, in just those processes. You can readily see that the remarks of Dr. Hayden have opened up possibilities not only for giving employment to certain men who find it difficult to find employment but the opportunity for saving the hearing of men with normal hearing. I simply pass on the suggestion that any of you who have become acquainted with such special situations as those commented on by Dr. Hayden report the matter, with the name of the industry in which the occurrence is taking place, either to the Bureau of Labor Statistics or to the United States Office of Education, the Department of Vocational Rehabilitation.

Dr. SEEGER. I think it will be of interest, in connection with Mr. Dawson's remarks relative to clearinghouse possibilities, that one of the early arguments favoring the formation of the Council on Industrial Health was advanced by the Section on Dermatology and Syphilology of the American Medical Association with this very point in view. Dermatologists, as you know, both in private practice and in the United States Public Health Service under Dr. Schwartz, have done a tremendous amount of work in the field of industrial dermatology, and it is desirable because of the presence of dermatologic conditions in industry to disseminate information to men who practice without the opportunities of clinical material. The possibility of a clearinghouse for various fields is being reviewed by the Council, but it is, as Mr. Dawson and all of us must realize, a tremendous task and offers some very practical difficulties which I hope, as time goes on, it will be possible to solve with your help.

DR LOYAL A SHOUDY, Bethlehem, Pa I still want to say that what industry wants and what the employee wants is the good doctor in industry We want it from the standpoint of the employer and we want it from the standpoint of the employee Dr Marble is going to go ahead on that

DR H C MARBLE, Boston I agree with Dr Shoudy that what is needed in industrial work is better doctors, as better doctors become interested in the treatment of the industrial sick and injured the problem will take care of itself Our problem in the future is the problem of education, the getting of adequate teaching in the medical schools, the getting of better teaching in the graduate schools Until we get more training more graduate teaching in our medical societies, our discussions about the inadequacy of certain physicians avail nothing We have got to have better doctors doing industrial work

MR E T BUCKINGHAM Bridgeport, Conn Might I ask a question? The doctor from South Bend Ind, brought up a question that is very interesting to us commissioners where we have a hearing and one doctor says "Yes" and another doctor says "No" and then you select a third How do you arrange for the payment of the third physician? We are troubled with that problem all the time

MR DAWSON In most states that amount is charged directly to the insurance carrier Most compensation administrations do use that impartial physician

DR HAYDEN Maybe the reason you had to bring in a third party was that the original physician or employer or employee did not have the proper standards by which to evaluate their observations Dr William P Wherry is interested for the Council on Physical Therapy is evaluating hearing loss in the same way that the original evaluation was done in 1916, beginning in the Section on Ophthalmology of the American Medical Association, for vision When that is done when we can come before a court and say that a man is disabled to a certain extent and to exactly what extent he is disabled by a

certain hearing loss, maybe the necessity for third party consultants will be much less I should like to hear from Dr Wherry

DR W P WHERRY, Omaha The program has not as yet gotten far enough under way to discuss it I would prefer to hold that for a later date

(To be continued)

## RADIO BROADCASTS

The fourth series of programs broadcast in dramatic form portraying fictitious but typical incidents of significance in relation to health by the American Medical Association and the National Broadcasting Company entitled "Your Health," began Wednesday October 19 and will run consecutively for thirty-six weeks The program is broadcast each Wednesday over the blue network of the National Broadcasting Company at 2 p m eastern standard time (1 p m central standard time, 12 noon mountain time 11 a m Pacific time)<sup>1</sup>

These programs are broadcast on what is known in radio as a sustaining basis that is, the time is furnished gratis by the radio network and local stations and no revenue is derived from the programs Therefore local stations may or may not take the program, at their discretion except those stations which are owned and operated by the National Broadcasting Company

The next three programs to be broadcast together with their dates and their topics, are as follows

February 8	Avoiding Arthritis
February 15	Healthy Hearts
February 22	Cancer Can Be Cured

1 Owing to program conflicts there will be no Chicago broadcast of the network program Instead a recording of the program will be broadcast over station WENR at 8 p m each Wednesday This recording will be an identical rebroadcast of the network program broadcast earlier the same day

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Bills Introduced*—S 569, introduced by Senator Hatch New Mexico, proposes to extend the provisions of the United States Employees' Compensation Act to enrollees in the Civilian Conservation Corps suffering disability or death resulting from injury while in the performance of duty S 672 introduced by Senator McKellar Tennessee, and H R 1520 introduced by Representative Taylor Tennessee propose to indemnify certain named physicians in the amount of \$10 000 each for loss of practice due to the flooding of areas in which they formerly engaged in practice, resulting from the construction of the Norris dam S 1007, introduced by Senator Bone Washington provides that the licensed personnel of the Bureau of Marine Inspection and Navigation Department of Commerce regularly engaged in the inspection of steam and motor vehicles and the licensed local pilots actively engaged in piloting vessels in the United States waters shall be entitled to medical relief without charge at the hospitals and other stations of the United States Public Health Service, under the rules and regulations governing the care of seamen of the merchant marine S 1021, introduced by Senator Sheppard Texas proposes to extend the benefits of the United States Employees' Compensation Act to members of the Officers' Reserve Corps and of the Enlisted Reserve Corps of the Army who are physically injured in line of duty while performing active duty or engaged in authorized training H R 1950, introduced by Representative Bland Virginia proposes that commissioned officers of the United States Coast and Geodetic Survey and their widows children and dependent parents shall be entitled to the benefits administered by the Veterans Administration under the same regulations and restrictions as are or may be provided by law with respect to officers of the Army Navy Marine Corps and Coast Guard H R 1985 introduced by Representative Robison Kentucky proposes to reenact all

laws in force on March 19 1933 granting presumptive service connection of disease or disabilities to World War veterans H R 2296, introduced by Representative Rankin Mississippi proposes that, after the date of enactment of the bill any World War veteran suffering from paralysis, paresis or blindness or who is helpless or bedridden as the result of any disability may be awarded compensation under the laws and interpretations governing this class of cases prior to the enactment of the Economy Act of March 20 1933 H R 2893 introduced by Representative Izac California proposes that hereafter retired enlisted men of the Army, Navy Marine Corps and Coast Guard when hospitalized or domiciled in either an Army or Navy hospital or United States naval or United States soldiers home, shall be extended such treatment or domiciliary care without cost H R 3055 introduced by Representative Randolph, West Virginia proposes to provide for the retirement of nurses attendants or orderlies in any neuropsychiatric hospital or ward in any hospital operated by the government of the United States after the completion of twenty-five years of service H R 3115 introduced (by request) by Representative Buckler Minnesota proposes to extend the status of veterans of the World War to persons enlisted and serving on United States Shipping Board vessels during the World War in war zones H R 3137 introduced by Representative Spence Kentucky, proposes to authorize an appropriation of \$350 000 to construct a hospital building of 146 bed capacity at the Veterans Administration Facility Lexington Ky to provide adequate hospital and outpatient dispensary facilities to care for veterans entitled to hospital care and treatment under the laws and regulations administered by the Veterans Administration H R 3214 introduced by Representative Geyer California proposes to authorize an appropriation of \$2 500 000 to construct a marine hospital at Los Angeles Harbor Los Angeles



## STATE MEDICAL LEGISLATION

## Alabama

*Bill Introduced*—H 56 proposes to require the governing body of each county to appropriate annually a sum equivalent to not less than 20 cents per capita of the population of such county, to be used for the maintenance and operation of a full time county health department under the direction of the county board of health and the county health officer and subject to the supervision and control of the state board of health

## Arkansas

*Bill Introduced*—H 101 proposes to prohibit the operation of a hospital unless licensed by the state board of health. The board is to be authorized to revoke the licenses of a hospital having 'sanitary conditions and ethical conduct' contrary in the opinion of the board to the best interest, safety and welfare of the people. The bill specifically provides that "The standard of ethics as adopted by the American Medical Association at date of passage of this Act is hereby adopted as a standard by which any hospital in this State shall operate"

## California

*Bills Introduced*—S 234, to amend those provisions of the Business and Professions Code stating the educational qualifications required of applicants for licenses to practice medicine, among other things, apparently proposes to make no differentiation with respect to requirements for licensure between graduates of Canadian medical schools approved by the board of medical examiners and graduates of approved American medical schools. A 531, to amend those provisions of the Business and Professions Code stating the educational qualifications required of applicants for licenses to practice chiropody, proposes that each applicant graduating from a chiropody college after Jan 1, 1941, present satisfactory evidence of having completed a one year resident course of 'pre-chiropodial work of college grade' in a school approved by the board of medical examiners before commencing the resident course of professional instruction. A 532 to amend those provisions of the Business and Professions Code relating to chiropody, proposes to make "Advertising free chiropodial services or examinations as an inducement to secure chiropodial patronage or advertising any amount as a price or fee for services" unprofessional conduct within the meaning of the code

## Georgia

*Bill Passed*—S 1 passed the senate January 20, proposing to create a state hospital authority to construct, operate and maintain self-liquidating projects embracing hospitals, sanatoriums, dormitories and housing accommodations and utilities and other facilities in connection therewith, at institutions under the control or supervision of any state agency or department. The authority is to be authorized to issue revenue bonds payable solely from the earnings and revenues of projects under the jurisdiction of the authority. A companion bill (H 1) has been introduced in the house

## Idaho

*Bill Introduced*—H 37 proposes to enact a cosmetology practice act and to create a state board of cosmetology to examine and license persons to practice cosmetology. Among other things, a licensed cosmetologist is to be authorized to remove superfluous hair from the body of any person by the use of depilatories or by the use of tweezers, chemicals, preparations or by the use of devices or applications of any kind or description

## Illinois

*Bill Introduced*—S 32, to amend the uniform narcotic drug act, proposes to redefine "cannabis" within the meaning of the act to include "all parts of the plant *Cannabis sativa* L., whether growing or not, the seeds thereof, the resin extracted from any part of such plant, and every compound, manufacture, salt, derivative, mixture, or preparation of such plant, its seeds, or resin, including specifically the drugs known as American hemp, marihuana, Indian hemp or hasheesh, as used in cigarettes or in any other articles, compounds, mixtures, preparations, or products whatsoever, but shall not include the

mature stalks of such plant, fiber produced from such stalks, oil or cake made from the seeds of such plant, any compound, manufacture, salt, derivative, mixture, or preparation of such mature stalks (except the resin extracted therefrom), fiber, oil or cake, or the sterilized seed of such plant which is incapable of germination"

## Indiana

*Bill Introduced*—H 78, to amend the narcotic drug act, proposes to redefine "cannabis" as to include "all parts of the plant *Cannabis sativa* L., whether growing or not, the seeds thereof the resin extracted from any part of such plant, and every compound manufacture, salt, derivative, mixture, or preparation of such plant, its seeds, or resin, including specifically the drugs known as American hemp, marihuana, Indian hemp or hasheesh, as used in cigarettes or in any other articles, compounds, mixtures, preparations, or products whatsoever, but shall not include the mature stalks of the plant, fiber produced from such stalks, oil or cake made from the seeds of such plant, any compound, manufacture, salt, derivative, mixture, or preparation of such mature stalks (except the resin extracted therefrom), fiber, oil or cake or the sterilized seed of such plant which is incapable of germination" This bill was reported favorably to the house on January 20

*Bill Passed*—H 37 passed the house January 25, proposing to appropriate \$75,000 annually for the biennium beginning July 1, 1939 with which the state board of health is to be authorized to purchase and to distribute free of cost to poor persons pneumococcus serum, diphtheria toxoid, smallpox virus and typhoid bacterins

## Iowa

*Bills Introduced*—S 28 proposes to require every physician attending a pregnant woman to take or cause to be taken a sample of her blood at the time of first examination and to submit that sample for standard serologic tests for syphilis to the State Hygienic Laboratory of the State Department of Health or to any laboratory approved by the department. H 30 proposes to require every person entering employment in any capacity in any food establishment to furnish the employer with a certificate of health and to furnish a similar certificate annually thereafter

## Kansas

*Bill Introduced*—H 44 proposes to enact a separate naturopathic practice act and to create an independent board of naturopathic examiners to examine and license persons to practice naturopathy. The bill proposes that any licensed naturopath may 'diagnose and treat diseases, injuries, deformities and other mental and physical conditions of human beings by means of the physiological and material sciences, such as physiotherapy, mechanotherapy, massage, corrective orthopedic gymnastics, neurotherapy, phytotherapy, hydrotherapy, psychotherapy, electrotherapy, thermotherapy, biochemistry, chromotherapy, vibrotherapy, thalamotherapy, dietetics, first aid, and such natural methods as are taught now or in the future in the approved naturopathic schools or colleges, to restore and maintain health" The bill specifically provides that nothing in it shall be construed to authorize any naturopath to administer or prescribe drugs or to practice surgery, osteopathy, chiropractic or Christian science

## Massachusetts

*Bills Introduced*—S 219, to amend the law prohibiting the operation of motor vehicles except by persons licensed to do so, proposes that each applicant for such a license be required to furnish a written certificate, after an acceptable medical examination, showing physical and mental fitness with a favorable intelligence rating. S 258 to amend the medical practice act, proposes that the term "practice of medicine" or "rendering medical service" shall include 'any examination or treatment of a human being, by the use or disuse of any means, for the purpose of diagnosing, preventing or curing any deviation from normal condition of mind or body or for the purpose of relieving any condition of mind or body whether arising from such a deviation or otherwise" H 985, to amend the medical practice act, proposes to provide that two members of the board of registration in medicine be osteopaths. H 986, to amend the medical

practice act, proposes that the approving authority vested with the right to approve schools from which applicants for licenses must be graduated shall consist of one doctor of medicine, one doctor of osteopathy, the commissioner of education and the commissioner of public health. The bill also proposes that the approving authority shall approve all medical schools which have the approval of the American Medical Association and all osteopathic schools which have the approval of the American Osteopathic Association, unless the decision to the contrary by the approving authority is unanimous on the part of all its members. H 1127 proposes to authorize the county commissioners of any county having a tuberculosis hospital to provide for the treatment of persons suffering from a disease other than tuberculosis when suitable accommodations are available. H 1221 to amend the workmen's compensation act, proposes that the employer's insurer shall pay to any nurse rendering nursing services in a hospital the rate of compensation prevailing in the city or town wherever such hospital is located.

#### Michigan

*Bill Introduced*—H 47, to amend the dental practice act, proposes to authorize the revocation or suspension of the license of any dentist "For advertising professional superiority or the performance of professional services in a superior manner, advertising prices for professional services, advertising by means of large display, glaring light signs, or containing as a part thereof the representation of a tooth, teeth, bridge work or any portion of the human head, employing or making use of advertising solicitors or free publicity agents, or advertising any free dental work, or free examination, or advertising to guarantee any dental service, or to perform any dental operation painlessly."

#### Minnesota

*Bill Introduced*—H 111 proposes to authorize the state board of control to establish a statewide system for the after-care of patients discharged from county and state tuberculosis sanatoriums.

#### New Mexico

*Bills Introduced*—H 13 proposes to enact a chiropody practice act and to establish a board of chiropody examiners to examine and license persons to practice chiropody. The bill proposes to define chiropody as "The diagnosis and the medical, surgical, mechanical, manipulative and electrical treatment of ailments of the human foot excepting amputation of the foot or toes or the administration of an anesthetic other than local." H 42, to amend the medical practice act, proposes to limit licensure to applicants who are citizens of the United States and who are graduated from medical colleges situated in the United States.

#### New York

*Bills Introduced*—A 279 and A 307 propose to enact a so called consumers protection act to prevent the manufacture and sale of adulterated or misrepresented drugs, foods, cosmetics or health devices and to regulate the traffic therein. S 180 and A 260 propose to authorize courts to enjoin persons engaging in the unlicensed practice of any profession for which a license and registration are required. A 269 proposes to make hospital records, or accurate copies thereof when certified by the officer in charge of the hospital admissible in courts as prima facie evidence of the contents thereof, provided that any declarations or statements made by the injured party of a nonmedical nature or which are explanatory or descriptive of the occurrence, happening or accident in question are not to be admissible. A 302 proposes to require a person engaged in the preparation, sale, inspection, supervision or handling of any food to submit to such examination including a standard serologic test as may be necessary for the discovery of syphilis, by a duly licensed physician at least once in every six months and to prohibit employment unless free of syphilis. A 218 and A 295 to amend the law requiring physicians attending a pregnant woman to take or cause to be taken a sample of her blood for a serologic test by an approved laboratory propose that a detailed report of the laboratory test, showing the result of the test shall be transmitted by the laboratory to the physician and that a copy of this report shall be submitted to the district state health officer or in a city of over 50,000 population or in a county health district to the department of health of such city or county.

#### North Dakota

*Bill Introduced*—H 113 proposes that "In all cases in which the Board of County Commissioners, State Welfare Board, or any other public board having supervision of poor relief shall provide medical assistance to indigent persons, such assistance shall be furnished by a Medical doctor, an Osteopath, a Chiropractor, or other legally licensed practitioners in the State of North Dakota, as requested by such indigent persons."

#### Ohio

*Bills Introduced*—S 28 proposes as a condition precedent to the issuance of a license to marry that both parties to the proposed marriage present physicians' certificate that they have been given such examination, including a standard serologic test made by a duly authorized representative of the state board of health as may be necessary for the discovery of syphilis, made on a day not more than twenty days preceding the date of application, and that, in the opinion of the physicians, the parties are not infected with syphilis. The bill proposes however that, if the woman is pregnant at the time of application for license to marry, the application be accepted without the certificate referred to being furnished by either party. S 22 proposes to create a commission to study, investigate and survey the possibilities for the rehabilitation of the visual and physically handicapped of the state. This commission is to consist of five persons named by the speaker of the house, five persons named by the president of the senate and three persons named by the governor.

#### Oklahoma

*Bill Introduced*—H 103 proposes that "Any regularly licensed physician or surgeon shall have the right to practice in any public or private hospital in this State, and the owner or manager of any such hospital who denies any such physician or surgeon from practicing in such hospital, or who refuses to admit any patient to such hospital because such patient desires to be treated by any particular physician or surgeon, upon conviction thereof shall be guilty of a misdemeanor."

#### Pennsylvania

*Bills Introduced*—S 12 proposes to require every physician who attends any woman pregnant with child to take or cause to be taken a sample of her blood at the time of the first examination and to submit that sample to an approved laboratory for a standard serologic test for syphilis. S 13 proposes to require as a condition precedent to the issuance of a license to marry that both parties to the proposed marriage present a statement signed by licensed physicians that both parties within thirty days of the application have submitted to examinations to determine the existence or nonexistence of syphilis, which examinations have included standard serologic tests for syphilis, and that in the opinion of the examining physician the applicants with syphilis or if so infected are not in a stage of that disease which may become communicable. H 28 proposes to prohibit the retail sale or distribution of sulfanilamide except on the written prescription of a licensed physician, dentist or veterinarian. A pharmacist is not to dispense any sulfanilamide without affixing to its container the label bearing the name and address of the pharmacist, the date compounded, the consecutive number of the prescription under which it is recorded in his prescription files and the name of the physician, dentist or veterinarian prescribing it. Physicians, dentists and veterinarians must keep a record of the amount of sulfanilamide purchased by them and dispensing records showing the dates on which and the names and addresses of patients to whom they have dispensed the drug and notations as to the quantity of the drug dispensed.

#### Wisconsin

*Bill Introduced*—A 55 to amend the workmen's compensation act, proposes to permit an injured employee to select at his employer's expense any physician, chiropractor or osteopath to attend him for his industrial injuries.

#### Wyoming

*Bill Passed*—H 18 has passed the house proposing that one member of the state board of health be a licensed dentist.

*Bill Introduced*—H 65 proposes to prohibit the sale of adulterated and misbranded cosmetics.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS REPLATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### CALIFORNIA

**Mortality Rate in 1937**—There were 80,322 deaths registered in California in 1937, according to the state department of health. The death rate was 123 per thousand of estimated population, the highest for the state since 1928, when it was 125. Diseases of the heart and circulatory system led the list of causes of death with a total of 24,598. Cancer caused 8,670 deaths. There were 276 deaths attributed to whooping cough. Of the total number of deaths in the state, 71,295 were of members of the white race, 1,695 Negroes, 455 Indians, 545 Chinese, 620 Japanese, 5,257 Mexicans, 282 Filipinos and 173 of other races.

### COLORADO

**Society News**—The Mesa County Medical Society was addressed in Grand Junction December 20 by Dr. Edward L. H. Munro, Grand Junction, on silicosis. At a meeting of the Northern Colorado County Medical Society December 8, Dr. John V. Ambler, Denver, discussed 'Skin Conditions Affecting the Genitals'. Dr. William W. Haggart, Denver, discussed medical economics before the medical society, Sterling, January 12. At a meeting of the Fremont County Medical Society, Florence, December 19, Drs. Vardis A. Hutton, Florence, and Thomas A. Davis, Portland, discussed lobar pneumonia and bronchial pneumonia. The Pueblo County Medical Society was addressed in Pueblo January 17 by Drs. Charles Walter Metz and Clifford L. Hooper, Pueblo, on 'Newer Anesthetic Agents and Fupral Bursal Anesthesia with Cyclopropane' respectively.

### ILLINOIS

**Pictures of Physicians**—The Morgan County Medical Society recently sponsored an exhibit of more than 2,000 pictures of physicians and surgeons at the David Strawn Art Home, Jacksonville. The display also included about 1,000 pictures of medical subjects such as monuments and hospitals. The entire collection is the property of Dr. Carl L. Black.

**Society News**—Dr. Frederick W. Fitz, Chicago, addressed the Rock Island County Medical Society in Moline January 10 on "Heart Disease in Relation to Certain Manifestations of Nephritis". Dr. Willard Van Hazel discussed 'Treatment of Empyema' before the Kankakee County Medical Society in Kankakee January 12. At a meeting of the McHenry County Medical Society in Woodstock January 19, Dr. Philip H. Schneider, Evanston, spoke on 'Toxemia of Pregnancy'. The Will Grundy County Medical Society was addressed at Joliet January 18 by Dr. Robert B. Malcolm, Chicago, on hematuria. Dr. John A. Bigler, Highland Park, addressed the Ogle County Medical Society January 19 on 'Use of Sulfanilamide in Pediatric Practice'. Dr. Norman Tobias, St. Louis, discussed 'Treatment of the Common Dermatoses' before the Perry County Medical Society, DuQuoin, December 2.

### Chicago

**The Hektoen Lecture**—Dr. Eleonora T. Bell, professor of pathology, University of Minnesota Medical School, Minneapolis, will present the fifteenth Ludvig Hektoen Lecture of the Frank Billings Foundation at the Palmer House February 24. He will discuss 'The Pathogenesis of Glomerulonephritis Including Lipoid Nephrosis'.

**Medicodental-Military Training Course**—The second Chicago medicodental-military training course will be held February 26-March 11. Attendance is not restricted to those from the Chicago area. Requests for additional information concerning the course should be addressed to the commanding general, sixth corps area, Post Office Building.

**Personal**—Dr. John R. Neal, Springfield, has been appointed dean of the Cook County Graduate School of Medicine. Dr. Neal is secretary of the Illinois Professional Committee for Medicine, state department of registration and education and formerly served as president of the state medical society. He graduated at Northwestern University Medical

School in 1909. Miss B. Fain Tucker, an attorney, has recently written a comprehensive article entitled "Social Health Laws" in which she reviews existing legislation concerning the issuance of licenses to marry from a health point of view.

### MAINE

**Society News**—At the annual meeting of the Oxford County Medical Society in Bethel recently, Dr. Gilbert E. Haggart, Boston, among others, discussed some problems in bone and joint surgery. Dr. Maxwell E. Macdonald, Boston, addressed the Cumberland County Medical Society in Portland December 9 on 'Emotions and Bodily Changes'. At a meeting of the Portland Medical Club December 6, Dr. Edwin W. Gehring, spoke on 'The Interrelation Between Medicine and General Economics'. Dr. Albert Warren Stearns, Boston, discussed medicolegal problems before the Kennebec County Medical Association in Augusta December 15. At the annual meeting of the Waldo County Medical Society in Belfast January 26, Dr. Charles B. Popplestone, Rockland, spoke on electrocardiography.

**Graduate Fellowships in Obstetrics and Gynecology**—The Bingham Associates Fund is offering fellowships in obstetrics and gynecology to practicing physicians of Maine, the work to be conducted under the supervision of the faculty of Tufts College Medical School. The facilities of the New England Medical Center, the Joseph H. Pratt Diagnostic Hospital, the Poston Dispensary and the Evangeline Booth Maternity Hospital, Boston, will be utilized. The fellowships are for one month each and are available to graduates of approved medical schools. Each fellowship carries an honorarium of \$250. Rooms and meals are available to fellows at reduced rates in the medical center. Additional information may be obtained from Dr. Samuel Proger, 25 Bennett Street, Boston, Dr. Frederick R. Carter, Augusta, or Dr. Frederick T. Hill, the Professional Building, Waterville.

### MASSACHUSETTS

**Society News**—The Greater Lawrence Medical Association held its first annual dinner in Methuen November 17 with Dr. John F. Curtin, Lawrence, as toastmaster. The speakers included Drs. Charles F. Mongan, Somerville, formerly president of the state medical society, and Frank H. Lahey, Boston. Organized Dec. 12, 1933, the society's membership is made up of physicians in Lawrence, Methuen, North Andover, Andover, Mass., and Salem, N. H.

**Annual Meeting of Gynecologists**—The tenth annual meeting of the New England Obstetrical and Gynecological Society was held in Boston in December under the presidency of Dr. Bertram H. Buxton, Providence, R. I. Clinics made up a large part of the program and papers were delivered by the following, among others:

Dr. Somers H. Sturgis, Treatment of Dysmenorrhea with Estrin.  
Dr. Joe V. Meigs, The Technique of Total Hysterectomy and Its Use in Patients with Cystocele and Urolyse.  
Dr. Charles Langdon Parsons, Endometriosis.  
Dr. Marshall K. Bartlett, Recent Vitamin C Studies.  
Dr. Ward I. Gregg, Demonstration of the Samuels Apparatus to Detect Ovulation.  
Dr. Edward B. Benedict, Peritoneoscopy.  
Dr. Fuller Albright, Treatment of Ovarian Insufficiency.  
Dr. Oliver Cope, Experiences with Adrenal Tumors.

### MICHIGAN

**Adjusters Medical Committee**—A joint committee, composed of representatives of the Wayne County Medical Society and the Detroit Adjusters Association, has been established for discussions and cooperative studies designed to correct the causes of complaints and to eliminate such abuses as may be current and particularly to remove friction from the several interests represented on a voluntary basis and without necessity of resorting to mandatory measures. Members of the committee are Drs. Howard B. Garner, chairman, Earl G. M. Krieg and Frank T. McCormick, and Messrs. L. J. Carey, E. Dean Alexander and William H. Heidt.

**Changes in State Health Department**—Dr. Richard Sears, epidemiologist with the Michigan State Department of Health and recently acting director of the Muskegon County health department, has been appointed director of health district number 5, including Lake Newaygo and Oceana counties, succeeding Dr. Guy R. Post who resigned. His headquarters will be in White Cloud. William E. Bunney, Ph.D., director of the biologic products division of the state department of health for seven years, has resigned to become director of biologic products for E. R. Squibb & Sons, New Brunswick, N. J. George F. Forster, Ph.D., Lansing, who has been

engaged in research on pneumonia for the department during the past two years, has resigned to become assistant director of the laboratories of the Illinois State Department of Health, Springfield, according to the state medical journal

## MISSOURI

**Lectures on Tuberculosis**—The Missouri Tuberculosis Association is sponsoring a series of lectures for colleges in the state. Speakers at the Central Missouri State Teachers College, Warrensburg December 13-15 were Drs Paul A. Teschner, assistant director Bureau of Health Education American Medical Association, Chicago, on "The History of Tuberculosis" Herbert L. Mantz, Kansas City, Treatment and Diagnosis of Tuberculosis and Jesse E. Douglass, Webb City, 'Sociology and Tuberculosis'.

**Society News**—Dr Warren H. Cole Chicago discussed 'Late Advances in Diseases of the Pancreas' before the Kansas City Academy of Medicine December 16—Dr Walter Roger Moore discussed 'The Treatment of Toxicity of Snake Bite' before the Buchanan County Medical Society in St. Joseph January 4—The Chariton County Medical Society was addressed in Salisbury recently by Drs Arthur Lloyd Stockwell and Paul C. Quistgard, Kansas City on Clinical Interpretation and Management of Pyuria and Hematuria and Intestinal Obstruction respectively.

**Cornerstone Laid for Cancer Hospital**—The cornerstone of the Ellis Fischel State Cancer Hospital, Columbia was laid with suitable exercises December 9. The speakers included Mr Frank T. Hodgdon chairman of the state cancer commission who presided Lloyd Crow Stark, governor of Missouri and Clarence C. Little D.Sc. Bar Harbor Maine. The hospital is named for the late Dr Ellis Fischel first chairman of the commission. Dr Fischel was instrumental in the passage of the bill by the fifty ninth general assembly of Missouri which created the cancer hospital and instituted the program for cancer control in the state. The bill also established the cancer commission and provided for the formation of various diagnostic tumor clinics throughout the state. The hospital will occupy a forty acre site donated by the city of Columbia. It will cost about \$900,000 the state appropriating \$500,000 and the PWA the remainder. The building will consist of seven stories and a penthouse offering an approximate capacity of eighty-three beds.

## NEW JERSEY

**Tuberculosis Meeting in Jersey City**—A clinical session of the Tuberculosis Sanatorium Conference of Metropolitan New York will be held at the Hudson County Tuberculosis Hospital Jersey City, February 15 with the following speakers: Drs Frank C. Henry Jr, Perth Amboy, on 'End Results in Thoracic Surgery with the Use of Ultra-violet Radiation' Thomas de Cécio Secaucus, Management of Nonpyematous Pleural Effusions Complicating Artificial Pneumothorax and Paul Geary Plainfield Extrapleural Pneumothorax.

**Society News**—Dr John J. H. Keating New York addressed the Bergen County Medical Society Englewood January 10 on Background and Newer Aspects of Coronary Diseases—Dr John A. Kolmer, Philadelphia addressed the Essex County Anatomical and Pathological Society Newark January 26 on The Toxicity and Therapeutic Applications of Sulfanilamide. Dr Reuben Ottenberg New York opened discussion—At a meeting of the New Jersey Neuro-Psychiatric Association December 14 Dr Ambrose F. Dowd Newark was reelected president. Dr Laurence M. Collins Greystone Park was elected vice president and Dr Henry A. Davidson, Newark, secretary.

## NEW YORK

**Court Upholds Refusal to Endorse Foreign License**—The appellate division of the Supreme Court of New York handed down a decision January 11 upholding the refusal of the Board of Regents of the University of the State of New York to endorse the Italian license or diploma to practice medicine of Dr Gustave G. E. De Luca. The board refused to endorse the license on the ground that there is great uncertainty as to whether the standards of the European institutions today are comparable to what they were when the law was enacted which gives the commissioner and the board of regents authority to endorse foreign licenses without examination. The board offered the petitioner in this case the opportunity to take the licensing examinations.

## New York City

**Hospital News**—Dr George G. Ornstein delivered the Pol N. Coryllos Memorial Lecture on Thoracic Diseases at the Manhattan General Hospital January 9 on 'Classification and Management of Pulmonary Tuberculosis'—Dr Otto Marburg, formerly professor of neurology at the University of Vienna gave a lecture at Mount Sinai Hospital January 24 on 'Hydrocephalus Clinical Manifestations Pathogenesis and Therapy'.

**Women Physicians' Meeting**—The semiannual meeting of the Women's Medical Society of New York was held January 7-8. At the scientific session the first day at Lenox Hill Hospital the speakers were Drs Margaretha A. Ribble on 'The Relation of Infant Nurture to Mental Health' Frances L. H. Bogatko 'Five Year Follow-Up to Fifty Cases of Varicose Veins Treated by Injection', Mary M. Thomson 'Difficulties of Parents in Understanding Their Children' and Martha Theresa Scanlan 'Recent Advances in the Treatment of Pulmonary Tuberculosis'.

**Meeting on Pneumonia**—At a meeting of the section on medicine of the New York Academy of Medicine January 17 Dr Yale Kneeland Jr spoke on 'Pneumonias Other than Pneumococcus Pneumonia' and a group of speakers reported on the use of sulfapyridine in the treatment of lobar pneumonia. The speakers were Herbert E. Stokinger on 'The Absorption Acetylation and Excretion of Sulfapyridine' Drs Norman H. Plummer and Herbert K. Emsworth representing New York and Bellevue hospitals. Colin M. MacLeod Rockefeller Institute Charles A. Ragan Jr and Crispin Cooke Presbyterian Hospital, and Ezra B. Sanford Roosevelt Hospital. Drs Alphonse R. Dochez and Jesse G. M. Bullowa discussed the contributions.

## NORTH CAROLINA

**Conference on Maternal and Child Health**—A State-wide Conference on Better Care of Mothers and Babies will be held in Raleigh February 15 under the auspices of the National Council for Mothers and Babies and the North Carolina State Board of Health. There will be symposiums on 'Safeguarding the Infant and Young Child and Reduction of the Hazards of Childbirth to the Mother and Baby' in the morning. In the latter symposium Dr Edum F. Dail of the U. S. Children's Bureau Washington D. C. will be a guest speaker. Among other guests will be Drs Fred L. Adair Chicago chairman of the American Committee on Maternal Welfare, and Martha M. Lhot Children's Bureau Washington. Dr F. Bayard Carter professor of obstetrics and gynecology, Duke University School of Medicine Durham will summarize the discussions at the end of the day. Dr Aldert S. Root Raleigh chairman of the North Carolina section of the American Academy of Pediatrics will be chairman of the conference.

## OHIO

**Public Health Lectures in Cleveland**—The ninth annual series of free public health lectures sponsored by the Academy of Medicine of Cleveland, the Albert Fairchild Holden Foundation and the Cleveland Medical Library Association will begin February 12 with a lecture by Dr Howard Dittich on 'Getting Ready for Married Life'. The succeeding lectures will be presented by Drs Neil F. McDermott February 26 on 'Adjustments of Married Life' and Chauncey W. Wyckoff March 12 on 'The Young Age Child'.

**Personal**—Dr George W. Cline Cleveland with Mrs Cline and Daniel P. Quiring Ph.D. assistant professor of biology at Western Reserve University School of Medicine recently undertook an expedition to Guatemala to study animals in pursuit of information on comparative anatomy. In addition they will make measurements of metabolism on primitive Indians in Guatemala. The trip is sponsored by the Cleveland Clinic Foundation—Dr Earl Crafts has resigned as psychiatrist at the Luna State Hospital to enter private practice—Dr Roland A. Willett Elmore was honored by the Ottawa County Medical Society recently with a testimonial dinner in Danbury celebrating his fiftieth anniversary in the practice of medicine—Dr Frederick C. Smith Marion was elected to the national House of Representatives from the eighth district in the November election. Dr Loret Le Fevre Gloucester was elected to the state house of representatives and Dr Henry T. Phillips Athens to the state senate—The Jefferson County Medical Society gave a dinner in honor of Dr Silas O. Barkhurst Steubenville November 3 in Steubenville celebrating his fiftieth anniversary of medical practice. Dr Fred M. Shugher Steubenville was toastmaster.

## OKLAHOMA

**State Society Appoints Executive Secretary**—At a meeting of the council of the Oklahoma State Medical Association December 11 Mr. R. H. Graham, Peabody, Kan., was appointed executive secretary to take office January 1. His office will be in McAlester with the secretary of the state association, Dr. Leonard S. Willour. Mr. Graham will immediately visit several states to study methods of executive secretaries.

## PENNSYLVANIA

**Diabetes Commission Formed**—At the recent annual meeting of the Medical Society of the State of Pennsylvania in Scranton a commission on diabetes was formed with Dr. Belford C. Blaine, Pottsville, as chairman and representatives of all the councilor districts as active members. Drs. David W. Thomas, Lock Haven, president of the state society, Charles H. Henninger, Pittsburgh, president elect, and Walter F. Donaldson, Pittsburgh, secretary of the state society and Dr. Edward L. Bortz, Philadelphia, are ex officio members. The commission plans to make an intensive study of the incidence and mortality from diabetes, the complications, facilities for treatment and the facilities for education of physicians. It hopes to disseminate knowledge to the public as well as to physicians, nurses and technicians. At the same time the commission was formed as an agency of the state society, a diabetic society was organized with Dr. Joseph T. Beardwood, Jr., Philadelphia, as president and Dr. Blaine, Pottsville, as secretary.

## RHODE ISLAND

**Society News**—Dr. Albert Warren Stearns, Boston, addressed the Providence Medical Association January 9 on "The Evolution of the Concept of Functional Nervous Diseases." Mr. Myron Weiss, associate editor of *Time*, New York, and Dr. David R. Lyman, Wallingford Conn., addressed the association at its December meeting on "The Future Pattern of Medicine" and "Early Diagnosis of Tuberculosis" respectively. The association has recently added the presentation of a weekly radio program to its activities.

## VIRGINIA

**State Board Appointment**—Dr. William B. McIlwaine III, Petersburg, has been appointed to the state board of medical examiners to succeed the late Dr. Fletcher J. Wright, Petersburg, it is reported. The appointment is for four years.

**Society News**—"The National Health Program and Medical Care" was the subject of discussion at the quarterly meeting of the Augusta County Medical Society recently in Staunton. Among the speakers were Drs. Hugh H. Trout, Roanoke, president-elect of the Medical Society of Virginia, and Walter B. Martin, Norfolk, chairman of the committee on medical economics of the state society.—Dr. Hamilton W. McKay, Charlotte, N. C., among others, addressed the Roanoke Academy of Medicine recently on pediatric urology.—Drs. John A. Kolmer, Philadelphia, and Cecil S. O'Brien, Iowa City, addressed the Richmond Academy of Medicine recently on "Toxicity and Therapeutic Applications of Sulfanilamide" and "Common Causes of Loss of Vision" respectively.—Speakers at a meeting of the South Piedmont Medical Society in South Boston recently included Drs. Hugh H. Trout, Roanoke, on "Posthospital Care of Surgical Patients", Kinloch Nelson, Richmond, "Diagnosis and Treatment of Aortic Syphilis," and Flavius O. Plunkett, Lynchburg, "Obstetric Analgesia and Anesthesia."

## GENERAL

**Examination Date Changed**—The American Board of Pathology announces that it has changed the date of its next examination from April 8-9 to April 3-4.

**Congress on Military Medicine**—The tenth International Congress of Military Medicine and Pharmacy will be held in Washington, D. C., May 7-15, with headquarters at the Hotel Willard. Major Gen. Charles R. Reynolds, surgeon general, U. S. Army, is president of the congress and the secretary general is Col. Harold W. Jones, Army Medical Library, Washington, to whom all communications should be addressed. Questions listed for discussion at the congress are organization and function of the medical services in colonial expeditions, probable casualties in war and methods of calculation, practical procedures for anesthesia and analgesia in war surgery, organization and function of the military chemico-pharmaceuti-

cal service, emergency treatment and primary apparatus for fractures of the jaw in war, technical specialization of administrative officers in the medical service and oxygen therapy and its practical use with troops on active service.

**Physicians' Art Association**—The American Physicians' Art Association, composed of members in the United States, Canada and Hawaii, will hold its second art exhibition in the Museum of Art, St. Louis May 14-20, during the annual session of the American Medical Association. In order to submit art pieces to this exhibition each exhibitor must become a member of the American Physicians' Art Association. For details of membership and exhibition rules write to Dr. Max Thorek, secretary, 850 Irving Park Boulevard, Chicago, or Dr. Francis H. Redewill, president, 870 Market Street, San Francisco.

**Mid-South Graduate Assembly**—The fifty-fourth annual session of the Mid-South Post Graduate Assembly will be held at the Hotel Peabody, Memphis, Tenn., February 14-17. There will be twenty-seven speakers, among whom are the following:

Dr. Norris W. Vaux, Philadelphia, Puerperal Sepsis  
Dr. Dean M. Tierle, Iowa City, The Causes of Hoarseness  
Dr. Leon J. Menville, New Orleans, Irradiation Therapy in Diseases of the Glands of Internal Secretion  
Dr. William P. Herley, New York, Carcinoma of the Cervix Uteri  
Problems of Diagnosis  
Dr. Edward B. Shaw, San Francisco, The Evaluation of Methods for Immunization  
Dr. Anthony Bessler, New York, The Pathologic Gallbladder: What Causes It and What to Do With It  
Dr. Saml Weiss, Boston, The Importance of Differentiation of Failure of the Peripheral Vascular System from Heart Failure  
Dr. Julius H. Hess, Chicago, The Premature Infant  
Dr. Frederick A. Collier, Ann Arbor, Mich., Peritonitis

**Birth Rate Declines with Urbanization**—Birth rates have decreased most rapidly in the past ten years in states in which the population is concentrated in urban areas according to a study reported in the *Statistical Bulletin* of the Metropolitan Life Insurance Company. A block of states from New England to Nebraska containing 50.2 per cent of the whole population of the country, showed decreases of 10 per cent or more. They include New Hampshire, Massachusetts, Rhode Island, Connecticut, New Jersey, New York, Delaware, Maryland, Virginia, Pennsylvania, Ohio, Indiana, Illinois, Missouri, Arkansas and Nebraska. All the next group with decreases of from 5 to 9 per cent in the birth rate are east of the Mississippi except California, Kansas and North Dakota, in this group is found 25.9 per cent of the nation's population. Five sparsely settled and essentially rural mountain states—Montana, Idaho, Nevada, Arizona and New Mexico—with Mississippi, recorded higher rates for the ten years. It is apparent then, the report pointed out, that the country's population growth depends on its rural nonindustrialized element. "With this situation confronting us, it is obvious that our rural areas will need the guidance of child welfare and maternal aid agencies more than ever before if they are to continue as our chief source for population growth," the bulletin concluded.

**Northwest Regional Conference in Chicago**—The Northwest Regional Conference will be held at the Palmer House, Chicago, Sunday February 12, with Dr. Carl F. Vohs, St. Louis, chairman of the Committee on Medical Economics of the Missouri State Medical Association, as president, and Dr. L. Fernald Foster, Bay City, Mich., secretary of the Michigan State Medical Society, as secretary. Beginning at 10 a. m. in the Red Lacquer Room, Dr. Major G. Seelig, St. Louis, will discuss "A State-Wide Hospitalization Plan for the Low Income Group", Dr. Walter F. Donaldson, Pittsburgh, "Pennsylvania's Public Assistance Program for the Medically Indigent", Drs. Donald A. Covall, Joseph C. Silvers and Lall G. Montgomery, Muncie, Ind., "Middletown Modernizes Medicine (lantern slides)", Dr. Theodore R. Meyer, Clayton, Mo., "The Physician's Role in a Public Health Program."

The Missouri State Medical Association will be host to the representatives from other state medical associations at a 1 o'clock luncheon, at which Dr. Vohs will make a report. The election of officers will follow.

At 2 p. m. Dr. Henry A. Luce, Detroit, will discuss "The National Health Conference". Dr. William F. Braasch, Rochester, Minn., will survey on the Need and Supply of Medical and Hospital Care, Dr. Rosco G. Leland, Chicago, "Supplementary Arrangements for Medical Care", and Mr. Clarence G. Munns, Topeka, Kan., "Kansas Can Control Cultists". All presentations will be open to general discussion.

## Government Services

### Annual Report of Public Health Service

In his annual report for the fiscal year ended June 30, 1938, released January 8, the Surgeon General, U S Public Health Service, states that the general death rate for the calendar year 1937 was 109 per thousand of population as compared with 113 for the preceding year. This favorable condition continued in 1938, when preliminary figures for the first six months disclosed a mortality rate of 108 per thousand as compared with 118 for the corresponding period of 1937.

There was a decrease in infant mortality from 571 per thousand live births for 1936 to 544 in 1937. The maternal mortality rate continued to decline, 4.6 per thousand live births in 1937 against 5.3 during 1936.

The tuberculosis mortality resumed a downward course after a slight increase in 1936. The improvement was apparent in the provisional tuberculosis death rate, which declined from 51.7 per hundred thousand population in 1936 to 49.6 in 1937.

During 1937 lowered death rates were reported for typhoid fever, scarlet fever, diphtheria, tuberculosis, malaria, pellagra, nephritis and puerperal causes. During 1937 a total of 11,673 cases of smallpox was reported, as compared with 7,834 in 1936 and 7,957 in 1935. The number of reported cases in 1937 was the highest since 1931. The prevailing smallpox is of a nonvirulent type, causing relatively few deaths.

The United States suffered minor epidemics of influenza and poliomyelitis in 1937. The number of cases of poliomyelitis, 9,511, has been exceeded only in four previous years for which records are available, 1916, 1927, 1931 and 1935.

The leading causes of death in 1937 were diseases of the heart, cancer and other malignant tumors, pneumonia, cerebral hemorrhage and softening, nephritis, accidents (except automobile) and tuberculosis.

The U S Public Health Service inspected at ports of entry 1,784 airplanes carrying 23,172 passengers and 15,873 vessels carrying 789,591 passengers and 1,196,688 seamen. Fumigation of 1,004 vessels was performed and 5,399 rats were examined for evidence of plague infection. Medical officers at various United States ports of entry inspected 2,447,339 alien passengers and 805,306 alien seamen. Of these, 20,372 passengers and 1,438 seamen were reported as having some certifiable disease or defect. In foreign countries 65,261 applications for immigration visas were examined.

The most important event in the campaign against the venereal diseases during the fiscal year was the enactment by Congress of the Venereal Disease Control Act, whereby facilities for the more effective control of syphilis and gonorrhea were placed on a permanent national basis. Congress appropriated \$3,000,000 to assist states in establishing and maintaining measures for the prevention, control and treatment of venereal diseases. The use of Social Security funds for the training of physicians in the clinical management and public health control of the venereal diseases was continued in several universities and clinics. The experimental control of syphilis among indigent people of rural areas was demonstrated by the use of a trailer clinic in Georgia. A study of untreated syphilis in a group of male Negroes was continued. Measures designed to control syphilis in industry were inaugurated.

The Public Health Service continued to supervise and furnish medical, psychiatric, technical and other scientific services to federal and penal institutions. Special studies were conducted in cooperation with the Mental Hygiene Survey Committee to stimulate interest in the adequate care of the mentally ill, bring about greater equality and wider distribution of facilities, promote uniform policies and improve the facilities for psychiatric instruction.

The twenty-seven hospitals of the Public Health Service engaged in the care and treatment of legally designated beneficiaries and also in scientific clinical research, furnished hospital and outpatient relief at 154 ports where 566,931 accredited persons applied for treatment. This represents an increase of 211,121 patients over the preceding year. Merchant seamen continued to constitute the largest class of beneficiaries. Research was continued in pyretotherapy, focal infections, arthritis and psoriasis.

The erection of specially designed structures for the National Institute of Health near Bethesda, Md., makes available increased facilities for scientific research. Continued attention was directed to the control of biologic products, particularly antipneumococcal rabbit serum and antimeningococcal serum, and close supervision over the stability of antiphthalmine.

In the field of industrial hygiene, investigations were directed to the development of means for the protection and the improvement of the health of workers in various fields of industry.

The activities of the National Institute of Health, comments the Surgeon General, are becoming increasingly numerous. Thus, one group of workers is engaged in chemical research while another is directing its attention to studies of such infectious diseases as Rocky Mountain spotted fever, typhus, scarlet fever, Weil's disease, leprosy and poliomyelitis. A special series of investigations have shed considerable light on the various phases of trichomonis infection. Clinical epidemiologic and laboratory studies of heart disease, especially the rheumatic type, have produced valuable information.

The interesting discovery was made that fluorides, which cause mottled enamel, may be removed from drinking water by treatment with manganese dioxide, a method which gives promise of economical development.

A firm basis for future cancer studies is being laid through grants in aid to selected institutions and the training of research specialists.

Every state and many cities, as well as every department and independent agency of the federal government, has received some degree of assistance from the Public Health Service in solving special health problems arising in the course of routine operations. This cooperative work is carried on principally by the division of states relations.

The availability of funds under the provisions of the Social Security Act has made it possible to assist in improving state and local health administration. From Jan. 1, 1935, to December 1937 there was an increase in full-time health units of 96 per cent. Facilities for the promotion and supervision of such full-time facilities have been developed in nineteen states.

Stimulated by federal grants in aid, the state and local appropriations for public health purposes have increased \$8,000,000 annually.

Cooperation was continued with the states and the Works Progress Administration by providing technical supervision of work relief labor projects for the construction of sanitary toilets, malaria control drainage in the South and sealing of abandoned coal mines. Certification of water supplies used by interstate carriers, a valuable measure in preventing water-borne illness, continued without interruption.

In closing, the Surgeon General recommended among other essentials the establishment in the National Institute of Health of a unit for wider chemotherapy investigations, additional funds under the Venereal Disease Control Act on an increasing scale until an annual appropriation of \$25,000,000 is reached, and the establishment of a neurologic institute for laboratory and clinical investigations of mental and nervous diseases.

### CORRECTIONS

**Returns Under the Social Security Act**—The statement in the organization section of *THE JOURNAL*, January 14, page 153, that a tax return with respect to federal old age benefit taxes is required every month, on form SS-1, was incorrect. Such returns are required quarterly on form SS 1A.

**Appointed Assistant Superintendent**—Dr. Raymond J. Gully, formerly senior physician at the Minnesota St. Peter State Hospital, St. Peter, has been appointed assistant superintendent at the Minnesota Colony for Epileptics, Cambridge. Instead of superintendent as reported in *THE JOURNAL*, January 21, page 250. The news item originally appeared in *The Journal Lancet*, October 1938, page 461.

**Sulfanilamide Omission of "not"**—In the paper by Long Bliss and Feinstein in *THE JOURNAL*, January 14, page 119, second column in the sentence beginning in the thirteenth line from the bottom, the word "not" should be inserted so that the sentence reads "Marshall and Walz express the opinion that the formation of methemoglobin is not always responsible for the cyanosis."

**Study of Medical Care**—The executive secretary of the Ohio State Medical Association has called attention to the following statement in the Ohio State Medical Association Report on the Study of Medical Care in the organization section of *THE JOURNAL*, January 21, page 243: "Legislative appropriations however have been insufficient to meet the hospital's operating expense, this condition has necessitated a reduction in the number of pay patients admitted." The exact statement in the original report was: "Legislative appropriations have been insufficient to meet the hospital's operating expense. This has necessitated the admittance of pay patients."



## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Jan 7, 1939

#### The Medical Uses of Radium

The sixteenth annual report of the Medical Research Council on the medical uses of radium reflects the increasing importance of experimental work.

#### NEUTRONS

Professor Hopwood is investigating the physicochemical effects of neutrons (particles of unit atomic weight 1 but carrying no electrical charge) and gamma rays. He has established that the effects of neutrons are of the same nature as those of the gamma rays but far more powerful and that negatively charged colloidal particles become more stable and positively charged colloids less stable when irradiated with either neutrons or gamma rays. Over a wide range of exposures the breakdown of dilute aqueous solutions of hydrogen peroxide and the oxidation of dilute solutions of potassium metabisulfite were directly proportional to the number of neutrons captured or the amount of gamma ray energy absorbed. His experiments support the view that the primary action of the radiations is on water, which suggests that the part played by water in the animal body is more important than has been supposed.

#### THE TREATMENT OF CANCER

At the Marie Curie Hospital, cancer of the corpus uteri has been treated by operation when possible and radiation has been reserved for cases in which operation was contraindicated or declined. But irradiation has given results which suggest that after all this may be the best treatment in all cases of cancer of the corpus except when the cancer is complicated by myomas or ovarian tumors or possibly when pelvic inflammatory disease is present. The five year survival rate is found to be the same for radiotherapy as for operation while the distress to the patient is much less.

Cancer of the esophagus is treated at the Middlesex Hospital by radon mounted on Souttar's tubes a dose of 3000 roentgens being given in five days, during which the patient is fed by a stomach tube passed through the nose and the Souttar tube. This procedure improves the general health, avoids the need for gastrostomy and relieves the dysphagia during subsequent roentgen therapy, which is still considered to be the best treatment.

#### RADIOTHERAPY IN METRORRHAGIA A WARNING

The Marie Curie Hospital issues a warning as to the radiotherapy of metrorrhagia in young women. The report points out that irradiation has produced abnormalities in the offspring of animals. This suggests that gene mutations may be produced in the young. As only one generation has passed since radiotherapy has been used extensively, sufficient data are not yet obtainable as to the effect on human offspring. It is important that all women of child-bearing age receiving radiotherapy be kept under observation and their descendants followed up.

#### The Value of a Surgeon's Finger Tip

The value to a surgeon of his finger tip has been the subject of judgment in a law court. Mr Hett, a London laryngologist, while on a vacation in Scotland hired an automobile for a drive. On alighting he placed his right hand on the center post of the front door in order to assist his wife, who was lame, to get out. The driver slammed the door, catching Mr Hett's right middle finger across the nail between the flange and the post and severing the bone. He brought an action for \$10,000 against the proprietress of the car for the

negligence of the driver. In the Edinburgh court of session the judge, Lord Keith, held that the driver should have looked to see that the passenger's hand was not in danger before he shut the door. His failure to do so amounted to negligence. The surgeon had suffered permanent disfigurement and loss of sensitiveness of his finger tip. Being a specialist in ear and throat surgery, he would suffer from the loss, particularly in tonsil cases. He might be unable to undertake some of the more difficult throat operations and have to rely on an assistant more than formerly. The judge had difficulty in assessing damages. Mr Hett was now 60 and he admitted that he intended to retire at 70, but he produced no figures to show his earnings during the year. The judge awarded \$3,000 damages, a little over a third of the claim.

#### London Jewish Medical Society

The eleventh annual dinner of the London Jewish Hospital Medical Society was held in London, with Prof Henry Cohen of Liverpool in the chair. The guest of honor was Dr Robert Hutchinson, president of the Royal College of Physicians, who said that he was glad to be honored by a society in which he had so many friends and whose members belonged to a race to which the science of medicine owed so much. In proportion to its numbers no race had contributed so freely to medicine especially during the last fifty years. The Jews and the Scots (of whom he is one) had many qualities in common such as devotion to education, awareness of the value of hard work and a capacity for getting on. We fear God and push him said. He suggested that both Jews and Scots were real strangers in England and should always remember that they were the guests of a kindly and tolerant people.

The society and its president was the toast proposed by Mr R. Scott Stevenson, in whose opinion too great limitations should not be imposed on the number of Jewish physicians admitted from central Europe. Replying on behalf of the society the ophthalmologist Mr Arnold Sorsby said that the persecution of the Jews was not a specifically Jewish problem but had its wider aspect: it was essentially an attack on the dignity of human life. An appeal was made on behalf of the refugees.

#### PARIS

(From Our Regular Correspondent)

Dec 31, 1938

#### Protest Against Inroads of Social Insurance and Competition of Public Hospitals

Attention was called in a letter in THE JOURNAL Dec 10 1938 to a protest meeting in Paris November 4 under the auspices of the medical syndicate or organization which has charge of public relations of the physicians practicing in Paris and its suburbs. More than 1500 practitioners attended the meeting. The president, Dr Boelle, said that practitioners with few exceptions are at present unable to earn a living. This affects recently licensed as well as older men, as shown by the number of appeals for aid from members of the syndicate. This state of affairs is a danger, because it is liable to tempt physicians to abandon the ethical methods so long upheld by the profession. Not only has the average practitioner's income been reduced but his expenses have been increased by excessive taxation and the rise in the cost of living. The department of the Seine, in which Paris is located, contains one eighth of the entire population of France and one fourth of all French practitioners. Many foreign physicians have come to France since the World War, thus adding to the competition. Another cause of the sad plight of the practitioner is the free rein given to quackery of all types. In few other countries does the press allow as much space to be occupied by advertisements of all sorts of cures. So far the medical profession has not been successful in its efforts

to suppress such practices, but some hope will be held out if proposed laws are passed

These two causes of the present depression are of minor importance compared with the major one of collective medicine as it is being practiced all over France, but not so seriously affecting the country practitioners as it does their city colleagues. A large percentage of patients, instead of consulting a physician at his office or calling him to attend them at their homes, apply for medical aid to the hospitals of the city of Paris, dispensaries of all kinds, social insurance bureaus and the organizations established by various industrial concerns. The city hospitals made no discrimination in their admission of patients. Many patients from country districts, by giving false addresses, are admitted although well able to pay for care in private institutions. It is estimated that 22 per cent of the patients in public hospitals would be refused admission if inquiries were made as to their financial status. Many patients prefer to go to a city hospital because the staffs are composed of some of the most eminent members of the profession, who are appointed after a severe competitive examination. A bill is now before the parliament which will enable a stricter control to be maintained against admission of those who are able to pay for medical aid.

A final cause of the present sad lot of the practitioner is the social insurance organization. The indemnities allowed for sickness and maternity claims have been so insignificant that it has resulted in the insureds being forced to apply to dispensaries and city hospitals instead of consulting practitioners and going to private hospitals. The insured receives only 15 francs (35 cents) from the *caisse* or social insurance office, but is obliged to pay twice as much for consulting a physician. Even if the patients go to a physician's office or call him to their homes, the *caisses* compel a great many formalities to be fulfilled and pay only after much argument.

#### Sulfanilamide in the Prevention of Puerperal Infection

Before receiving a state license, every medical student in France is obliged to submit a thesis based on clinical or research problems. Dr. Guy Picot chose as the subject of his thesis a review of the effort now being made at the Tarnier Maternity Hospital of Paris to use sulfanilamide as a prophylactic in the prevention of puerperal infection. The observations included in the thesis cover a year, the drug being given only to women at or near term. Every pathologic case was excluded from the first series to forestall any criticisms. For every patient to whom the drug was given, another was kept under observation as a control, not receiving any medication. The treatment was begun four days before labor, the total dose being 16 Gm., and four days after delivery the same total dose was given. Of 1,175 patients, 479 were given sulfanilamide and 696 used as controls. A puerperal infection occurred in fifteen or 3.13 per cent, of the 479 receiving treatment but there were no deaths. Of the 696 who did not receive any sulfanilamide ninety-seven or 13.93 per cent, had a puerperal infection, and there was one death from peritonitis. Some interesting observations were made in a second series of women who had high temperatures before delivery as evidence of amniotic infection. Of five such patients treated before delivery with sulfanilamide three failed to show any signs of puerperal complications but the others presented symptoms of mild infection. Five other women who had high temperatures before delivery and who had not received any drug treatment all presented the clinical picture of severe puerperal infection, one dying of subacute peritonitis. Although it is too early to evaluate the benefits of the administration of sulfanilamide as a prophylactic measure against puerperal infection the results thus far have been encouraging and the treatment merits wider application.

#### Saenz Appointed Professor at Montevideo

The internationally known researches on the bacteriology of tuberculosis of Dr. A. Saenz of the Pasteur Institute of Paris have received recognition by the Medical School of Montevideo, Uruguay, which has just notified Dr. Saenz of his appointment as professor of bacteriology. He has been engaged in research work for the past ten years at the Pasteur Institute of Paris specializing in the bacteriology of tuberculosis. Dr. Saenz has been especially successful in isolating by the cultural method the tubercle bacillus from genito-urinary, cutaneous and meningeal localizations of this type of infection. His monograph on the bacteriologic diagnosis of tuberculosis has had a large circulation.

#### BERLIN

(From Our Regular Correspondent)

Dec 26, 1938

#### The Origin of Syphilis

Professor Aschoff, the Freiburg pathologist who is also interested in the history of medicine, has taken a stand with regard to the problem of whether syphilis was indigenous in Europe in ancient times. Scientists at one time believed that the disease had been imported into Europe by the sailors of Columbus. Then through the efforts of Sudhoff at Leipzig this theory came to be completely reversed, so that for many years the view has prevailed that syphilis has always been indigenous in Europe and that it merely chanced to appear in a particular severe form at the close of the fifteenth century. Sudhoff based his hypothesis in the main on data elicited from textual criticism. He claimed to have found in precolumbian European records a number of regulations issued in various cities allegedly to combat syphilis. Meanwhile it has been proved that the descriptions of symptoms with which Sudhoff bolstered his theory lacked uniformity and in all probability had to do with epileptic and epileptoid seizures. Consequently proofs of precolumbian European cases of syphilitic changes in the bones (and if possible, in the vascular system) were much needed in support of Sudhoff's theory. During the past ten or twenty years discovery of European paleolithic and neolithic sites containing human bones has been more and more frequent, yet in none of the skeletal remains was any trace of syphilitic change determinable. The old view of Virchow would thus seem to be substantiated. Sudhoff himself has pointed out that incontestable references to a venereal disease resembling syphilis are entirely lacking in the literary work of classical antiquity. About forty years ago at Marnet, France, ancient bones were discovered which at first were reported to exhibit syphilitic alterations. It was later proved that this observation was based on a geologic error.

Conversely, excavation of precolumbian burial sites in America has yielded skeletal material in which signs of syphilis are plainly evidenced. Yet such discoveries do not solve the problem of possible indigenous syphilis in Europe in ancient times. References to aneurysms are to be found in classical literature. Professor Aschoff, who made special mention of the American discoveries and these classical references, contributes greatly to the elucidation of the entire problem. Recently he was able to establish that the aneurysms described by the ancients were merely incised wounds of the smaller blood vessels of the extremities and of the head, produced by venesection. Conversely, the same authors even in medical case records make no reference whatever to the characteristic aneurysmal formation (usually at the arch of the aorta) of syphilitic origin. The more recent investigations made by Williams (1932) and the wholly new body of proof which he adduces with regard to syphilitic changes in precolumbian American skeletons are to Professor Aschoff far more convincing than Sudhoff's still dubious textual research. Professor Aschoff is therefore of the opinion that syphilis had no existence in Europe before the time of Columbus.

### Congress of the German Genetic Society

The German Genetic Society has in its membership interested biologists, botanists, zoologists and physicians. One useful feature of the society's discussions is the diversification of points of view based on the various scientific disciplines, with regard to problems of general interest. The recent congress discussed some questions of importance to human genetics.

On the first day F. Claussen of Frankfurt on the Main spoke on the pathology of heritable diseases. The parents of a tainted person may appear healthy and only by the most meticulous methods of examination will it be possible to elicit the slightest pathologic signs. In such cases one has to deal not with a recessive trait, as might be assumed on the basis of cursory examination, but with a dominant trait. Furthermore polypheny can also be present, that is to say, disorders having a more or less dissimilar clinical appearance may be genetically related. The divergent aspect of characters belonging to the same gene can be conditioned by diverse environmental stimuli. The stimuli may from time to time modify the action of the gene. Research on twins here offers a useful explanation. A pair of enzygotic twins present a much higher proportion of correspondence with respect to pathologic manifestations than do a pair of dizygotic twins. This circumstance bespeaks the largely hereditary conditionality of the trait in question. Genotypically related clinical syndromes come to be recognized through careful analysis and this makes possible a new classification of disorders, based on genetic points of view. It is possible to observe the most conspicuous symptom of a disorder without by any means understanding the gene action as a whole. Nevertheless, still other signs, less striking perhaps, may be coordinated with this particular gene, for example in deformities in which different groups are to be traced to the same gene, albeit with varying time of onset of the effect, as in disturbances in the growth of bone.

#### NORMAL CRANIOTICS

Prof. Eugen Fischer of Berlin-Dahlem discussed "normal genetics." The two factors that condition the development of the gene are heredity and environment. The action of the gene on the human vertebral column for example has been thoroughly investigated. Since it has been proved that analogous variations may occur in the vertebral column and the nerve plexus, the same gene would seem to be responsible for the distribution and structure of the vertebral column as well as for the distribution and structure of the great nerve plexus. Fischer next went into the problem of inverse symmetry and asymmetries. He contrasted the inherited asymmetries based on the action of a gene with those asymmetries which originate from slight environmental influences at work in utero. Other asymmetries, such as dextrality and sinistrality, can be understood not by a study of the individual but by a study of the population as a whole. They are explicable in terms of a purely environmental effect based on general developmental lability through various trivial circumstances such as position and curve of the embryo in quite early stages and the related divergent influence and nutrition of the two sides of the body. Finally there is the group of the true anomalies, known as deviating asymmetries. Irregularity of the cilia or freckles on the two sides of the body are typical anomalies of this group.

#### HERITABILITY OF PSYCHIC CHARACTERS

Gottschaldt of Berlin-Dahlem lectured on "phenogenesis in psychology." His point of departure was the premise that the heritability of psychic characters has been proved through research on twins and that normal characters are as a rule polymERICALLY conditioned. In camps for twins which have been organized for the express purpose of conducting these tests it has been possible to demonstrate the hereditary conditionality of certain traits. The prevalent mood shows a

proportionately greater correspondence in enzygotic twins. A preponderant hereditary conditionality is also evidenced by other psychic qualities, such as responsivity, impulsiveness, intellectual capacity and the intelligence. For pathologic mental activity, various types of hereditary transmission should be assumed. The author believes that, just as there are racial differences in the physique, there are likely to be differences in the realm of the psyche.

### Law to Regulate Orthopedic Shoes

Regulation of the manufacture of orthopedic footwear has been decreed by the interested ministers. Hereafter orthopedic shoes can be made only by cobblers who have undergone special training and received a special certificate. An orthopedic shoe is a custom made product of handicraft which differs from the so called normal shoe in the manner of its manufacture and in the general contour or in structural details. The individual peculiarities of orthopedic footwear are determined by pathologic anomalies in the soft parts or in the bones of the foot or leg of the destined wearer, form and function alike may be taken into consideration. In order to prepare for the special examination the cobbler must undergo at least six months of training in a special recognized school or, in lieu of this training, offer one year's experience as assistant to an orthopedic master cobbler. The new law should certainly represent an improvement, orthopedic footwear should henceforward be orthopedic in fact as well as in name.

## Marriages

BEN NALAN MILLER JR., Columbia, S. C., to Miss Ruth Elizabeth Gambill of West Jefferson, N. C., in North Wilkesboro, N. C., in December 1938.

HERMAN LLOYD SCHIFFS, Shelley, Idaho, to Miss Betty Lee Miller of New Sweden at Logan, Utah, Sept. 25, 1938.

DANIEL NIVEN STEWART JR., Hickory, N. C., to Miss Nan Norman of Gastonia, in Norfolk, Va., Dec. 22, 1938.

HORACE GILBERT STRICKLAND to Miss Agnes McIntyre Leak, both of Greensboro, N. C. in December 1938.

MAURICE VERNON SHIELDS to Miss Phoebe Ann Sheldon, both of Newcomerstown, Ohio, Oct. 31, 1938.

SIMON ANDREW SCHLUETER to Miss Mary Catherine McGarry, both of Akron, Ohio, recently.

INA MORRIS HARPER to Mr. F. Le Roy Bradford, both of Benton Harbor, Mich., Dec. 31, 1938.

CHARLES A. HOFFMAN to Miss Margaret Lynn Jack, both of Huntington, W. Va., Dec. 21, 1938.

VINCE MOSELEY to Miss Matilda Elizabeth Holleman, both of Durham, N. C., Oct. 11, 1938.

JAMES MILO SHAFFER, Cincinnati, to Miss Mary Louise Ailes of Anna, Ohio, Nov. 23, 1938.

MARK P. HOLLAND, Mahanoy City, Pa., to Miss Edith Ditchey of Timbiqua, Nov. 24, 1938.

JAMES B. SEELEY, Dearborn, Mich., to Mrs. Corette Cowan of Detroit in October 1938.

JOHN R. SHOENMAKER to Miss Bette Hunter, both of Cuyahoga Falls, Ohio, Nov. 16, 1938.

LYNN E. SHARRAI, Lincoln, Neb., to Miss Mary Ellen Ahern of Shubert., Oct. 17, 1938.

FREDRICK W. SIEGERT, Pana, Ill., to Miss Anne Arpe of St. Louis, Oct. 27, 1938.

JOHN SPROULL to Miss Daurice V. Haley, both of Haverhill, Mass., in October 1938.

IRVING WEINSTEIN to Miss Blanche Sukoemg, both of New York, Aug. 21, 1938.

JOHN B. SUINO to Miss Virginia O. Byrne, both of La Salle, Ill., in October 1938.

EDSON J. ANDREWS to Miss Lola French, both of Milwaukee, Nov. 24, 1938.

## Deaths

**Anton Schwartz Schneider**, Plattsburg, N Y, Albany (N Y) Medical College 1920, member of the Medical Society of the State of New York and the American Academy of Ophthalmology and Otolaryngology, fellow of the American College of Surgeons, on the attending staff of the Physicians Hospital and Children's Home of Northern New York, Plattsburg, and the Clinton Prison, General and Tuberculosis Hospital, Dannemora, aged 48, died, Nov 19, 1938, of coronary thrombosis

**Alexander Macalister**, Camden N J, University of Pennsylvania Department of Medicine, Philadelphia 1885 member of the Medical Society of the State of New Jersey, past president of the Camden County Medical Society formerly secretary of the State Board of Medical Examiners of New Jersey, past president of the Camden County Tuberculosis Association, aged 76, died Nov 22, 1938 of carcinoma of the stomach with metastasis

**William W Bachman**, Bath, N Y University of Buffalo School of Medicine, 1899, member of the Medical Society of the State of New York, at one time health officer of the town and village of Prattsburg, superintendent of the Pleasant Valley Sanatorium on the consulting staff of the Veterans Administration Facility, on the staff of the Bath Memorial Hospital, aged 64, died Nov 28, 1938, of hypertensive heart disease

**Carl Jacob Leutenegger**, Buffalo, University of Buffalo School of Medicine, 1920 associate in urology at his alma mater, member of the American Urological Association on the staffs of the State Institute for the Study of Malignant Diseases Buffalo General Hospital, City Hospital, Our Lady of Victory Hospital and the Children's Hospital, aged 45, died, Nov 24, 1938, of aplastic anemia and tuberculosis

**Frank Thomas Duffy**, Los Angeles, Bennett College of Eclectic Medicine and Surgery, Chicago, 1914 member of the Illinois State Medical Society, served during the World War, was commissioned in the U S Veterans' Administration and held various high positions, aged 48, died, Nov 17, 1938 in the Veterans' Administration Facility of coronary thrombosis

**Vito Luigi Raia**, Providence, R I, Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy 1883, on the consulting staff of the Rhode Island Hospital fellow of the American College of Surgeons, aged 81, died, Nov 21, 1938 in the Jane Brown Memorial Hospital of carcinoma of the colon, intestinal obstruction and pneumonia

**Clarence Henry Hall**, Cherokee, Iowa Medico-Chirurgical College of Philadelphia, 1904, past president of the Cherokee County Medical Society, veteran of the Spanish-American War formerly on the staff of the Sioux Valley Hospital aged 61, died suddenly, Nov 30, 1938 of coronary sclerosis and diabetes mellitus

**Mark Gorman Gates**, Santa Monica, Calif Los Angeles Medical Department of the University of California, 1910, on the courtesy staff of the Santa Monica Hospital aged 52 was drowned Nov 15 1938, near Kernville, when he fell into an irrigation canal while on a hunting trip

**Walter Parks Bliss**, Pasadena Calif, Columbia University College of Physicians and Surgeons New York, 1916 on the staff of the Collis P and Howard Huntington Memorial Hospital, aged 49 was found dead Nov 3 1938 of a self inflicted knife wound of the heart

**Alva P Maine**, Webster N Y University of Pennsylvania Department of Medicine Philadelphia 1870 for many years health officer and member of the school board past president of the village aged 92 died, Nov 7, 1938, of diabetes mellitus and myocarditis

**Edgar Franklin Magenheimer**, Evansville, Ind, Indiana University School of Medicine Indianapolis 1910, served during the World War on the staffs of the Deaconess Hospital and St Mary's Hospital, aged 51 died Nov 27, 1938 of cerebral hemorrhage

**William Henry Redmond**, Cedar Rapids Iowa Northwestern University Medical School Chicago 1910 past president and secretary of the Linn County Medical Society, served during the World War, aged 53 died Nov 5 1938 of coronary thrombosis

**William Wilson Gingles**, Castana Iowa, Kentucky School of Medicine Louisville 1890, member of the Iowa State Medical Society formerly secretary of the Monona County Medical Society, aged 71, died Nov 10, 1938, of acute dilatation of the heart

**James Francis Power**, New York, Bellevue Hospital Medical College, New York, 1898 consulting otolaryngologist to St Johns Long Island City Hospital, Long Island City, N Y, aged 64, died, Nov 25, 1938 of cerebral embolism

**Alphons E Bachhuber**, Mayville, Wis, Northwestern University Medical School, Chicago, 1898, past president and secretary of the Dodge County Medical Society, aged 61, died, Nov 24, 1938, of coronary thrombosis

**David Arch Rannels**, Chillicothe, Ohio, Starling Medical College, Columbus, 1891, veteran of the Spanish-American War, aged 72 died, Nov 11, 1938, in the Veterans Administration Facility of bronchopneumonia

**Carl Wurm**, Pleasantville N Y, Bellevue Hospital Medical College, New York 1892, member of the Medical Society of the State of New York aged 75, died, Nov 1, 1938 of carcinoma of the stomach and liver

**Eugene Thomas McNamara**, Somerville, Mass Tufts College Medical School, Boston, 1896, Bellevue Hospital Medical College, New York 1897, aged 79, died, Nov 19, 1938, in Melrose of chronic nephritis

**William Jacob Bott**, Rockville Centre, N Y, University of Buffalo School of Medicine, 1898, served during the World War aged 65, died, Nov 22, 1938, of coronary thrombosis and arteriosclerosis

**Hugh Howard Mitchell**, Regina Sask, Canada, University of Toronto Faculty of Medicine 1910, for many years coroner, superintendent of the Regina General Hospital, aged 55, died, Oct 14, 1938

**Arthur Alexandre La Rue**, Worcester, Mass, Baltimore Medical College, 1901, formerly member of the board of health of Waltham, Mass aged 61, died, Nov 1, 1938, of chronic myocarditis

**John C Moore**, Trenton Tenn, University of Louisville (Ky) Medical Department 1875, Jefferson Medical College of Philadelphia, 1881, aged 86 died, Nov 25, 1938, of pneumonia

**John Huntington Lewis**, Cincinnati, Cincinnati College of Medicine and Surgery, 1896, aged 68, died Nov 7, 1938 in St Mary Hospital of cardiorenal disease and arteriosclerosis

**Lorne Joseph Violette**, St Leonard, N B, Canada, University of Montreal Faculty of Medicine, 1911, for several years mayor, aged 54, died, Oct 6, 1938

**Declan Edward Foley**, Los Angeles, Queen's University Faculty of Medicine, Kingston, Ont, Canada, 1886, also a priest, aged 75, died in October

**Edward Allmeroth**, St Louis, St Louis College of Physicians and Surgeons, 1891, aged 69, was found dead, Oct 16, 1938 of chronic endocarditis

**Ulysses M Carwell**, Hendricks W Va University of Virginia Department of Medicine, Charlottesville, 1898, aged 65, died Oct 17, 1938

**August Pohlman**, Philadelphia, Baltimore Medical College, 1896, also a clergyman, formerly a medical missionary aged 74, died Oct 9, 1938

**Alonzo Garrett**, Gallipolis, Ohio (licensed in West Virginia in 1888), Civil War veteran, aged 91, died, Nov 1, 1938, of coronary occlusion

**John Jackson Rivenbark**, Samson, Ala, Georgia College of Eclectic Medicine and Surgery, Atlanta, 1897, aged 77, died, Oct 17, 1938

**John Archibald MacMurchy**, Dresden Ont, Canada, University of Toronto Faculty of Medicine, 1916, aged 53, died, Nov 28 1938

**Angus A McLean**, London Ont Canada, University of Toronto Faculty of Medicine Toronto 1907, aged 58, died, Nov 9, 1938

**Milton Newman**, New York University of Southern California School of Medicine, Los Angeles, 1935, aged 29, died, Oct 1 1938

**William Angelo Mott**, Rathwell Man, Canada Manitoba Medical College, Winnipeg 1907 aged 73, died, Oct 20 1938

**Gustav A Christensen**, Cass Lake Minn (licensed in Minnesota under the Act of 1887) aged 74, died Oct 9 1938

**Wilson Yates Young**, Toronto Ont Canada Trinity Medical College Toronto 1895 aged 73 died, Oct 7 1938

**Oliver S Burns**, Lebanon, Va Kentucky School of Medicine Louisville, 1885, aged 73, died Oct 26 1938

**Walstein M Tompkins**, New York University of Buffalo School of Medicine 1898, aged 79, died, Oct 13, 1938

**Thomas Jones Mendenhall**, Rosston Ark (licensed in Arkansas in 1903) aged 73 died Oct 6 1938

isolate the virus from the nasopharynx (Trask and Paul and others) and from rectal washings (Harmon, Krigsten and Harkins) within the first ten days after the onset of paralysis. However, there are a few isolations of the virus on record, made more than a month after the onset of the disease and from persons (healthy carriers) who have never had the disease. To add to the present confusion, the time honored concept of this disease as being spread by nasopharyngeal secretions has been questioned as the result of finding the virus in the intestinal tract of man convalescent from the disease (Harmon, Krigsten and Harkins, confirmed by Kramer) and by the failure to find lesions in the olfactory bulbs in fatal cases in man (Sabin).

At the present time it appears that a rigidly enforced quarantine of three weeks after the onset of the disease is adequate. The effectiveness of closing schools and preventing the congregation of children in attempting to control epidemics has been questioned.

EFFECT OF SHOCK ON DRUNKENNESS

To the Editor—Could shock such as that sustained following an automobile accident with a resulting head injury and temporary loss of consciousness, cause a man who had been drunk before the accident to become sober? In this particular case there are five witnesses who will swear that the person involved was drunk before an accident and when I saw him a few minutes afterward he was definitely sober. It is my opinion that if this man had a high enough concentration of alcohol in his blood stream to cause drunkenness shock would not eliminate it fast enough to sober him up immediately. Am I correct in this?

M D New York

ANSWER—It is not unusual for a drunken man to appear to be sober after an accident. This sobering effect has nothing to do with elimination of alcohol but is largely a psychic phenomenon, probably associated with a temporary redistribution of alcohol in the body. Just as a sleepy or apparently exhausted person can pull himself together when the occasion demands, so the drunken person may be able to control himself as long as an unusual mental or physical stimulus has sufficient effect. He is simply compensating for the toxic action of alcohol by increased effort. When the stimulus has been removed he usually reverts to a state of drunkenness. This fact is extremely important, since many persons escape conviction as drunken drivers because they are able to give a good account of themselves when in contact with the police, and it is only through chemical tests for alcohol in body fluids that the correct diagnosis can be made.

Elbel in Die wissenschaftlichen Grundlagen der Beurteilung von Blutalkoholfunden, page 93, explains the sobering effect of emotional stimuli by consideration of the action of epinephrine on the body. If the adrenal glands are extirpated in an animal, the tolerance for alcohol is greatly decreased. Also ordinary amounts of alcohol cause splanchnic vasoconstriction and a correspondingly increased intracranial circulation of alcohol containing blood. When fright or excitement occurs, the sudden splanchnic vasodilatation is associated with a decreased circulation of alcohol through the brain.

AGE DISTRIBUTION OF DIPHTHERIA AND FREQUENCY OF RECURRENCES

To the Editor—1. What percentage of cases of diphtheria occur between ages 14 and 20? 2. What percentage of cases in adults? 3. What is the frequency of recurrences in an individual having had a proved case?

M D Texas

ANSWER—Age incidence for diphtheria is influenced by special factors in different communities. For example, after an immunization campaign among children of preschool age the percentage of diphtheria patients in the higher age groups will be more evident. If the immunization campaign is carried out energetically among school children as well as those of preschool age, the percentage of adults with diphtheria in a large city is likely to be noticeable.

1. Ordinarily the proportion of cases between 14 and 20 is about 8 per cent.

2. The proportion of cases in adults (those 16 years and over) is about 10 per cent. Nevertheless in a large contagious disease hospital during the years 1935 to 1937 inclusive among 1,298 diphtheria patients treated 18 per cent were adults, that is 16 or more years of age.

3. Second attacks of diphtheria are not exceedingly uncommon. However among 20,000 hospital cases of diphtheria the rate was approximately 0.1 per cent.

According to the annual report of the chief medical officer of the Ministry of Health (Great Britain) for the year 1937, approximately 90 per cent of all cases of diphtheria occur under 15 years of age.

POSSIBLE PAROXYSMAL HYPERTENSION

To the Editor—A white man aged 56 weighing 240 pounds (109 Kg) complains of a chilly sensation up and down his spinal column occurring when sitting at his desk driving his automobile walking or in a theater. This sensation is followed in a few minutes by a complete blanching of his entire body usually beginning on the hands, which lose their normal pink color and become extremely pale and white. His face becomes white and following this goose pimples appear over his body. He says that at this time his arm from his elbow feels numb and lifeless. Immediately after this he becomes weak and his legs want to buckle under him he says. Within three to ten minutes his normal color will return. He feels fairly well except for being extremely weak. He sometimes suffers eight or ten attacks during a day. At times the blanching appears only on one arm and hand the other arm and hand remaining pink in a few minutes they resume the normal color. His blood pressure has varied from 90/76 to 150/76. His pressure has varied as much as 40 points in each arm. All laboratory work gives normal results. The electrocardiogram is normal. X-ray studies of the chest are negative. I should like to know the cause and treatment of this phenomenon.

M D, Ohio

ANSWER—The situation described is an unusual one. It is apparent that the patient suffers from extreme stimulation of the sympathetic nervous system during the episodes described, since they are characterized by vasoconstriction (blanching of the skin) and "goose pimples." It is important to know the values of the blood pressure and the pulse rate during one of these episodes. The condition is suggestive of paroxysmal hypertension due to adrenal tumor. If there is definite elevation of the blood pressure and tachycardia during the episodes described, this possibility should be distinctly considered. A tumor of the adrenal gland which causes paroxysmal hypertension may be palpated occasionally and sometimes causes sufficient displacement of the kidney to show changes in the excretory urograms. In some instances it is advisable to inject air around the kidney in an attempt to visualize such tumors. The correspondent is referred to the following articles on paroxysmal hypertension.

Pincoffs M C Paroxysmal Hypertension Associated with Suprarenal Tumor *abstr THE JOURNAL* July 6 1929 p 63  
Mayo, Charles H Paroxysmal Hypertension with Tumor of Retroperitoneal Nerve *THE JOURNAL* Sept 24 1927 p 1047  
Howard J E and Barker W H Paroxysmal Hypertension and Other Clinical Manifestations Associated with Benign Chromaffin Cell Tumors (Phaeochromocytomata) *Bull Johns Hopkins Hosp* 61 371 (Dec) 1937

QUININE FOR INFLUENZA

To the Editor—The head of our nursing school brought me a pamphlet edited by the Cinchona Products Institute Incorporated New York in which the value of quinine as a preventive agent in influenza is extolled. The bibliography which includes some thirty six authors contains only one article published in this country (Frankel *New York M J* Nov 23 1938). I told her that I had no opinion on the subject. May I ask whether or not there is evidence that the drug has prophylactic value during epidemics of influenza?

H D PALMER M D Rockford Ill

ANSWER—While much material has developed regarding the value of quinine as a preventive and a therapeutic agent in influenza, the evidence at hand does not support the claims. Certain reports have stressed the fact that large doses of quinine must be used before the onset of infection and that under these conditions fewer individuals come down with the disease while others have thought that the administration of the drug in such a manner afforded benefit only by lessening the severity of the disease. There has been equally good or even better evidence that in the north temperate climate this effect of quinine has not been so striking. The same effects have been reported for antipyrene and the results, if any, are in the latter instance better than they are for quinine. To date it is safe to say that no one drug has established itself as an efficient prophylactic.

APPENDICAL ABSCESS

To the Editor—Please give references or definite technical information on opening an appendical abscess extraperitoneally.

RAYMOND H McPHERSON M D Chicago

ANSWER—Roger Vaughan, writing on appendicitis in Nelson's Loose-Leaf Surgery (vol V, page 341 L), objects to the extraperitoneal route of abscess evacuation on account of the inability of the surgeon to explore for secondary abscess and because intraperitoneal damage may occur without the operator's knowledge of the accident. On the other hand, Sir James Berry in his oration before the Medical Society of London in 1932 (Fallen Idols. The Case of Appendicitis, *Lancet* 1 1027 [May 14] 1932), tracing the entire history of appendical surgery, states that the experience of half a century has taught that local drainage preferably extraperitoneally, is the method of choice in all walled-off appendical abscesses. He further cites the case of King Edward VII, whose life was undoubtedly saved by a small incision and drainage of an appendical abscess. Orr, in the

discussion of treatment of appendical abscess (*J Missouri M A* 31 232 [June] 1934), states that "if, instead of subsiding, the [appendical] mass increases in size and develops into a well defined abscess, drainage is indicated. The abscess should be drained extraperitoneally through a small incision when possible. A small percentage may be drained through the vagina or the rectum. If the peritoneal cavity is opened when the incision is made, it is safer to pack gauze down to the abscess wall, making a sealed channel to the surface of the body, through which the abscess may be drained later. No effort should be made to remove the appendix when a localized appendiceal abscess is drained." In a surgical clinic J N Coombs (*S Clin North America* 14 173 [Feb.] 1934) shows by an excellent illustration the retroperitoneal approach to an appendiceal abscess. Most surgeons agree that the mortality in the neglected case of appendicitis has been distinctly lowered by conservative surgery, consisting in waiting until there is definite abscess formation and drainage through a small opening, carefully avoiding the free peritoneal cavity.

#### HIGH PALATAL ARCH IN YOUNG WOMAN

To the Editor—A woman aged 20 has an exceedingly high palatal arch which greatly obstructs her nasal passages. At the age of 6 her tonsils and adenoids were removed, nevertheless she has been a mouth breather and has a high arch. Would you advise either removal of the lower turbinates or removal of one or more molar teeth or both?

C B GREAR MD Honaker Va

ANSWER—Malformations of the face and jaws are dependent on local and systemic factors, prenatal and postnatal in their influence. Of the local factors, mouth breathing due to nasal obstruction from any cause is usually cited as causing narrow high arched palates and narrow nasal cavities with subsequent malocclusion. It is true that some such cases are probably caused by the lack of nasal ventilation, for they may be watched in their development after nasal obstruction. On the other hand, the so-called adenoid facies may be seen in children without adenoids, and tracheotomy tubes have been worn by children for years without any ill results on the nasal or palatal development. Thus it is probable that nasal obstruction and high palatal arch do not necessarily have a cause and effect relationship.

In the patient under discussion it is likely that, with the malformation well established and present at the age of 20, corrective procedures would be ineffective in correcting the condition. It may be that some intranasal surgical procedure, trimming the lower portions but not entirely removing the lower turbinates, may give enough increase in nasal space to constitute mechanical relief and allow nasal respiration. However, this would not change the palatal configuration, which is probably permanent.

#### OXYGEN REQUIREMENTS AT HIGH ALTITUDES

To the Editor—I am interested in obtaining information concerning the use of oxygen for human beings at high altitudes or in the stratosphere. I have so far been unable to find any references on the quantity of oxygen needed for respiration. If there has been any research as to vital capacity and total oxygen used in high altitude such as mountain tops compared to sea level I should like to know about it. What other reaction does one have to consider besides oxygen consumption in sending a patient by air? I would appreciate any reference that would give quantitative amounts of oxygen used and foot pounds of energy necessary for the extra work of the heart in high altitude. M D California

ANSWER—Experiments in the low pressure chamber, as well as investigations in which various oxygen concentrations were inhaled at normal barometric pressure, indicate that the oxygen consumption is unchanged when the oxygen concentration is diminished to 13 per cent. At lower concentrations of oxygen such as from 8 to 10 per cent, the oxygen consumption is diminished.

Experiments carried out by Zuntz and von Schrotter showed an insignificant rise in the oxygen consumption in a balloon flight up to an altitude of more than 5,000 meters. Observations carried out at high altitudes did not reveal any change in oxygen consumption at an altitude below 3,000 meters. Increases in oxygen consumption were observed at altitudes varying from 3,600 to 4,500 meters but the great variability of the results obtained suggests that differences in temperature and nonbasal conditions are largely responsible for the increases in metabolism observed.

According to Grollman (*Am J Physiol* 94 287 [Aug.] 1930) the minute volume increased by 40 per cent on Pike's Peak. Similar results were obtained by Ewig and Hinsberg (*Ztschr f klin Med* 115 732 1931) in Switzerland.

It must be taken into consideration that these increases in minute volume are only temporary and that normal values may be obtained again after the number of blood corpuscles have increased sufficiently.

#### CONNECTIONS BETWEEN THALAMIC AND HYPOTHALAMIC NUCLEI

To the Editor—Please discuss the connection between the various nuclei of the thalamus to the hypothalamus and periventricular nuclei. I should like to know whether there is such a connection established in man.

JOHN GARB, MD, New York

ANSWER—Relatively little is known concerning the connections between thalamic and hypothalamic nuclei. The mammillo-thalamic tract, which arises from the medial mammillary nucleus and ends in the anterior nuclei of the thalamus, is said to contain some fibers running in the reverse direction. Periventricular fibers, running close to the wall of the third ventricle, join the thalamic nuclei of the midline with the hypothalamic nuclei and more especially with the posterior hypothalamic nucleus. These connections probably contain both ascending and descending fibers. It is probable that the dorsomedial nucleus of the thalamus may receive impulses from the hypothalamic and periventricular nuclei and relay them to the frontal cerebral cortex. What little is known concerning these connections is based on the study of mammalian brains and can only tentatively be applied to man. The chief papers dealing with this subject are those of

Clark W E Le Gros Functional Localization in the Thalamus and Hypothalamus *J Ment Sc* 82 99 (March) 1936

Clark W E Le Gros Morphological Aspects of the Hypothalamus in Clark W E Le Gros Beattie John Riddoch George and Dott Norman M The Hypothalamus Edinburgh and London Oliver and Boyd 1938

Clark W E Le Gros and Boggon R H On the Connections of the Anterior Nucleus of the Thalamus *J Anat* 67 215 (Jan) 1933

Krieg W J S The Hypothalamus of the Albino Rat *J Comp Neurol* 55 19 (June) 1932

Riech D M Studies on the Diencephalon of Carnivora III Certain Myelinated Fiber Connections of the Diencephalon of the Dog (*Canis Familiaris*) Cat (*Felis Domestica*) and Ape (*Prosimia*) (*Obscurus*) *J Comp Neurol* 53 319 (Oct) 1931

#### ABNORMAL BREAST AND CHILDBIRTH

To the Editor—As a child a primipara who is now about four months pregnant suffered a severe burn of the right side of the chest. There is a good deal of scar formation and no nipple present on the right side. The breast itself is fairly well developed. What procedure should one follow when the breast becomes greatly distended in later months and after delivery? Is a tight dressing all that is necessary? Would it be best to dry up both breasts as soon as possible? M D Ohio

ANSWER—Although there may be considerable congestion of the breasts following delivery, it may be possible to continue nursing from the breast which has the normal nipple. The abnormal breast will undergo considerable congestion, but in several days this should decrease and eventually subside completely. During the interval, ice caps and a tight binder can be applied to the breast which is to be dried up. The aim in a breast will secrete only as long as there is an exit for the milk. When the milk secretion fails to be removed, these glands undergo atrophy. During the latter part of pregnancy, a breast support will give relief if there is any discomfort.

#### NO BLOOD TEST FOR RACE DIFFERENTIATION

To the Editor—Several of us are anxious to know whether any work has been done to differentiate by the precipitin test the blood of Negroes from the blood of white persons. We have read one or two of the conventional toxicologies and no mention was made of this.

M D Alabama

ANSWER—Since the introduction of the precipitin test attempts have been made to apply this technic for the differentiation of human bloods of different races, particularly bloods of Negroes and white persons. For the latest attempt to develop such a test see the paper by Fischer and Racquet (*Ztschr f Immunitätsforsch* 94 104, 1938). Though from time to time reports have appeared in which the writers claim to have succeeded in differentiating blood of various races, none of these claims could be confirmed by subsequent investigation. All authorities agree at the present time that it is not possible to differentiate the bloods of Negroes and white persons by the precipitin test.

On the other hand there are certain serologic differences between Negro and white blood of a statistical nature. For example, group B is more frequent in Negroes in New York City than in white persons, and in addition subgroup A<sub>2</sub> occurs more often in Negroes, and also the so-called agglutinin P (Landsteiner Karl and Levine Philip *J Immunol* 18 87 [Feb.] 1930). Several years ago Landsteiner, Strutton and Chase (*ibid* 27 469 [Nov.] 1934) discovered a rare agglutinable property in human blood with the aid of agglutinating serums obtained by immunizing rabbits with the blood of a particular Negro. This rare agglutinin was far more common among Negroes than among white persons.



## Medical Examinations and Licensure

### COMING EXAMINATIONS

#### STATE AND TERRITORIAL BOARDS

ALABAMA	Montgomery	June 20 22	Sec Dr J N Baker	517
Dexter Ave	Montgomery			
ALASKA	Juneau	March 2	Sec Dr W W Council	Box 561
Juneau				
ARIZONA	Basic Science	Tucson	March 21	Sec Dr Robert L
Nugent Science Hall	University of Arizona	Tucson		
ARKANSAS	Medical (Regular)	Little Rock	June 8 9	Sec State
Medical Board of the Arkansas Medical Society	Dr I J Kosminsky			
317 State Line	Texarkana	Medical (Eclectic)	Little Rock	June 8 9
Sec Dr Clarence H Young	1415 Main St	Little Rock		
CALIFORNIA	Written examinations	Los Angeles	Feb 6 9	San
Francisco	July 10 13 and Sacramento	Oct 16 19	Oral examinations	
(required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California)				
San Francisco	March 22	Los Angeles	August 7	and San Francisco
Nov 15	Sec Dr Charles B Pinkham	420 State Office Bldg		
Sacramento				
CONNECTICUT	Basic Science	New Haven	Feb 11	Prerequisite to
license examination	Address State Board of Healing Arts	1895 Yale		
Station	New Haven	Medical (Regular)	Hartford	March 14 15
Endorsement	Hartford	March 28	Sec Dr Thomas P Murdock	147
W Main St	Meriden	Medical (Homeopathic)	Derby	March 14
Sec Dr Joseph H Evans	1488 Chapel St	New Haven		
DELAWARE	Dover	July 11 13	Sec Medical Council of Delaware	
Dr Joseph S McDaniel	229 S State St	Dover		
DISTRICT OF COLUMBIA	Basic Science	Washington	June 26 27	Sec
Commission on Licensure	Dr George C Ruhland	203 District		
Bldg	Washington			
FLORIDA	Jacksonville	June 19 20	Sec Dr William M Rowlett	
Box 786	Tampa			
GEORGIA	Atlanta	June	Joint Sec State Examining Boards	Mr
R C Coleman	111 State Capitol	Atlanta		
IDAHO	Boise	April 4 7	Dir Bureau of Occupational License	Mr
D B Cruikshank	Rm 355 State Capitol Bldg	Boise		
ILLINOIS	Chicago	April 11 13	June 20 22 and Oct 17 19	Super
intendent of Registration	Department of Registration and Education			
Mr Homer J Byrd	Springfield			
INDIANA	Indianapolis	June 20 22	Sec Board of Medical Registration	
and Examination	Dr J W Bowers	301 State House	Indianapolis	
KANSAS	Kansas City	June 20 21	Sec Board of Medical Registration	
and Examination	Dr J F Hassig	905 N 7th St	Kansas City	
KENTUCKY	Louisville	June 7 9	Sec State Board of Health	Dr
A T McCormick	620 S Third St	Louisville		
MAINE	Portland	March 14 15	Sec Board of Registration of Medicine	Dr
Adam P Leighton	192 State St	Portland		
MARYLAND	Medical (Regular)	Baltimore	June 20 21	Sec Dr
John T O'Mara	1215 Cathedral St	Baltimore	Medical (Homeopathic)	
Baltimore	June 20 21	Sec Dr John A Evans	612 W 40th St	Baltimore
MASSACHUSETTS	Boston	March 14 16	Sec Board of Registration	
in Medicine	Dr Stephen Rushmore	413 F State House	Boston	
MICHIGAN	Ann Arbor	and Detroit	June 14 16	Sec Board of Regis-
tration in Medicine	Dr J Earl McIntyre	100 W Allegan St	Lansing	
MISSISSIPPI	Jackson	June	Asst Sec State Board of Health	Dr
R N Whitfield	Jackson			
MONTANA	Helena	April 4 5	Sec Dr S A Cooney	216 Power
Block	Helena			
NEVADA	Reciprocity and oral examination	Carson City	Feb 6	Sec
Dr John E Worden	Capitol Bldg	Carson City		
NEW HAMPSHIRE	Concord	March 9 10	Sec Board of Registration	
in Medicine	Dr Fred E Clow	State House	Concord	
NEW JERSEY	Trenton	June 20 21	Sec Dr Earl S Hallinger	28
W State St	Trenton			
NEW MEXICO	Santa Fe	April	Sec Dr Le Grand Ward	145 Sena
Piza	Santa Fe			
NORTH CAROLINA	Raleigh	June 19	Sec Dr William D James	
The Hamlet Hospital	Hamlet			
OREGON	Basic Science	Portland	Feb 25	Corvallis
Portland	Oct 28	Sec State Board of Higher Education	Mr Charles	
D Byrne	University of Oregon	Eugene		
PUERTO RICO	San Juan	March 7	Sec Dr O Costa	Mandry
Department of Health	San Juan			
SOUTH CAROLINA	Columbia	June 27	Sec Dr A Earle Boozer	
505 Saluda Ave	Columbia			
VERMONT	Burlington	Feb 7 9	Sec Board of Medical Registration	
Dr W Scott Noy	Underhill			
VIRGINIA	Richmond	June 21 23	Sec Dr J W Preston	30½
Franklin Road	Roanoke			
WEST VIRGINIA	Charleston	March 6 8	Sec Public Health Council	
Dr Arthur E McClue	State Capitol	Charleston		
WISCONSIN	Basic Science	Madison	April 1	Sec Prof Robert N
Bauer	3414 W Wisconsin Ave	Milwaukee		
WYOMING	Cheyenne	Feb 6	Sec Dr G M Anderson	Capitol
Bldg	Cheyenne			

#### NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL January 28 page 357

### Oklahoma Reciprocity and Endorsement Report

Dr James D Osborn Jr, secretary, Oklahoma State Board of Medical Examiners, reports sixteen physicians licensed by reciprocity and two physicians licensed by endorsement from Sept 15 through Nov 28 1938. The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine	(1937)	Arkansas	
Univ of Illinois College of Medicine (1936)	(1937)	Illinois	
University of Kansas School of Medicine	(1932)	Kansas	
Tulane University of Louisiana School of Medicine	(1933)	Louisiana	

University of Michigan Medical School	(1930)	(1931)	Michigan
University Medical College of Kansas City	Missouri	(1913)	Nebraska
Creighton University School of Medicine		(1936)	Missouri
Ohio State University College of Medicine		(1933)	Ohio
University of Oklahoma School of Medicine	(1937)	Colorado	New York
University of Tennessee College of Medicine	(1937)	Tennessee	Tennessee
Baylor University College of Medicine	(1936)	Texas	Texas
University of Vermont College of Medicine	(1923)	Vermont	Vermont

School	LICENSED BY ENDORSEMENT	Year Endorsement of Grad
College of Medical Evangelists		(1935) N B M Ex
Vanderbilt University School of Medicine		(1935) N B M Ex

### Oregon June Examination

Dr Joseph F Wood, secretary, Oregon State Board of Medical Examiners, reports the written examination held at Portland, June 21-23, 1938. The examination covered sixteen subjects and included ninety-two questions. An average of 75 per cent was required to pass. Forty candidates were examined, all of whom passed. The following schools were represented

School	PASSED	Year Grad	Per Cent
College of Medical Evangelists	(1938)	76 8	
George Washington University School of Medicine	(1937)	86	
Northwestern University Medical School	(1938)	86 9	89 9
University of Kansas School of Medicine	(1935)	84 1	
University of Nebraska College of Medicine (1937)	81 8	82 2	87 8
University of Oklahoma School of Medicine	(1937)	85 8	
University of Oregon Medical School	(1936)	85 8	88 9
(1937)	85 2	85 9	86 6
87 1	88 3	88 7	89 3
84 5	86	86 3	86 3
89 9	90 1	91 9	(1938)
82	84 2		
Jefferson Medical College of Philadelphia	(1937)	90	
McGill University Faculty of Medicine	(1937)	86 7	
Georg-August-Universität Medizinische Fakultät Gottingen	(1917)	82 3	
Osteopath *		84 2	

\* Licensed to practice osteopathy and surgery

## Book Notices

**The Pneumonias** By Hobart A Reimann M D Professor of Medicine Jefferson Medical College Philadelphia. With a foreword by Rufus Cole. Cloth Price \$5.00 Pp 381 with 111 illustrations Philadelphia & London W B Saunders Company 1938

Thus is the second recent presentation which classifies etiologically acute inflammations of the lungs or pneumonias and presents them as individual diseases. The pathologic histology of the various pneumonias is expounded most acceptably and beautifully illustrated. To avoid any anatomic implications, Dr Reimann discusses the pneumonias in part I A, on pneumococcal lobar pneumonia, and I B, on atypical pneumonia, giving as synonyms bronchopneumonia, lobular and catarrhal and diffuse pneumonia and pneumonitis. Part II is devoted to pneumonia as a specific form occurring as part of a systemic disease. Part III discusses pneumonias secondary to acute and chronic disease, mechanical shock, senility and so on caused by mixed infection. Strict adherence to the author's classification leads to some reduplication, such as presentation of influenzal pneumonia and tuberculous pneumonia in two separated sections and also to such a cryptic statement as one on page 325 "In the usual form in nonspecific atypical pneumonia, the earliest typical roentgenographic evidence is the appearance of small moderately dense irregular shadows".

Because of its succinct presentation of much valuable material, this volume should be accessible to all who study and treat acute respiratory diseases. In a scientific presentation in book form such statements as "from the literature" or "from various authors" attached to charts are inappropriately incomplete because they cannot be verified or critically evaluated. The statement that "in normal persons the upper air passages generally harbor a variety of potentially pathogenic micro organisms" is debatable and is an example of statements which lack adequate bibliographic or other documentation. In some instances emphasis is ill placed. More space is given to the rare experimental vaccinal pneumonia than to the entire discussion of oxygen therapy. The latter is limited to three fourths of a page and omits both descriptive details of treatment and the basis for the selection of apparatus.

So that they may be corrected in a future edition, some misstatements and omissions are called to the attention of the author. On page 27 the description of the effect of injecting carbohydrate during pneumonia and in the response to serum therapy is

reversed. On recovery from pneumonia and when ample serum is given, the skin reaction (described by Francis) appears (not disappears as stated). On page 75 only vitamin A is mentioned in the section on metabolism. Vitamins B and C are not mentioned, although vitamin C has been studied in its relation to pneumonia. On page 142 there is no adequate evidence for the retention of chlorides during pneumonia. The studies of Peabody and of Greenwald refute this old belief. On page 157 the advice that serum should be stopped if several severe reactions occur would be better if changed to read that a different lot or kind of serum should be used. On page 140, such a statement as "experience in large hospitals, however, shows that it is quite safe for a patient to be placed unscreened in a general ward, at least as far as the danger of contagion among immediately neighboring patients is concerned, since cross infection seldom occurs" is harmful because false, unless modified to state that wide spacing of beds is provided and an aseptic technic practiced. Where the matter has been studied, ample evidence has been provided to show that cross infections occur, even among pneumonia patients. The practice in Scotland and in some large American hospitals of removing pneumonia patients from general medical wards is justified.

**Le duodénum. Atlas de radiologie clinique.** Par P. Cottenot, médecin radiologiste de l'Hôpital Broussais, Max Lévy et Ed. Chériglé, assistant de radiologie de l'Hôpital Broussais. Préface de M. Robineau. Cloth. Price 235 francs. Pp. 223 with 394 illustrations. Paris: G. Doin & Cie, 1938.

This highly practical work, presented in atlas form, essays to provide a sound basis for the training of physicians who wish to undertake the interpretation of roentgenographic and screen appearances in the upper digestive tube and to supply a font of experience in the form of a rich collection of interesting and proved duodenal cases with which to make comparisons. The opening pages are concerned with technical considerations, followed by a discussion of the numerous variations from the usual normal that may be encountered, then in turn are passed in review the various chapters of duodenal abnormalities with a concluding chapter on the radiologic aspects of the stomach and upper small bowel after duodenal operations. The illustrations are abundant, well chosen and excellently reproduced, with clarifying schematic drawings provided for each. Only cases are included which have been well worked up and the diagnosis verified indisputably. This is a valuable contribution to the radiologic and gastro-enterologic specialties.

**Slums of New York.** By Harry Manuel Shulman. Cloth. Price \$3. Pp. 394. New York: Albert & Charles Boni Inc., 1938.

The reader picking up this book from a sense of duty, anticipating a dull and depressing catalogue of human misery and degradation or a social worker's crusade is soon agreeably surprised to find a readable and interesting character study of slum neighborhoods and tenement demizens. The book deals with four typical slum areas, which are briefly described as follows: Tyler Street is an Old World community, Fleet Street a cross-roads between Occident and Orient, Parnell Street an old slum and Palm Street a "conflict of cultures." The first section of the book is descriptive of the slum areas to be studied, from a general point of view. Then follow chapters more specific in character, dealing in each instance with the slum in its relation to the family and then, in a separate chapter with the social world of the child in each of these areas. Each general chapter on each of the areas under study deals with composition of the population, housing, broken and disorganized homes, family accord and discord, health of parents, effects of the depression adjustment to slum life, language and literacy, social institutions and family life, adult antisocial behavior, and social selection as a factor in the crime rate. Typical chapters on the social world of the child treat of education, retardation, attitudes toward schools, health, employment, the home, outdoor play, clubs and organizations, summer recreation, supervised recreation, commercial recreation, parental supervision, behavior disorders and juvenile delinquency. Throughout the approach appears objective and free from preconceived theories which it is sought to prove.

Most interesting to the medical reader is the treatment of the health situations in these slums. Except for one suggestion among the conclusions to the effect that the school must look

after the health of the children unless some other agency does so, one finds here no suggestion of the stock in trade of the advocates of medical socialism, no suggestion that all the evils of poverty can be remedied by merely providing more and cheaper medical care. The author has not apparently been misled into confusing causes and effects and prescribing the superficial remedy of more medical care for the deep-seated economic, social and cultural causes which underlie the manifestation known as a slum. Instead, he challenges public education to furnish the cultural stimuli which will penetrate the barriers of lethargy, lingual obstacles and adherence to Old World traditions and furnish the dwellers in these slum areas with cultural interests and with educational opportunities to prepare them for a more fully rounded life.

**Klinische Infektionslehre. Einführung in die Pathogenese der Infektionskrankheiten.** Von Dr. med. habil. Felix O. Höring, Oberarzt der II. Medizinischen Klinik und Dozent an der Universität München. Mit einem Geleitwort von Professor Dr. A. Schlittenhelm. Paper. Price 9.60 marks. Pp. 184. Berlin: Julius Springer, 1938.

This presents an interesting and instructive discussion of the genesis of infectious diseases from the point of view of the symbiotic relations between the host—the patient—and the specific infectious agent. The common principles of the various manifestations as distinct diseases of this symbiosis under different conditions are clearly set forth. Reading the book will serve to clarify and enlarge the understanding of the infectious diseases because so to speak, it bridges the gaps between microbiology, immunology and these diseases as usually presented in the medical curriculum.

**A Manual of Reporative Plastic Surgery.** By J. Eastman Sheehan, M.D., F.A.C.S., Professor of Plastic Reporative Surgery, New York Polyclinic Medical School and Hospital, New York. Cloth. Price \$5.50. Pp. 311 with 332 illustrations including 18 plates. New York & London: Paul B. Hoeber Inc., 1938.

**Plastic Surgery.** By Arthur Joseph Barsky, M.D., D.D.S., Associate Surgeon in charge of the Department of Reconstructive Surgery, Beth Israel Hospital, New York City. Cloth. Price \$5.75. Pp. 355 with 432 illustrations. Philadelphia & London: W. B. Saunders Company, 1938.

**Plastische Anatomie. Die konstruktive Form des menschlichen Körpers.** Von S. Möllner. Second edition. Cloth. Price 36 marks. Pp. 280 with 468 illustrations by Hermann Sachs. Munich: J. F. Bergmann, 1938.

Three books on the plastic art within a short period certainly indicate a growing interest in this recently revived but ancient specialty. At present many interesting books are available. The recent additions by Sheehan and his former associate Barsky will no doubt be welcomed by those who found the previous publications in this country too restricted in scope. Both of these authors have attempted to extend their text beyond the province of one specialty and have taken the broader view of plastic surgery in its fundamentals as applicable to all fields of surgery.

Sheehan, whose previous books on plastic surgery of the orbit and plastic surgery of the nose won him such renown, now turns his attention to the subject of autoplasmic repair and devotes a third of his new book to a discussion of the principles of tissue restoration. His long experience in the field has ably fitted him for the task and one finds it easy to read and understand these basic facts which he has boiled down to a comparatively few pages. The remainder of the book is taken up with the application of these principles to certain common conditions in the field of eye, ear, nose and throat, the oral cavity, the hand and cutaneous conditions.

Barsky's book follows a similar pattern but devotes less space to the fundamentals and more to the actual technic in various locations. One is amazed at the wide field that is covered in this comparatively small book. The author states that it was his intention to show only those operations which are typical for certain conditions, thus implying that many other procedures are available. It is therefore a book which should appeal to those who are preparing themselves for this type of work as well as to those who are doing only a modest amount of it. General surgeons will find much that is helpful in both books and every surgeon who expects to treat traumatic cases necessitating reparative procedures should acquaint himself with the many fine details which make for more successful results and which have been brought down to date by both of these authors.

Möllner's book is intended primarily for artists and sculptors and is concerned with the study of the framework of the body.

as manifested by and having an influence over its contour. The bones, muscles, ligaments and joints are discussed from the point of view not only of supporting structures but of plastic materials subject to certain limitations of motion and flexibility. Much of the value of the book lies in the beautiful colored drawings by Hermann Sachs, which seem to breathe life into an otherwise rather dry subject. Orthopedists might find this book valuable in their daily practice because of the attention given to the mechanics of the joints, muscles and ligaments and their influence on posture and motion.

**Lehrbuch der speziellen pathologischen Anatomie für Studierende und Ärzte** Von Dr. Eduard Kaufmann. Band II. Teil 1. Lieferung 1. Knochen, Gelenke, Muskeln, Sehnen, Sehnenscheiden, Schleimbeutel. Anhang: Literaturangaben. Bearbeitet von Georg B. Cruber. Ninth and tenth edition. Paper. Price 30 marks. Pp. 993, 1367, 207\*, 279\* with 247 illustrations. Berlin: Walter de Gruyter & Co. 1938.

This is the first instalment of the first part of the second volume of the ninth and tenth edition, revised and enlarged of Kaufmann's well known Pathologic Anatomy. The first volume, 991 pages, was published in 1931 and the second part of the second volume, which consists of the references (206 pages) for volume I, was published in 1932. The remaining instalments of the book will appear shortly. According to the foreword the revision of the second volume was commenced by Kaufmann, who died in 1931, and is now in the course of completion by his successor in Göttingen and others. The aim is to preserve the original character of the work so far as possible. The number of illustrations, all black and white drawings in the instalment before us, will be increased and some of the old ones replaced by new. The present instalment deals with the diseases of bones, joints, muscles, tendons, tendon sheaths and bursae. The pathologic anatomy of these diseases receives a thorough, well arranged and well illustrated consideration. The references are collected at the end and cover seventy-two closely printed pages, forming a continuation of references to the first volume. Evidently the second part of the second volume will contain only references.

**Pediatric Surgery** By Edward C. Brenner. A.B. M.D. F.A.C.S. Director of Surgery, Riker's Island Hospital, New York. Cloth. Price \$10. Pp. 843 with 293 illustrations. Philadelphia: Lea & Febiger, 1938.

The use of judicious operative procedures in infants and children presumes an appreciation of knowledge peculiar to that age period. The author has attempted to present this information in a textbook covering pediatric surgery systematically. Practically all the conventional subjects except fractures are included in the scope of the book. Chapters on anesthesia, blood transfusions, cleft lip and palate, thoracic surgery, genitourinary surgery and neurosurgery are contributed by colleagues of the author. These are well done and materially contribute to the book. The author has been left the task of epitomizing the rest of the field of pediatric surgery. This is a difficult assignment in the space permitted in one volume and he has done it creditably. The common surgical conditions in infants and children are for the most part well handled. The section on congenital malformations of the upper part of the gastrointestinal tract could be expanded as this phase of pediatric surgery is a most important one in infancy. Likewise it would seem advisable to present some definite detail on the nutritional aspects of postoperative care in infants. Not all physicians will have the services of a well trained pediatric consultant. The chapter on preoperative and postoperative care is not in keeping with the quality of some of the other chapters. This should be improved in the next revision, as it is an important consideration in pediatric surgery. The book is well illustrated with diagrams and reproductions of photographs. The data are in keeping with current medical thought except for the author's discussion on tetanus. The use of intrathecal therapy as outlined by the author will be questioned by students of tetanus. If the author has conviction on this type of treatment he still owes it to his readers to present the current views. Other omissions appear which will undoubtedly be corrected in the next edition. The author should also give serious consideration to the omission of a well selected bibliography. In spite of his expressed intention of not writing a textbook of encyclopedic character, the reader often would like to go beyond the confines of the text in a particular subject and guidance would be helpful.

**Clinical Atlas of Blood Diseases** By A. Piney, M.D. M.R.C.P. Consulting Physician, International Clinic, Tunbridge Wells, London and Stanley Wyard, M.D. M.R.C.P. Physician, the Royal Cancer Hospital, London. Fourth edition. Cloth. Price \$4.50. Pp. 127 with 42 plates. 38 in color. Philadelphia: P. Blakiston's Son & Co. Inc. 1938.

Many physicians are familiar with this concise atlas of hematology. The present revision comprises rewriting of much of the text and the addition of five new plates. The authors have carefully considered the inclusion of an index but have decided to arrange the table of contents in alphabetical order and append page numbers to the entries in the glossary as a means of facilitating reference. While most physicians will use the book chiefly as an atlas, others will find the epitomized text useful in refreshing themselves on clinical hematology. Under the discussion of glandular fever some mention should be made of the fact that the determination of heterophile antibody is useful when the blood smear is doubtful. The plate on glandular fever would also be more valuable if it pictured more than one type of cell found in glandular fever. Since bone marrow study is being undertaken with increasing frequency, the authors should consider the advisability of including a concise discussion of sternal aspiration and the picturing of some typical smears in normal and disease states in the next revision of their book. This should not cause undue expansion. The present edition is highly recommended to the practitioner and student of medicine. It is one of the most useful books in hematology and compares favorably with any large atlas for clinical purposes.

**Kurzes Wörterbuch zur Geschichte der Medizin** Von Prof. Dr. B. Mayrhofer, Vorstand der Lehrmittelsammlung für Geschichte der Medizin an der Universität Innsbruck. Paper. Price 9 marks. Ip. 224. Jena: Gustav Fischer, 1937.

This is a history of medicine in which subjects, personalities and other material are listed in alphabetical order with from one to fifteen lines on each subject. The American reader will find the book difficult to use intelligently because, for example, the first published medical work is listed alphabetically under the words "Erste medizinische Drucke." Naturally many a great American investigator and contributor to medical science is omitted entirely. There is no mention of Benjamin Rush or of Walter Reed, and three lines are given to Banting. Oliver Wendell Holmes is omitted and fifteen lines are given to Semmelweis. Crawford Long is omitted and William Thomas Green Morton is listed as Wilhelm Morton.

**The Art and Science of Marriage** By Esther Bogen Tietz, M.D. Ph.D. Resident Physician, Longview State Hospital, Cincinnati, Ohio, and Charles Klipp Welchert, Ph.D. Associate Professor of Zoology, University of Cincinnati. With an Introduction by Morris Fishbein, M.D. Editor, Journal of the American Medical Association. Whittlesey House Health Series. Morris Fishbein, Editor. Cloth. Price \$2.50. Pp. 279. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc. 1938.

The writers of this book are a physician, with a special training in psychology, and a biologist. They have approached the problem of modern marriage from these two points of view and have endeavored to provide not only a guide to those about to be married but also an understanding of the chemical, physical, physiologic and biologic factors of the human body concerned in these sex relationships. After three chapters dealing with courtship and marriage they provide an easily understandable outline of the various systems of the human body and of their physiology. The concluding chapters of the book deal with adolescence, embryology, heredity and parenthood. The book is among the sanest and most dependable of all the many in this field that have been recently published.

**Index Catalogue of the Library of the Surgeon General's Office, United States Army (Army Medical Library)** Authors and Subjects. Fourth Series. Vol. III. C. Czypian. [Including] Second Supplement. Fourth Series. Congresses, Tentative Chronological and Bibliographical Reference List of National and International Meetings of Physicians, Scientists and Experts. Cloth. Price \$2.75. Pp. 295, 1,051. Washington, D.C.: Superintendent of Documents, Government Printing Office, 1938.

To those who are familiar with the Index Catalogue this volume covering the letter C needs no further recommendation. The listing of approximately 1,200 congresses, most of them of medical interest, represents an addition which will be widely welcomed. These publications constitute invaluable aids in bibliographic research.

**Psyche and the Physiologists and Other Essays on Sensation** By Edward Guy Dru Drury MD BS DPH Lecturer on Physiology and Hygiene at Rhodes University College Grahamstown South Africa Cloth Price 5s Pp 98 London H K Lewis & Co Ltd 1938

The author of this volume is a general practitioner of South Africa as well as a lecturer on physiology and hygiene. He has a fine sense of humor. Here he has collected six addresses made at various occasions, in which he pokes gentle fun at some of the exaggerations of modern medical science in the fields of psychology, pediatrics and physiology. In the course of his essays he conveys a great deal of practical information. One of the most interesting of the essays is the last, which has the title "Visceral Disharmony," in which he concludes with an analysis of the physiology of sex and love.

**Keats as Doctor and Patient** By Sir William Hale White KBE Consulting Physician to Guy's Hospital London Cloth Price \$2 Pp 96 with 5 illustrations New York Toronto & London Oxford University Press 1938

The poet Keats was slightly over 25 years of age when he died. He had studied medicine for five years and during one of these years had been seriously ill of tuberculosis. Dr Hale-White tells the story of Keats's medical career and of the medical care given to him in his illness. The book affords certain intimate views of the great poet which many a previous biographer has not emphasized. Dr Hale-White is convinced that the medical studies of Keats influenced his writings so little as to be negligible. He is also convinced that the native industry of the poet forced him to work very hard at medicine but that his heart was not really in it.

**Treatment in General Practice The Management of Some Major Medical Disorders** I Articles Republished from the British Medical Journal Second edition Cloth Price 8s 6d Pp 259 with 6 illustrations London H K Lewis & Co Ltd 1938

This is a collection of practical brief articles on the management of some of the major medical disorders that were published in the *British Medical Journal* between 1935 and 1936. The fact that a second edition is necessary bears testimony to its utility. Advantage has been taken of the possibility of revision to bring the new edition down to date and most especially to introduce in the proper sections the use of sulfanilamide. The book deals with diseases of the nervous system, the blood and blood forming organs, rheumatic diseases, diseases of the metabolism and of the kidney, and it may be recommended as a summary of the practice of eminent British physicians.

**The Happy Family** By John Levy MD CM and Ruth Munroe PhD Cloth Price \$2.75 Pp 319 New York Alfred A Knopf 1938

The thesis of this book is that a happy home requires home makers who are "comfortable in their own skins", that is to say, well adjusted personalities. The bickerings, the jealousies, the misunderstandings, the divorces, the infidelities which break up homes are, in the opinion of these authors, but the symptoms of deeper underlying failures to make a satisfactory adjustment to life's problems. The chronic divorcee, flitting from mate to mate, indicates this fundamental unfitness. Immediate circumstances which may seem to determine conduct of this type are in reality but the superficial occasions thereof. The book contains some sensible points of view, which are nevertheless somewhat startling. Settling down to marriage and disillusionment in marriage are sensibly described not as necessary evils but as consummations devoutly to be desired on the theory that it is impossible to maintain forever an artificially high emotional level and that disillusionment, realistically accepted, means getting rid of illusions and facing realities. The failures come to those who cannot achieve these adjustments. The theme is pursued through eight chapters, dealing in turn with how families begin settling down to marriage, the other woman, sexual satisfaction, living together, work and money, children and the difficulties encountered by all children. The book, though published as a collaboration, is written in the first person with a delightfully human in places whimsical, touch perhaps well characterized by the author's remark: "At this point I would like to light my pipe and take a few pages off to chat." The whole treatment of the subject gives this impression, making it an intimate and readable as well as informative piece of work. Some of the views the authors admit are rather advanced, as

for example the belief that, while monogamy is to be preferred, a sensible wife who enjoys her husband's love and understanding may even condone infidelity and the marriage be none the worse for it, provided the underlying cause can be found and remedied, this cause being not necessarily sexual. For men and women whose home life is unsatisfactory this book may well be recommended by the physician as an accessory to whatever medical or psychotherapeutic treatment may be indicated. Dr Levy, who died in 1938, was a psychiatrist. His wife and co-author is a psychologist. The book is a happy blending of their related and coordinated scientific views.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Workmen's Compensation Acts Physicians Presumed to Know Limits of Liability Imposed on Employer by Compensation Act**—A physician, said the Supreme Court of Tennessee who treats an injured workman and who is informed by the employer's insurer that the case is a compensation case and is to be governed by the medical provisions of the workmen's compensation act cannot thereafter recover from the employer a sum in excess of the limit specified in that act. In this case the medical provisions of the workmen's compensation act of Tennessee provided that the total liability of the employer on account of medical services rendered to an injured employee shall not exceed \$100, with an additional \$100 for hospital expenses. The physician attempted to collect from the employer an amount in excess of the \$100 but the Supreme Court limited the physician's recovery to the statutory amount. The physician, in the opinion of the court, was presumed to know the law — *Brandon v Kentucky-Tennessee Light & Power Co (Tenn)*, 116 S W (2d) 1029.

**Dental Practice Acts Statutory Restrictions on Advertising Valid**—The plaintiffs, licensed dentists, sued to restrain the state board of dental examiners from enforcing certain provisions of the dental practice act relating to advertising. From a judgment denying the injunction, the plaintiffs appealed to the court of civil appeals, Texas, San Antonio. The act, among other things, defines as unprofessional conduct advertising by a dentist by means of a large display sign or glaring light sign, either electrical or neon, or by signs containing as a part thereof the representation of a tooth, teeth, bridgework, plates of teeth or any portion of the human head, or using specimens of such in display, directing the attention of the public to any person or persons engaged in the practice of dentistry. This prohibition, the plaintiffs contended, was unconstitutional. But, said the court, the power of the state, through its legislature, to regulate and circumscribe the character of advertising by dentists of their professional services, equipment and facilities is now generally recognized and upheld. The power includes the authority to prohibit the character of advertising condemned by the dental practice act of Texas. This power the court observed, does not rest necessarily on the theory that such advertising must be false or within itself harmful in every case. The true theory is, primarily, at least, that such methods of inducing business are contrary to the well established and universally recognized and respected standard of ethics of an honored and useful profession the maintenance of which will tend to insure competence in individual practitioners and minimize the influence of the charlatan and quack, who, unable to establish or maintain himself on his own merits and virtues, must and does resort to the tricks and devices denounced by the act. It may be the court continued that purely ethical or esthetic considerations will not of themselves warrant legislative interference in setting up and enforcing standards of professional conduct although the tendency among the decisions is to hold

these considerations to be sufficient. Such considerations, however, are proper elements of public policy behind valid legislative acts of control and regulation, they spring from a presumed opinion and demand on the part of the general public that such methods as those condemned by the act here in question are unseemly and demoralizing and actually in derogation of the general welfare, and should be prohibited. Such acts are upheld on the further ground that they are necessary to protect the weak and gullible from their own incapacity, when suffering from real or imaginary ills, to resist alluring promises of cures guaranteed or not, and painless or not, at cheaper prices with better facilities, more skilled treatment and the like.

There was no merit, the court said, in the plaintiffs' contention that the dental practice act offends against the constitutional guaranty of freedom of speech and of the press. The question of freedom of the press was not involved, except as a remote incident of the purpose and effect of the act. The act does not purport to affect the right of the press to publish whatever it sees fit to print, in whatever form or language it chooses. It has been repeatedly and uniformly held that such legislation is not in contravention of the constitutional guaranty of freedom of speech.

The judgment of the trial court, refusing to enjoin the state board of examiners from enforcing the provisions of the act, was therefore affirmed. — *Sherman et al v State Board of Dental Examiners (Texas)* 116 S W (2d) 843

**Evidence Admissibility of Results of Pathometer Tests of Defendant** — The defendant was accused of the crime of robbery. At the trial before the Queens County court, New York, he proffered a witness in his behalf who had subjected him to interrogation under a machine described as a pathometer or psychogalvanometer. The prosecution objected to the testimony of this witness on the ground that the scientific principle involved in the use of the pathometer had not gone beyond the experimental to the demonstrable stage and that it had not received general scientific acceptance.

Evidence was presented to show that the apparatus used was designed for the accurate recording of human emotional reactions. The claim for its accuracy and reliability was based on a study which covered more than 6,000 individual tests. The apparatus, according to the evidence, works on the electrical phenomena developed at the surface of the body during emotional changes. According to the testimony of the witness who applied the test to the defendant there are three of these electrical phenomena, two of which are constant and the third a variable. The variable is eliminated entirely during the examination, and one of the two constant phenomena is selected by means of appropriate contact electrodes. By reason of the human emotional reactions which result on the asking of each question, the witness claimed to be able to separate and detect both the true and the false answers made by the subject. He testified that in actual examinations of persons involved in the forty-nine criminal cases, and in many cases of noncriminal and private nature, the results have indicated 100 per cent accuracy.

Objection to the use of scientific proof the court said, is not at all novel. At one time or another in their development testimony as to fingerprints, as to X-rays, as to handwriting, as to bullet markings and as to psychiatric examinations were all refused admission into evidence. Their gradual admission into evidence came only after many rebuffs and rejections at the hands of various courts. Today their right to admission in evidence is firmly entrenched in law. Yet the deductions of handwriting experts and of psychiatrists are not at all uniform, and frequently experts testifying in courts draw conflicting inferences from their examinations. Despite the fact that such experts frequently differ in their conclusions, their testimony is received in evidence and it is left to a jury to determine which, if either expert to believe. In the present case, the court pointed out, there was testimony that the deductions and the accuracy of the conclusions to be drawn from the examination were undebatable. Both on legal principle and on sound reasoning courts that accept and receive handwriting testimony, psychiatric testimony and other such expert opinion should also admit in evidence, the court thought

testimony of the pathometer test and the results disclosed thereby when a proper foundation has been laid therefor.

The objection of the prosecution to the admission of the testimony was therefore overruled and the testimony was ordered to be received and the jury permitted to evaluate it. — *People v Kenny (N Y)*, 3 N Y S (2d) 348

**Hospitals Sanatorium Not Exempt from Taxation** — The plaintiff sanatorium sued the defendant town to recover taxes paid under protest. The trial court gave judgment for the plaintiff, and the defendant appealed to the Supreme Court of Wisconsin.

A Wisconsin statute exempts from taxation property owned by any educational institution having a regular curriculum and offering courses for at least six months in the year, or by any scientific literary or benevolent association, with certain limitations not here pertinent. The educational institutions covered by the statute, the court pointed out, are those having a regular curriculum and offering courses for six months of each year. The plaintiff had no such curriculum and offered no such courses. Obviously it could not claim exemption as an educational institution. Neither was it a literary institution. The suggestion that the sanatorium was a scientific association was based on the fact that its physicians were engaged in the treatment and study of persons afflicted with mental and nervous diseases, that the knowledge thus acquired was promulgated to the medical profession and that the plaintiff was thus engaged in furthering the science of the care and treatment of mental and nervous diseases. Plainly, the court pointed out, the sanatorium was no more a scientific institution than any hospital or clinic whose physicians disclose their medical discoveries and practices to the profession generally, as physicians as a class take pride in doing.

It was claimed that the sanatorium was a benevolent institution, based on the fact that no person made any profit out of its operation and that a large part of its inmates received treatment and hospitalization at less than cost. Its articles of incorporation too, declared that the "purpose" of the organization of the corporation was "exclusively for benevolent charitable and educational purposes." But, the court said, the sanatorium must be judged by what it actually does rather than by its declared purposes, and the record showed that it receives no patients as charity patients every patient is expected to pay for the service rendered him. No physician or nurse attending the patients and no person administering in any way to them donates his services. The fact that the hospital and its equipment were donated to the corporation did not make it a benevolent institution. The gift was a benevolence but that benevolence cannot be construed as making the hospital a benevolent institution within the meaning of the statute. If so the court pointed out, a gift to a physician to enable him to build and equip a hospital would make the hospital a benevolent institution the gift might be considered a benevolence and the giver a benevolent person, but the hospital would not qualify as a benevolent institution.

The judgment of the trial court, therefore, was reversed, and the case remanded with directions to dismiss the complaint. — *Rogers Memorial Sanitarium v Town of Summit (Iris)* 279 N H 623

## Society Proceedings

### COMING MEETINGS

American College of Physicians New Orleans March 27 31 Mr. E. R. Loveland 4200 Pine St. Philadelphia Executive Secretary  
American Orthopsychiatric Association New York Feb. 23 25 Dr. Norville C. La Mar 149 East 73d St. New York Secretary  
American Society of Anesthetists New York Feb. 10 Dr. Paul M. Wood 131 Riverside Drive New York Secretary  
Annual Congress on Medical Education and Licensure Chicago Feb. 13 14 Dr. W. D. Cutter 535 North Dearborn St. Chicago Secretary  
Mid-South Post Graduate Assembly Memphis Feb. 14 17 Dr. A. F. Cooper Goodwyn Institute Bldg. Memphis Tenn. Secretary  
Pacific Coast Surgical Association San Francisco Oakland Del Monte March 28 31 Dr. H. Glenn Bell University of California Hospital San Francisco Secretary

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

#### American J Digestive Diseases, Huntington, Ind

5 657 720 (Dec) 1938

- Gastric Absorption of Phenol Red in Humans A Penner F Hollander and M Saltzman New York—p 657
- Modification of the Anon and Mirsky Hemoglobin Method for the Determination of Pepsin in Gastric Drainage J M Beazell C R Schmidt A C Ivy Chicago and J F Monaghan Philadelphia—p 661
- Diabetes Mellitus and Peptic Ulcer Clinical Study of Nine Cases R E Rothenberg and I Teicher Brooklyn—p 663
- End Results After Gallbladder Operations with an Analysis of the Causes of Residual Symptoms S G Meyers D J Sandweiss and H C Saltzstein Detroit—p 667
- Mycotic Infections of the Stomach C Bearse Boston—p 674
- Studies in Calcium Metabolism II Further Contributions to Comparative Studies of Physicochemical Properties of Gluconate and Citramate of Calcium and of Vitamin C S L Ruskin New York and R Jonnard Paris France—p 676
- \*Untoward Effects Resulting from the Use of Large Doses of Vitamin B<sub>1</sub> C L Steinberg Rochester N Y—p 680
- \*Melanosis Proctocoli Preliminary Report of Twelve Cases H E Bacon Philadelphia and W A H Scheffler Camden N J—p 681
- Carcinoma of Head of Pancreas Without Jaundice C Haines New York—p 683
- \*Calcium Gluconate and Kaolin in Treatment of Bacillary Dysentery B L Greene Elgin Ill and L H Block Chicago—p 684
- Human Autonomic Pharmacology XVII Effect of Acetyl Beta Methyl choline Chloride on the Gallbladder P G Schube A Myerson and Ruth Lambert Boston—p 687
- Digestion and Absorption in a Man with Three Feet of Small Intestine E S West J R Montague and F R Judy Portland, Ore—p 690
- Melanosis Coli in a Boy Aged Two and One Half Years J H Willard and T J Shutt Philadelphia—p 693
- The Medical Treatment of Cholecystitis W J Mallory Washington, D C—p 694

**Untoward Effects from Vitamin B<sub>1</sub>**—During the last two years Steinberg has used various preparations of vitamin B complex and vitamin B<sub>1</sub> in the treatment of more than 300 cases of chronic arthritis. During this period herpes zoster has occurred in three patients after large doses of vitamin B<sub>1</sub>. The author was able to produce herpes on two separate occasions in one of these patients. This was not possible in the other two as they refused further treatment because of the pain incident to herpes. Symptoms suggestive of smooth muscle spasm have occurred in other cases. The observations indicate that large doses of vitamin B<sub>1</sub> are capable of irritating the peripheral nerve plates. Therefore one should be on guard in the use of this substance, and when an individual so treated begins to complain of intense burning pain in an unsuspected area the administration of this vitamin should be stopped.

**Rectal Melanosis**—Bacon and Scheffler report twelve cases of rectal melanosis. While the condition is relatively uncommon it is by no means as infrequent as is usually considered. The fact that it can be visualized only by sigmoidoscopy emphasizes the importance of a complete examination of the rectum and sigmoid in all cases coming under observation. Of the twelve patients observed, eight had taken cascara frequently and other laxatives only one was quite emphatic that none of the group had been used. There is little to be said about treatment except that the withdrawal of anthracene cathartics and correction of the constipation will usually result in a disappearance of the pigmentation. It has been estimated that from three to six months is required. This is approximately the period observed in the authors' cases.

**Calcium Gluconate and Kaolin in Dysentery**—Greene and Block used the intravenous or intramuscular injection of 10 cc of a 20 per cent solution of calcium gluconogalactogluconate twice daily complemented by 8 Gm each of kaolin

and calcium gluconate with or without an equal amount of a calcium malt preparation every two hours orally in the treatment of sixty patients with bacillary dysentery. An analysis of the cases revealed a great disparity in the mortality of this and a control group of seventy-five patients. The control group showed a mortality of 24 per cent as compared with 7 per cent in the group treated with calcium. The period of hospitalization was slightly reduced. While the detailed action of the calcium and kaolin treatment used cannot be wholly explained, it seems entirely logical that the beneficial effects obtained are due to a combination of several well known properties of the two substances. The method is not offered as a specific but as a valuable adjunct to other proved medical measures.

#### American Journal of Medical Jurisprudence, Boston

1 217 280 (Dec) 1938

- Crime and Justice S Glueck Boston—p 217
- Roentgenograms as Evidence S W Donaldson Ann Arbor Mich—p 228
- Injury and Disease Their Relation in Personal Injury Damage Cases J V Reed Indianapolis—p 234
- The Institute of Forensic Medicine University of Lund Sweden E Sjoval Lund Sweden—p 237
- Lawlessness—a National Menace J E Hoover Washington D C—p 242
- Medical Examiner's Routine and Records E L Hunt Worcester Mass—p 247
- Summary of the Report of the American Neurological Association Committee for the Investigation of Sterilization A Myerson Boston—p 253

#### American Journal of Pathology, Boston

14 691 870 (Nov) 1938

- Clinical and Pathologic Study of Subacute and Chronic Glomerulonephritis Including Lipoid Nephrosis E T Bell Minneapolis—p 691
- Acute Hematogenous Interstitial Nephritis P Kimmelstiel Richmond Va—p 737
- The Pharyngeal Pituitary Gland R H Melchionna and R A Moore New York—p 763
- Differences Between Castration Cells and Thyroidectomy Cells of the Pituitary of the Rat in Response to the Administration of Estrone and Thyroid Extract Isolda T Zeckwer Philadelphia—p 773
- Histologic Variations in Autonomic Ganglions and Ganglion Cells Associated with Age and Disease A Kuntz St Louis—p 783
- Multiple Tumors of Sympathetic Nervous System Report of Case Showing a Distinct Ganglioneuroma a Neuroblastoma and a Cystic Calcifying Ganglioneuroblastoma H R Wahl and P E Craig Kansas City Kan—p 797
- The Amount of Splenic Lymphatic Tissue at Different Ages J M S Hwang S W Lippincott and E B Krumbhaar Philadelphia—p 809
- \*Multiple Necroses of the Spleen (Fleckmilz) H C Schmeisser and L C Harris Jr Memphis Tenn—p 821
- \*Giant Interstitial Cells and Extrarenal Interstitial Cells of the Human Testis A A Nelson Minneapolis—p 831
- Effect of Ascorbic Acid Deficiency on Enamel Formation in the Teeth of Guinea Pigs P E Boyle Boston—p 843

**Multiple Necroses of the Spleen**—Schmeisser and Harris divide multiple necroses of the spleen into five groups (arteriosclerotic toxic-thrombotic, angiospastic toxic-thrombotic, purely toxic, arteritic and infectious toxic-thrombotic), review the twenty-seven cases reported in the literature and cite two further cases. The origin of the necrosis itself may be explained by closure of the vessel to a designated region of tissue, relative vascular insufficiency with superimposed tissue injury, or pure tissue injury which by accident was situated in the region supplied by the individual vessel. Nineteen of the twenty-nine cases are observed to be similar to those originally described by Fetus and are associated with renal insufficiency. He ascribed the necrosis to arterial damage superimposed on an arteriosclerosis. The lesions affected primarily the smaller middle size arteries and consisted of hyaline and fatty degeneration with intimal proliferation and often subsequent thrombosis. Lubarsch directed attention to the additional factor of the toxin liberated in uremia and renal insufficiency with which these cases were associated. Geipel and Matthias studied spleens in which there was considerable arterial and venous thrombosis but in which the walls of the vessel were normal. The organs were from patients who died from eclampsia. They agreed with Beneke's idea of the origin of organic injuries through angiospasm caused by the hypothetic eclampsia toxin and followed by secondary thrombosis. These (two) are classed as the angiospastic toxic-thrombotic group. Enzer Lubarsch and Magnus examined spleens from individuals who suffered from profound anemia but no changes were observed in the walls of the blood vessel, either



thrombosis or degeneration. These (three) are probably due to pure tissue injuries which were by chance located in areas supplied by individual arteries, and the etiologic factor is purely toxic. There is one case due to a widespread acute necrotizing arteritis resembling somewhat periarteritis nodosa but in which there was an absence of periarteritic leukocytic infiltration and aneurysm formation. The necrosis was manifest in the spleen, pancreas, kidneys and alimentary tract. This is grouped as arteritic in nature. Four cases are classed as due to infection with the possibility of the toxins liberated coming into play.

**Giant Interstitial Cells of Human Testis**—In a study of the microscopic sections of 721 testes from a series of 470 necropsies on males 18 years of age or over Nelson found in eighty-five testes giant interstitial (Leydig) cells having from four to thirty (usually from eight to ten) nuclei. They were found at all ages and in all sorts of general disease conditions. They do not appear to have been previously described, although their existence has been hinted at. The observations of Berger and others on the "sympathicotropic" or "hilus" cells have been confirmed and extended. It is generally agreed that these cells in the testis are identical with the ordinary interstitial or Leydig cells. The author proposes the name "extraparenchymal interstitial cells" or "extraparenchymal Leydig cells" as best describing them.

### American Review of Tuberculosis, New York

38 651 804 (Dec) 1938

- Chronic Nontuberculous Infections of the Lung. Clinical Discussion R G Bloch and B F Francis Chicago—p 651  
Pathology of Chronic Nontuberculous Inflammations of the Lung B S Kline Cleveland—p 663  
Roentgenologic Aspects of Nontuberculous Pulmonary Disease J J Singer Los Angeles—p 680  
Bronchoscopy in Chronic Nontuberculous Infections of the Lung P C Samson Oakland Calif—p 688  
Surgical Treatment of Nontuberculous Pulmonary Suppurations H Brunn and A Goldman San Francisco—p 703  
\*Primary Coccidioidomycosis. The Initial Acute Infection Which Results in Coccidioidal Granuloma E C Dickson San Francisco—p 722  
Pneumonitis M Pinner New York—p 730  
Thoracoplasty in Treatment of Pulmonary Tuberculosis. Experience of French Clinics A Maurer and E de Savitsch Paris France—p 738  
Tuberculosis of Tonsils. Study of 107 Patients Following Removal of Tuberculous Tonsils H M Pollard and A B Combs Ann Arbor Mich—p 746  
Treatment of Tuberculous Tracheobronchitis J S Pickard and F W Davison Allenwood Pa—p 758  
\*Myocardial Tuberculosis. Cause of Congestive Heart Failure E L Wilbur Durham N C—p 769  
Spontaneous Lysis of Tubercle Bacilli on Artificial Culture Mediums II W Steenken Jr Trudeau N Y—p 777

**Primary Coccidioidomycosis**—The main endemic focus of coccidioidomycosis in North America is the San Joaquin Valley in California. Dickson states that it is definitely established that infection with coccidioides fungus is caused by the chlamydospores of the vegetative phase of the fungus which in some way gain access to the tissues. There seems to be no doubt that the chlamydospores are carried through the air, presumably associated with dust. When primary cutaneous lesions follow trauma of the skin, as by the prick or abrasion of the skin, undoubtedly the chlamydospores are associated with the dust on the objects causing the primary cutaneous lesions. In general, however, primary coccidioides infection seems to be acquired by inhalation of the chlamydospores, and the development of the primary lesions is in the lungs or regional lymph nodes. The development of the later coccidioidal granuloma is undoubtedly secondary and is caused by migration of the virus to different parts of the body from the primary foci in the lungs or peribronchial lymph nodes, presumably by the blood stream. Infection with coccidioides fungus may be manifested by a primary acute respiratory infection, often accompanied by erythema nodosum from which the majority of patients recover without complication, and a later more or less chronic granulomatous disease, known as coccidioidal granuloma, which may be disabling and has a mortality rate of approximately 50 per cent. It therefore becomes necessary to have a name for coccidioides infection to include both types of illness, and the term coccidioidomycosis has been suggested.

**Myocardial Tuberculosis**—Wilbur encountered a case of congestive cardiac failure in which there was no valvular lesion, hypertension or renal disease. At necropsy there was sufficient

myocardial involvement by tuberculosis to explain the clinical observations in the patient. This and the three other cases are presented to draw attention to tuberculous myocarditis as a primary cause of congestive cardiac failure and to the frequency of tuberculosis involving the cardiac muscle.

### Annals of Medical History, New York

10 463 570 (Nov) 1938

- Karl Vierordt R H Major Kansas City Kan—p 463  
Samuel Powel Griffiths W S Middleton Madison Wis—p 474  
Niels Stensen His Tercentenary Anne Tjomsland New York—p 491  
The American Medicine Man and the Asiatic Shaman Comparison C. Quinn Nevada City Calif—p 508  
Aboriginal American Medicine, North of Mexico R C Major New Orleans—p 534  
Dr. Theodore Turquet de Mayerne's Account of the Illness, Death and Postmortem Examination of the Body of His Royal Highness Prince Henry of Wales. Translated from the French Version in Brownes Opera Medica T Gibson Kingston Ont—p 550

### Archives of Neurology and Psychiatry, Chicago

40 1067 1330 (Dec) 1938

- Perineurial Cysts of the Spinal Nerve Roots I M Tarlov New York—p 1067  
Histologic Changes in Senile Dementia and Related Conditions Studied by Silver Impregnation and Micro Incineration L Alexander and J M Looney Worcester Mass—p 1075  
Disseminated Encephalomyelitis (Meningo Encephalomyeloculitis) versus Multiple Sclerosis G B Hassin Chicago—p 1111  
Physiopathologic and Patho Anatomic Aspects of Major Trigeminal Neuralgia F H Lewy and F C Grant Philadelphia—p 1176  
Studies in Diseases of Muscle. VII. Effect of Ketosis and of the Ingestion of Creatine in Myotonia Congenita A T Vilhorat and H G Wolff New York—p 1135  
\*Evaluation of Artificial Fever Therapy for Neuropsychiatric Disorders. A E Bennett Omaha—p 1141  
\*Anticonvulsive Action of Vital Dyes S Cobb and M E Cohen Boston, and J Ney New Haven Conn—p 1156  
\*Brilliant Vital Red as an Anticonvulsant in Treatment of Epilepsy. Study of Thirteen Cases R Osgood and L J Robinson Palmer Mass—p 1178  
Oxycephaly. New Operation and Its Results (Preliminary Report) J E J King New York—p 1205  
Cerebral Angioma Arteriale. Case in Which Migrainous Headache Was the Earliest Manifestation H H Hyland and R P Douglas Toronto—p 1220  
Experimental Anoxemia J W Thompson and W Corwin Waltham Mass—p 1233  
Small Aneurysm Completely Obstructing Lower End of Aqueduct of Sylvius G F Rowbotham Manchester England—p 1241  
Absence of the Septum Pellucidum as the Only Anomaly in the Brain. Report of Case Vera B Dolgopel New York—p 1244

**Fever Therapy for Neuropsychiatric Disorders**—During a period of three years Bennett has given 3,539 artificial fever treatments to 766 patients, 244 of whom were suffering from neuropsychiatric disorders. The results on these last patients indicate that fever in itself is the beneficial agent. Future investigations will finally determine whether the method of choice for the induction of fever is biologic, infectious or physical. Combined artificial fever and chemotherapy appears to have certain advantages over malarial therapy for resistant asymptomatic and severe clinical grades of neurosyphilis. Fever therapy is of doubtful value for multiple sclerosis. In obtaining relief from pain in severe neuritic disturbances, artificial fever seems a promising aid. For chronic meningococcal infections, fever therapy may be curative. Artificial fever appears to be the best treatment now available for shortening the course of infectious chorea and other manifestations of the rheumatic state. Experiments in treating toxic infectious psychotic states indicate that fever therapy may shorten convalescence. For such disorders as cerebral arteriosclerosis, functional psychoses and chronic encephalitic states, fever therapy is of no value.

**Anticonvulsive Action of Vital Dyes**—Cobb and his associates gave intravenous injections of brilliant vital red to ten children with various types of epilepsy. The total amount of dye (1 per cent) injected varied from 115 to 1,396 cc. Seven of the ten patients showed temporarily some diminution in the number of convulsions coincidental with the administration of brilliant vital red. Six patients showed sustained improvement, but in the treatment of three of these phenobarbital also was used. However the drug alone had been used before without success. One patient had complete remission of convulsions. Transient albuminuria occurred in four cases. Up to now harmful complications have not been observed. Two patients treated

with neoprontosil have shown marked diminution in the number and severity of convulsions, with no harmful complications. Despite the obvious shortcomings of the study, the authors believe that since in addition to the children four species of animals showed fewer convulsions after the administration of dye it is important to carry on a study of this problem. The results in the ten cases seem to make its trial justifiable, at least in cases of intractable epilepsy.

**Brilliant Vital Red in Epilepsy**—Osgood and Robinson obtained the following results in thirteen institutionalized epileptic boys who received brilliant vital red. 1 Both petit and grand mal seizures were significantly reduced in number in three cases. 2 The number of petit mal seizures only was markedly reduced in three cases, while that of the grand mal seizures remained about the same. 3 The number of grand mal seizures was significantly reduced in one case, in which petit mal seizures had never been known to occur until brilliant vital red was administered. 4 Petit and grand mal seizures were considerably increased in number in four cases. This the authors attribute directly to the dye, since the increased frequency of seizures persisted throughout the period of administration of dye and for weeks or months thereafter. 5 Petit mal seizures were greatly increased, while grand mal seizures remained about the same in one case. Thus they also attribute to the direct action of the dye. 6 No significant change occurred in one case. From their experience the authors believe that the safest and most satisfactory procedure in the administration of brilliant vital red is as follows. At the beginning, from 10 to 15 cc of a 1 per cent solution of the dye is given each day for two or three days, the dye is omitted for a day after these small initial doses, then 30 cc is given two or three days in succession, followed by omission on one day. This procedure has been accompanied by the least amount of renal irritation and other transitory effects.

### Canadian Medical Association Journal, Montreal

39 517 622 (Dec.) 1938

- Mental Complications of Heart Disease. A H Gordon and W Cohen Montreal—p 517  
Head Injuries. Treatise on the Pathology Sequelae and Medicolegal Aspects. W O Stevenson Hamilton Ont.—p 522  
Indications for Cesarean Section. R. Mitchell, Winnipeg Man.—p 527  
Tick Paralysis in British Columbia. G A Mail and J D Gregson Kamloops B C—p 532  
Anesthetic Complications from Reflexes Excited During Abdominal Surgery. E A Rovenstine and B B Hershenson New York.—p 538  
Renal Sympathectomy. A C Abbott and E Stephenson, Winnipeg Man.—p 542  
Bilateral Lobectomy for Bronchiectasis (Presentation of Two Cases). D E Ross Montreal—p 549  
Cerebral Pneumography in Childhood. A E Childe Montreal—p 552  
Some Observations on Disappearance of Bromsulphalein Dye from the Blood. Its Relation to Liver Function (Preliminary Report). D Macdonald St. Catharines Ont.—p 556  
Squint. J P Boley Windsor Ont.—p 560  
Etiology of Chorea. Its Relation to Rheumatic Fever and Heart Disease (Analysis of 105 Cases). S J Usher Montreal—p 565

**Bromsulphalein Test in Liver Function**—Of all the tests yet devised for hepatic function, it is generally agreed that the bromsulphalein dye retention test is as good as any and better than the majority. Because this dye is completely taken out of the blood at the end of thirty minutes in apparently normal persons it is at present considered that any person who at the end of this half hour has no dye has a normal functioning liver. It is with this that Macdonald disagrees, because if this is true it must be admitted that any two livers which have no dye in the blood at the end of thirty minutes are functionally the same and have the same reserve. But this is not reasonable nor is it true. An abnormal liver with its tremendous reserve power can do, if given time, the same work that a normal liver can do. The defect of the test as used at present is this. A normal result does not indicate an absence of hepatic damage because of this great reserve although an abnormal retention means almost definitely a diseased liver. In other words, disease must have advanced to some degree before the test is abnormal, i.e. before it gives a retention at the thirty minute mark, so that early or small amounts or potential disease is passed over and the pathologic liver is considered normal. This is worse than no test at all. If the rate at which the liver takes dye out of the blood can be determined and a graph plotted, it should be possible to

produce a curve that would always be relatively the same for a normal organ (with variations, of course within normal limits). This the author has done by estimating the remaining dye in the blood at intervals of two minutes, by means of a simple three-way valve on a needle remaining in the vein, so that only one puncture is necessary. The curve is plotted with the percentage retention of dye as vertical ordinates and the two minute intervals as horizontal ordinates. The technic of the procedure is as follows. An intravenous needle of short bevel and 18 or 20 gage is introduced into a suitable vein, as for a Wassermann test, the syringe is withdrawn and a three-way Luer valve is attached to the needle in the vein. To this valve is connected a tube leading from a flask of saline or citrate solution which can, by the valve, be directed into the vein or out through the opening which holds the syringe. The handle in the third position allows direct suction through the needle and valve to the syringe into which the blood is sucked, the syringe is detached and the fluid is first directed through the open end, which will prevent clotting in this portion, and then continued into the vein for the two minute period. This prevents clotting in the needle. When it is determined that the fluid is dripping at the proper rate in the vacuum tube and the valve is working properly, 2 mg of bromsulphalein per kilogram of body weight is injected slowly (one minute) into another vein and the first specimen of blood is drawn off in exactly two minutes. This is deposited in a clean dry test tube, allowed to clot and, with the other specimens, centrifuged, and the clear straw-colored serum is examined to determine the percentage retention of dye in that particular specimen. The estimations should not be in numerical order, as this unconsciously tends to determine the next value. The values are then plotted on the graph and joined, to produce the curve.

**Relation of Chorea to Rheumatic Fever and Heart Disease**—Usher determined the incidence of heart disease in fifty-six children presenting a history of one or more attacks of chorea uncomplicated by any other rheumatic manifestations (pure chorea) and compared it with the incidence of heart disease in forty-nine children presenting histories of chorea plus other manifestations of rheumatism (mixed chorea). Definite cardiac involvement was present on admission in 27 per cent of the children with pure choreas, and, if the children with infected tonsils and repeated infections of the upper part of the respiratory tract are omitted, only 14 per cent were associated with endocarditis. In the group of mixed choreas 65 per cent of the children showed heart disease, of which 22 per cent showed a considerable degree of involvement. Valvular heart disease in cases of chorea is due not to the chorea itself but to intercurrent attacks of polyarthritis or severe infections of the upper part of the respiratory tract associated with infected tonsils. It is important as regards treatment and prevention of recurrences to lay more stress on the psychic element in chorea. Removal of foci of infection does not always cure chorea. In the treatment and follow-up there has been a tendency to neglect the basic nervous constitution of the child and its susceptibility to psychic trauma.

### Florida Medical Association Journal, Jacksonville

25 265 316 (Dec.) 1938

- The Management of Sinusitis. O N Nelson Bay Pines—p 275  
Relationship of Intrinsic Carcinoma of the Larynx to Precancerous Lesions. R E Repass and C S McLemore Miami Beach—p 280  
Congenital Malformations of the Intestinal Tract. T C Maguire Plant City—p 283  
Known and Unknown Factors in Tuberculosis. A S Anderson St Petersburg—p 287  
Review of the Literature on Sulfanilamide with Some Personal Observations. F T Holland Tallahassee—p 291

### Johns Hopkins Hospital Bulletin, Baltimore

63 349-430 (Dec.) 1938

- The Use of Gonadotropic Hormones in the Adult Rhesus Monkey. C G Hartman Baltimore—p 351  
Researches on Tetanus. IX. Further Evidence to Show That Tetanus Toxin Is Not Carried to Central Neurons by Way of the Axon. Cylinders of Motor Nerves. J J Abel, W M Firor and W Chalian Baltimore—p 373  
Congenital Aneurysmal Dilatation of the Left Auricle. J H Semans and Helen B Taussig Baltimore—p 404  
Tuberculous Endocarditis of the Pulmonary Valve. Case Report. J Mark Baltimore—p 415

**Journal of Investigative Dermatology, Baltimore**

1 399 494 (Dec) 1938

Excretion of Bromide Through the Skin T Cornbleet Chicago—p 399  
Effect of Temperature on the Skin Review H C Bazett Philadelphia—p 413

\*Value of Administration of Liver in Patients Intolerant to Arsenicals G D Astrachan New York in collaboration with E A Sharp Detroit—p 427

Experimental Studies with the Dermatophytes I Primary Disease in Laboratory Animals E D DeLamater and Rhoda W Benham, New York—p 451

Id II Immunity and Hypersensitivity Produced in Laboratory Animals E D DeLamater and Rhoda W Benham New York—p 469

**Liver for Patients Intolerant to Arsenicals**—Astrachan determined the effect of injections of liver extract (from 1 to 2 cc half an hour before the arsenical) in forty-eight cases of syphilis in which there was an intolerance to arsenicals. In many cases the injections of liver extract were followed by definite favorable progressive changes in the blood counts and improvement of the patients' general condition. The results of the prophylactic effect in arsenical intolerance seem to indicate that injections of the extract may be of some value in preventing pruritus and in preventing or ameliorating intestinal disturbances and erythema with scaling as well as fixed eruptions but that the injections are of no prophylactic value in preventing the recurrence of exfoliative dermatitis. In view of the results of his investigation the author believes that this problem is worthy of further and more extensive study, including for example the possible advantage of increasing the dosage of liver.

**Journal of Lab and Clinical Medicine, St Louis**

2-4 225 336 (Dec) 1938

\*Indications for Coramin in Cardiovascular Disease J H Cowan Jersey City N J—p 225

Determination and Quantitative Estimation of Decomposition of Chlorophyll in the Human Body J T Brugsch and C Sheard Rochester Minn—p 230

Protonal and Treatment of Spreading Peritonitis in Dogs J O Bower J C Burns Philadelphia and H A Mingle Franklin N C—p 240

Action of Chemical and Physical Agents on Clostridium Welchii and Its Toxin F E Cohen Omaha—p 245

Role of Upper Gastrointestinal Tract in Etiology of Pernicious Anemia Experimental Study in Dogs W H Brachrach and S J Fogelson Chicago—p 249

Studies in Convulsant Therapy II Role of Alkalization S R Dean Newtown Conn—p 256

Abnormal Uterine Bleeding as a Symptom in Typhoid Fever C P Wofford Cleveland D G Calder and F Fetter Philadelphia—p 260

Dissecting Aneurysms of Aorta H J Schattenberg and J Ziskind New Orleans—p 264

Standardized Procedure for Study of Coagulation Reactions (in Vitro) J H Ferguson Ann Arbor Mich—p 273

\*Multiple Primary Malignant Tumors J D Kirshbaum and F L Shively Jr Chicago—p 283

Quantitative Unreliability of Nitroprusside Test for Sulfhydryl and Disulfide F S Hammett and S S Chapman North Truro Mass—p 293

Reliability of Agglutination Test for Undulant Fever with Special Reference to Brucella Agglutinins in Tuberculous Individuals H J Shaughnessy Chicago and T C Grubb Baltimore—p 298

The Iron of Human Blood Serum B S Walker Boston—p 308

Modified Apparatus for Obtaining Gastric Contents J L Posner J T Myers and A R Fodor New York—p 315

Determination of Morphine in the Urine of Morphine Addicts F W Oberst Lexington Ky—p 318

**Coramin in Cardiovascular Disease**—Cowan states that out of a group of seventeen patients suffering from the chronic coronary artery syndrome, observed clinically over a period of several months and treated solely with a 25 per cent solution of pyridine betacarboxylic acid diethylamine, twelve were considerably improved, kept free from symptoms and maintained in reasonably complete economic restitution, three patients were slightly improved and two remained unchanged. As an addition to the armamentarium of cardiac therapy, the substance is suggested in therapeutic doses of from 20 to 30 minims (125 to 2 cc) twice daily, given orally in fruit juices, in the middle aged and younger patient who has shown varying degrees of impaired myocardial efficiency explainable on an arteriosclerotic and atherosclerotic basis. This type of degenerative myocardial disease has been described as (1) the failing heart of middle age, (2) chronic coronary artery disease and (3) multiple myocardial infarction.

**Multiple Primary Malignant Tumors**—In a study of 10870 consecutive necropsies performed at the Cook County Hospital from 1929 to May 1938, Kirshbaum and Shively dis-

covered twenty-five cases of malignant neoplasms, an incidence of 177 per cent among all the malignant growths. There were besides these twenty-five cases 1,288 cases of primary carcinomas causing death, 123 carcinomas were an incidental finding at necropsy. The incidence of sarcomas and malignant neurogenic tumors was not determined in these necropsies. The colon was the site of one of the multiple tumors in thirteen cases, or 52 per cent, the colon and kidney were the most frequent combination involved. The average age was 63.3 years. Seventeen of the patients were men and eight were women. Some persons may be endowed with a congenital, or acquired, predisposition toward tumor formation. These factors may explain the presence of multiple primary malignant tumors in the same individual.

**Journal-Lancet, Minneapolis**

58 505 538 (Dec) 1938

Phytoeczema with Gastric Ulcer Report of Case N O Ramstad Bismarck N D—p 505

Primary Carcinoma of the Lung E J Simons Swanville Minn—p 507

New Theory of Physiology of the Sinuses L J Alger Grand Forks N D—p 511

Head Injuries E Sachs St Louis—p 513

Diagnosis of Acute Abdominal Conditions R W McNealy, Chicago—p 515

Puerperal Sepsis W F Mengert Iowa City—p 517

**Journal of Neurophysiology, Springfield, Ill**

1 477 602 (Nov) 1938

Reorganization of Motor Function in the Cerebral Cortex of Monkeys Deprived of Motor and Premotor Areas in Infancy Margaret A Kennard New Haven Conn—p 477

Summation of Facilitating and Inhibitory Effects at the Mammalian Neuromuscular Junction T E Boyd J J Brosnan and C A Marcke Chicago—p 497

Further Study of the Crossed Phrenic Phenomenon A Rosenbluth C T Klopp and F A Simeone Boston—p 508

A Fourier Transform of the Electro-Encephalogram A M Grass and F A Gibbs Boston—p 521

Influence of Cyanide on Brain Potentials in Man M A Rubin and H Freeman Worcester Mass—p 527

Certain Effects of Prolonged Stimulation of Afferent Nerves on the Reflexes Evoked D M Riosh C Nelson and E W Dempsey Boston—p 533

Separation in the Brain Stem of the Mechanisms of Heat Loss from Those of Heat Production A D Keller University Ala—p 543

Anoxia and Brain Potentials O Sugar and R W Gerard Chicago—p 558

Studies on Corticohypothalamic Relations in the Cat and Man R R Grinker and H Serota Chicago—p 573

Effects on Electro-Encephalogram of Various Agents Used in Treating Schizophrenia I Lemere Seattle—p 590

**Journal of Nutrition, Philadelphia**

16 511 628 (Dec) 1938

Effects of Prolonged Use of Extremely Low Fat Diet on an Adult Human Subject W R Brown A E Hansen G O Burr and I McQuarrie Minneapolis—p 511

Effect on Hematopoiesis of Variations in the Dietary Levels of Calcium Phosphorus Iron and Vitamin D H G Day and H J Stein Baltimore—p 525

Cure of Experimental Canine Blacktongue with Optimal and Minimal Doses of Nicotinic Acid G Margolis L H Margolis and Susan Gower Smith Durham N C—p 541

\*Theoretical and Actual Caloric Requirements I M Rabinowitch Montreal—p 549

Variation of Weight of Dry Feces in Short Period Experiments with a Low Residue Neutral Ash Diet I M Rabinowitch and A F Fowler Montreal—p 565

Destruction of Vitamin A by Rancid Fats E J Lease Jane G Lease Janet Weber and H Steenbock Madison Wis—p 571

The Lack of Nerve Degeneration in Uncomplicated Vitamin B<sub>1</sub> Deficiency in the Chick and the Rat R W Engel and P H Phillips Madison, Wis—p 585

Relation of Growth and Nutrition to Reticulocyte Level in the Young Rat H L Alt Chicago—p 597

Nutritional Effects of Addition of Meat and Green Vegetables to a Wheat and Milk Diet Experiments with Rats H L Campbell and H C Sherman New York—p 603

The Utilization of Calcium F F Tisdall and T G H Drake, Toronto—p 613

**Caloric Requirements**—In order to estimate the smallest amount of food that is compatible with the health and the occupation of the individual, Rabinowitch studied the effect of restricted diets on 500 diabetic subjects, since these persons must live on diets considerably below their usual habits. He found that bodily equilibrium may be maintained with diets the caloric

contents of which are much below the generally accepted standards. With these diets the average loss of weight was much less than expected theoretically. According to the equation which expresses the law of the conservation of energy in man, it is shown that the amount of energy available for work in the diets of these persons was very small. Since these diets resulted in improvement of health it is necessary to assume that the human body is efficient or that with a tendency toward underfeeding the body has available some unrecognized source of energy. Since the average diet contains sufficient energy (about 2,500 calories) to do about 3,000,000 foot-pounds of work, independent of the basal metabolism requirements the human machine appears to be very inefficient under ordinary conditions. The alternative therefore appears to be that, with a tendency toward underfeeding, the body has available some unrecognized source of energy. That the body can at times use energy which is ordinarily wasted as heat is suggested from the reduction of the specific dynamic action of food during work.

### Journal of Thoracic Surgery, St. Louis

S 127 238 (Dec) 1938

- Esophageal Hiatus Diaphragmatic Hernia. Etiology, Diagnosis and Treatment in 123 Cases. S. W. Harrington. Rochester, Minn.—p. 127.
- \*Technic Indications and Maintenance of Extrapleural Pneumothorax. M. O. Monod. Paris, France.—p. 150.
- Examination of Sputum for Malignant Cells and Particles of Malignant Growth. N. R. Barrett. London, England.—p. 169.
- Action of Sulfanilamide on Growth of Tubercle Bacillus in Vitro. H. C. Ballon and A. Guernon. Montreal.—p. 184.
- \*Effect of Sulfanilamide on the Development of Experimental Tuberculosis in the Guinea Pig. H. C. Ballon and A. Guernon. Montreal.—p. 188.
- Treatment of Acute Empyema Thoracis by Open Intercostal Drainage. Report of Fifty Three Consecutive Cases with No Mortality. J. Weinberg. Omaha.—p. 193.
- Experimental Pulmonary Embolism. M. Mendlowitz. Chicago.—p. 204.
- Tuberculosis of Intercostal Lymph Glands. Lymphatic Drainage of Pleura. W. Van Hazel. Chicago.—p. 219.
- Method for Preventing and Controlling Subcutaneous Emphysema Following Closed Intrapleural Pneumolysis. A. Goldman. San Francisco.—p. 226.
- An Unusual Accident Occurring in Closed Intrapleural Pneumolysis. H. W. Leitch. Saranac Lake, N. Y.—p. 230.

**Extrapleural Pneumothorax.**—Monod believes that artificial extrapleural pneumothorax is an operation of choice because it is a less traumatizing operation than thoracoplasty, it can be done in one stage, it is less painful and more easily tolerated and its action approximates mostly that of an artificial intrapleural pneumothorax, which is the most physiologic intervention on the lungs. Artificial extrapleural pneumothorax may be used in urgent cases because its action is frequently as rapid as that of an artificial intrapleural pneumothorax. In pregnancy, for example, when one must act quickly, the artificial extrapleural pneumothorax is indicated. It is essentially a conservative operation as, given similar lesions, it permits a more selective collapse than does the most conservative thoracoplasty. It is the operation of necessity in advanced cases in which the choice of treatment is limited and thoracoplasty cannot be undertaken. The fact that extrapleural pneumothorax can be used in urgent cases makes it a procedure with immense possibilities—unless the results in the future should prove the contrary.

**Sulfanilamide and Experimental Tuberculosis.**—The experiments on guinea pigs that Ballon and Guernon report indicate that under the conditions of their study sulfanilamide exerts an inhibitory effect on the development of tuberculosis. Their observations confirm those reported by Rich and Folliis. The authors commenced treatment with sulfanilamide five and ten days after infecting the guinea pigs. Repeated relatively small doses of the drug were tolerated better than larger doses given less frequently. Daily doses of from 340 to 380 mg. of sulfanilamide proved adequate yet not too toxic for most guinea pigs weighing 350 Gm. An inhibitory effect on the tubercle is possible even though treatment is interrupted. The effect is shown by the fact that the local lesion in the treated animal is less necrotic; similarly the regional lymph nodes are less swollen and less indurated, the spleen is considerably smaller and usually free of macroscopic tuberculous lesions. In addition there is a relative absence of generalized tuberculosis in the treated animal. On the other hand not only does the untreated

animal have generalized tuberculosis but, in addition, the local lesion is more extensive, more necrotic and the regional lymph node is much larger and more swollen and indurated. The spleen of the untreated guinea pig is not only large but also exhibits macroscopic tuberculous lesions. The experimental results do not permit clinical application.

### Journal of Urology, Baltimore

40 737 880 (Dec) 1938

- Differential Diagnosis of Renal and Suprarenal Tumors. A. Hyman and S. F. Wilhelm. New York.—p. 737.
- Intussusception of the Ureter Due to a Large Papilloma like Polypus. G. L. Hunner. Baltimore.—p. 752.
- The Neuromuscular Physiology of the Detrusor Muscle of the Urinary Bladder. I. J. Zimmerman. Manchester, N. H.—p. 766.
- \*Treatment of Neurogenic Diseases of the Bladder. W. P. Herbst. Washington, D. C.—p. 789.
- Neurogenic Disturbances of the Bladder. Physiology, Pathology, Symptomatology and Diagnosis. R. D. Gill. Wheeling, W. Va.—p. 797.
- Gonadal Activity in Prostatic Hypertrophy. M. Muschat, M. Labess and D. Meranze. Philadelphia.—p. 805.
- Priapism and Chordee Due to Metastatic Carcinoma of the Penis, the Prostate Being the Primary Source. C. N. Peters and R. L. Huntress. Portland, Maine.—p. 810.
- Hypospadias and Epispadias. V. P. Blair and L. T. Bjars. St. Louis.—p. 814.
- Endothelioma of the Corpora Cavernosa. G. S. Foulds and R. H. Flett. Toronto.—p. 826.
- Observations on the Neuropsychology of Sexual Function in the Male. Cat. J. H. Semans and O. R. Langworthy, Baltimore.—p. 836.
- \*Value of Fever Therapy in Sulfanilamide Resistant Gonorrhea. C. A. Owens, W. D. Wright and M. D. Lewis. Omaha.—p. 847.
- The Use of Sulfanilamide in Treatment of Gonococcal Infection in the Male. J. E. Dees. St. Paul.—p. 854.
- The Use of Anthiomaline in Treatment of Lymphogranuloma Venereum. B. Shaffer, G. H. Fonde and L. C. Goldberg. Philadelphia.—p. 863.

**Neurogenic Diseases of the Bladder.**—The treatment of neurogenic diseases of the bladder is one of the most indefinite and, in some instances, most unsatisfactory problems with which the urologist has to deal. Herbst states that the investigation of patients with dysfunction of the bladder should consist of a careful history, thorough physical examination, urinalysis and renal function tests, x-ray examination of the kidneys, ureters and bladder, careful catheterization, cystoscopy and neurologic examination. He discusses briefly the treatment of cerebral and spinal cord tumors, tabetic bladders, temporary paralysis of the detrusor muscle incident to labor trauma, painful contraction of the wall of the bladder, spasm of the vesico-ureteral junction and painful cystitis, from which he concludes that a conservative attitude should be maintained and the simpler measures employed before resorting to renal sympathectomy, ureteral neurectomy, presacral neurectomy and sacral resection of the ganglions. In rare instances, spinal injection of alcohol or chordotomy may be employed. Whenever marked deviations from a normal neuromuscular functional balance are recognized, a thorough neurologic examination is imperative.

**Fever Therapy in Resistant Gonorrhea.**—Owens and his co-workers present the results of artificially induced fever in eleven patients with gonorrhea who were intolerant to sulfanilamide. Each patient had received sulfanilamide therapy in fairly adequate dosage. Some had had two or three courses of this medication. Each patient had persistently positive smears for gonococci following the sulfanilamide therapy. Several had developed epididymitis or arthritis during the course of treatment. Each patient entered the hospital and received a preliminary three hours in the Kettering hypertherm during which time his temperature was raised to from 103 to 104 F. This preliminary heating was given largely to accustom the patients to lying in the warm cabinet and to quiet their fears. The following day each patient received ten hours of artificial fever at from 106 to 107 F. He then remained in the hospital one or two days after this treatment, during which time check-up examinations were made. He was then dismissed but remained under observation for repeated check-up examinations. Ten of the eleven patients were cured (entirely free of all clinical symptoms and signs, and repeated examinations by smears have failed to show gonococci after periods of normal behavior as regards alcoholic and sexual stimulation) by the single fever treatment. Although the remaining patient was not cured by the fever session apparently the organisms were made more susceptible as a second course of sulfanilamide succeeded in curing him.

## Kansas Medical Society Journal, Topeka

39 501 542 (Dec.) 1938

- Fractures of the Metacarpals and Phalanges C K Wier, Wichita — p 501
- Use of Benzedrine Sulfate in a Case of Encephalitis Lethargica as a Sequela to Measles A J Revell, Pittsburgh — p 505
- Globose Tumor Report of Case M Gerundo and W M Mills, Topeka — p 506
- Appendicitis Associated with Pregnancy A W Fegley, Wichita — p 508
- Infectious Mononucleosis Treatment with Sulfanilamide M Bernreiter Kansas City — p 513
- Nephritic Edema R Jeffries Atchison — p 516

## Maine Medical Journal, Portland

29 261 284 (Dec.) 1938

- Ragweed Pollen Survey in Maine for 1937 C B Sylvester, Portland and O C Durham North Chicago Ill — p 261
- Developmental Abnormalities Simulating Arthritis of the Shoulder Report of Case A J Stinchfield, Skowhegan — p 267
- Hospital Atmosphere Pearl R Fisher, Waterville — p 269

## Medical Annals of District of Columbia, Washington

7 371 410 (Dec.) 1938

- \*Endometrial Patterns in Menorrhagia and Metrorrhagia J Kotz and Elizabeth Parker Washington — p 371
- The Pneumonia Control Program of the District of Columbia S Ruffin Washington — p 380
- The Pneumonia Control Program District of Columbia Report of Results Obtained in Treatment of Type I Cases T J Abernethy and H F Dowling, Washington — p 384
- Chronic Appendicitis Conservative Surgical Point of View A Horwitz, Washington — p 389
- Hematologic Interpretation in General Practice V J Dardinski Washington — p 392

**Endometrial Patterns and Menstruation**—Kotz and Parker studied by endometrial biopsy fifty cases in which functional bleeding was the chief complaint. In these cases the endometrium exhibited all degrees of normal differentiation as well as aberrations manifested by hyperplasia, hypoplasia, persistent or delayed reactions or senility in either the follicular or the luteal phases of the cycle. There were nine cases in which the endometrium was of the follicular type. There was bleeding in five from two to three weeks, while in three there was prolonged, acyclic bleeding. In all cases estrogen was demonstrable in the blood, although there was a tendency for it to be decreased in quantity below normal. There was no case of excessive gonadotropic substance. There were fourteen patients who exhibited follicular hyperplasia of the endometrium. All of these had acyclic, either profuse or prolonged, bleeding. The test for the estrogen content of the blood was positive in all these cases with a tendency for increases above normal. There was no incidence of excessive gonadotropic substance. There were six cases in which the endometrium exhibited a delayed postovulatory reaction, subnuclear vacuolization. In five cases there was evidence of previous excessive proliferation, in only one case was the condition apparently normal. In one case bleeding was acyclic and profuse, while in five it was cyclic with the interval ranging from fourteen to twenty-eight days. The blood estrogen was negative in two, strongly positive in two and normally positive in one. There was no incidence of excessive gonadotropic substance. The authors have encountered what seems to be an exaggeration of the early secretory reaction of the endometrium in eight cases, all with cyclic bleeding, but with shortened intervals in four cases. All these women complained of profuse or prolonged bleeding. Estrogen was demonstrable in all and there was a tendency for it to be increased above normal. In no cases was there an excess of the gonadotropic substance. It would seem that this type of endometrium is an early secretory reaction in which bleeding has been initiated in the presence of a high level of estrogen and before the corpus luteum has reached its full maturity. In thirteen cases the endometrium showed variations of the late secretory reaction. In nine cases there was cyclic but profuse bleeding, while in the remainder it was acyclic and prolonged. There was no definite correlation between the character of the bleeding and the type of endometrium encountered. The blood estrogen was positive in all cases and the gonadotropic substance was negative. The series as a whole represented a younger age group (from 16

to 45) than that usually encountered in cases in which follicular cystic hyperplasia was the characteristic condition. It would seem that there are three degrees of endometrial abnormality which correspond to the degree of ovarian failure. First there is the type in which an abnormal secretory reaction is present and which may be the forerunner of the next type, in which follicular endometrium is characteristic. Both of these types occur during the reproductive stage of life. The third type is the hyperplasia occurring after the menopause. The first two types are almost without exception benign, while malignant changes in the third type occasionally occur. The factors or factors which account for this transition cannot be explained.

## Minnesota Medicine, St Paul

21 817 888 (Dec.) 1938

- Role of Insects and Allied Forms in the Transmission of Diseases Due to Filtrable Viruses W A Riley St Paul — p 817
- Influenza, Rabies and Encephalitis C M Eklund Minneapolis — p 821
- Emergency Treatment of Injuries H M Lee Minneapolis — p 824
- Abdominal Injuries E M Jones St Paul — p 828
- Intractable Low Back and Sciatic Pain Due to Protruded Intervertebral Disks Diagnosis and Treatment J G Love, Rochester — p 832
- Value of X Rays in General Practice C G Sutherland, Rochester — p 839
- Röntgen Treatment of Inflammatory Diseases G Clement Duluth — p 847

## New England Journal of Medicine, Boston

219 899 942 (Dec. 8) 1938

- Introduction to Panel Discussion on Cyanosis of the Newborn. C F McKhann Boston — p 899
- Cyanosis Following Intracranial Injuries S H Clifford, Brookline Mass — p 900
- Circulatory Causes of Cyanosis H Green, Boston — p 901
- Pulmonary Causes of Cyanosis J M Baty, Boston — p 903
- Pathologic Aspects of Cyanosis S Farber Boston — p 904
- Obstetric Aspects of Cyanosis H M Teel Boston — p 906
- Iron Ascorbate in Treatment of Anemia D G Friend Boston — p 910
- Premature Separation of the Normally Implanted Placenta C P Sheldon, Boston — p 913
- Observations on the Clinical Status of Gastroscopy I R Jankelson and C W McClure Boston — p 917
- Treatment of Colles Fracture. F J Cotton Boston — p 921

219 943 976 (Dec. 15) 1938

- The Investigation of Selected Cases of Syphilis L. G. Levingson Geneva, N. Y. — p 943
- \*The Use of Sulfanilamide in Scarlet Fever C Wesselhoeft and E. C. Smith Boston — p 947
- Actinomycosis of the Scrotum C W Anderson and R. H. Jenkins New Haven, Conn. — p 953
- Intravenous Anesthesia in Obstetrics F. C. LaBrecque Boston — p 954
- Maternal Mortality in a Small Hospital S. H. Moses Boston — p 957
- Fishbone in the Omentum F. B. Sweet and W. A. R. Chapin Springfield Mass. — p 959

**Sulfanilamide in Scarlet Fever**—Wesselhoeft and Smith epitomize that sulfanilamide therapy of scarlet fever in the eruptive stage in the accepted dosage does not reduce the toxicity as manifested by the intensity of the eruption or the duration of the fever. Sulfanilamide therapy, given during the initial stage of the disease, did not reduce the incidence of complications. However, in cases in which the drug was continued longer the incidence was markedly reduced. Since the usual invasion of the scarlet fever streptococcus takes place in the upper part of the respiratory tract and this primary toxic phase is not influenced by sulfanilamide therapy, it is reasonable to infer that the drug will not be efficacious in the septic complications involving the respiratory tract. This inference appears to be substantiated by clinical results, although satisfactory data on this point are not as yet available. Sulfanilamide therapy appears to be useful in certain infections of the mastoid cells, but the possibility of an associated infection of the blood stream through destruction of bone may be a factor. Infections of the blood stream and meningitis are indications for sulfanilamide therapy. In these two complications the results of its administration have lowered the mortality. Bacteriologic evidence suggests that the use of sulfanilamide in the last week of convalescence from scarlet fever does not reduce the carrier rate through the eradication of hemolytic streptococci from the nose and throat. The use of sulfanilamide as a prophylactic in nonimmune contacts is a problem for carefully controlled investigations.

# New York State Journal of Medicine, New York

38 1531 1576 (Dec 15) 1938

- Sulfanilamide Therapy Results at the Infants and the Children's Hospitals (Boston) B W Carey Jr Boston—p 1531
- Primary Carcinoma of the Liver J R Liss and J T Hart New York—p 1537
- Systemic Sarcoidosis Report of Case with Coincident Thrombocytopenic Purpura E T Bernstein New York—p 1543
- Pneumonia Practical Considerations of Oxygen Therapy with Special Reference to Home Use D D Rutstein, Albany—p 1548

# Northwest Medicine, Seattle

37 379 412 (Dec) 1938

- Treatment of Tic Douloureux P G Flothow Seattle—p 384
- Influenzal Meningitis Recovery in an Eight Year Old Child M L Bridgeman and R A Bissett Portland Ore—p 388
- \*Incidence of Rheumatic Infections in Children of Oregon J B Bilderback and R M Overstreet Portland Ore—p 390
- Amyotonia Congenita (Oppenheim) Report of Case J C Brougher Vancouver Wash—p 393
- Chronic (Subclinical) Undulant Fever Report of Case C G Bain Centralia Wash—p 395
- Induction of Labor B Berenson Everett Wash—p 397
- Water Bed for the Bedridden C A Ewald Seattle—p 397
- The Good Old Days W B McCreery, Tacoma, Wash—p 399

**Incidence of Rheumatic Infections in Oregon**—The investigations of Bilderback and Overstreet agree with others that the universally recognized manifestations of rheumatic infection, arthritis and carditis may occur in the same patient, superimposed on or at a varying time interval before or after chorea. However, rheumatic carditis is not found as frequently in the person with chorea alone as in the person with both chorea and rheumatic involvement of the joints. Rheumatic fever and chorea constituted 3.46 per cent of the 4,197 medical admissions (116 patients) to Doernbecher Hospital during a period of five and one-half years. Some of these were admitted for recurrence of the disease on several different occasions. The youngest patient was found to be ill at the age of 20 months, but the diagnosis was not made until death occurred at 3 years of age at which time healed rheumatic endocarditis was discovered. Rheumatic fever is a seasonal disease to some extent, having its greatest incidence in the winter and early spring months. However, no month is exempt and the curve of monthly incidence is roughly parallel to that of precipitation and inversely proportional to the average normal temperature but not sufficiently so to permit any definite conclusions. The presence or absence of the lymphoid tissue of the pharynx has been the subject of considerable investigation. Recent work tends to suggest that the popular surgical procedures of a few years ago are less often performed in the presence of acute infection. Of the 116 patients studied, thirty-nine had had adenotonsillectomy performed prior to the first attack, while seventy-one had not undergone the procedure. In six no statement was obtained. No conclusions are to be drawn from this except that tonsillectomy seems to reduce the incidence appreciably.

# Pennsylvania Medical Journal, Harrisburg

42 209 336 (Dec) 1938

- The Diagnosis and Therapy of Otogenic Meningitis S J Kopetzky New York—p 217
- Otolaryngologic Suggestions in Pediatric Practice H Dintenfuss Philadelphia—p 226
- The Problem of the Radical Mictoid Critical Analysis of 151 Cases A H Persky Philadelphia—p 231
- The Purposes of the Evaluation and Planning Committee B L Hull Altoona—p 237
- Progress in the Control of Syphilis R L Gilman Philadelphia—p 241
- Simplified Postoperative Care C G Strickland Erie—p 245
- \*Oxygen Therapy in General Practice F B Davies Scranton—p 248

**Oxygen Therapy**—Davies states that, until such time as the clinician and the layman understand that oxygen therapy is a perfectly logical, practical procedure and an excellent symptomatic treatment, one will labor under a definite psychologic handicap. It is unfortunate that the reaction to oxygen therapy in the mind of the layman is either that oxygen is life giving, a miraculous panacea, or more frequently that oxygen is to be employed when all hope is lost—a symbol of the inevitable approach of death. Oxygen therapy is a decided adjunct to modern methods of treatment. It should be employed early, continuously and in a concentration adequate to overcome anoxemia. In the operation of any type of oxygen tent, cer-

tain practical points should be emphasized. 1 The apparatus used must produce and hold the desired oxygen concentration. 2 There is only one way to know the exact concentration of oxygen in the tent and that is by actual analysis. 3 The need for a soda-lime absorber for carbon dioxide is more theoretical than actual. 4 The concentration of oxygen should be kept at or above 45 per cent and is to be increased whenever necessary to overcome anoxemia. 5 The temperature and humidity gages should be kept inside the tent and it should be taken and recorded every two hours. It is a dependable check on the operation of the tent. 6 The temperature in the tent should be kept between 55 and 65 F for adults and from 65 to 70 F for infants and children and the humidity between 30 and 60 per cent. 7 The intern, nurse, orderly or relative (in the home) should know the correct method of changing oxygen tanks as reducing valves may be easily ruined by carelessly changing high pressure tanks. 8 The physician should accept complete personal responsibility for oxygen therapy. Oxygen therapy is medical treatment and should be kept out of the hands of commercial enterprises. 9 The concentration of oxygen in the tent should be brought down before the patient is changed to room air for any considerable period. Oxygen therapy has long passed the probationary period and is of considerable importance in the treatment of all forms of anoxemia.

# Public Health Reports, Washington, D C

53 2121 2152 (Dec. 2) 1938

- Studies on Trichinosis. II. Preparation and Use of Improved Trichina Antigen J Bozicevich—p 2130
- 53 2153 2192 (Dec 9) 1938
- Study of Economics of Pneumonia Costs of Diagnosis and Treatment of 625 Cases in New York City J Hirsh—p 2153
- Ixodes Marmotae New Species of Tick from Marmots (Acarina Ixodidae) R A Cooley and G M Kohls—p 2174

# Surgery, Gynecology and Obstetrics, Chicago

68 1 128 (Jan) 1939

- Purposeful Splinting Following Injuries of the Hand S L Koch and M L Mason Chicago—p 1
- \*Fluid Balance in the Puerperium E G Crabtree Boston—p 17
- Carcinoma of the Body of the Uterus Clinical and Pathologic Review K C Morrin and P F Max, St. Louis—p 30
- Treatment of Colon Bacillus Peritonitis in Rabbits with Escherichia Coli Antiserum H M Trusler and J M Moss Indianapolis—p 34
- The Anatomic and Surgical Features of Ectopic Kidney B J Anson and L W Riba Chicago—p 37
- Primary Reticulum Cell Sarcoma of Bone F Parker Jr and H Jackson Jr Boston—p 45
- Study of Superficial Venous Pattern in Pregnant and Nonpregnant Women by Infra Red Photography W A Gorman Duluth Minn and A Hirsheimer Dayton Ohio—p 54
- Studies on the Growth Stimulating Effect of Potassium Naphthalene Acetate and Potassium Indole Butyrate J K Narat and G Chobot, Chicago—p 63
- \*Bone Sarcoma Factors Influencing the Prognosis C C Simmons Boston—p 67
- New Radical Operation for Carcinoma of the Bulbous Urethra New Use for the Penis H H Young Baltimore—p 77
- Fractures of the Neck of the Femur Open Operation and Pathologic Observations New Incision and New Director for the Use of a Simplified Flange W R Cubbins J J Callahan and C S Scuderi Chicago—p 87
- Technic of Anastomosis Using the Stone Clamp J C Owings and H B Stone Baltimore—p 95
- Modern Technic of Subtotal Thyroidectomy J L DeCoursey Cincinnati—p 99
- Study and End Result Report of Seventy Arthroplasties and Reconstruction Operations on the Hip Joint H Hallock New York—p 106
- Use of Living Sutures of External Oblique Aponeurosis in the Repair of Inguinal Hernias in Adults J D Bigard Omaha—p 113
- Modified Wangensteen Suction Drainage H D Furniss New York—p 118

**Fluid Balance in the Puerperium**—Crabtree presents a group of heretofore unassociated observations which indicate that the pregnant woman fails to eliminate fluids as adequately as does the nonpregnant one and that the storage of fluids in the blood stream and tissues of the body in the course of a normal pregnancy may and probably does, without production of anasarca, take place elsewhere in the body besides in the products of pregnancy. He concludes that pressure of the gravid uterus on the ureters is not adequate to explain the changes in the renal tree which commonly occur in pregnancy. A double etiology for these changes, if considered both as to nature and as to



degree, should be accepted for human beings. An endocrine factor should be given equal if not greater significance than the pressure factor. There are several established lines of evidence which indicate that fluid storage in the course of pregnancy should occur regularly and in all cases. In all except one of fifty-four cases that the author studied over the average fourteen days that women in the puerperium stay in the hospital, except in five febrile cases, there was an output of urine in excess of fluid intake too large and of too long duration to be considered accidental. If fluid losses attendant on delivery and the puerperium, purely obstetric in nature, and lactation are included the foregoing figures will be greatly exaggerated. Medical, surgical and urologic diseases, when they develop in the course of either pregnancy or the puerperium, should be considered in relation to a disturbed fluid balance and not by the fluid balance in nonpregnant women.

**Bone Sarcoma**—Simmons reports the results of treatment of forty-seven patients with primary malignant tumors of the long bones, excluding plasma cell myeloma. These patients were seen during a period of thirteen years (1920 to 1932). No patient is considered cured unless he is living without evidence of disease five or more years after treatment. It appears that the prognosis is far from hopeless when patients are treated by radical surgery. The tumors in which relatively adult tissue such as fibrous tissue and cartilage, predominated did not form metastases for some time after the tumor was demonstrated clinically, and the patients were usually cured by complete removal of the growth. The duration of the tumor before treatment undoubtedly has a bearing on the result in a given case, although if these cases are considered as a group this is not so. The prognosis appeared to be worse in the cases of short duration, but it was found that the duration in the majority of low malignant tumors in which cures were obtained was appreciably longer. The value of preoperative radiation treatment is problematic. It was not employed in any case in the present series, for the time element was considered more important. Radiation undoubtedly affects the cells profoundly but apparently does not destroy the tumor. There is no instance of cure by radiation alone of a proved case of osteogenic sarcoma in the Registry of Bone Sarcoma. The surgical procedure adopted whenever possible was a biopsy and immediate amputation if the tumor was reported to be sarcoma. There is no way by which the various types of osteogenic sarcoma can be distinguished clinically with any degree of accuracy, although occasionally the character may be suspected. In persons more than 50 years of age the tumor is usually secondary to Paget's disease of the bone or of the chondral type. The eight patients with Ewing's sarcoma are all dead. Of the twenty-eight patients with osteogenic sarcoma in which amputation was done, eleven are living without disease five or more years after operation. The prognosis depends more on the amount of differentiation of the cells comprising the major portion of the tumor than on any one other factor. If the tumor is composed in large part of adult fibrous tissue or cartilage, the prognosis is better than if the cells show marked anaplasia. The five patients in whom fibrous tissue predominated, treated by amputation, are well. Of seven on whom amputation was done and cartilage was the predominating tissue, five patients are well. Of sixteen patients who required amputation and who may be placed in an anaplastic group, one is well. Of two patients with reticulum cell sarcoma in which amputation was done, one is well fourteen years later and one died twelve years later of a tumor of another bone, the character of which was not determined.

### Yale Journal of Biology and Medicine, New Haven

11 97 164 (Dec.) 1938 Partial Index

- Rapid Production of Tumors by Two New Hydrocarbons W. E. Bachmann, Ann Arbor Mich. E. L. Kennaway and N. M. Kennaway London, England—p. 97  
Bio Electric Correlates of Wound Healing H. S. Burr, S. C. Harvey and M. Taffel New Haven Conn.—p. 103  
Evipal Soluble for the Control of Convulsions from Novocain Poisoning Alice M. Hunt New Haven Conn.—p. 109  
Germicidal Power of Some Alcohols for Bacterium Typhosum and Staphylococcus Aureus and Its Relation to Surface Tension P. B. Cowles, New Haven Conn.—p. 127  
Influence of Estrogenic Hormone on Hydrogen Ion Concentration and Bacterial Flora of Vagina of the Immature Monkey L. Weinstein N. W. Warr R. V. Worthington and E. Allen New Haven Conn.—p. 141

### FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

### British Journal of Radiology, London

11 769 832 (Dec.) 1938

- British Radiology in the Future W. L. Schall—p. 769  
Experimental Study of the Action of Radium on Developing Bones D. Engel—p. 779  
Direct Radiocinemography M. van de Maele—p. 804  
Dosage System for Use in Treatment of Cancer of the Uterine Cervix Margaret C. Tod and W. J. Meredith—p. 809  
Influence of a Lead Cone on Intensity Distribution of 2 Gm. Radium Beam Unit F. W. Spiers—p. 825

### British Medical Journal, London

2 1189 1244 (Dec. 10) 1938

- Physiology of the Vocal Mechanism D. Guthrie—p. 1189  
Vi Agglutination in Diagnosis of Typhoid Fever and Typhoid Carrier Condition S. S. Bhatnagar—p. 1195  
Hypersusceptibility to Basal Anesthetics B. P. Hill—p. 1199  
\*Treatment of Acute Osteomyelitis by Ultron A. Mitchell—p. 1200  
Pelvic Hydatid Cysts and Obstructed Labor M. P. Embrey—p. 1201  
\*Epidemic Myalgia Five Cases in One Household. C. R. G. Howard—p. 1203

**Treatment of Acute Osteomyelitis by a Sulfanilamide**—Mitchell treated five cases of severe acute osteomyelitis with a sulfanilamide preparation (ultron) in addition to the ordinary local treatment. To young children he gave one tablet (7½ grains, or 0.5 Gm.) every four hours. The period over which it has been administered has varied up to several weeks. All these patients have done exceptionally well, particularly two patients in whom the condition seemed absolutely hopeless. All of them had severe septic osteomyelitis and not the milder type sometimes seen.

**Epidemic Myalgia**—Howard reviews briefly the literature of epidemic myalgia and gives an account of five cases occurring in one household. These cases closely followed the clinical picture described by Sylvest, the main features being a sudden onset with abdominal pain and malaise, the pain moving to the chest, particularly the right costal margin, on the second day and later diffusing all over the chest and shoulder. The chief disabilities are intermittent attacks of malaise for about a week, combined with the inability to laugh or take a deep breath without excruciating pain in the chest, also the frustration, in spite of a strong urge, of being unable to defecate satisfactorily. At about the same time as the foregoing cases occurred there were admitted to the local hospital more cases than usual, perhaps, of appendicitis that never came to operation. Unfortunately these were not investigated with myalgia in mind.

### Indian Medical Gazette, Calcutta

73 649 712 (Nov.) 1938 Partial Index

- \*Chemotherapy in Acute Surgical Infections with Prontoil and Allied Drugs P. N. Ray, K. S. Alam and B. K. Ghose—p. 649  
Surgical Treatment of Epidemic Dropsy Glaucoma E. O. Kirwan—p. 654  
Thyroid Metastases in Bone M. M. Cruickshank—p. 656  
Precancerous Conditions of the Cervix Uteri and Their Treatment J. Chakraverti—p. 661  
Studies on Action of Synthetic Drugs on Simian Malaria Sulfanilamide Derivatives B. M. Das Gupta and R. N. Chopra—p. 665  
Studies on Action of Synthetic Antimalarial Drugs on Indian Strains of Malaria C. L. Chandra and B. Sen—p. 667  
Isolation of Vibrio Cholerae from Noncholera Individuals C. L. Pasricha, M. N. Lahiri and P. C. Das—p. 669  
\*Blood Culture in Cholera A. J. H. deMonte and S. K. Gupta—p. 670  
Vibrios from Certain Nonhuman Sources M. N. Lahiri and P. C. Das—p. 670  
Some Epidemiologic Features of Plague in Bengal with Special Reference to Calcutta S. Raghavender Rao—p. 671  
Variations in Platelet Count in Typhus Associated with Hematuria R. L. H. Minchin—p. 679

**Sulfanilamide in Acute Surgical Infections**—Ray and his associates used derivatives of sulfanilamide in 100 consecutive cases of acute surgical infections. In erysipelas and streptococcal septicemia, prontosil red may be regarded as a specific. In none of these conditions need antistreptococcus serum be given. In the authors' experience, prontosil red preparations appear to be of greater efficacy than prontosil album and allied sulfanilamide

preparations In acute funiculitis and epididymo orchitis of filarial origin a dramatic result is usually achieved, even in those cases in which no secondary bacterial infection could be discovered In acute urinary infections, gonococcic urethritis and acute staphylococcic infections the drug has proved to be of great value In their experience, treatment by intramuscular injections is best combined with oral administration of prontosil red tablets In about 6 per cent of cases the latter may give rise to vomiting or anorexia, when it may be replaced by prontosil album tablets Certain drugs are to be avoided during prontosil therapy In a series of seventy consecutive cases, excluding six late cases of sinus thrombosis and septic bronchopneumonia complicating facial cellulitis, the mortality rate was 47 per cent There were no deaths in a subsequent series of thirty consecutive cases In erysipelas the highest average temperature was 102.2 F, which was brought down to normal in 24 days In facial cellulitis the normal was reached on the fourth day

**Blood Culture in Cholera**—deMonte and Gupta examined the blood of twenty-six cholera patients for the presence of vibrios The blood was collected as early as possible after the onset of symptoms, in from three to nine hours Vibrios were not isolated from any of the samples, confirming the observations of Greig, who was unable to isolate vibrios in the blood during life

### Journal of Hygiene, London

38 647 778 (Nov.) 1938

- Genetic Studies on Immunity in Mice II Correlation Between Antibody Formation and Resistance P A Gorer and H Schutze—p 647  
A Vi Variant of *Salmonella* Typhi and Its Application to Serology of Typhoid Fever S S Bhatnagar C G J Speechly and M Singh—p 663  
Preparation of Antityphoid Serum in the Horse for Therapeutic Use in Man A Felix and G F Petrie—p 673  
Sulfuretted Hydrogen Production by Bacteria in a Lead Mine J W Edington—p 683  
Studies on Type Division of Typhoid and Paratyphoid B Bacilli by Fermentation M Kristensen—p 688  
Experimental Transformation of Variola to Vaccinia E S Horgan—p 702  
Two New *Salmonella* Types Isolated from Fowls P R Edwards and D W Bruner—p 716  
Comparative Study of Coliform Organisms Found in Chlorinated and in Nonchlorinated Swimming Bath Water Doris A Bardsley—p 721  
\*Estimation of Bactericidal Power of the Blood A A Miles and S S Misra with note by J O Irwin—p 732  
Titration of Therapeutic Antityphoid Serum A Felix—p 750

**Bactericidal Power of the Blood**—Miles and Misra believe that the survival rate of a measured inoculum of *Staphylococcus aureus* in a standard volume of defibrinated blood is a reliable quantitative measure of the bactericidal power of blood The number of viable organisms in the inoculum and in the blood-bacterium mixture may be estimated by counts of colonies developing from measured volumes of the fluids permitted to fall on the surface of solid mediums Fildes' agar was the most suitable medium for this surface viable count The number of colonies growing from a sample of a blood bacterium mixture may be reduced not by killing of the individual cocci but as a result of their aggregation either by agglutinins in the blood or in the cytoplasm of leukocytes that are phagocytic but not bactericidal It appears that these mechanisms are unlikely to operate in blood-bacterium mixture containing relatively few organisms, in such mixtures the survival rate is a reflection of the killing power only The immunologic significance of the survival rate has not been investigated but the range of values for healthy human adults differs significantly from that for sufferers from chronic staphylococcic infection

### Journal of Neurology and Psychiatry, London

1 301 418 (Oct.) 1938

- Brown Sequard Syndrome Case of Unusual Etiology J B Gaylor and J W Howie—p 301  
Recent Studies of Morphology of Neuron in Health and Disease J G Greenfield—p 306  
Aphasia with Special Reference to the Problems of Repetition and Word Finding Case K Goldstein and J Marmor—p 329  
Thalamic Hypertrophy or Gliomatosis of the Optic Thalamus S Levin—p 342  
Technic and Application of Electro-Encephalography W G Walter—p 359

### Lancet, London

2 1275 1338 (Dec 3) 1938

- The Place of Pathology Among the Medical Sciences W W C Topley—p 1275  
Hernia of the Vermiform Appendix Record of Sixteen Personal Cases C P G Wakeley—p 1282  
\*Percutaneous Absorption of Male Hormone Its Practical Application to Human Therapy C L Foss—p 1284  
Testing the Knee Jerk Alternative Method K J Franklin—p 1287  
\*Bayer 205 in Treatment of Lupus Erythematosus B Chajes—p 1288  
Trichlorethanol on Trial C L Hewer and D Belfrage—p 1290

**Percutaneous Absorption of Testis Hormone**—Foss studied the potency and the optimal dosage of the percutaneous application of testosterone propionate in a fatty vehicle and an alcoholic solution in a postpuberal eunuch, a eunuchoid and a patient with delayed puberty He compares their effects with those of a solution of testosterone in alcohol This method of giving testis hormone is effective and simple but a larger dosage is required than when the medication is given by injection An ointment containing 25 mg of testosterone propionate per gram in collapsible tubes of 2 Gm is recommended for practical use as the most efficient means of percutaneous androgen therapy at present available Much more rubbing is necessary before the greasy ointment is worked into the skin and disappears than when applying the alcoholic solution, which evaporates rapidly and gives the patient the impression that the medication is completely absorbed Allowing, however, for this wastage, the local effect, e g on hair growth and development of the penis and larynx—is greater with percutaneous medication than injection, which bears out the original experiment on the capon's comb There is no doubt also that the maintenance of prostatic and vesicular secretion is sustained by the percutaneous route, for the eunuch has a normal ejaculate after only four months of percutaneous application This method of application is most acceptable to the patient who desires a maintenance dosage, whereas subcutaneous injection will be reserved for initial intensive therapy or for a periodic depot dose

**Treatment of Lupus Erythematosus**—Chajes treated thirteen patients with long standing lupus erythematosus with a complex carbamide compound of trisulfonic acid (Bayer 205) Only two of the patients gave a history of having the disease less than one year In a few cases a mild ichthammol-resorcin paste was used to relieve the itching which sometimes occurred at the site of the intravenous injection of the 10 per cent solution of the drug A cure was obtained in nine of the thirteen cases and considerable improvement in four Recurrences after the first injection were observed in six cases but were always favorably influenced and usually cured by further injections The author observed four cases for more than a year and in only two of these could he diagnose a recurrence within the period of observation

2 1339 1394 (Dec 10) 1938

- Arterial Embolism Study of Eight Cases D L Griffiths—p 1339  
\*Cerebral Paratuberculosis R C Cohen and W B Wood—p 1344  
Beriberi Occurring in London Case J Yudkin—p 1347  
\*Vascular Reactions to Contrast Bath in Health and in Rheumatoid Arthritis A Woodmansey D H Collins and M M Ernst—p 1350  
The Four Lead Electrocardiogram in Angina of Effort G Bourne and C Evans—p 1354  
Ammonia Gas Burns Account of Six Cases G M J Slot—p 1356

**Cerebral Paratuberculosis**—Cohen and Wood draw attention to a disturbance of the central nervous system sometimes observed in children and young persons suffering from pulmonary tuberculosis It seems to be due to an acute exudative reaction localized in the cerebral meninges Though associated with tuberculosis and apparently a reaction (specific or allergic) to the tuberculous virus, its fleeting and benign character clearly distinguish it from tuberculous meningitis The authors have seen five cases in the last two years The ages of the patients ranged from 6 to 20 years Four were suffering from pulmonary tuberculosis of the adult type and one from generalized tuberculosis following primary infection In each instance the pulmonary disease has been mainly exudative and the symptoms of comparatively recent origin The principal symptoms were headache and lethargy or drowsiness These preceded or accompanied the onset of fever Physical signs were few, apart from sluggish reactions of the pupils and sluggish or absent knee jerks during the attack In three instances a rash was observed

—erythema nodosum, a generalized simple erythema and a mixed papular and morbilliform eruption. Lumbar puncture yielded cerebrospinal fluid which was under pressure but was clear and sterile and showed no cellular or chemical abnormality. Its withdrawal was followed by a notable relief of the headache. Recovery was uneventful and took from seven to fourteen days. One patient had a second attack after a quiescent interval of several months but this was again followed by a spontaneous recovery.

**Vascular Reactions to the Contrast Bath**—Woodmansey and his associates describe a contrast bath which allows the cutaneous temperatures of an immersed forearm and distal parts to be taken. It was found that the best reaction (active contraction and relaxation of blood vessels and increased blood flow) is obtained when hot water is applied for six minutes and cold water for four minutes. Patients with rheumatoid arthritis gave poor reactions, probably because the blood flow is attenuated in the affected limbs because of disuse. Some healthy women also gave feeble reactions, probably because of an inherent lack of adaptability in their peripheral circulation. This inherent defect may increase the susceptibility to rheumatoid arthritis but is not the primary cause. The greater incidence of vascular deficiency in women may account for the prevalence of severe and intractable forms of rheumatoid arthritis in them. The authors suggest that the so-called primary rheumatoid arthritis with vascular signs and symptoms is rheumatoid arthritis (probably of infective origin) in a person with a constitutional vascular defect. Disease brings the vascular failure into greater prominence.

### Medical Journal of Australia, Sydney

2 887 928 (Nov. 26) 1938

Muscle Dystrophies and Atrophies Occurring in Childhood. From the Orthopedic Aspect. A. R. Hamilton—p. 887

Muscular Atrophies and Dystrophies in Childhood. R. J. Taylor—p. 889

Nasal Spraying with Zinc Sulfate Solution in the Prophylaxis of Poliomyelitis. Diphtheria Immunization as a Partial Preventive. J. M. Dwyer—p. 892

Fractures of the Neck of the Femur. W. Vickers and N. Little—p. 895

Accidental Hemorrhage. M. T. Drummond—p. 898

The Value of Wad and Ruddy's Cultural Test for the Differentiation of Group A Hemolytic Streptococci. Hildred M. Butler—p. 903

Pulsion Diverticulum of the Pharynx. Report of Case. J. L. Watt—p. 905

**Nasal Spraying and Diphtheria Immunization in Prophylaxis of Poliomyelitis**—Dwyer states that nasal spraying with zinc sulfate solution was begun at Hindmarsh Dec. 22, 1937, soon after the commencement of an epidemic of poliomyelitis, and was continued at intervals until February 3. Of the 251 children treated 121 received two treatments at an interval of approximately three weeks. Treatment was continued as long as required and ceased Feb. 3, 1938. Of the 251 children 126 had been immunized against diphtheria. The author draws no conclusion concerning the efficacy of the method. The preliminary spraying with a solution of ephedrine and pontocaine greatly facilitated the procedure, and the frequency (62.5 per cent) of anosmia among those treated was higher than in many previous reports. In towns in which a substantial proportion of children were immunized against diphtheria, these children were significantly less likely to contract poliomyelitis than their unimmunized companions of the same age group.

### Tubercle, London

20 49 96 (Nov.) 1938

Congenital Cystic Disease of the Lung. T. H. Sellors—p. 49

Seriel Skiagraphy in Pulmonary Disease. G. Jessel—p. 72

The Work of a Tuberculosis Unit in East Africa. H. N. Davies—p. 76

### Chinese Medical Journal, Peiping

54 397 490 (Nov.) 1938

Sternal Puncture Technique and Its Clinical Value, with Especial Reference to Its Usefulness in Diagnosis of Kala Azar. H. L. Chung—p. 397

Studies on Clonorchis Sinensis in Vitro. Part II. Action of Various Dyes. H. J. Chu—p. 409

New Antagonorrheal Drug Ultron. M. O. Pfister—p. 416

Phlyctenular Disease in Shanghai. P. C. Kwan—p. 421

Analyses of Chinese Foods. Y. T. Chiu—p. 435

Anterior Poliomyelitis in China. Annie V. Scott—p. 442

### Bruxelles-Medical, Brussels

19 205 241 (Dec. 18) 1938

\*Lymphangiography in the Living. Method, Results and Applications. H. Monteiro—p. 205

19 242 280 (Dec. 25) 1938

\*Lymphangiography in the Living. Method, Results and Applications. H. Monteiro—p. 241

\*Action of Derivatives of Sulfanilamide in Postpartal and Postabortal Infections. J. Lambillon and A. Lejeune—p. 252

**Lymphangiography in Living Animals**—In spite of the condemnation of thorium dioxide sol by some investigators on account of its harmful effects on the hematopoiesis, on the liver and on the spleen, Monteiro says that the doses necessary for the injection of a section of the lymphatics are generally small and well below those that are injected to obtain roentgenograms of the liver, the spleen or the arteries. Usually 4 or 5 cc of the liquid is sufficient to obtain, after the injection of the popliteal lymphatic, a picture of the iliofemoral vessels and of the entire thoracic duct, in a dog weighing from 10 to 15 Kg. The technic of the injection is much like that used for the injection of the lymphatics in cadavers. Of the numerous lymphangiographies that were made on guinea pigs, rabbits, cats and dogs the author discusses only a few. He shows that the intradermic injection of the opaque substance into the external ear of a dog brings into evidence the superficial lymphatic vessels from the auricle to the lymphatic vessels at the base of the neck, corresponding to the supraclavicular group in man, that an injection into the skin of the toes shows the lymphatic vessels of the leg and thigh and the popliteal lymphatic, that an injection into the testicular albuginea shows the testicular lymphatics. In discussing the applications of this method, the author says that the experimental and clinical studies of Leriche having demonstrated that sympathectomies have a favorable effect on the reestablishment of the arterial circulation, it seems justified to inquire whether interventions on the sympathetic have an identical influence on the reestablishment of the course of the lymph stream. However, before giving his attention to the action of sympathectomies on the lymphatics he takes up the reestablishment of the circulation after ligation or section of the lymphatic vessels. Among the roentgenograms reproduced in the text there is one of a dog in which thirteen days previously the left jugular trunk had been ligated. The opaque substance injected into the lymphatics on the side on which operation was performed had passed through the well developed median anastomoses and had filled the lymphatics and the jugular trunk on the opposite side. Studying the influence of sympathectomies on the reestablishment of the interrupted lymphatic circulation, the author finds that sympathectomies favor, as in the case of the arteries, the reestablishment of the lymphatic circulation after interruption of the large trunks by the development of a large number of derivative passages and, perhaps, by better conditions of nutrition in the connective tissue which accelerate the reconstruction of the interrupted lymphatic vessels. Discussing the restoration of the lymphatic circulation after cutting of the ganglions, the author directs attention to the roentgenogram of a dog which twenty-one days before had undergone ligation of the left jugular trunk. The liquid injected into the jugular lymphatic of this side had not descended in the jugular trunk but had mounted and had filled the fine vessels which had conducted it to the opposite side, thanks to dilated median anastomoses. Consequently these thin vessels, at that time efferent vessels of the lymphatic, must represent normal afferent vessels of the jugular lymphatic. In experiments on the transplantation of lymphatics it was found that the roentgenologic visualization demonstrates that autoplasmic transplantation of capsulated lymphatics succeeds only in young animals. In the last part of his extensive report the author shows that the methods described are of value from the anatomic and physiologic as well as the clinical point of view, particularly with regard to the treatment of cancer.

**Sulfanilamide in Postpartal and Postabortal Infections**—Lambillon and Lejeune say that from the end of 1935 sulfanilamide preparations were used at their clinic in abortions in which infection is always to be feared. When it was found

that the preparations were well tolerated they were employed also in postoperative complications anginas, influenza and diverse infections. During the years 1936 and 1937 the authors had occasion to use sulfanilamide preparations in all obstetric cases in which long duration of labor or multiple obstetric maneuvers performed outside the clinic justified the fear of a puerperal infection. With this preventive measure only one fatality resulted in 827 confinements. Cases of mammary congestion after delivery likewise proved the anti-infectious action of the sulfanilamides. In order to be able to evaluate the action of sulfanilamide preparations objectively, the authors treated for a time only alternate cases, irrespective of their severity, with sulfanilamide, giving eight tablets daily. They show two tables listing the temperatures (on admission, the maximum after onset of the treatment and the final), the degree of leukocytosis and the duration of the febrile period. One table gives the records of the nine cases in which the sulfanilamide was omitted and the other one gives those of sixteen cases in which it was administered. That the second group is larger is due to the fact that after a certain time the sulfanilamide was again administered to all patients. A comparison of the two tables reveals that the cases treated with sulfanilamide took a more favorable course than those in which this treatment was not employed. The temperature usually decreased more rapidly in the patients who were treated with sulfanilamide than in those who were not. If complications such as Douglas abscess or ovarian abscess evolve in the cases in which sulfanilamide is administered, the subjective symptoms are slight. The authors gained the impression that sulfanilamide therapy favors localization of the infections and their passage toward suppuration. They cite several case histories which illustrate the tendency to localization during treatment with sulfanilamide. In the conclusion they stress that the preparations which they employed were well tolerated. Even in prolonged administration they did not observe complications. In view of this harmlessness and the favorable action, they recommend sulfanilamide as a valuable adjuvant in the preventive and curative therapy of puerperal and post-abortion infections.

### Journal de Chirurgie, Paris

52 737 896 (Dec.) 1938

\*Raynaud's Disease. Therapeutic and Pathologic Considerations on Basis of Thirteen Cases. P. Wertheimer and M. Berard —p. 737  
Technic of Total Extrafascial Apicolysis. M. Iselin and R. Dubau —p. 748

Relapsing Dislocation of Hip. C. Lenormant —p. 778

**Raynaud's Disease** —Wertheimer and Berard describe thirteen cases of Raynaud's disease in which they resorted to surgical treatment. In seven cases they performed periarterial sympathectomies and in the other six cases they made interventions on the cervicothoracic sympathetic nerve ganglions. Six of the periarterial sympathectomies were successful and one was not. However in the six cases the cure was not absolute, the patients themselves estimated their improvement at about 50 per cent. The attacks still recurred but were less frequent and not so severe during the cold season there was some aggravation. Pains were absent during the summer and were bearable during the winter. Discussing the results obtained with the operations on the cervicothoracic sympathetic ganglions the authors say that in one case they resorted to inferior cervical ramisection. Complete cure was obtained in this case. One of the two patients who were subjected to stellectomy was completely cured and the other had 50 per cent improvement. Substellate resections on the thoracic chain were made in three cases. Two of these patients were completely cured but the other one failed to obtain any relief. Thus of thirteen cases of Raynaud's disease in which surgical operation was performed four were completely cured seven were greatly improved and two were not improved. The authors think that no medical treatment can rival these results of the interventions on the sympathetic but although their efficacy is recognized the value of the various technics is still under discussion. The authors are in favor of interventions on the sympathetic chain the results of which are better than those of periarterial sympathectomy. Moreover studies by

Leriche and others have proved that of the different technics those on the lumbar sympathetic are superior to those on the cervical chain or the stellate ganglion. Discussing the pathologic problem of Raynaud's disease, the authors point out that three hypotheses have been advanced. The oldest one, already suggested by Raynaud, assumes that the disease is purely a vasomotor problem, another one supposes the constant existence of endarteritic lesions, the third one invokes a myoarterial origin. Evaluating these different theories, the authors say that the theory which assumes a myoarterial origin lacks anatomic demonstrations and the results of the sympathetic interventions likewise do not speak in its favor. On the contrary, their efficacy seems to demonstrate that the disorder is of a vasomotor type in which a vasoconstrictor hypertension predominates.

### Presse Medicale, Paris

46 1817 1832 (Dec. 10) 1938

^Ray Tube Has Not Suppressed the Stethoscope of Laennec. E. Seigant —p. 1817

\*Survey Over Results of Interventions Practiced in Forty Nine Cases of Nephro-Angiosclerose (Permanent Hypertensive States with Renal Lesions of Arterial Origin). H. Chabanier, P. Gaume and C. Lobo Onell —p. 1818

**Interventions in Nephro-Angiosclerosis** —Chabanier and his associates discuss the hypertensive states, which they prefer to designate as nephro angiosclerose. After citing the opinions of Volhard and Fahr, who differentiated between the benign and malignant types of nephro angiosclerosis, they review the anatomic and the clinical aspects of the malignant type of nephro-angiosclerosis and show that the benign and malignant forms are two entirely different disease entities. They also differentiate two types of permanent arterial hypertension: the form without renal symptoms and the hypertension with nephritis. To be sure, these two types do not correspond to morbid entities; they have only the value of nonspecific syndromes, because they may be the expression of essentially different morbid processes. Even solitary hypertension can be the manifestation of benign or malignant nephro-angiosclerosis. In hypertension with nephritis the situation is similar. This syndrome may be the expression of two essentially different morbid processes, that is, of malignant nephro-angiosclerosis and of a diffuse chronic glomerular nephritis. In general, all cases of hypertension in persons beyond the age of 60 can be considered as the manifestation of a benign nephro angiosclerosis, however, solitary hypertension developing before the age of 60 is likely to correspond to the initial stage of a malignant nephro angiosclerosis, especially when the subject is quite young. The authors say that therapy involves two factors: dietetic measures and medicaments. The regimen consists in the restriction of liquids, of the quantity of foods and, in case of secretory disturbances of the kidneys, in the restriction of nitrogenous foods and finally in dechlorination. Medicaments aim at the reduction of the hypertension or at least of its functional manifestations. Others are directed at the compensation of the results of the insufficiency of the left side of the heart and still others are to facilitate the renal elimination. After citing shortcomings of the medical treatment the authors give their attention to the surgical procedures. Their experiences on the surgical treatment of nephro angiosclerosis are based on sixty-five cases, but only forty-nine are considered here because in the others the operation was too recent to permit a conclusion. The methods utilized in these cases have been simple decapsulation, renal enervation combined with decapsulation, adrenalectomy, splanchicectomy, and splanchicectomy combined with the resection of the aorticorenal ganglion as well as of the nerves going to the renal pedicle and to the adrenals eventually combined with renal decapsulation. The general condition of the patients in the terminal stage of the disease when operated on was poor: there was marked renal insufficiency, the hypertensive syndrome was severe, there was decompensation of the left side of the heart and a fatal outcome was near. Consequently the authors considered an intervention justified in spite of the risk that was involved. Every improvement, even if only partial or of limited duration is priceless for these patients, and such a relief always follows the operation. More than that, there are even cases in which the improvement of the clinical syndrome is so considerable that the patients can resume an active life. To be sure

such a result is as a rule only temporary, it hardly extends beyond several months or a year and a half. In patients who were operated on before the terminal stage, that is during the stage of solitary hypertension or during the stage of hypertension with nephritis, the general resistance was usually such that they tolerate the different operations. However, vascular collapse must be watched for. The authors gained the impression that the diverse methods produce analogous and almost equivalent results. Usually the arterial tension decreases immediately, but after several months there is often a renewed increase, however, it generally remains more or less below the preoperative level and, even if the preoperative level is reached, the symptoms of hypertension remain suppressed. The general condition of the patients is so greatly improved that some can resume their occupations. The renal function is improved and the degeneration of the secretory elements of the kidney is arrested, at least for a shorter or longer period.

46 1833 1856 (Dec 14) 1938

Acetabular Protrusion Its Pathogenesis Costantini Bonnet and Brebant—p 1833

\*Hypophyseal Diabetes Action of Fever II Zondek and A Kaatz—p 1835

**Hypophyseal Diabetes Action of Fever**—Zondek and Kaatz describe two cases of hypophyseal diabetes. The first patient was a woman aged 32 who presented hypophyseal symptoms (endocrine obesity, psychic depression and manifest diabetes with constant increase in weight). The second patient was a man aged 30 who had a hypophyseal tumor and symptoms of hypophyseal dissociation (nanism, acromicria hypergenitalism, osteoporosis, delayed ossification of the growth cartilages and symptoms of hypothyroidism with mental and physical infantilism) complicated by latent diabetes. In both cases the diabetes was cured after an attack of fever, in the woman after an attack of angina and in the man after a fever that was provoked by the intravenous injection of antityphoid vaccine. In both cases the diabetes was of the hypophyseal type, the fever must have inhibited a diabetogenic principle. Whereas fever produces ordinarily an aggravation of pancreatic diabetes, it can have the reverse effect in certain cases of hypophyseal diabetes. The authors discuss the interglandular relations that are involved in the metabolism of carbohydrates. They are inclined to believe that the principle inhibited by the fever is not the diabetogenic hormone described by Houssey but rather that which acts through the medium of the adrenal cortex (according to the opinion of Long). The diabetes results in these cases in an exaggerated transformation of nonhydrocarbonaceous substances into carbohydrates in accordance with von Noorden's theory of diabetes, but it is possible that outside of this factor there are still others that intervene, factors which inhibit either the fixation of glycogen or the oxidation of sugar. Thus the modern ideas of the nature of diabetes approach more and more the conception that it represents a complex disturbance of the interglandular regulation, as is the case in other endocrine disorders, exophthalmic goiter for example.

### Rivista di Chirurgia, Naples

4 537 588 (Nov.) 1938

\*Zambrini's Ptyaloreaction in Surgical Diseases C Rendano—p 537  
Varices of Jugular Vein Case P Giliberti—p 551  
Congenital Partial Macrosomia Case F Iovino—p 560  
Bacteremia in Tetanus L Sanguigno—p 567

**Zambrini's Ptyaloreaction in Surgery**—Zambrini's reaction on saliva for the diagnosis and prognosis of vital resistance, its technic and several of its applications have been described in various medical journals, especially French and Italian, and in THE JOURNAL, Nov 14, 1936, page 1679, and April 2, 1938, page 1150. The test is based on the changes of saliva produced by the addition of a coloring reagent and measured by a standard colorimetric scale with figures from 16 to 1, which represent a scale of dark to light shades which stand respectively for good vital and for poor organic resistance. Aside from the color of the saliva reagent mixture the possible presence of turbidity, sediment and a yellow crescent

figure on the surface of the mixture are studied. In normal individuals the mixture is limpid and without the presence of either sediment or the crescent figure. The phenomena of turbidity and formation of sediment in the mixture follow in all cases the behavior of the colorimetric curve. Rendano followed the behavior of the test in more than 100 persons with surgical diseases who were to be operated on. The author found that there is an obvious agreement between the results of the test and the general conditions of the patients before the operation and in the course of the postoperative period. The prognosis for an operation is excellent if the curve of the colorimetric test shows figures within 16 and 13, good for figures within 12 and 9, reserved under 8 and unfavorable under 5. After the operation the colorimetric curve descends. If the evolution of the postoperative period is normal the colorimetric curve rises uninterruptedly from the second day on, oscillates within high figures and rapidly becomes normal. The development of local or general complications is preceded in one or two days by a lowering of the colorimetric curve, which remains within low figures for as long as complications threaten or develop. The curve rapidly regains either normal figures or figures which existed before the operation if complications are controlled. The curve drops abruptly in cases of infected operation wounds with suppuration. The curve rapidly returns to normal after complete elimination of pus and control of the infection. The author believes that the test is of value in estimating the organic resistance and powers of defense of the patient in relation to immediate results of an operation. It is also of value in showing the development of complications in the course of the postoperative period early enough to make it possible to control them by early treatment.

### Prensa Medica Argentina, Buenos Aires

25 2331 2382 (Dec 14) 1938 Partial Index

\*Triphasic Complex in Lead 3 of Electrocardiogram D Gross—p 2331  
Parathyroids Clinical and Biologic Study P Rojas and F J Manfredi—p 2335  
Achylic Hypochromic Anemia Differential Diagnosis E S Marzetti—p 2339

**Triphasic Complex in Lead 3 Electrocardiograms**—Gross made electrocardiographic studies of 250 of his patients who had heart disease. The electrocardiograms in lead 3 of twenty-five of the patients (nineteen men and six women) showed a triphasic complex (biphasic S wave). All the patients complained of precordial pain of the anginous type or of a dull pain of light intensity and uncertain precordial location. Most of the patients were close to the age of 50. Sixteen presented organic disease of the heart. The arterial pressure was normal in sixteen and increased in seven. The electrocardiograms of fourteen were normal except for the presence of a biphasic S wave in lead 3. The altitude of the wave varied from 2 to 12 mm. The wave had an increased amplitude in fourteen cases. In all cases the abnormality of the S wave in lead 3 was independent of the behavior of the other waves in the electrocardiogram, whether normal or pathologic. According to the author the triphasic complex in lead 3 of the electrocardiogram is not caused by electrical preponderance of the left side. It represents metabolic disturbances of the myocardium which originate both in vascular alterations (coronary sclerosis) and in the action of various factors (toxic, humoral, metabolic and hormonal) on the myocardium. The clinical significance of the complex can be evaluated by the following criteria: 1 The presence of a triphasic complex in normal electrocardiograms in lead 3 in patients who do not show clinical symptoms of heart disease but who have a dull precordial pain is to be considered as a warning of pathologic changes of the heart. 2 The presence of a triphasic complex in normal electrocardiograms in lead 3 in patients who do not have clinical symptoms of heart disease but who have anginal precordial pain, or in pathologic electrocardiograms of patients who show clinical symptoms of heart disease whether or not there is anginal precordial pain, is a sign of diagnostic value for heart disease.

**Archiv f orthopädische u unfall-Chirurgie, Berlin**

39 135 304 (Nov. 17) 1938 Partial Index

- Final Outcome of Traumatic Dislocations of Hip Joint B Pfab—p 135  
Diagnosis and Treatment of Contractures of Fingers W Thomsen—p 201  
Results of Treatment in Fractures of Forearm H Ehlert—p 206  
Capacity of Pirogoff's Stump to Support Body Completely or Partly H Greve—p 221  
Osteochondritis Dissecans and Joint Mice R Kienbock—p 240  
\*Work with Pneumatic Tools in Iron and Steel Industry as Cause of Diseases of Muscles Bones and Joints H Schramm—p 248  
Diagnosis and Estimation of Traumatic Impairment of Patellar Cartilage G von Haberler—p 258

**Pneumatic Tools as Cause of Diseases of Muscles, Bones and Joints**—Schramm points out that heretofore disabilities caused by pneumatic tools have been reported chiefly in men who work in mines and in the stone industry but not so much in the men who use such tools in the iron and steel industry. In this paper he describes his observations on fifty-eight iron and steel workers who operated pneumatic hammers and riveters. The pneumatic tools used by these workers are not as heavy as those used in mines and quarries, and the riveters used their pneumatic tools only for about six or seven tenths of their working hours. The author gives a tabular report of his observations on the fifty-eight workers. The table lists the ages, the length of time the workers had used the pneumatic tools, disorders of bones and joints observed before the time the work with the pneumatic tool was begun, articular and osseous symptoms that appeared afterward, positive or negative roentgenologic aspects and complaints about vasomotor disturbances. He discusses some of the complaints and reproduces several roentgenograms. He points out further that if it is considered that of fifty-eight men fourteen had worked with the pneumatic tools less than two years and therefore could as yet not have developed changes and that ten were not subjected to roentgenoscopy (on account of previous injuries), it can be said that defects caused by pneumatic tools are not less in workers of the iron and steel industry than in mine and quarry workers. In this respect the author's observations correspond with those of the few others who made similar studies. The author detected typical changes on the elbow joint in three workers, on the shoulder joint in two and necrosis of the semilunar bone in one. That predisposition plays a part as well as exposure is proved by the fact that some workers who had used the pneumatic tools for twenty-five years were free from complaints, whereas in a young worker, defects were noticeable after three years. Discussing the prevention, the author stresses the importance of selecting the right type of tool in accordance with the hardness of the material to be worked on. He also recommends the use of devices to reduce the effect of the recoil of the tools. Moreover, the exhaust opening for the escape of the compressed air should be adjustable so that the cold blast hits neither the guiding hand nor the body of the worker. The men who work with pneumatic tools should be subjected to examinations at regular intervals in order that possible impairment may be recognized early.

**Klinische Wochenschrift, Berlin**

17 1713 1744 (Dec 3) 1938 Partial Index

- Interpretation of Electrocardiogram in Disturbances of Blood Perfusion of Cardiac Muscle F Buchner—p 1713  
Normal and Pathologic Oxygen Supply of Tissues Especially of Kidney H Sarre—p 1716  
\*Action of Active Principle of Anterior Lobe of Hypophysis After Splenectomy B Rarei and H Gummel—p 1721  
Lipoid Antithyrotropic Protective Substances and Vitamin A K Fellinger—p 1722  
Action Mechanism of Gonadotropic Substance. P Hauptstein and U Otto—p 1724  
Studies on Photometric Determination of Vitamin C by Means of Methylene Blue Method W Zimmermann—p 1728  
Determination of Activities of Calcium Ions in Biologic Fluids G O Harnapp—p 1731

**Action of Active Principle of Anterior Lobe of Hypophysis After Splenectomy**—Rarei and Gummel investigated the content of gonadotropic substance in the urine of splenectomized animals and of patients who had undergone splenectomy. In order to be able to compare their results with those of Sauerbruch and Knake, they employed the same quantitative method as did those authors. Castration is also

followed by an increased elimination of gonadotropic substance in the urine but, since the peak of elimination is not reached until three or four months has elapsed since the castration, the authors gave especial attention to the time which elapsed after splenectomy before the increased content became evident. They found that during the first three months following the extirpation of the spleen the test for the follicle stimulating factor in the urine always produced negative results. The same was the case in splenectomized rabbits. However, in patients who had undergone splenectomy at least four months previously from 70 to 100 mouse units of the follicle stimulating factor was detected regularly in each liter of urine. These results correspond with those obtained by Sauerbruch and Knake, for these investigators detected on the average 50 mouse units of the follicle stimulating factor per liter of urine in cases in which one year or more had elapsed since splenectomy. In further investigations Rarei and Gummel aimed to determine whether the anterior lobe of the hypophysis of splenectomized animals forms more gonadotropic substance. They implanted the hypophyses of splenectomized rats into young female rats, pointing out that from four to six normal rat hypophyses are required for a positive Aschheim-Zondek reaction in such animals. In performing this experiment they found that the hypophyses of splenectomized rats were not heavier than the hypophyses of normal controls of the same age and weight. The implantation of the hypophyses of these splenectomized rats into young rats was not followed by an increased formation of gonadotropic substance, that is, hypophyses of splenectomized rats had about the same effect on the ripening of the follicle as did the hypophyses of normal animals. The authors conclude that their results seem to indicate that the increased elimination of gonadotropic substance can be given a similar interpretation as that which develops after castration, however, the theory that the spleen intercepts and destroys the gonadotropic substance cannot be accepted, because in newly splenectomized patients and animals the test is always negative. To be sure, although they obtained results similar to those reported by Sauerbruch and Knake, they do not feel justified in asserting definitely that splenectomy acts on the gonadotropic exchange similar to castration, because the knowledge about the formation of gonadotropic substance under normal conditions is as yet too limited and the patients who had undergone splenectomy were subject to such serious systemic diseases (leukopenia, thrombopenia, splenic tumors and so on) that their hormone regulation cannot be compared with that of healthy persons.

**Zeitschrift für Tuberkulose, Leipzig**

81 209 288 (Dec) 1938 Partial Index

- \*Massive Atelectasis and Bronchiectasis as Complication of Primary Pulmonary Tuberculosis in Children J Zeyland—p 209  
Distribution of Tuberculous Infection in Finnland S Savonen—p 219  
Pulmonary Tuberculosis As Late Complication After Wound of Lung H Rieckenberg—p 226

**Atelectasis and Bronchiectasis Complicating Tuberculosis in Children**—According to Zeyland, credit for having called attention to massive atelectasis as a complication of pulmonary tuberculosis is due chiefly to American authors. Before describing five typical cases that he observed, Zeyland says that the development of massive atelectasis (of an entire lung or an entire pulmonary lobe) may take place unnoticed if it is gradual, but that in case of sudden development the symptomatology may be like that of pneumonia. Atelectasis of large portions of the lung is accompanied by impairment of the respiratory excursions, retraction of the thorax on the diseased side, elevation of the diaphragm of the same side shifting of the mediastinum toward the same side, reduced percussion sound weakening or abolition of the respiratory sounds on the diseased side occasionally tracheal or bronchial breathing in the upper field as the result of distortion of the trachea and sometimes also at the base of the atelectatic lobe, even in the absence of bronchiectasis. In partial atelectasis there may also be rales. The author thinks that many cases of so called splenopneumonia are in reality unrecognized cases of atelectasis. Stressing the greater reliability of roentgenologic examination in the demonstration of the symptoms of atelectasis,



he gives especial attention to the pendular movements of the mediastinum, that is, during inspiration the mediastinum deviates toward the diseased side because it is pushed aside by the healthy lung. This pendular movement of the mediastinum is important in the differentiation of atelectasis from pulmonary cirrhosis and pleural adhesions, since all other symptoms may be the same in these different conditions. Atelectasis is a reversible process but may give rise to an entirely new disease entity, namely pulmonary cirrhosis (pulmonary fibrosis), which is irreversible. The development of pulmonary fibrosis is accompanied by the development of bronchiectasis. Bronchography is important for the diagnosis of bronchiectasis. The anamnesis and clinical observation furnish only pointers, bronchography is necessary to make the diagnosis definite, especially in children with a positive tuberculin reaction. This is evident in the cases the clinical histories of which are described in this report. In the first case a massive atelectasis of the upper left pulmonary lobe was caused by a temporary enlargement of the tracheobronchial lymph nodes and by their pressure on the bronchus. The complication in the form of the atelectasis disappeared completely, and after that roentgenoscopy revealed only the calcified primary complex in the left lung. In such cases it is important to differentiate between atelectasis and epituberculous pulmonary infiltration. In the second case an atelectasis of the left lung developed in connection with a primary pulmonary tuberculosis, probably as the result of pressure by an enlarged lymph node on the left bronchus, which was contracted and bent. The chronic atelectasis developed into partial pulmonary fibrosis with bronchiectasis. The third case resembled the second one, but the bronchiectases were more pronounced. In the fourth case the atelectasis evolved on the basis of a tuberculous process and it developed into a pulmonary fibrosis. The fifth patient presented the typical aspects of an atelectasis of the upper lobe, which was most likely connected with the tuberculous infection.

### Problemy Tuberkuleza, Moscow

Pp 1160 (No. 1) 1938. Partial Index.

- Stabilization of Pneumothorax from Point of View of Its Physicochemical Schematization. T. I. Moldaver and S. A. Agronovich—p. 3.  
\*Total Thoracoplasty with Economic Resection of Lower Ribs. A. G. Gilman—p. 11.  
Vaccination of Horned Cattle After Calmette. V. N. Matveev—p. 24.  
Allergic Reactions in the Lungs. G. E. Platonov—p. 37.  
Role of Tuberculin Reaction in Tuberculin Therapy. V. A. Rivich Shcherbo—p. 41.  
Therapeutic Problems in Prolonged Subfebrile States. B. S. Brevdo—p. 53.

**A Total Thoracoplasty with Resection of the Lower Ribs**—While approving of the operation of partial thoracoplasty in some cases, Gilman stresses its disadvantages, such as aspiration of the tuberculous processes by the lower pulmonary segment and above all the deformities to which it predisposes. On the other hand, scoliosis is practically unknown after a total thoracoplasty. The deformities are particularly prone to develop in patients of asthenic habitus and thoracic asthenic bodily conformation. Furthermore, partial thoracoplasties are successful only in the presence of small cavities located in the periphery of the lung. While admitting the desirability of preserving the maximum amount of pulmonary tissue, the author feels that it is wiser in the majority of the cases to sacrifice pulmonary tissue in order to obtain an adequate collapse. For patients with asthenic type of chest the author recommends a total thoracoplasty with what he calls "economic" resection of the lower ribs. The operation consists of the usual upper thoracoplasty or of complete removal of the first two or three ribs. This is either preceded or followed by an "economic," that is, partial, resection of the lower four or five ribs. This operation results in an even, more physiologic narrowing of the thoracic cage and a more rapid return to the physiologic balance. Partial resection of the lower ribs interferes but little with the respiratory function of the lower segment of the lungs. This modification of a total thoracoplasty is recommended by the author for asthenic patients, for enfeebled patients requiring an extensive upper plastic operation, for patients with fresh lesions and for patients with extremely large cavities.

### Acta Radiologica, Stockholm

19 409 504 (Nov. 30) 1938

- \*X-Ray Diagnosis of Intestinal Obstruction. A. Høyer—p. 409.  
Dosage, Duration of Treatment and Reactions in Protracted Fractional Roentgen Treatment, with Special Reference to Carcinoma of the Upper Air Passages. J. Juul—p. 433.  
Cancer of the Penis and Its Treatment. C. J. Hansson—p. 443.  
Peptic Ulcer of the Esophagus. T. Nørgaard—p. 458.  
Fundamental Property of Planigraphic Image Formation. R. H. De Waard—p. 465.  
Gastric Syphilis. Two Cases. P. A. Blinkenberg—p. 480.  
Notes on Myeloma. J. Bichel and P. Kirketerp—p. 487.

**X-Ray Diagnosis of Intestinal Obstruction**—Høyer points out that it may be difficult to make the clinical diagnosis of intestinal obstruction in the first twenty-four hours because of the fact that the symptoms typical of this lesion may be totally or partly absent. The pain generally gives rather indefinite data on which to base the diagnosis, as it is indistinguishable from colicky pain of other causes and it has no typical location. Neither does the vomit supply information before the vomitus becomes foul. This is a late symptom, however, and indicates that the situation is becoming exceedingly grave. Information to the effect that there has been no passage of feces or flatus is of small value during the first twenty-four hours. The signs also are scarce during the first twenty-four hours. In view of these difficulties encountered by the clinical diagnosis it was of great importance that Kloiber in 1919 discovered that the x-ray diagnosis of intestinal obstruction could be made with great certainty at an early point of time, without contrast mediums, only by x-ray examination with horizontal direction of the rays. In this manner he revealed the characteristic fluid levels caused by the simultaneous presence in the intestine of gas and thin intestinal contents. After reviewing Kloiber's experience with roentgenoscopy in 100 cases showing acute abdominal symptoms, the author describes and illustrates the x-ray symptoms of intestinal obstruction. When an occlusion takes place, the immediate result is an accumulation of thin intestinal contents in the oral direction, whereas anally to the occlusion the intestine is more or less completely emptied. There is increased peristalsis. The intestine makes every effort to pass the obstruction. Not infrequently patients with obstruction of the small intestine have spontaneous defecation shortly after the onset of the pain. Next comes an abnormal fermentative process of the intestinal contents with development of gas. This supplies conditions for the formation of fluid levels which, according to Kloiber, commences two or three hours after the onset of the attack. In mechanical ileus the fluid levels are usually visualized in two segments of the same coil at different heights. Fluoroscopic examination may demonstrate how the fluid levels rise and fall. This symptom is an important aid in the differential diagnosis between mechanical and paralytic ileus. In paralytic ileus the peristalsis has ceased and the fluid levels are stagnant. The coil of intestine lying immediately proximal to the obstruction, the so called prestentotic coil, frequently presents a peculiar condition. The peristalsis here is particularly strong. The coil rises in the abdomen in the form of a reversed U. It has a stiff appearance. The tonus seems to be stronger than in the other dilated intestines. If an entire coil of the small intestine is shut off from the intestinal tract, both segments being strangulated, this coil becomes greatly dilated by gas and is easily recognizable in the roentgenogram. At the same time this supplies the accurate topical diagnosis, which is represented clinically by the "hypogastric football" (Wahl balloon symptom). The author further mentions a roentgenologic symptom which, in his opinion, is of great importance to the diagnosis. This is the more or less complete absence of gas from the large intestine in the presence of obstruction of the small intestine. The author says that at the surgical department of his hospital x-ray examination is now employed in all cases of suspected intestinal obstruction. The material available so far includes forty-six cases. In all cases the x-ray examination supplied a correct reply as to whether or not an intestinal obstruction was present. In a majority of cases the site of the lesion could be given. The mortality from intestinal obstruction has decreased considerably subsequent to the adoption as a routine method of the x-ray examination of abdominal cases in which intestinal obstruction is suspected.

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## A STUDY OF PELVIC TYPE

AND ITS RELATIONSHIP TO BODY BUILD IN  
WHITE WOMEN

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In the literature of both anthropology and obstetrics, the pelvis of the white woman is described as having an inlet the transverse diameter of which is considerably larger than the anteroposterior, or conjugate, diameter. The pelvic index, i. e. the ratio of the anteroposterior to the transverse diameter of the inlet  $\times 100$ , is said to be less than 90 in white women, who are, accordingly, classed as platypellic. Pelves with a relatively larger anteroposterior diameter and with a pelvic index ranging from 90 to 94.9 are classed as the mesatipellic type. Those with an index of 95 or more, the dolichopellic type, are supposed to be characteristic of what are frequently referred to as the "more primitive" races. Thus, according to data compiled by Martin,<sup>1</sup> Negroes, Melanesians and Tasmanians are mesatipellic, while Bushwomen, Hottentots, Australians and Malays are dolichopellic.

In a paper by Dr Hans Scheyer<sup>2</sup> on the pelvis of the Chinese woman, there is a discussion of the relative primitiveness of the various types of pelves which seems to reflect rather accurately the opinion held by many anthropologists and others on this point. He writes:

From observations on the orang-outan it is known that the man like apes as well as all of the mammals have so called long oval pelves wherein the long axis is antero-posterior. The aborigines also have this long oval pelvis. So Fritsch found the stunted pelvis with the long oval entrance among the Hottentot and Bushwomen. With the evolution of the races one finds a tendency in the development of the pelvis from the long oval through the round to the transverse oval. Among European women generally the pelvis is transverse oval in shape. If a long oval pelvis is found it is considered pathological. Likewise the round pelvis when found in European women is a sign of underdevelopment (infantilism).

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This investigation was aided by grants from the Fluid Research Fund of Yale University School of Medicine and from the General Education Board of the Rockefeller Foundation.

Dr. Hugh M. Wilson, associate professor of radiology at the Yale School of Medicine, kindly made available to us the necessary radiologic facilities for this study. Mr. Laurence E. Cowles, technician in radiology, made the pelvic roentgenograms, and Mrs. C. B. Bidwell, Miss Esther Setlow, and Mr. R. L. Kemler of the Adolescence Study Unit did most of the work of recording, tabulating and charting our data.

<sup>1</sup> Martin, Rudolf. *Lehrbuch der Anthropologie*. Jena: Gustav Fischer, 1928.

<sup>2</sup> Scheyer, H. E. *Anthropological and Roentgenological Observations on the Pelves of Chinese Women*. Chinese M. J. 48: 1228 (Dec.) 1934.

## INCIDENCE OF THE VARIOUS PELVIC TYPES

Practically all published descriptions of the dimensions and configuration of the pelvic inlet are based on measurements made on cadavers or on dried pelves. With the development of satisfactory methods of roentgen pelvimetry, however, it has become possible to measure the pelvic inlet of living women with a rather high degree of accuracy. We wish to report these dimensions as determined by Thoms's method of roentgen pelvimetry<sup>3</sup> in 582 primigravid white women from the Obstetrical Clinic of the New Haven Hospital, 104 nulliparous young white women, most of whom were students of the Yale School of Nursing, and 107 young girls who ranged in age from 5 to 15 years.

In table 1 are listed the percentages of the different types of pelves found in this series of 793 white females. It will be noted that 73 per cent of the student nurses, 37.3 per cent of the clinic patients and 82.2 per cent of the young girls were dolichopellic, that 13.5 per cent of the student nurses, 27.5 per cent of the clinic patients and 9.3 per cent of the children were mesatipellic and that only 13.5 per cent of the student nurses, 35.2 per cent of the clinic patients and 8.4 per cent of the children were platypellic. Thus, of the 686 adult women studied, 68.1 per cent had a pelvic index of 90 or more and were therefore either dolichopellic or mesatipellic. The platypellic type, which is usually regarded as proper for white women, was found in only 31.9 per cent of the adults in our series. The high incidence of dolichopellic and of mesatipellic pelves among the adult white women of our series and the much lower incidence of the type usually considered to be characteristic of this race suggest that the prevailing concept of the latter is in need of some revision.

Special interest attaches to the high percentage of dolichopellic pelves among the student nurses for, on the basis of their pelvic type, 73 per cent of them showed a rather embarrassing resemblance to Hottentots and Bushwomen. This is especially surprising in view of the relatively high economic level and the superior physical status of the young women of whom that group was composed. More than two thirds of them were college graduates and a considerable percentage of the latter were alumnae of Mount Holyoke, Smith, Wellesley, Radcliffe or Vassar. As a group they gave the impression of having attained something at least approximating their maximum normal growth potentialities.

Despite the high incidence of round and of long oval pelves among the student nurses there was no indication of anything pathologic about them and, as may be seen from the accompanying illustrations, they were most

<sup>3</sup> Thoms, Herbert. *Roentgen Pelvimetry*. Radiology 21: 125 (Aug.) 1933. Thoms, Herbert and Wilson, H. M. *Roentgen Methods for Routine Obstetrical Pelvimetry*. Yale J. Biol. & Med. 10: 437 (May) 1938.

There is some further evidence that seems pertinent in this connection. In 1923 Thoms and Hershman<sup>10</sup> described a case of precocious puberty in a girl who menstruated first at the age of 3 years 7 months and whose menstrual periods continued with ordinary regularity up to within about one year of her death, which

There remains, of course, the possibility that the hormonal and associated factors elicited an atypical response from the developing pelvis in this girl because of the abnormally early period at which they began to operate. The fact that the mammary glands, the uterine mucosa, the subcutaneous fat and the axillary and pubic hair follicles all responded in a normal manner to these hormonal influences does not however, support such an assumption. It will be noted that the pelvic inlet

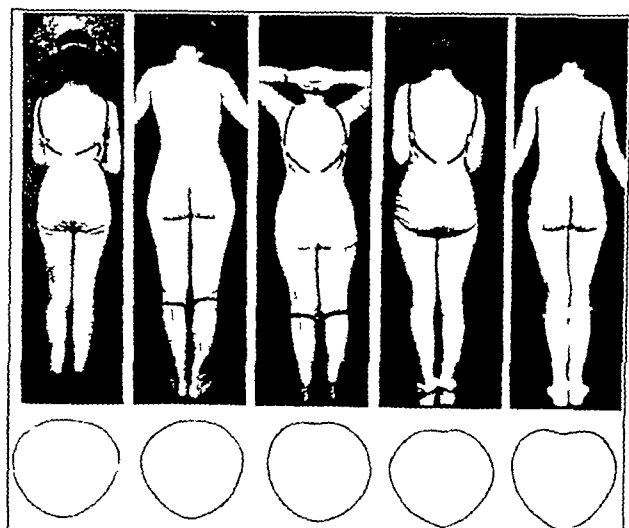


Fig 4—There is a range of 167 cm in the stature of these five women and there are comparable differences in their other dimensions. Note the variation in the shape of the inlet despite the fact that the anteroposterior and maximum transverse diameters are the same in all cases. The pelvic inlet of the shortest woman in this group (the third) appears to have the greatest area. The shape of the pelvic inlets of the first and second women is very similar despite a marked difference in all external dimensions except the external conjugate diameter. The tracings of the fourth and fifth women show some flattening of the forepart of the inlet. In both of them the promontory of the sacrum projects slightly into the superior strait.

#### PHYSICAL MEASUREMENTS

Conjugate diameter	11 50	11 50	11 50	11 50	11 50
Transverse diameter	12 70	12 70	12 70	12 70	12 70
Standing height	158 6	168 4	161 7	167 7	164 2
Sitting height/standing height	51 0	52 6	53 8	52 8	50 7
Cephalic index	78 8	81 6	82 7	70 6	78 8
Biacromial	33 0	35 2	33 3	36 5	33 9
Bicristal	26 1	28 8	27 8	28 6	27 3
Bitrochanteric	29 7	30 6	29 9	31 4	34 4
External conjugate	17 6	17 7	19 5	19 4	20 0

occurred at the age of 18½ years, following an operation. Figure 1 shows the child at the age of 4 years and at 8 years and 4 months. It will be noted that, at the time the second picture was taken, she appeared to be physically mature, the breasts and the pubic hair were essentially adult in type and the amount and distribution of subcutaneous fat had imparted to the body a contour which resembled that of a normal woman. In this illustration is reproduced a pelvic roentgenogram of this child made when she was 11 years of age. As is usual in such cases, her skeletal development was advanced far beyond that proper to her chronological age. Though they are not visible in the accompanying illustration, the centers for the crests of the iliums were already present, and the fusion between each ilium, ischium and pubis had proceeded to a point at which it was no longer possible to distinguish the line of their junction in the roentgenogram. Her pelvic inlet at that time was long oval. As determined by Thoms's method of roentgen pelvimetry about seven years later, the dimensions of the inlet were found to be 12 cm anteroposterior and 11.3 cm transverse.

This is an instance in which the bony pelvis was subjected to the influence of the female sex hormones during its entire formative period. The end result was a pelvis the inlet of which was elongated anteroposteriorly.

<sup>10</sup> Thoms, Herbert and Hershman, A. A. A Case of Sexual Precocity. *Am J Obst & Gynec* 6: 349 (Sept.) 1923.

TABLE 4—Incidence of Operative Intervention

Type	Number	Per Cent
Dolichopellic	10	16.3
Mesantipellic	49	18.0
Brachypellic	41	19.5
Platy-pellic	8	3.7
Delivery	Number	
Cesarean section	10	
Version extraction	4	
Midforceps	18	
Outlet forceps	76	

of this girl resembles very closely the type most frequently observed among the student nurses of our series.

#### A COMPARISON OF BODY BUILD AND PELVIC TYPE

It is self evident that, if a mammalian species is to survive, the pelves of the females of that species must be large enough to permit the birth of their young. It was a recognition of the necessity of such a relationship which led anthropologists of the nineteenth century to

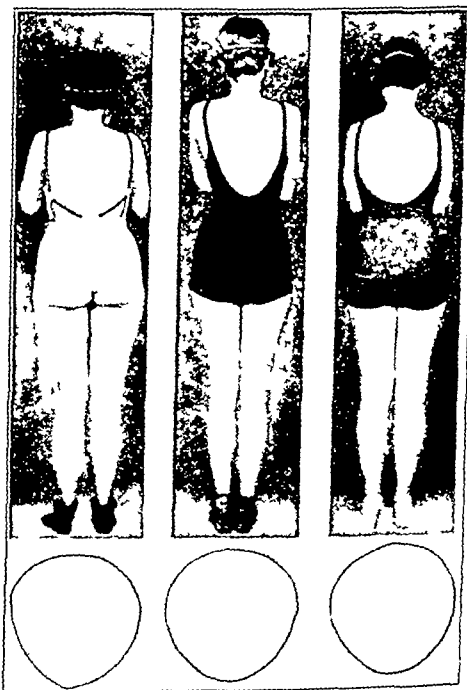


Fig 5—The pelvic tracings of these three women are very similar though there is a slight asymmetry of the forepart of the inlet of the first woman. The second woman shows in addition to her greater height strikingly broader shoulders, a narrower waist and broader hips in proportion of her bicristal diameter than the other two women.

#### PHYSICAL MEASUREMENTS

Conjugate diameter	12 50	12 50	12 50
Transverse diameter	12 75	12 75	12 75
Standing height	167 1	179 0	179 0
Sitting height/standing height	49 8	51 0	51 0
Cephalic index	79 3	61 2	78 9
Biacromial	30 6	36 9	35 3
Bicristal	31 1	29 1	26 8
Bitrochanteric	32 8	33 6	32 8
External conjugate	19 7	21 9	20 3

expect a rather close correspondence between the shape of the head and the shape of the pelvic inlet in various races. There persists today a somewhat similar notion, implicit in the opinion of many obstetricians, that a rather closer relationship exists between pelvic type and body build. It is said, for example, that short, stocky women tend to have a relatively wide pelvic inlet, whereas tall, linear women are more likely to have the round or the "anthropoid" type. It seemed desirable to investigate this possible relationship and especially to determine whether there are any external characters which would serve to distinguish women of one pelvic type from another. We accordingly measured and photographed 132 of the clinic women and the 104 student nurses of our series and compared the various average dimensions of the women of the different pelvic

height, however, did not differ significantly from one pelvic type to another, among either the student nurses or the clinic women.

3 The average cephalic index was lowest among the dolichopellic, somewhat higher among the mesatipellic and highest among the brachypellic women of both groups. Thus, long oval pelvis occurred most frequently among women with relatively long, narrow heads, whereas round and transversely elongated pelvis were most frequently associated with relatively broader heads. There was no comparable correspondence between pelvic type and facial index.

4 The average biacromial breadth of the student nurses was larger than that of the clinic women in every pelvic type. In both groups of women this dimension was largest among those having long oval or round

TABLE 5—Average Physical Measurements of 132 Clinic Women and 104 Student Nurses Grouped According to Their Pelvic Type\*

	Pelvic Type					
	Clinic Women				Student Nurses	
	Dolichopellic	Mesatipellic	Brachypellic	Platypellic	Dolichopellic	Mesatipellic
Number of cases	18	58	51	5	39	46
Average standing height	158.5	160.3	155.6	158.3	166.5	163.8
Range	148.0-173.4	145.9-170.2	139.1-168.4	149.4-165.4	151.9-178.6	155.6-170.2
Average sitting height	84.6	84.5	83.1	84.4	87.3	86.5
Range	79.9-94.5	70.8-92.4	77.2-88.9	79.7-88.1	80.4-94.0	78.7-93.5
Sitting height / standing height	53.4	53.0	53.4	53.4	52.1	52.0
Range	50.2-57.1	48.0-55.0	50.5-56.3	52.3-54.0	50.7-54.2	49.6-55.6
Average cephalic index	79.7	81.1	81.6	81.8	78.9	79.4
Range	74.7-87.4	75.5-92.2	74.0-89.0	77.3-86.2	72.1-86.4	71.9-85.1
Average facial index	75.3	77.4	77.0	76.0	75.1	75.4
Range	67.0-81.2	67.2-96.2	70.1-87.9	67.9-81.5	66.9-84.1	69.7-85.6
Average depth of chest at mesosternale	17.8	18.2	17.7	17.5	17.3	17.3
Range	16.6-20.7	15.7-21.9	15.2-22.1	14.5-19.6	15.2-19.6	14.2-22.3
Average biacromial width	34.8	34.6	33.9	34.1	35.9	35.6
Range	32.5-36.7	31.2-35.6	31.0-37.5	30.5-36.0	32.3-39.0	31.6-38.5
Average bicristal width	27.6	27.7	27.5	27.5	28.7	28.6
Range	22.1-30.9	24.9-32.5	25.1-30.3	23.8-31.0	25.2-32.0	26.0-32.3
Average bitrochanteric width	33.3	33.3	33.4	32.6	33.1	32.8
Range	30.2-39.4	30.0-38.8	29.0-38.5	29.4-36.7	29.3-36.3	30.4-35.8
Bicristal / biacromial	79.3	79.6	81.2	80.6	79.9	80.6
Bitrochanteric / biacromial	95.7	95.7	98.3	97.1	90.8	92.0
Average external conjugate diameter	19.8	19.3	18.6	18.4	19.8	19.7
Range	17.5-21.0	17.0-22.0	16.5-27.0	17.0-20.0	16.9-22.9	16.4-23.1
Dimensions of pelvic inlet						
Average anteroposterior diameter	11.8	11.8	10.7	9.9	12.9	12.0
Average maximum transverse diameter	12.1	12.4	10.8	13.2	11.6	12.4

\* The data have been checked statistically by Dr. Frank Shuttleworth of the Yale University Institute of Human Relations. The correlation between the bicristal diameter and the maximum transverse diameter of the pelvic inlet was only 0.40, and that between the external conjugate and the anteroposterior diameter of the inlet was 0.41. These were the highest correlations noted. They confirm the observed unreliability of external measurements in predicting the dimensions of the inlet.

types. The measurements so obtained are listed separately for the clinic women and for the student nurses in table 5. The average measurements of the five platypellic clinic women have been included in the table, for the sake of completeness, even though the number of such cases is too small to permit a valid comparison of their measurements with those of the other pelvic types. They have, however, been omitted in the subsequent discussion. It will be noted that in some instances the platypellic group did, and in others they did not, conform to the trends here outlined.

Attention is directed to the following relationships between pelvic type and body build, which seem to be indicated by our observations.

1 The clinic women and the student nurses who had long oval (dolichopellic) or round (mesatipellic) pelvis were, on the average, the tallest women of our series, those with a relatively wider pelvic inlet, the brachypellic type, were the shortest. The student nurses were taller than the clinic women of the corresponding pelvic type.

2 The clinic women had relatively longer trunks and shorter legs than the student nurses of corresponding pelvic type. The ratio of sitting height to standing

pelvis and smallest among those having transversely elongated pelvis.

5 There was no significant difference in average bicristal diameter between the various pelvic types among either group of women. The average bicristal diameter of the student nurses was, however, greater than that of the clinic women of corresponding pelvic type.

6 As shown by the ratio of their bicristal to their biacromial diameters, the shoulders of the student nurses of each pelvic type were wider in proportion to the width between their iliac crests than were those of the clinic women. In both groups, however, this excess of the biacromial over the bicristal diameter was largest among the women with long oval pelvis, somewhat smaller among those with round pelvis and smallest among those with transversely elongated pelvis.

7 The average bitrochanteric breadth was larger among the clinic women than among the student nurses in each pelvic type. This dimension was not significantly larger in women with transversely elongated pelvis than it was in those with the round or long oval type.

8 The ratio of the bitrochanteric to the biacromial diameter was higher among the clinic women than among the student nurses of corresponding pelvic type. In both groups this ratio was higher in the brachy-

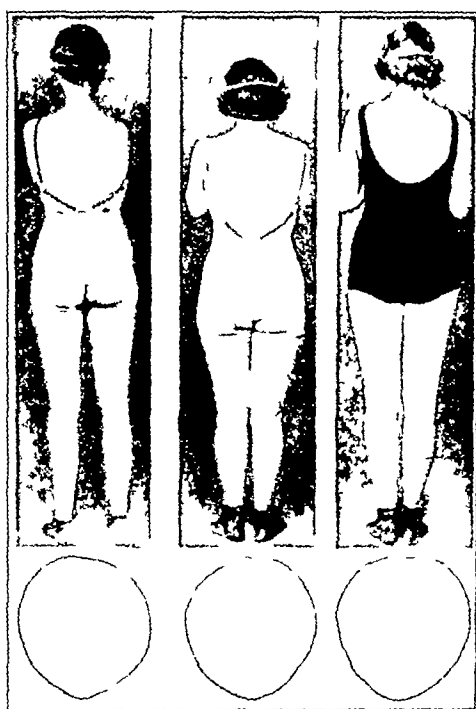


Fig. 6—Though their pelvic tracings are very much alike these three women are quite different in their external dimensions and general bodily configurations

#### PHYSICAL MEASUREMENTS

Conjugate diameter	13.0	13.0	13.0
Transverse diameter	12.5	12.5	12.5
Standing height	170.1	159.2	173.0
Sitting height/standing height	51.8	53.4	51.8
Cephalic index	72.1	81.5	81.4
Biacromial	30.0	31.1	38.1
Bicristal	27.4	29.2	30.1
Bitrochanteric	32.7	32.4	35.0
External conjugate	19.8	19.0	21.8

pelvic than in the mesatipellic or dolichopellic women. The width of the hips across the trochanters, in women with transversely elongated pelves, was therefore greater in proportion to the width of their shoulders than in women with round or long oval pelves.

9 The average depth of the chest at the level of the fourth costosternal articulation (mesosternale) was found to be greater among the clinic women than among the student nurses, but there appeared to be no consistent relationship between that dimension and the pelvic type.

10 The average external conjugate diameter was found to grow progressively smaller as one proceeded from the long oval to the round and finally to the transversely elongated pelves. There was, however, considerable variation in this dimension between women of the same pelvic type and even between some in whom the true conjugate diameters were identical.

These results may be summarized as follows (a) The women with long oval pelves (dolichopellic) were predominantly tall, long headed and broad shouldered. The width of their pelves between the iliac crests and of their hips between the trochanters was smaller in proportion to the width of their shoulders than in women of the other pelvic types, and they had the largest average external conjugate diameter. (b) The women with transversely elongated pelves (brachypellic) were, on the average, the shortest of the series,

and they had the broadest heads, the narrowest shoulders, the widest pelves and hips in proportion to the width of their shoulders, and the smallest average external conjugate diameter. (c) The women with round pelves (mesatipellic) were approximately intermediate between the other two groups in all these dimensions.

TABLE 6—Nationality of the Women Examined

Country of Origin	Clinic Women	Student Nurses
England	4.9%	41.8%
Scotland	0.8%	10.3%
Ireland	5.8%	8.6%
Wales		3.9%
Germany	2.5%	13.0%
Austria	1.6%	
Hungary	1.6%	1.6%
France	0.8%	4.3%
Belgium	0.8%	
Switzerland		0.5%
Italy	20.4%	
Sweden	0.8%	1.1%
Denmark	1.6%	0.3%
Netherlands		1.1%
Poland	13.4%	2.7%
Lithuania	1.6%	0.7%
Russia	3.3%	5.9%
Turkey		1.1%
Armenia	0.8%	
Greece	1.6%	
United States	28.5%	3.9%*

\* Subsequent inquiry disclosed that these student nurses were of Northern European ancestry.

It should be emphasized that the characters just enumerated are based on average dimensions of groups and that the characters which distinguished one group were not possessed to the same degree by every member of that group. As indicated by the range of the various measurements listed in the table there was con-

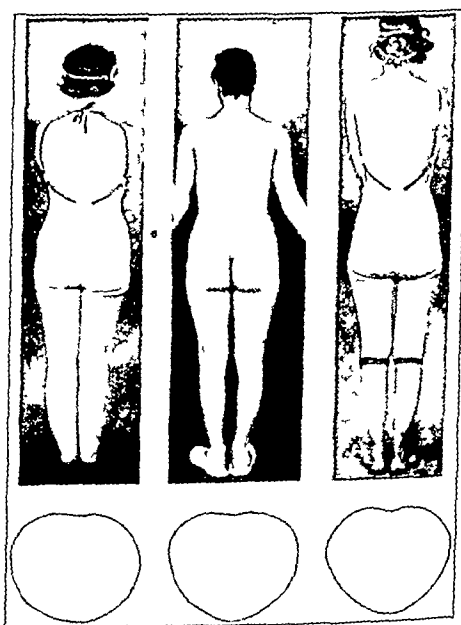


Fig. 7—Though the shape of these three pelvic tracings shows minor differences they are all characterized by the same degree of anteroposterior flattening. The three women however are very different. The shape of the inlet of the second woman corresponds very closely to that pictured in the last edition of Gray's Anatomy as a typical female pelvis although the woman herself has anything but a typical feminine figure.

#### PHYSICAL MEASUREMENTS

Conjugate diameter	10.5	10.5	10.5
Transverse diameter	13.0	13.0	13.0
Standing height	157.4	154.6	167.1
Sitting height/standing height	54.0	54.7	54.5
Cephalic index	80.1	80.4	77.0
Biacromial	32.2	35.5	29.4
Bicristal	27.9	29.5	27.2
Bitrochanteric	31.9	32.0	32.5
External conjugate	16.2	19.0	20.5

siderable overlapping from one pelvic type to another in practically all these measurements. Indeed, this variation was so great that we were unable to find any measurement or index or any combination of measurements or of indexes from which the pelvic type might safely be predicted in individual cases. In this connection attention is directed to the fact that in some average measurements and indexes there was a greater difference between clinic women and student nurses of the same pelvic type than there was between different pelvic types within either the student or the clinic group.

The observed differences in average bodily dimensions between the clinic women and the student nurses are, in part, attributable to the different racial composition of those two groups. In table 6 are listed the countries of origin of the ancestors of 119 of the 132 clinic women and of ninety-two of the 104 student nurses. One or both parents of eighty-five, or 71.4 per cent, of the clinic women and of eighteen, or 19.5 per cent, of the student nurses from whom this information was obtained were foreign born. Though the majority of the student nurses were descended from two or more generations of American-born ancestors, the countries from which the latter originally emigrated are also listed in table 6 in order that the racial composition of the two groups may be compared.

It will be noted that 63.9 per cent of the student nurses were of English, Irish, Scottish or Welsh descent, as compared with 11.5 per cent of the clinic women. Of the clinic women 29.4 per cent were of Italian and 18.3 per cent were of Polish, Lithuanian or Russian parentage, whereas there were no Italians among the student nurses and only 9.1 per cent of them were of Polish, Lithuanian or Russian parentage. Judging from the appearance of the clinic women whose parents were listed in their case history as having been born in the United States, the majority of them also were Italian or Slavic in origin. It is apparent from the table that the student nurses were predominantly of North European stock whereas the clinic women were mostly of Italian or Slavic origin.

It is because the clinic women and the student nurses differed so much in racial composition and in economic level that we have listed separately their average physical measurements and the incidence of the various pelvic types among them. As has already been pointed out, the student nurses, who were predominantly dolichopelvic and mesatipellic, were on the average larger than the clinic women of the corresponding pelvic type in practically every bodily dimension. It is interesting to note that among both the clinic women and the student nurses the women who had long oval (dolichopelvic) or round (mesatipellic) pelvises were the largest of their respective groups. The greater average size of the dolichopelvic and the mesatipellic women in these two racially and economically diverse groups, together with the evidence we have presented for the functional adequacy of these two types of pelvises during parturition, does not support the assertion that such pelvises are indicative either of infantilism or of some pathologic state when they occur in white women.

It seems reasonable to assume that if any reliable correspondence exists between pelvic type and body build it would be reflected in a similarity in external dimensions and in general bodily configuration of women who have pelvises of the same type and that such resemblance ought to be especially striking in women in whom the dimensions of the pelvic inlet are identical. In the accompanying illustrations we have accordingly

grouped together photographs, tracings of the pelvic inlet made from the x-ray films and the principal anthropometric measurements of women from our series in whom the dimensions of the pelvic inlet were found to be identical. The photographs and tracings are reproduced to scale and together with the measurements are arranged so as to facilitate comparison.<sup>11</sup>

Even a cursory examination of the illustrations will substantiate our conclusion that women in whom the size and shape of the pelvic inlet were identical can resemble one another very closely, only slightly or not at all in general appearance and in their other bodily dimensions. Figure 10 is especially instructive. The woman shown in the middle of the illustration has a pelvic inlet identical in dimensions with, and very

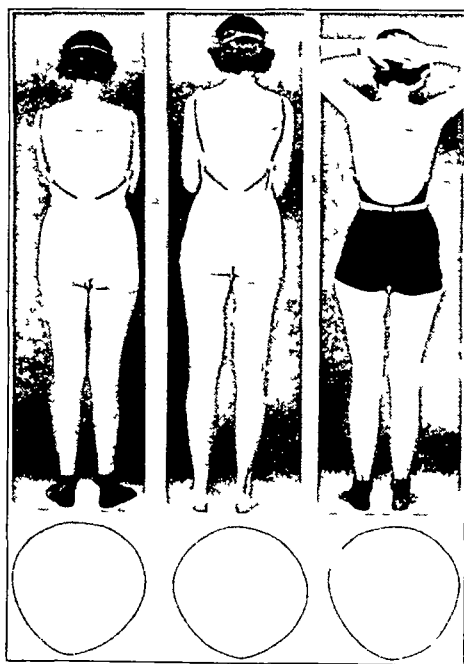


Fig. 8—Despite the similarity in the shape of the pelvic inlets of these three women they differ considerably in stature and to a somewhat less extent in their other bodily dimensions. Note especially the broad shoulders, narrow waist and relatively broad hips of the woman on the right.

#### PHYSICAL MEASUREMENTS

Conjugate diameter	12 7½	12 75	12 7½
Transverse diameter	13 0	13 0	13 0
Standing height	167 8	174 4	168 8
Sitting height/standing height	60.8	49.9	51.1
Cephalic index	82.5	76.6	77.4
Biacromial	33.8	35.4	35.0
Bicristal	28.5	29.3	27.4
Bitrochanteric	31.4	33.4	30.9
External conjugate	19.4	20.8	19.7

similar in outline to, that of the woman shown on her left, but they are very different in stature and in their other bodily dimensions. The woman on her right, however, resembles the central figure very closely in practically all her external measurements, but she has a pelvic inlet of a most contrasting type. It is also evident therefore, that women who are much alike in their other bodily dimensions and proportions can have pelvises which are very different from one another.

Throughout this paper we have described the pelvis in terms of the size and shape of the inlet, merely because it is that aspect of the pelvis that is stressed most in the textbook descriptions of the "normal" female pelvis. We do not, however, wish to seem to

11. For mechanical reasons figures 3 and 4 had to be reduced about one fourth from the scale of the others.



minimize the obstetric importance of other dimensions of the birth canal, we are quite aware of the existence of variations in those dimensions among pelvises with the same type of superior strait

#### SUMMARY AND CONCLUSIONS

1 The type of pelvis that is described in textbooks of anatomy and of obstetrics as the "normal" female pelvis was found in only 14.9 per cent of 582 primi-

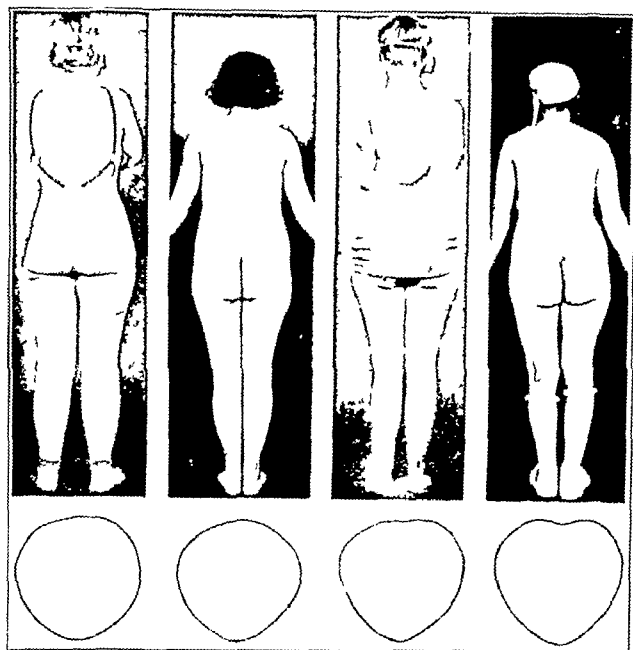


Fig. 9—This illustrates the degree of variability that may be encountered in the shape of the inlet of pelvises which have the same anteroposterior and transverse diameters. The second, third and fourth tracings show progressive flattening of the forepart of the pelvis. In the fourth the sacral promontory projects somewhat into the superior strait. The differences in the dimensions and external configurations of these four women are however much greater than the differences in the shape of their pelvic inlets.

#### PHYSICAL MEASUREMENTS

Conjugate diameter	11.5	11.1	11.5	11.0
Transverse diameter	12.0	12.0	12.0	12.0
Standing height	164.9	154.4	166.5	153.7
Sitting height/standing height	50.5	54.0	53.5	53.6
Cephalic index	78.4	79.1	81.2	81.3
Biacromial	34.5	32.7	37.1	34.2
Bieristal	27.1	28.2	27.8	28.7
Bitrochanteric	32.2	33.1	33.3	32.3
External conjugate	18.5	19.0	20.9	18.0

gravid white women from the obstetric clinic of the New Haven Hospital, 5.7 per cent of 104 student nurses who were of somewhat different racial stock and a much more privileged economic group than the clinic women, and 8.5 per cent of 107 young girls who ranged in age from 5 to 15 years. Only 31.9 per cent of the 686 adults of this series had the type of pelvis which, according to the anthropologic literature, is proper for white women.

2 Among 600 primiparous white women from the same clinic, the percentage of operative intervention required during delivery was lowest among those with long, oval pelvises, somewhat higher among those with round pelvises and highest among those with transversely elongated pelvises—the type usually regarded as normal. The latter was therefore neither the normal—in the sense of being the most frequently occurring type—nor the most adequate type, as gaged by the frequency of operative intervention required during delivery by the women possessing it.

3 A comparison of body build and pelvic type in 132 of the clinic women and the 104 student nurses

disclosed the following relationships: (a) The women with long oval pelvises were predominantly tall, long headed, and broad shouldered, the width of the pelvis between the iliac crests and of their hips between the trochanters were smaller in proportion to the width of their shoulders than in women of the other pelvic types, they had the largest average external conjugate diameter. (b) The women with transversely elongated pelvises were, on the average, the shortest of the series and they had the broadest heads, the narrowest shoulders, the widest pelvises and hips in proportion to the width of their shoulders and the smallest average external conjugate diameter. (c) The women with round pelvises were approximately intermediate between the other two groups in all these dimensions. There was, however, so much variation in these external dimensions between student nurses and clinic women of the same pelvic type that, in our opinion, it would be quite hazardous to attempt to predict pelvic type on the basis of these dimensions in individual cases in a population as heterogeneous as that of this country.

4 The high incidence of long oval and of round pelvises among the largest women of both groups suggests the possibility that nutritive and other factors which make for the attainment of maximum normal growth tend to prevent that degree of anteroposterior flattening of the pelvis which has come to be regarded as characteristically feminine.

5 A comparison of photographs, external measurements and pelvic tracings of 132 clinic women and 104 student nurses showed that some women who resembled one another very closely in size and in general body build had pelvises which were very dissimilar and that, conversely, women in whom the size and shape of the

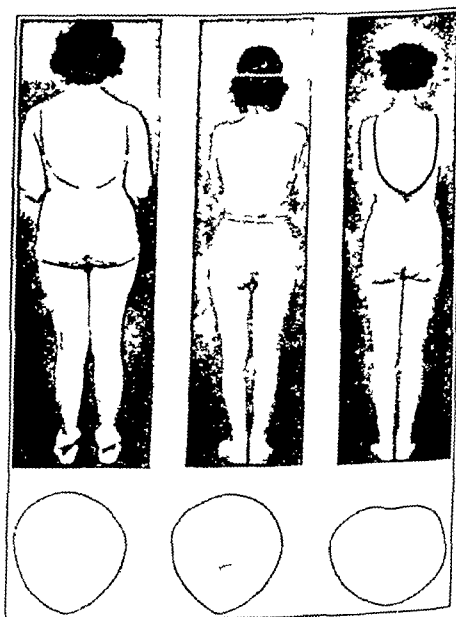


Fig. 10—The size and shape of the pelvic tracings of the first and second women are very much alike though the women themselves are very different in their external dimensions. The second and third women however resemble each other very closely in stature and in other external measurements but they have pelvises of extremely different types.

#### PHYSICAL MEASUREMENTS

Conjugate diameter	12.0	12.0	9.75
Transverse diameter	11.0	11.0	12.5
Standing height	161.8	157.0	151.2
Sitting height/standing height	53.9	50.1	50.3
Cephalic index	70.8	80.5	80.0
Biacromial	36.9	37.4	33.4
Bieristal	27.4	27.0	23.9
Bitrochanteric	32.1	29.3	31.6
External conjugate	20.3	19.1	18.6

pelvic inlet were identical resembled one another rather closely, only slightly or not at all in general appearance and in external bodily dimensions

6 Our observations indicate that the type of pelvic inlet can be determined in the intact living woman only by the use of some dependable method of roentgen pelvimetry. It cannot with certainty be deduced from external measurements, and the ability to infer it from general body build would appear to be one of the more esoteric of anthropologic accomplishments

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## HYPOGLYCEMIA AND CONVULSIVE THERAPY IN SCHIZOPHRENIA

### CLINICAL OBSERVATIONS AND RESULTS

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When Kraepelin sifted out fundamental types of psychoses and classified dementia praecox from a nosologic standpoint into four subtypes with different arial reaction pictures, he undoubtedly did much to clarify psychiatry. When Kretschmer then added various somatic substrates of personality model groups to the psychobiologic conception another advance was made. When Freud's theoretical principles of psychoanalysis and his concepts of the personality unraveled limitless tangles of psychic attitudes or conflicts, he benefited certainly the lot of mankind. Adolf Meyer's researches in psychobiology and psychopathology combined with his didactic attitude toward the inseparable unity of matter and its functions integrated the incongruities of life, and Petersen explained the autonomic dualism of biochemical fluidity with responses in the psychic mentation swings and its disintegrative effect on matter by meteorologic conditions.

This introduction with high points of progress, suggests the tremendous activity in psychiatric workshops and attests the preparedness of psychiatrists as clinicians to investigate the epochal contributions of Sakel and von Meduna. The multitudinous publications on insulin and metrazol shock therapy are the common knowledge today of scientifically minded physicians. Therefore I shall not delve into the historical development,<sup>1</sup> I shall not reiterate the technic or the phasic clinical course of either method, and I shall not waste time with statements as to precautions, complications and termination procedures.

The presented material comprises patients with schizophrenia legally admitted to the two state hospitals of Wisconsin—Mendota State Hospital (Dr M. K. Green), 108 patients, and Winnebago State Hospital (Dr G. E. Seaman), sixty-five patients. These patients after complete clinical and laboratory examinations, received treatment in special wards prepared solely for the administration of shock therapy. They returned to their various residence wards on termination of the therapy. The patients did not have any attention, supervision or occupational recreation differ-

ent from the usual care given as a routine at state hospitals. Such an ordinary hospital regimen was adhered to with the objective of judging the efficacy of the insulin and metrazol treatment per se and avoiding the possible influence of contributory psychic factors on the patients during this special study.

Statistical studies of the literature on insulin with regard to the incidence of remissions of disease of less than one year's duration show variation between 50 and 85 per cent, whereas the optimum number of recoveries in an untreated group is assumed to be 30 per cent. The duration of illness over one and two years reduces the percentage of remissions to 27 and 10 per cent respectively but it must be remembered that spontaneous remission in these groups is less common and occurs only after many months of hospitalization. Malzberg's<sup>2</sup> pooled statistics (New York civil state hospitals) gave for 1,035 untreated patients an incidence of recovery of 22.1 per cent after from one to two years of hospitalization.

Insulin remissions are of good quality. The patients present a higher degree of emotional rapport, a better insight and an unusual stability.

The quantitative and qualitative objective investigation of prolonged insulin recoveries from schizophrenic psychoses must be left to the future. Pooling of data and checking of remissions will permit an analysis by qualified and psychologically skilled psychiatric centers which have at their disposal a specially trained staff.

A number of percentage reports in the literature appear too optimistic, but even they do not as yet justify hypercritical condemnation of Sakel's or von Meduna's treatment. The recorded variations in remissions, improvements and failures may be explained, in my opinion, by the selection of the material, by the deviations from the standard technic and, naturally by the manner of statistical compilation.

The genetic-dynamic conception of schizophrenia as a matter of abnormal genotypic reactions, which by underlying physiochemical and psychobiologic alterations crystallize into strong feelings of inadequacy and dissociated thought complexes, or the psychoanalytic evaluation of twists and incongruities in a personality with a schizoid coloring, permits today classification of types from incipient schizophrenia to full-fledged psychosis. Needless to say, the statistician reporting only on disintegrating reactions in a leptosome, i.e., probable parergastic reactions, will surpass with a miraculous percentage of "cures" the investigator who bases his results on clinical types of schizophrenic reactions, i.e., catatonic, hebephrenic and paranoid subdivisions. My patients presented schizophrenic illness with habit deterioration, affective features, submission reactions and negativism or agitation. They furnished the data for this report.

Statements on the duration of the psychosis are often erroneous, as they depend commonly on lay persons' intelligence and constellation, on the milieu or social status and on the employment or activity. Therefore too rigid lines of duration of illness should not be drawn, they should in no way influence the prognosis for insulin or metrazol therapy.

I have adopted a slightly altered form of Sakel's<sup>3</sup> regimen which seems to shorten the period of pre-

From the Wisconsin Psychiatric Institute, University of Wisconsin. Aid from the Wisconsin Alumni Research Foundation made this study possible.

Read before the Section on Nervous and Mental Diseases at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

1. W. J. Wortis, Joseph Sakel's Hypoglycemic Insulin Treatment of Psychoses: History and Present Status. *J. Nerv. & Ment. Dis.* 55: 581-595 (May) 1937.

2. Malzberg, B. Outcome of Insulin Therapy read before the Quarterly Conference of the New York State Department of Mental Hygiene, March 26, 1938.

3. Sakel, Manfred. Neue Behandlungsmethode der Schizophrenie. Vienna: Verlag Moritz Perles, 1935.

matous treatment. An initial dose of 60 units of insulin is given. The daily increase, from 10 to 30 units is more rapid than that used by most workers and depends on the patient's symptomatic reactions until the shock dose ranging between 70 and 240 units has been determined (ascending phase). From this point on constant variations are necessary to avoid "sensitivity" to insulin. In other words, reductions from the maximum dose (240 units at Mendota and 460 units at Winnebago) to a still effective wet shock producing minimum becomes a necessity (descending phase).

A convulsion is by no means of grave prognostic import in the clinical course of insulin therapy. It must be remembered that even an uncomplicated deep comatose wet shock is always potentially precarious. It should never be allowed to continue for more than from two and one-half to three hours, and the total period of hypoglycemia must not exceed six hours. The patient has to be kept warm, the air passages must be kept open and respiratory disturbances must be combated immediately by frequent postural changes. The

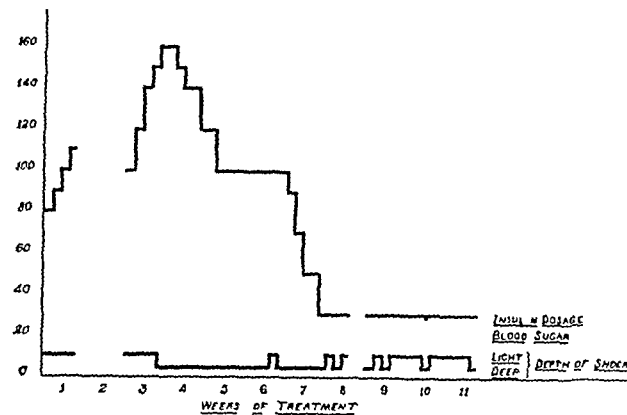
cases are of importance. No convulsive response but an attack like petit mal creates a fear complex with a sensation of impending death. Repeated failure to produce convulsions and amnesia develop reactions which soon result in objective aversion, opposition and refusal to accept this therapy. I do not enforce metrazol medication on agitated and combative persons, because the emotionally induced vascular tension will be dangerously raised in these persons. To avoid the objections and the psychic irritations in metrazol failures, I have adopted the recommendation of Georgi.<sup>5</sup> Insulin in shock-producing amounts is given, and after two hours of hypoglycemia the patient is given a convulsion with metrazol. The convulsive episode is set at the time when the blood sugar level is lowest and the prevalent alkalosis is at its peak. These factors lower the convulsive threshold, and with small amounts of metrazol good convulsions are produced. The convulsions terminate the patient's hypoglycemic state, and he is able to take sugar water. Nevertheless, I control the intake of dextrose in these cases to prevent late after-shock.

A brief statement will suffice to give my idea of the efficacy and of the preference between the two methods, which I have reached from clinical observations and from statistical analyses. In my opinion, all patients with schizophrenic psychoses (reactions) should be submitted to insulin therapy first. During the course one must decide whether interspersing with or a change to metrazol convulsions seems advisable. In stuporous, depressed or catatonic patients a drastic metabolic shake-up with metrazol appears necessary to effect a response more favorable to insulin shock therapy. When one method fails, a trial at least of the other should be made.

A comparison of positive therapeutic results demonstrates a definite advantage of insulin over metrazol in all groups, whereas the failures reveal almost equal percentages. Outstanding was the number of full remissions with insulin of illness of less than one year's duration, with a falling off of the results for disease of over two years' duration. The former group is naturally the one in which after from two and one half to three months, by any method of active therapy, a larger number of remissions would be expected. I am aware that the series is too small and that a division into clinical groups from a deductive therapeutic point of view is impossible. The results might be improved with additional readjustment therapeutics. Our results do not approach the favorable data given in the world literature.

Dussik and Sakel<sup>6</sup> of Austria reported full remission in 70 per cent and spontaneous remission in 88 per cent for disease of less than one-half year's duration. Mueller<sup>7</sup> of Switzerland reported an incidence of 57 per cent for full and spontaneous remissions in disease of less than one year's duration and of 27 per cent in disease of less than two years' duration. Kueppers<sup>8</sup> of Germany reported full remission in 39 per cent and improvement in 40 per cent for disease of less than one year's duration and of 14 and 37 per cent, respectively, for disease of less than two years'.

5 Georgi, F. and Strauss, R. Krampfproblem und Insulintherapie. *Schweiz. Arch. f. Neurol. u. Psychiat.* 39: 55-64, 1937.  
6 Dussik, K. T. and Sakel, Manfred. Ergebnisse und Grenzen der Hypoglykämiebehandlung der Schizophrenie. *Ztschr. f. d. ges. Neurol. u. Psychiat.* 155: 351-416 (May) 1936.  
7 Mueller, M. Die Insulintherapie der Schizophrenie. *Schweiz. Arch. f. Neurol. u. Psychiat.* 39: 9-21, 1937.  
8 Kueppers, E. Die Insulin- und Cardiazolbehandlung der Schizophrenie. *Allg. Ztschr. f. Psychiat.* 107: 76-96, 1938.



Variations in dose of insulin during a typical course of treatment. The dots indicate values for blood sugar at the termination of shock. The doses of insulin are to be read in the left hand column of the figures in units and the values for blood sugar are in the same column in milligrams per hundred cubic centimeters. It is to be noted that in this instance 160 units of insulin was required to produce the first deep shock. Sensitivity to insulin then developed quickly necessitating gradual reduction in the dose to 30 units. With the latter dose the depth of shock was not constant from day to day. It is evident that the extent of depression of the blood sugar is largely independent of the size of the dose of insulin. The gaps in treatment were due to intercurrent illness.

critical physiologic danger zone is reached from one and one-half to two hours after the injection of insulin, i.e., when hypoglycemic irritation phenomena of neurogenic origin develop.

Hydration or dehydration, alkalinization with sodium bicarbonate or acidosis with ammonium chloride, administration of oxygen by nasal catheter during the wet and comatose shock phase and atropine medication for the purpose of blocking the compensatory epinephrine mechanism have not influenced materially clinical symptoms or the phasic course of the insulin-induced hypoglycemia.

Von Meduna's<sup>4</sup> metrazol treatment means artificial inducement of epileptiform convulsions. A clinically sound cardiovascular, pulmonary and bony system is therefore a requisite for this therapy. Speed injections are a necessity—only they will produce major convulsions. In 67 per cent of the cases positive reactions were obtained with a 10 per cent solution of metrazol, 20 per cent metrazol did not increase the incidence of convulsions. The failures in 33 per cent of the

4 von Meduna, Ladislaus. Die Konvulsionstherapie der Schizophrenie. *Carl Marhold* 1936.

duration Malzberg<sup>2</sup> of the New York civil state hospitals reported 129 per cent recovery and much improvement (271 per cent) among 1,039 patients treated with insulin

I consider sixty days the minimum for insulin treatment, with almost ninety days for older disease. Patients with early paranoid and agitated catatonic disease offer a more favorable prognosis with insulin,

TABLE 1—Comparison of Results of Insulin and Metrazol

Number of cases	Insulin		Metrazol		Insulin		Metrazol		Insulin		Metrazol	
	16	10	7	10	24	17	Illness Less Than 1 Year	Illness Less Than 2 Years	Illness More Than 2 Years	17	16	16
Schizophrenic reactions												
Full remission	8*	2	2	1	3	1						
Social remission	2		2		1							
Discharge	10	2	4	1	4	1						
Improvement	1	4		2	6	2						
No improvement	5	4	3	7	14	14						
Hospitalization	6	8	3	9	20	16						

For forty seven insulin patients there were 332 treatment days with an average of 44.8 days of deep wet shock per person. The average duration of insulin therapy was 10.9 weeks.

For thirty seven metrazol patients there were 263 treatment days with an average of 17.6 convulsions per person. The average duration of metrazol therapy was 13.4 weeks.

Summary	Insulin	Metrazol
Full remission	13 (27.7%)	3 (8.1%)
Social remission	5 (10.6%)	1 (2.7%)
Improvement	7 (14.9%)	8 (21.6%)
No improvement	22 (46.8%)	20 (67.6%)

\* Relapse

whereas stuporous catatonic and depressed hebephrenic subjects respond better to metrazol. Advanced paranoid and delusional hebephrenic patients must be treated according to their response.

Since my associates and I have had no fatalities with either treatment in 173 cases in Wisconsin, I shall not enter into a discussion as to which factors may be responsible for the reported neuropathologic alterations. The cumulative effect of unnecessary continuous large doses of insulin or the severity and frequency of metrazol seizures may account for such histopathologic changes.

Clinical experience with insulin and metrazol therapy is far in advance of theory. The similarities between the two types are loss of consciousness, definite vegetative, circulatory and biochemical alterations, tonic-clonic signs with abnormal reflex actions, and recovery from induced drastic autonomic disintegration. Insulin or metrazol as an agent alone certainly does not condition the changes in the mental syndromes. The clinical manifestations caused by the two substances offer important factors in the explanation of the therapeutic mechanism. At present investigation in reference to carbohydrate metabolism and oxidation of the central nervous system are in the foreground.

Intermediary carbohydrate metabolism is still in the midst of elucidation. Any scheme offered at the moment is tentative, not final. The process function is probably similar in many essentials in both muscle and brain, there are also differences, yet the mechanisms are not certain. In cerebral glycolysis the principal substrate is dextrose, in muscle it is glycogen.

Anaerobic and aerobic phases are distinguished. The following sequence is given for muscle (Embsen): In the anaerobic phase, glycogen to hexosephosphate to triosephosphate to phosphoglyceric acid to phosphopyruvic acid to pyruvic acid to lactic acid.

In the aerobic phase, lactic acid forms pyruvic acid, which may be decarboxylated or condensed with oxaloacetic acid to initiate a circular chain of reactions in which oxidative breakdowns occur. Vitamin B<sub>1</sub> is concerned in the disposal of pyruvic acid. Whether methylglyoxal plays a part in normal glycolysis is debated, it is believed to be formed in the retardation of glycolysis by addition of bromacetic acid (Barrenscheen and Beneschorsky).

It is said that insulin blocks glycogen mobilization in the brain, liver and muscles and that toxic hypoglycemia would ensue if the body could not form sugar from fats, lipids and proteins. By medical termination of hypoglycemia at the proper time, toxic reactions can be avoided. This has not been done in most shock experiments, therefore one should not form absolute conclusions from the picture of insulin hypoglycemia in animals and assume similar organic abnormality in human beings.

A split product of sugar metabolism, the triose methylglyoxal,<sup>9</sup> deserves special attention as a possible causative factor in the production of neural and psychic symptoms during hypoglycemic insulin shock therapy. Almost immediately after intravenous injections of

TABLE 2—Variation Schemes of Insulin-Metrazol Therapy

A Combination Therapy		Insulin	then	Metrazol	then	Insulin
O	Hebephrenia	33 doses		14 injections		2 doses
aged 24	for 4 yr	(7 wk )		(7 wk )		(12 wk )
		29 deep wet		11 convulsions		50 deep wet
		shocks social		no improve		shocks
		remission for		ment		improvement
		4 mo				
D	Hebephrenia	88 doses		37 injections		
aged 22	for less than	(18 wk )		(18 wk )		
	1 yr	80 deep wet		20 convulsions		
		shock, slight		social remission		
		improvement				
N	Hebephrenia	42 doses		54 injections		
aged 29	and stupor	(8 wk )		(27 wk )		
	for 3 yr	33 deep wet		44 convulsions		
		shocks no		no improve		
		improvement		ment		
16 patients	Under 1 yr	5	3 full remission	2	no improvement	
	Under 2 yr	2		2	no improvement	
	Over 2 yr	9	3 social remission	6	no improvement	
B Combination Therapy		Metrazol	then	Insulin	then	Metrazol
B	Hebephrenia	30 injections		61 doses		30 injections
aged 29	for 3 yr	(15 wk )		(12 wk )		(11 wk )
		20 convulsions		30 deep wet		50 convulsions
		no improve		shocks no		no improve
		ment		improvement		ment
P	Hebephrenia	17 injections		32 doses		10 injections
aged 30	for less than	(8 wk )		(6 wk )		(5 wk )
	2 yr	13 convulsions		29 deep wet		8 convulsions
		no improve		shocks no		no improve
		ment		improvement		ment
S	Hebephrenia	26 injections		70 doses		3 injections
aged 28	for less than	(13 wk )		(14 wk )		(1½ wk )
	1 yr	18 convulsions		60 deep wet		no convul
		no improve		shocks no		sions no
		ment		improvement		improvement
19 patients	Under 1 yr	3		3	no improvement	
	Under 2 yr	3	1 improvement	2	no improvement	
	Over 2 yr	6	1 social remission	3	no improvement	
C Summation Therapy		Insulin shock of 1½ to 2 hr then metrazol convulsion				
8 patients		Results difficult to evaluate				

small amounts of methylglyoxal the animals present severe and bizarre psychomotor excitability, with tonic distortions, grimacing, noisy respiratory and masticatory phenomena, salivation and incontinence. If the blood sugar content of animals had been depleted, this symptom complex would progress to a convulsive status with

9 Fischler F and Hirsch O. Wirkung einiger Abbauprodukte des Traubenzuckers bei Störungen des Kohlenhydratstoffwechsels. Ztschr f physiol Chem 165: 287-307 1927. Fischler F and Lindner A. Weiteres über Zuckersplattung unter der Wirkung stark verdünnten Alkali. ibid 175: 237-247 1928.

death It is possible that in insulin therapy at the low point of hypoglycemia and the high peak of alkalosis, methylglyoxal exerts a toxic effect on the autoregulation of metabolic centers For a certain time, at least these dysfunctions can be tolerated or become adjusted by a compensatory endocrine sequence mechanism

The function of insulin is only beginning to be clarified Its action in decreasing the blood sugar content has been explained by an increase in the rate of tissue oxidation and inhibition of glycogenolysis (or increase in glycogenesis), a decrease in liver glycogen being considered secondary to the hypoglycemia Vendeg asserted that the factors mentioned are insufficient to account for all the sugar which disappears during insulin therapy and offered evidence that there may be a considerable transformation in the liver of glycogen to fat An *in vitro* effect of insulin has recently been demonstrated for the first time (Krebs) The preparation has been shown to have a catalytic action on the oxidative breakdown chain referred to previously (pyruvic, oxaloacetic, citric, ketoglutaric, succinic, fumaric, malic, oxaloacetic)

The amount of glycogen in the brain is small and relatively constant, decreasing only with large overdoses of insulin (Kerr<sup>10</sup>) The free sugar content of the brain is also small, but labile The brain is believed to depend for its carbohydrate on a constant supply from the blood stream Its sugar content is constantly less than that of the blood except in extreme insulin hypoglycemia, when the true blood sugar content may fall to zero Decreased oxygen uptake by the brain during insulin therapy has been reported from analyses of blood (Dameshek, Myerson, Stephenson, Himwich, Bowman, Fazekas, Wortis) and from *in vitro* studies (Holmes<sup>11</sup>) This decrease in utilization of oxygen with hyperinsulinization is probably secondary to lack of carbohydrate due to hypoglycemia

Gerard<sup>12</sup> reported from a study of brain potentials that brain cells deprived of carbohydrate are abnormal and discharge excessively Derangement of intracellular carbohydrate metabolism with accumulation of normal or formation of abnormal intermediaries (pyruvic acid, methylglyoxal<sup>7</sup>) has been suggested as a possible cause of the observed and striking cerebral disturbances of insulin shock In conjunction with this question, Demole<sup>13</sup> noted a decreased incidence of convulsive phenomena during insulin therapy in rats treated with vitamin B<sub>1</sub> and cited Freudenberg's work

Available laboratory tests which objectively support the degree or profundity of the insulin and metrazol remissions are (1) comparative studies of wave rhythms in electro-encephalic graphs<sup>14</sup> and (2) determination of the oxygen concentration ratios in arterial and venous blood

In conclusion, I wish to state that the results of the two forms of treatment of schizophrenia are encouraging and that either therapy should be started early and be extended over a sufficiently long period A definite opinion as to duration of the remissions cannot be given

at present The two methods have furnished abundant clinical and laboratory research problems, they have greatly stimulated the interest in psychiatric clinics and they have altered by refreshing, stimulating activity the fatalistic attitude toward mental diseases of the medical and nursing staff in state institutions

## TREATMENT OF THE PSYCHOSES WITH INDUCED HYPOGLYCEMIA AND CONVULSIONS

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AND

G. ALEXANDER YOUNG, M.D.

O'LAHA

In this paper we present our results with the hypoglycemic treatment of seventy patients with schizophrenic reactions We have selected this group because it constitutes our first year's experience (October 1936 to October 1937) and because it offers an opportunity for consideration of the late as well as the immediate results of treatment In addition, we report our experience with the use of metrazol for twenty-one patients with depressive psychoses We have used metrazol for schizophrenic patients in a variety of combinations with insulin which we shall describe, however, in this paper we are placing chief emphasis on the employment of metrazol as a pharmacologic adjunct in the depressions

### HYPOGLYCEMIC METHOD

During the first year in which we utilized the hypoglycemic method seventy patients satisfactorily completed an adequate period of treatment As we reported last year,<sup>1</sup> there were two deaths in the course of treatment, but there have been none since in a larger series, 135 cases We have classified the immediate results in four groups (1) remission, (2) incomplete remission, (3) improvement, and (4) no improvement Under remission we classified those cases in which schizophrenic symptoms disappeared and adequate emotional response insight and capacity to return to former work were recovered We classed the remission as incomplete when one of these requirements was missing

We present the results in table 1 In over half the cases (forty-three) the psychotic symptoms were of less than one year's duration, and in this group results of treatment were significant The lack of remission of disease of over a year's duration was striking There was only one remission in such a case, while the remission rate when the disease had lasted under one year was 56 per cent Although the total number of cases was not large, it is of interest that our immediate results compared closely with those in the larger series, 495 cases, reported by Muller<sup>2</sup> at the Swiss Psychiatric Congress in May 1937

While there is time for no more than a superficial accounting of our work, a review of the cases in which remission was attained suggests that the best responses were in those of short duration and sudden onset, with a history of remission from a prior psychotic episode in those of vivid delusional content, with features of

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Read before the Section on Nervous and Mental Diseases at the Eighty Ninth Annual Session of the American Medical Association San Francisco, June 15 1938

1. Young G. A. Young R. H. and Roucek L. *Am J Psychiat* 94 159 (July) 1937

2. Muller M. Schweiz Arch f Neurol u Psychiat (Erganzh) 39 9 1937

excitement, and in those of disorganization of personality, which might be in part attributed to a strong affective force other than depression. It is our impression, however, that the hypoglycemic method does not affect any specific type of psychobiologic functioning.

One of the important questions that remains to be answered concerning the hypoglycemic treatment relates to the permanence of the remission. An inquiry into our group reveals that of the thirty-two patients who achieved either complete or incomplete remission eleven have shown some transient or more permanent return of psychotic symptoms. At the present time but three of the eleven patients are in psychiatric hospitals, and one committed suicide by drowning a year after discharge from the hospital.

A review of these cases fails to bring out any common factors that predispose the patient to relapse. Our statistics would indicate that the less complete the remission, the greater the tendency toward reappearance of psychotic features. This tendency toward relapse would seem to indicate that the change in personality functioning produced by the hypoglycemic method fails to offer any special outlook for the future. It is impossible to disregard the psychopathologic basis of schizophrenia and the important facts of the patient's life, the past and present situations.

USE OF METRAZOL IN SCHIZOPHRENIA

The literature that has reviewed the use of the hypoglycemic and the convulsive therapy has dealt largely with one method to the exclusion of the other. The statistical results of the two methods compare closely. Little literature has dealt with the use of insulin and metrazol in combination. It has been our belief that both drugs are efficacious, and our more recent interest has been directed toward developing plans of treatment that would utilize a combination of the two.

We have used metrazol in eighty cases to produce convulsions, with no serious complications. In the schizophrenic group we have used insulin in conjunction with the metrazol, and we have combined the two drugs in different ways to develop five different plans for treatment. We feel that the different groups of cases are too small to invite statistical comparison, so we shall merely describe our plans of treatment.

In the first group were patients who, after approximately three weeks on insulin, failed to show progress and were then given a series of metrazol convulsions. We make this change when a long period of private psychiatric care is impossible for financial reasons, because it has been our experience that the majority of patients who do well with the hypoglycemic method show some improvement in the first three weeks of treatment. It is also our belief that in some cases such a period of treatment with the hypoglycemic method is of particular benefit. This may be illustrated by the case of a 19 year old girl in whom a schizophrenic reaction with both hebephrenic and stuporous features developed. During phase 1 of the insulin treatment mild coryza developed, and we produced two convulsions with metrazol as a substitute for the hypoglycemic method. Neither at this time nor subsequently with the insulin-produced coma did she show any change in behavior. However, after a series of fourteen comas in which she showed increasing insulin sensitivity we gave metrazol again. She demonstrated a profound change in behavior after the

first convulsion, and a remission promptly occurred. To patients who fail to respond after the change to metrazol we give alternate weekly courses of insulin and metrazol, as in the "block" method described by von Braunmuhl.<sup>3</sup>

We gave a second group of schizophrenic patients metrazol after their failure to attain coma on a dose of 200 units of insulin or over. We used metrazol in such cases as a less dangerous medicament.

To a third group of patients we have given small doses of insulin in addition to the metrazol. We have added insulin to the treatment of these patients because in our early experience of giving metrazol alone we found that some who showed no progress made prompt improvement when we added the insulin.

In the fourth group are included patients to whom, during the usual course of insulin therapy, we gave metrazol twice a week, approximately one and a half hours after a shock dose of insulin. By this method we largely alleviated the fear of the metrazol treatment, a comparison of these patients at a later date with those who have shown fear will allow some evaluation of the role that is played by this affective force.

TABLE 1—Results in Seventy Cases of Schizophrenia Treated with Insulin Between Oct 1 1936 and Oct 1, 1937

Duration of Symptoms	Number of Cases	Remission		Incomplete Remission		Improvement		No Improvement	
		No	%	No	%	No	%	No	%
Under 1 year	43	24	55.8	4	9.3	5	11.8	10	23.1
From 1 to 2 years	12	1	8.0	2	17.0	6	50.0	3	25.0
Over 2 years	15	0	0	1	6.0	4	27.0	10	67.0
Total	70	25	35.7	7	10.0	15	21.4	23	32.9
Follow up in cases of remission								Remission	Incomplete Remission
Total								25	7
Symptoms of relapse								8	3
Hospitalized at present								2	1
Suicide								1	

In the last group are patients to whom we gave metrazol after they failed to improve on a full course of insulin. This additional attempt with the pharmacologic method has seemed justified by the results obtained. Of a group of eight such patients one obtained remission, a second incomplete remission, four had some improvement, three of them only temporarily, and two showed no response.

USE OF METRAZOL IN DEPRESSIVE PSYCHOSES

While the therapeutic use of convulsions induced by metrazol has been to date largely confined to the schizophrenic group, there is no reason to believe that its efficacy should be restricted to any special type of personality dysfunction. We have observed a patient, cachectic because of hypernephroma with metastasis to the brain, who after a week of delirium had a series of convulsions. On recovering from the post-convulsive stupor he was for several days oriented, no longer fearful and, strangely enough, partially relieved of pain temporarily.

Last summer, after using metrazol in cases of schizophrenic reactions, we tried the convulsive therapy for affective psychoses. The first patient with depression for whom we used this type of therapy was a 44 year old woman who had an agitated depression of two years' standing. This patient had been hospital-

3 von Braunmuhl A. Die Insulinschockbehandlung der Schizophrenie. Berlin: Julius Springer, 1938.



ized after a suicidal attempt and, in spite of eight weeks' treatment with usual methods, was well ruttid in her depressive reaction, with harping hypochondriacal beliefs and fixed ideas of the hopelessness of her situation. We gave her metrazol, she had six convulsions and left the hospital well, after a period of treatment of eighteen days. Because of this fortunate result and subsequent favorable responses, we gave metrazol in selected cases of depression, twenty-one in all. In this series we noted an improvement in all but one case, that of a man of 54, in a second depression of two years' duration, who showed marked psychomotor retardation and loss of interest but relatively little display of depressive affect. However, a patient with a somewhat similar depressive reaction (case 11, table 2) showed a good result from metrazol after a five week period of hospitalization with no improvement resulting from the usual methods of treatment.

described by Muncie,<sup>4</sup> seemed to improve rapidly. The presence of schizophrenic features or catathymic material also seemed to affect the response unfavorably. This method will not merit a universal application and will be open to criticism as too aggressive and dangerous for the treatment of conditions that are for the most part benign and offer a favorable prognosis with more orthodox plans of therapy. In spite of our favorable results, we feel that metrazol should be used in the depressions as an adjunct, and that the necessary psychotherapeutic attention should be given the personal-emotional and situational factors after the pharmacologic phase has been terminated. However, one of our difficulties has been to interest the patient after recovery (due to metrazol treatment) in psychodynamic features to be considered if recurrence is to be avoided. As with schizophrenic patients who show remission with metrazol, patients with depression who recover have mostly a rather superficial, objective type

TABLE 2—Treatment of Depressive Psychoses with Convulsions Induced by Metrazol

	Name	Age	Sex	Diagnosis	Duration of Illness	No of Convulsions	Dosage Cc	Period of Treatment Days	Results
1	A H	60	♂	Recurrent depression	6 wks	5	5-7	13	Recovery
2	W F	21	♂	Depression following a mild elation	4 mos	6	5-8	14	Recovery
3	A J	54	♂	Depression	5 mos	7	6-10	20	Marked improvement
4	L H	27	♀	Depression	4 mos	7	5-10	20	Recovery
5	M A	40	♀	Depression	3 mos	7	3-6	14	Recovery
6	I L	54	♀	Depression	1 mo	6	4-7	14	Recovery
7	I F	30	♀	Depression with anxiety	2 1/4 mos	9	4-7	26	Marked improvement
8	L M	40	♀	Depression	5 mos	1	5	1	Recovery
9	R L	23	♂	Depression with schizophrenic features	4 mos	4	5	9	Marked improvement
10	R M	53	♂	Recurrent depression	5 mos	3	0-8	12	Recovery
11	C L	36	♀	Depression with retardation	6 mos	4	6	14	Recovery
12	N T	26	♀	Depression with anxiety	8 mos	8	0-8	21	Improvement
13	E Se	37	♀	Depression with schizophrenic features	6 mos	8	5-10	30	Recovery
14	E Sw	52	♀	Depression with obsessive features	9 mos	16	3-8	40	Recovery
15	A P	50	♀	Recurrent depression	2 yrs	14	5-10	36	Marked improvement
16	A S	44	♀	Agitated depression	2 yrs	6	5-7	18	Recovery
17	E G	41	♀	Agitated depression	1 1/2 yrs	7	5-6	10	Recovery
18	C W	49	♀	Depression with schizophrenic features	2 yrs	7	0-8	30	Marked improvement
19	F H	54	♀	Depression with marked slowing	2 yrs	8	4-9	21	No improvement
20	G C	35	♀	Depression	14 mos	11	5-10	40	Improvement
21	P G	40	♂	Depression	16 mos	5	0-7	21	Marked improvement
Average number of convulsions				7	Recovery	12	Improvement	9	
Average days of treatment				21.6	Marked improvement	6	No improvement	1	

The results, as shown in table 2, were complete restoration of a normal feeling of well being, a disappearance of all psychotic symptoms and recovery of ability to reassume past activities in twelve cases. Six patients were markedly improved by the treatment. Two were improved and gradually recovered subsequently. To date only one patient has relapsed. The duration of the psychosis affects the prognosis, but not as markedly as in the schizophrenic group.

Perusal of table 2 reveals that the number of convulsions given was less than usually given in cases of schizophrenia, and it has been our experience that improvement is usually noted after the first or second convulsion. The average number of convulsions produced was seven. The economic aspect of this method of treatment should be stressed. The period of hospitalization has been greatly reduced, the average period of treatment in the twenty-one cases was 21.6 days.

The cases of depression in which metrazol was given were not particularly selected and represent a variety of reactions. The age range was from 21 to 60, with about equal distribution between the third, fourth and fifth decade of life. Our experience suggests that the more marked the affective features, the better the response to treatment. The presence of anxiety in the depressive setting seemed to affect the response to metrazol adversely, although tension depressions, as

of insight. With a return of well being they focus their attention on reconstructive plans which will allow the best possible adjustment in future life situations.

COMMENT

In commenting on this report of clinical results, we feel that a statistical evaluation of the pharmacologic methods is difficult. Problems arise because of the

TABLE 3—Results in Twenty-One Cases of Depressive Psychoses Treated with Metrazol

Duration of Symptoms	Number of Cases	Recovery	Marked Improvement	Improvement	No Improvement
Under 6 mos	10	7	3	0	0
From 6 to 12 mos	4	3	0	1	0
Over 1 year	7	2	3	1	1
Total	21	12	6	2	1
Age range	21 to 60				
Number of convulsions	1 to 16				
Average number of convulsions	7				
Period of treatment	From 1 to 40 days				
Average period of treatment	21.6 days				

variety of case material, the judgment of the examiner, the possibility of dissimulation on the part of the patient, the variance in the degree of insight and the task

4 Muncie, Wendell. Depressions with Tension. Their Relation to General Problem of Tension. Arch Neurol & Psychiat 32: 328 (Aug) 1934.

involved in a quantitative consideration of the amount of return of emotional response

The use of these methods carries the danger of arousing special interests along associated biochemical, physiologic, psychologic and neuro-anatomic lines. While such studies are necessary and informative, one should attempt to understand the changes of functioning of a part in terms of the integrative relationship of all the parts. There is also the danger of disregarding former disciplines and replacing them with a set of facts based on new methods of treatment. We feel that, no matter how striking the results of any special method, treatment of psychiatric disorders must continue along broad lines which focus the interest of the physician on the patient as a psychobiologic unit with complex sets of integration, functioning in a variety of life situations, past, present and future.

### ABSTRACT OF DISCUSSION

ON PAPERS OF DR REESE AND DRS RICHARD H AND  
G ALEXANDER YOUNG

DR A A LOW, Chicago. It is gratifying to witness the sound conservatism of the authors, especially in view of the exaggerated claims still made by some European workers with regard to rate of remission. The experiences of the Youngs with the metrazol treatment of depressive psychoses coincide fairly well with the results obtained at the Psychiatric Institute of the University of Illinois. Aside from persons with depression we have treated a number of manic patients and six patients suffering from psychoneuroses sufficiently severe to warrant commitment. The results were generally satisfactory. Our report was given in the April 1938 issue of the *Archives of Neurology and Psychiatry*. Dr Reese emphasized the lack of theoretical knowledge concerning the newer treatments. However that our practical knowledge is also insufficient is evidenced by the general lack of agreement on such important issues as the number of times hypoglycemia should be induced, the optimal length of coma, the advisability of combining metrazol with insulin and, last but not least, the method of estimating the rate of remission. At the Psychiatric Institute we had an interesting experience with regard to spontaneous remissions. To avoid selection we gave treatment to every admitted patient who did not suffer from an organic syndrome. In addition, to weed out candidates for speedy, spontaneous remission we insisted on a four week waiting period prior to treatment. Of 108 patients scheduled for treatment twelve experienced remission during this waiting period. Had they been treated our rate of recovery would have been padded by more than 10 per cent. To obtain reliable information on the effectiveness and durability of post-therapeutic remissions we induced our patients to form an organization with an abominably long name, Association of Former Patients of the Psychiatric Institute of the University of Illinois. The association, founded in 1937 is growing and has for its main purpose the elimination of the stigma attached to mental disease. The members plan an employment agency and have already secured the support of local business leaders. The first issue of a bimonthly bulletin is ready for print. Its name 'Lost and Found' was suggested by a patient. Its columns will be devoted to a fight against the stigma and will contain contributions from both patients and physicians. The patients' contributions to the forthcoming first issue are conspicuous for moderation in tone and significance of statement. The association meets twice a month at the hospital in the presence of the staff and owing to these biweekly conferences, we claim to have as reliable information as possible concerning the quality of the remissions.

DR TITUS H HARRIS, Galveston, Texas. Insulin therapy has been in use at the Galveston State Psychopathic Hospital since March 1 1936 and metrazol therapy since July 15 1937. The results in 106 cases of schizophrenia treated with insulin compare favorably with those reported elsewhere. Among thirty one cases of illness lasting six months or less there

were seventeen, or 54.83 per cent, good remissions—remissions and incomplete remissions combined—and, during a follow-up period of from three to eighteen months, thirteen, or 44.83 per cent, were still good. In only two cases of remission classified as complete did relapse occur. Follow-up studies also showed that relapses were more frequent among patients showing less complete remissions. My associates and I have used the various combinations of insulin and metrazol described here, with the exception of the combination-summation method, and have obtained beneficial results in many instances. We have also given metrazol during the course of insulin treatment, giving the shock dose of insulin immediately after the seizure in cases in which a good coma was not produced with a high dose or in which no further improvement was shown with insulin alone. I wish to emphasize the statement of the Youngs that patients who fail to have comas on doses of 200 units or over of insulin should be given metrazol instead, because it is less dangerous. Our studies of metrazol show that six patients were improved who had not been benefited previously with insulin. Of thirty-eight schizophrenic patients treated with metrazol, sixteen were benefited and twenty-two not benefited. The results show that of seven cases of recent disease treated with metrazol good remissions occurred in three and improvement in two. In one case the improvement continued and is now classified as a social remission. This gives a good remission in four, or 57 per cent (cases of recent involvement), which compares favorably with the results with insulin. It shows further that chances for a favorable outcome decrease markedly after eighteen months. Our experience with other reaction types has been limited, but thus far work along these lines has proved encouraging. I agree with the Youngs that while metrazol may bring about recovery in these cases it should be used only as an adjunct and that psychotherapy is still necessary.

DR A C BENNETT, Omaha. I wish to report my experience with metrazol, similar to that of the Youngs, in twenty-one cases of pure affective disorders of the depressive type. My patients were somewhat older. There were twenty-one with depressive psychosis whose ages ranged from 29 to 68. The majority of them were in midlife or the presenile period—eight were past 55. The psychoses were classified as of manic-depressive, reactive and involutional type. The duration averaged eight months for the manic-depressive, six months for the reactive and twelve and one-half months for the involutional type. The average doses of metrazol were 6 or 7 cc and the average number of convulsions produced was five. The days under shock treatment were fifteen, twenty and nineteen. All twenty-one patients showed improvement within two weeks after convulsive shock treatment began. One relapsed to a manic state. Dr W D Wright of Omaha made electrocardiograms for eighteen of these patients. Seventeen showed no clinical evidence of heart disease. One had rheumatic heart disease with mitral stenosis but no history of congestive failure. Five had suggestive but not conclusive evidence of disease of the coronary artery. In none of these cases was the original pattern changed by shock therapy, and the ages varied from 29 to 68, seven being past 55. Repeated electrocardiograms following treatment demonstrated abnormality in only one case. This study suggests that in this older age group the treatment may be given with safety.

DR EMERICK GRIFFIN, Greenwich, Conn. The basis of application of the metrazol convulsive procedure with the manic-depressive psychoses after its use in schizophrenia may not be construed as wholly empirical. Workers have recorded a statistical antagonism between the affective groups and the convulsive state similar to the theory propounded by von Meduna for schizophrenic illnesses. Many schizophrenic patients during these chemotherapeutic routines undergo definite affective reaction patterns in the form of agitation, hypomania, anxiety and the like before ultimate remission of the original schizophrenia. Finally, in many instances schizophrenia starts with a clearcut affective picture or is made up of many manic-depressive components throughout its course. The foregoing would tend to imply vaguely that there might be a common psychopathologic basis for these disorders, with

the affective reaction standing out as the more benign stage and the entire disease picture dependent on the psychologic and physiologic constitution of the individual patient. Even though these statements might impress one as syllogistic, there are no other definitely known facts on which to base the successes with the metrazol convulsive therapy other than a statistically prominent antagonism between certain functional psychoses and the convulsive state. Whereas the actions of metrazol and of insulin are known, it is not known why they produce ameliorative phenomena in the psychoses, chiefly because the actual psychosomatic interrelated factors of these psychoses are relatively little known. Concurrent with this last thought, it is advisable to note that the various so called combinations of metrazol and insulin are as yet unjustified statistically or theoretically. Scientifically, this combining of the use of two drugs whose individual pharmacology when applied to the psychoses is still nebulous provides a definite hindrance to the ultimate objectives which these drugs do to the psychoses and what is the cause of the psychoses in psychosomatic terms is derived from the use of these drugs. In broader terms, the goal should be to determine what component of these chemotherapeutic maneuvers is responsible for the amelioration of what phase of the psychosis. This cannot be achieved with agglomerated pharmaceutical shock procedures. It is believed more scientific and somewhat less hazardous to consider that these are two separate procedures: if one fails after suitable trial, the other may be employed. Logically, however, it is assumed that the metrazol procedure would be employed first, because of its simplicity and for general economic reasons.

DR G. W. HALL, Chicago. I think the possibility of mistaken diagnosis must be considered in some cases of schizophrenia. The word 'recovery' is used too freely at present because this method of treatment has not been used long enough to justify it. I am in favor of this treatment when no outlook remains except the possibility of the patient's going into a hospital permanently. Another point to be considered is the treatment after the patient has left the hospital and has had the final treatment, as far as the injections are concerned. A great deal of attention should be paid to the environment the patient is put in after treatment has been given rather than sending him back to his environment before the treatment was begun.

DR EUGENE ZISKIND, Los Angeles. Insulin therapy is bound up with the effects of hypoglycemia. On the other hand one of the primary functions of insulin is its effect in increasing the oxidation of carbohydrates in the tissues. I saw a patient last December whom I had first seen in 1930 when she had early manifestations of organic deterioration. She was then 53. During the past seven years she had undergone profound deterioration. It was impossible to keep clothing on her. She paced back and forth in her room, she soiled herself. Her conversation was limited to 'Where is pr?' and 'Where is Joe?' and she made these statements when she held these particular members of her family by the hand. She had a bedsores and a pellagrous lesion on her extremities and was profoundly emaciated. I thought her span of life under these conditions would be about two weeks. I suggested, since the outlook was so hopeless, that the patient receive insulin in large doses according to the technique of Sakel though with frequent feedings. To my surprise she gained in the first twenty-one days a pound a day, and she lost her restlessness. It was then possible to clothe her. She regained her previous habits as to toilet and she has got to the point at which she goes to the table and eats, although at times she has to be fed. About a fourth of her statements at this time are coherent and relevant, although she is still far from being well. This experience struck me as evidence that in a condition of cerebral malnutrition, insulin buffered and aided in the restoration of some of the lost function. It may have some bearing on the mechanism with which insulin acts exclusive of the 'shock'.

DR H. F. HINWICH, Albany, N. Y. Three points may be made concerning the mechanisms of insulin and metrazol treatment. A similarity of the two forms of treatment lies

in the fact that both depress the metabolism of the brain. The brain is different from other organs, using only carbohydrates to furnish the energy required. When hypoglycemia supervenes the brain is therefore deprived of its only source of energy. Cerebral metabolism is therefore depressed, and under these conditions first excitement and then coma supervene. Metrazol convulsions are also characterized by depression of the metabolism of the brain. This is not caused by a diminished dextrose uptake but by decrease in the oxygen supply. During the convulsion there is a cessation of respiratory movements, so that the arterial blood becomes venous and the brain is deprived of oxygen. Thus, the two treatments have in common a depression of cerebral metabolism. The second point concerns quantitative differences between the two mechanisms. Hypoglycemia produces a slow, gradual and prolonged depression. Metrazol convulsions on the other hand, cause a severe deprivation of oxygen and therefore necessarily must be briefer. Today we have heard that the treatments may be combined. Then the actions are synergistic. To the slow gradual hypoglycemic effect is added the brief acute deprivation of oxygen. Finally the intermediate links in the chain of events which starts with the original deprivation of cerebral energy and leads to the final amelioration in a certain number of cases are not known. However, it may be concluded that the deprivation of cerebral energy is associated with the initiation of the changes which cause the amelioration.

DR HANS H. F. REESF, Madison, Wis. Dr. Low is correct in stating that the after-care of the discharged patient is of the utmost importance and necessitates the physician's cooperation. I do not use the term 'recovery' but call restoration to mental health 'clinical remission'. Full clinical remission or social remission is preferable and the word 'recovery' should be avoided. I do not believe that the dangers of insulin are greater than those of metrazol therapy. There are better weapons for combating reactions to insulin than to metrazol, which once shot into the vein, is beyond control. I am often disturbed by the severity of metrazol convulsions. Prolonged and severe cerebral vascular constrictions may produce ischemic necrosis. It is not known as yet whether such possible necrotic infarctions are altering the metabolic anatomic schizophrenic syndrome in the brain. Petit mal reactions after injections of metrazol are said to be better than true convulsions in certain instances, especially of the incipient stages of the illness. I wonder whether the unpleasant sensations from metrazol therapy are not creating, after a certain readjustment at least, falsifications and unreliable statements as to the patient's mental health because of his aversion, apprehension and fear of the effect of metrazol. With regard to Dr. Friedman's remarks, the question of expense is no argument in any scientific evaluation of new therapeutic procedures. I am treating disorders as a physician, and the question before me is which therapy brings the best results. Therefore, metrazol should not be favored because it is less expensive. I agree that it is easier and simpler to give an injection. It requires much less clinical judgment and alertness to supervise metrazol treatment. Dr. Hinwisch remarked about the changes in the metabolism and chemistry of the brain. I am well acquainted with his excellent investigations. The deficiency and recovery phases of the chemistry of the brain are not known as yet for schizophrenia. It is not known even whether the disease is one of oxygen hunger or of overstimulation by carbon dioxide or whether the cerebral carbohydrate metabolism is affected. The question of cerebral metabolism is still in a state of flux, and it cannot be stated accurately today whether the needs for minerals, oxygen, pigments, enzymes, coenzymes and vitamins are adequate in the presence of schizophrenia. It is necessary more or less to speculate as to what may be and what may not be the factors of the energy restoring mechanism in the remittent schizophrenic psychoses. Neurologists and psychiatrists have opened with insulin and metrazol therapy a field of research which has brought the specialties into the closest cooperation with those of the biochemist, the physiologist and the internist. Only group investigations will benefit humanity in the future.

# THE CONVULSIVE-IRRITATIVE THERAPY OF THE PSYCHOSES

A SURVEY OF MORE THAN THREE THOUSAND CASES

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Our purpose in this paper is primarily to present in tabular form statistics on the metrazol and camphor-metrazol irritative therapies obtained through the cooperation of seventy-five clinics. It is our further purpose to bring to the attention of the various workers in the more or less recently developed chemotherapeutic procedures certain important points regarding indications, contraindications, complications and technique and finally, certain theoretical considerations of the *modus operandi* of convulsive-irritative therapy.

## STATISTICAL SECTION

The case material shown in the tables was derived from direct correspondence with the hospitals and workers respectively listed.

For the most part these tables are self explanatory. Because of the great variability in the statistical classification of the duration of illness by the various European workers, this feature was given in terms of less or more than one and one-half years. It was rather unfortunate in a sense that a more detailed analysis of the types of illness was not available, because in view of the well known heterogeneity of schizophrenic disorders such data would have been valuable in estimating the type of disorder that seemed to respond best to convulsive therapy. On the other hand diversity of diagnostic classification in different countries and the absence of international criteria for purposes of standardization made the listing of schizophrenic subtypes difficult. For the present we must content ourselves with a study of therapeutic efficacy of the convulsive-irritative therapy in this heterogeneous schizophrenic group and the energetic proposal of international diagnostic standards. This topic will be taken up in the section on indications.

From these totals we may tersely set forth the results. Practically every existent anthropologic group with the exception of the oriental is represented in these cases. From the criteria proposed in most of the European centers at the present time the schizophrenic disorders are divided into "acute" (duration less than one-half year), "subacute" (duration from one-half to one or one and one-half years) and "chronic" (duration longer than one or one and one-half years) types. With the terms "remission" and "improvement" we refer to complete remission and great or much improvement commonly employed in most mental hospitals. Under the latter term are included the so-called partial and social remissions (table 4).

The universally better results in cases of earlier involvement are at once evident. However there are significant results in cases of chronic illness even if in these not such a bright therapeutic outlook can be

demonstrated. Persons who have undergone remissions have remained well for a period ranging from several weeks to almost four years.

On closer analysis of the fatalities, which were of minor significance, the following necropsy reports were noted:

One case of aortic insufficiency with chronic myocardial changes.

One case of bilateral hypernephroma and a compressing thyroid adenoma.

One case of pulmonary embolism from clinically unrecognized pelvic thrombosis.

One case of unknown causes.

One case of cerebral thrombosis.

One case of acute pulmonary tuberculosis (after latency).

One case of suicide.

Two cases of acute camphor poisoning.

It is to be concluded from these figures that in at least three cases the therapy could not be held directly accountable. Yet inclusive of these three the mortality stands at 0.29 per cent.

The incidence of complications was 2.2 per cent. The most frequent complication, but one which could not be numerically estimated or included, was that of temporomandibular subluxation. This occurred "very frequently" with some workers, with others very infrequently. The most important numerically designated complications were of the "mechanical" type—dislocations and fractures with or without dislocations of the extremities. The upper and lower extremities were alike involved. Next in order were the so-called inflammatory complications—the "production of, or exacerbation of, an inflammatory process." In this category were included local abscesses due to injections of camphor, "lighting up" of latent tuberculosis, pulmonary abscesses and acute (myocardial?) collapses. All of these complications will be discussed in a later section.

Concerning convulsive therapy of persons with affective psychotic reaction types, including involuntional melancholia, brief attention may be given to preliminary theoretical considerations. In a study dealing with the concurrence of epileptic convulsions in certain psychoses, Notkin<sup>1</sup> commented on the relative absence of convulsive episodes in manic-depressive psychosis, as well as in schizophrenia. The same thesis was pointed out editorially by Paskind<sup>2</sup>. Obviously, it was not unexpected that a therapy that seemed likely in one psychosis would also be employed probationally in other psychoses, e. g., fever therapy in other mental conditions besides dementia paralytica. But the aforementioned authors tend to make one consider convulsive therapy in the affective psychoses in a manner similar to that followed by von Meduna in schizophrenia viz., on the basis of the theoretical antagonism between the disease and epilepsy.

In table 3 are given the results of convulsive therapy in affective psychoses, including involuntional melancholia. The features given are self explanatory. The amount of therapy ranged between four and fifteen reactions of grand mal in all the cases.

Besides the figures in table 3 more informal reports communicated to us indicated that the results of the convulsive therapy in the affective psychoses were

<sup>1</sup> Part of this work was done in the Buffalo City Hospital and at Stony Lodge.

<sup>2</sup> Read at the annual meeting of the Southern Psychiatric Association, Atlanta, Ga., Oct. 11, 1938.

From the Angyalfold Royal Hungarian Institute for Nervous and Mental Diseases and the Metropolitan State Hospital.

1. Notkin, J. Epileptic Manifestations in the Group of Schizophrenic and Manic Depressive Psychoses. *J. Nerv. & Ment. Dis.* 69:494-521 (May) 1929.

2. Paskind, H. A. Editorial Insert in Reese, H. H. F. Severinghaus, E. L., and Paskind, H. L. *The Year Book of Neurology, Psychiatry and Endocrinology*. Chicago: Year Book Publishers, Inc. 1937, p. 361.

decidedly positive. Some workers went so far as to state that in the depressed types the therapy acted in "almost a specific manner." It was found that 77.6 per cent of persons with affective reaction types underwent

As we consider these statistical results, the lack of concurrent control data forms the greatest objection—that these patients might spontaneously have displayed similar improvement or remission in time. This ques-

TABLE 1—Schizophrenic Disorders, American Hospitals

Hospitals and Workers or Correspondent	Total Cases	Acute Type				Subacute Type				Chronic Type				Fractures and Dislocations of Joints	Complications	Deaths	Causes
		Remission	Improvement	No Improvement	Total	Remission	Improvement	No Improvement	Total	Remission	Improvement	No Improvement	Total				
1 Buffalo City Hosp. Friedman, Ulrich*	58	16	9	3	28	1			1	15	6	3	24		3	1	Acute camphor poisoning
2 Brooklyn State Hosp.,† Bellinger, Zeffert et al.†	171				11				19	6	7	59	139	3	8		
3 Buffalo State Hosp. Ruslander	26		4		4						14	8	22	1	1		
4 St. Lawrence (Ogdensburg, N. Y.) State Hosp. Brown	6					1	3	4			2		2		1		
5 N. Y. State Psychiatric Inst. and Hosp. Lewis, Blalock, Harris	5						3	3				3	3				
6 Cowanda (Helmuth, N. Y.) State Hosp. Sweet, Tomlinson†, McCaffee	39					6	1	7		13	19	32				1	Suicide
7 Chicago State Hosp. Dombrowski, Idlin, Goldstein et al.	205	63	6	1	7		11	6	17	6	24	31	61	4	1	1	Acute camphor poisoning
8 Elgin (Ill.) State Hosp.† Finkelman, Steinberg, Liebert	136	12			13	4	2	6	12	14	41	74	129	3	1		
9 Illinois Psychiatric Inst. (Chicago) Iow, Singer et al.	69	9		8	17	7		17	24	2		26	28	3			
10 Kankakee (Ill.) State Hosp. Beckert	27									3	12	11	26	2	1		
11 East Moline (Ill.) State Hosp. Oltman	6										3		3				
12 Peoria (Ill.) State Hosp. Stone, Cordon, Costello	2	1	2				2			2		17	24			1	Acute tuberculosis
13 Torrance (Pa.) State Hosp.† Wilkman	41	2			7	1		1	4	2	24	4	30				
14 Norristown (Pa.) State Hosp.† Save, Bookhammer	75				2					4	2	22	21	2			
15 Danville (Ill.) State Hosp. Jackson	13	1			1	2		2		1	7	2	10				
16 Philadelphia Gen. Hosp.† Stricker, Fried, Flaherty	32	1	10	6	17	1	4	7	12		10	13	23				
17 Ypsilanti (Mich.) State Hosp. Dunstone	2	1	1	1		2	1	4	7		5	14	22	2			
18 Evansville (Ind.) State Hosp. Fitchelberg,†	7										1	1	2				
19 Cleveland State Hosp.† Williams	66										43	23	66				
20 Cleveland City Hosp. Schur	25	1	1		7					4	6	8	18				
21 Longview Hosp.† (Cincinnati) Coldman	11					1	6	4	14	1	14	25	41			1	Cerebral thrombosis
22 Columbus (Ohio) State Hosp. Postle	30					3	3	4	1	1	2	15	18		2		
23 San Antonio (Texas) State Hosp. Lasch	4	1			1							3	3				
24 Worcester (Mass.) State Hosp. Cohen	40										40		40				
25 Salem (Ore.) State Hosp.† Lidebeck	7									1	24	12	7	2			
26 Marlboro (N. J.) State Hosp. Groves	6										3	3	6				
27 Douglas County (Omaha) Hosp. Young	13	6			6						1	6	7				
28 Owensby (Chic.) (Atlanta) Ga. Owensby	8	2			2							1	6				
29 Fairfield (Conn.) State Hosp. Dean	18					2			2			6	16		1		
30 Yankton (S. D.) State Hosp.† Adams	44	1			1						33	4	41				
31 Mendota (Wis.) State Hosp. Wisconsin (Madison) Wis. Psych. Inst.†, Norrmandale (Madison Wis.) San, Reece	36									9	23	24	36				
32 Marcy (N. Y.) State Hosp. Wright	18									3	3	10	18				
33 Galveston (Texas) State Psychopathic Hosp. Barbato, Brown	27	2	1	1	4	2	1			1	2	12	15				
34 Stony Lodge (Ossining on Hudson, N. Y.)† Glueck, Ackerman, Friedman	27	1			1					11	15		26		3		
35 Westport (Conn.) Sanit. House	17	3			3			8		1	3	2	6	1	1		
36 Pinewood (Katonah, N. Y.) Sanit.† Epstein	4										1	1	2				
37 Livermore (Calif.) Sanit. Mack	2										1		1				
	146	125	42	23	210	71	47	46	261	99	44	119	104	1	31	3	

\* Friedman's modification of alkalization hydration; camphor metrazol used in some cases.

† Final results incomplete.

No divisible duration of illness; assumption of durations by inference.

‡ Exacerbation of latent infection or production of acute inflammatory changes.

The results at hospitals 1, 2, 3, 7, 9, 10, 11, 12, 14, 16, 19, 20, 21, 25, 29, 31, 33, 34, and 35 have been or are in process of being published.

remissions (or "near" remissions) after a relatively brief course of therapy. Neither of us has had any real personal experience with convulsive-irritative therapy in the affective psychoses; what is offered here is purely caution from the experience of other workers.

tion may be given a general and a specific answer. In an entirely general manner the statistics, particularly of larger mental hospitals, before the advent of the chemotherapeutic approaches implied or stated that schizophrenia (dementia praecox) was of relatively poor

prognosis Deterioration would occur with but few exceptions. The literature was replete with statements deploring the sad outcome, the burdening of mental hospitals and the enormous cost entailed in the proportionately large intake of schizophrenic patients. Generally there was a dismal note struck in psychiatrists' minds when the diagnosis of schizophrenia was established.

Since the development of the recent chemotherapeutic procedures there have appeared with more and more frequency in the literature various workers' views that schizophrenia has not been hopeless and that perhaps there have occurred many more spontaneous remissions than has been previously believed—that these present day results are not to be attributed to the procedures—seemingly a strangely paradoxical point of view. Specifically, certain statistical evaluations of the schizophrenic disorders may be quoted, there are many other equivalent references. According to a number of statistical workers<sup>3</sup> it has been found that the rate of spontaneous remission of schizophrenic patients varies between 4 and 12.5 per cent. Schizophrenic patients are usually hospitalized for a number of years, so that as a rule more than 50 per cent of the populations of mental hospitals is made up of schizophrenic patients. One other important point. These patients who after so-called spontaneous remissions emerge from mental hospitals are not usually able to pursue their former occupations, even though they may be taken care of in their homes. It is to be noted then, that the quantity and quality of remission attained by the convulsive-irritative procedure are superior to those of spontaneous remission, and, finally, the length of hospitalization is markedly abbreviated.

If, now, we consider the affective psychoses, it is to be noted that, as they are regarded generally as having a great tendency toward spontaneous remission, the therapeutic factor then resides mainly in the shortening of the period of confinement. Unfortunately there are no definite criteria whereby one might predict the possible duration of a given affective psychosis. However some figures are available regarding the duration of psychotic "episodes" of the affective reaction type.<sup>4</sup> In a survey of some 8,000 manic-depressive patients it was found that the average duration of attacks or episodes was a little over one year, in repeated attacks the duration tended to be longer. It was difficult in that survey to estimate the duration, in certain cases in which great improvement occurred. There is known the axiomatic statement that the affective psychosis "lasts from six months to six years," but for statistical comparisons the figure in the aforementioned survey is more accurate.

If then, as noted in table 4 between five and fifteen treatments were necessary to produce a remission or "parole condition" in the affective psychoses treated a maximum period of seven and one-half weeks was necessary which should rather definitely indicate positive results.

## INDICATIONS

In the various publications relating to convulsive therapy, and likewise from the papers on the insulin hypoglycemic therapy, almost all the workers have demonstrated a tendency to depose certain criteria of specified treatment for specified types of disease. Many confusing and contradictory reports are noted, for the reason that individual clinics have not yet accumulated enough cases. Perhaps the most constant issue, if this term is permitted, arises in the treatment of stuporous disease of the catatonic type. The workers whose experience is chiefly with insulin therapy are protagonists of the opinion that this type responds best to convulsive therapy, as it appears relatively refractile in the insulin procedure. Some workers go so far as

TABLE 2—Schizophrenic Disorders—European Hospitals

Worker and Location	Total	Full Remissions	Cases Under 1½ Yrs	Full Remissions	Cases Over 1½ Yrs	Remissions
1 L von Meduna Budapest Hungary	230	76	74	48	104	28
2 Buchmuller Budapest	106	32	55	24	45	8
3 M Csikjaghy and B Mezi Szeged, Hungary	73	18	31	11	42	7
4 J Nyiro Budapest	24	12	1	11	9	1
5 L von Angyal and Gyrfas Budapest	4	17	27	12	18	5
6 A Broussier Paris France	110	53	36†	33	74†	20
7 R Stahl and O Briner Berne Switzerland	112	23	24	1	78	6
8 E Sorger and F Hofman Graz Austria	100	27	51	23	40	4
9 P Schenhammer and L Wisgott Vienna	20	13	1	9	17	4
10 L G Cook, Bexley Kent England	27	12	13	9	14	3
11 F Kuppert Muenster Germany*	26†	44	96	36	106	8
12 Lehman Faeus Frankfurt	18	7	12	7	6	0
13 F Hager Kiel	20	9	21	8	9	1
14 A Wahlman Hadamar	21	8				
15 Santangelo and Arnone Palermo Italy	120	48	5	42	67	6
16 F Cortesi Venice	38	14				
17 E Brodski Milan §	126	4				
	1412	447	574	290	711	101

There were four deaths of underlying aortic insufficiency with myocarditis, one of pulmonary embolism from the loosening of a pelvic thrombosis, one of underlying bilateral hypernephroma with obstructing thyroid adenoma and one of unknown cause.

Complications included pulmonary abscess in two cases and fracture of limb in seven.

Report from twenty-two German clinics.

† Under or over six months duration.

\* A Hungarian substitute for metrazol was used.

§ No enumeration of duration 60 per cent of patients with acute disease had remissions.

to state or imply that convulsive therapy should be restricted only to this type. In fact most of the "combinations" of insulin and metrazol have been primarily directed to its treatment. In broader terms, the opinion is frequently expressed that the psychosis with a predominant picture of motor phenomena is to be handled with convulsive therapy, while the psychosis demonstrating mainly psychic phenomena (hallucinations, delusions) is to be treated with insulin. This concept is held to be basically erroneous primarily because the schizophrenic disturbance is in itself made up of both psychic and motor components in each instance, and secondarily because this schematization is unsubstantiated by experience. In the experience of some workers we note that their paranoid patients responded best to convulsive therapy and patients with hypokinetic or hyperkinetic psychosis not at all. On the other hand other workers have demonstrated exactly oppo-

<sup>3</sup> Forty Eighth Annual Report of the New York State Department of Mental Hygiene Legislative Document (1937). Hunsie L E. Treatment of Schizophrenia. Baltimore: Williams & Wilkins Company, 1930 pp. 211-223. Fuller R G. Expectation of Hospital Life and Outcome for Mental Patients on First Admission. Psychiatric Quart. 4: 295-333 (April) 1930. Malzberg Benjamin. Trends of Mental Disease in New York State. Ibid. 10: 66-707 (Oct) 1936. Nyiro J. Three Year Report of the Budapest Angyalfold Hungarian State Institute. Budapest 1931.

<sup>4</sup> Pollock H M. Recurrence of Attacks in Manic-Depressive Psychoses. Manic-Depressive Psychosis. Baltimore: Williams & Wilkins Company, 1931 pp. 66-67.



site results. These two types of data are valueless for grouping statistically in order to point out indications.

Many of the workers with whom we corresponded stated that a certain number of their patients recovered under convulsive therapy after an unsuccessful insulin regimen. We ourselves have observed a number of

us in previous papers.<sup>5</sup> In table 1 an apparent remission rate of 66 per cent in twenty-seven cases of chronic disease was obtained. These results merit at least further consideration, as they indicate a further sphere of usefulness of the camphor-metrazol irritative procedure in the treatment of the chronic schizophrenic disorders.

The results of the convulsive procedure in the affective psychotic illnesses as seen in table 3, indicate a definite sphere of usefulness of this therapy—on the basis of 77 per cent rate of relatively rapid remission in 109 cases. The great majority of workers stated or implied that a rather definite ("almost specific") indication was noted in the various depressed or agitated subtypes of this group of psychoses.

#### CONTRAINDICATIONS, COMPLICATIONS, MORTALITY

The contraindications although mentioned in previous papers, are again listed and divided into absolute and relative types.

1 *Absolute Contraindications*—(a) Organic cardiovascular disease, whether arteriosclerotic, hypertensive or inflammatory, (b) acute febrile illness, (c) pregnancy, (d) active tuberculosis and (e) abnormality of the blood or urinary constituents determined by complete laboratory examinations.

TABLE 4—Results of Convulsive Irritative Therapy of Schizophrenic Psychoses

	Cases
Total number of cases	794
Total number of full remissions	737 (92.8%)
Summary of American Statistics	
Total number of cases from 57 hospital and clinic	1,462
Total number of full remissions	290 (19.8%)
Total number improved	714 (48.8%)
Acute type (under 6 months)	210
Number of remissions	125 (59.5%)
Number improved	47 (22.4%)
Subacute type (between 6 months and 1 year)	901
Number of remissions	14 (1.6%)
Number improved	47 (5.2%)
Chronic type (over 1 year)	85
Number of remissions	38 (44.7%)
Number improved	38 (44.7%)
Summary of European Statistics	
Total number of cases from 35 hospital and clinic	1,417
Total number of full remissions	441 (31.2%)
Acute and subacute type (under 1½ years)	864
Number of remissions	290 (33.6%)
Chronic type (over 1½ years)	761
Number of remissions	101 (13.3%)
(The apparent discrepancy in the total of the European figures is due to the fact that some hospitals did not give full details as to duration of illness.)	
Mortality (calculated from total number of cases tables 1, 2 and 3)	9 (0.6%)
Complications (calculated from total number of cases tables 1, 2 and 3)	6 (0.4%)

2 *Relative Contraindications*—(a) Exophthalmic goiter, (b) history of severe intracranial injury, (c) seropositive syphilis, (d) latent tuberculosis, (e) confinement to bed for one year before treatment is undertaken.

The last named condition deserves special mention. It is believed, according to the experiences of one of us, that if a patient has been bedridden for a number

TABLE 3—Other Nonschizophrenic Chiefly Affective Psychoses

Sources of Data	Total Cases	Recovered or Greatly Improved	Unimproved or Slightly Improved
Philadelphia General Hospital	2	1	1
Cleveland City Hospital	4		4
Cleveland State Hospital		1	2
Kankakee (Ill.) State Hospital*	6	5	1
Chicago State Hospital	14	12	2
Elgin (Ill.) State Hospital*	20	13	7
Illinois Psychiatric Inst. (Chicago)	10	13	7
Salem (Ore.) State Hospital	7	6	1
Douglas Co. (Omaha) Hospital	10	8	2
Marlboro (N. H.) State Hospital	4	2	2
Westport (Conn.) Sanitarium	1	1	
Pinewood (Hatonah N. H.) Sanit.	1	1	
Verstraeten Belgium	20	15	5
von Meduna	1	1	
	109	80	29

\* Results not fully complete.

such cases. Whereas the aggregate of these cases displays a fair-sized sum, it is pointless to argue that, therefore, convulsive therapy is superior to insulin therapy, because a similar number of cases showing the reverse to be true could be demonstrated. What is important is that in spite of the large number of cases collected by us and the large number of cases collected by the insulin therapists, it is impossible to set forth relatively inflexible rules for specified (metrazol or insulin or both) treatment in specified cases. It is possible to state that to modern psychiatrists there are two chemotherapeutic methods, if one fails after a fair trial, the other may be employed.

What is known from the given statistics in schizophrenic disorders and what can be utilized for "indications" may be given in three statements.

1 In the acute and subacute schizophrenic disorders (lasting less than one and one-half years) remissions were obtained in nearly 52 per cent of cases. According to the workers who further subdivided their cases into acute or early types (under six months' duration) the incidence in that group amounts to nearly 60 per cent. Further, great improvement, as defined previously, was noted in an additional 20 per cent of each group.

2 The aforementioned cases included all the well known types of schizophrenic disorders, in the majority of reports no specific division was given but in occasional instances the workers stated or implied that one or another type seemed to do better with metrazol than with insulin. Conflicting reports in this respect exclude the possibility of "type-specified" therapy.

3 In chronic schizophrenia (lasting longer than from one to one and one-half years) there was a rate of remission of 10 per cent. This would have been markedly increased if the selection of cases had excluded very chronic disease, namely of more than five years' duration, which made up much of this group. Much improvement was obtained in an additional 37 per cent. Attention might be called to the apparently high rate of remission noted in the chronic group treated by the camphor-metrazol irritative routine outlined by one of

5 Friedman Emerick. Irritative Therapy of Schizophrenia. Practical Application and Theoretical Considerations. New York State J. Med 37: 1813-1821 (Nov. 1) 1937. Friedman Emerick and Ackerman A. W. The Problem of Schizophrenia. Recent Therapeutic Considerations. Clin. Med. to be published (citations from von Meduna).

of months and a considerable degree of emaciation has developed, there occurs perhaps a relative avitaminosis, reflected in osseous changes. The latter condition, and not so much the muscular pull (by emaciated muscles?) during the metrazol convulsion, is thought to be the basis for fractures of the extremities during treatment an important complication. This will be taken up in the following paragraphs.

The complications noted in the tables were conveniently divided into two groups, the "mechanical" and the "inflammatory." The first group was made up of dislocations and fractures with or without dislocations. This does not include the numerous temporomandibular dislocations which were replaceable without difficulty or sequelae. The second group consisted of pulmonary abscesses, activations of latent pulmonary tuberculosis, acute (myocardial) reactions, local (camphor in oil) abscesses and severe camphor intoxications. Numerically stated, the complication rate was

Total "mechanical" complications, thirty-five (11 per cent)

Total "inflammatory" complications, thirty-three (11 per cent)

Total complications, sixty-eight (22 per cent)

There are several known means whereby these "mechanical" complications may be overcome. In the first place, as noted previously, the emaciated bedridden patients who are to receive treatment ought to be regarded as suffering from possible avitaminosis—a possible disturbance in calcium metabolism. Before active convulsive therapy is begun, it is recommended that the patient receive several months' standard intensive vitamin and calcium treatment. Second, certain technical details are suggested. In larger hospitals where many patients are treated at a time the patients are brought to a treatment room, given their convulsion and then wheeled out either on the same bed or on a stretcher cart and thus transferred to an adjoining "recovery" ward. In either event it must be remembered that the patient is not fully conscious and must be handled as though he were emerging from anesthesia. Care must be taken lest one or another limb dangle over the side of the bed and be dislocated by its own weight. Likewise, care must be taken during the postconvulsive period of excitement or restlessness that in thrashing about the patient does not get his limbs caught in the various parts of the headboard and footboard of the bed or get them entangled in the bedclothes or even underneath his trunk. At times during this postconvulsive state the patient may dislocate his shoulder by attempting to lift his body off the bed by rising up on his arms. In a similar manner the hip may be dislocated in this period by attempts to raise up the body on the legs or by gross kicking movements. Subluxations may occur also during the tonic-clonic phases of the convulsion, and these are not easily guarded against. However, it is possible to study the particular motor pattern of each patient during his first reaction. This motor pattern is usually repeated at each successive treatment. With adequate knowledge of the underlying mechanisms of various dislocations and fracture dislocations, an attempt may be made to prevent their occurrence by supporting the joints that appear vulnerable in the particular motor pattern that the patient displays. One single important direction is to prevent abduction of the limbs.<sup>6</sup> As an added

precaution it is well to examine the patient immediately after the clonic phase of the convulsion and apply the various tests for dislocation of the limbs. If this has occurred, it is possible usually to relocate these joints while the patient is still partially unconscious and thus avoid undue stretching of the ligaments as well as operative procedures after the patient is awake.

In order to lessen the frequency of dislocations of the jaw, several suggestions are offered. If the patient has been known to dislocate his jaw easily before the treatment is started, or if the patient is very prognathous, it is well to place the gag in his mouth before the injection and employ a Barton bandage or similar appliance to prevent the mouth from opening too wide during the convulsion. This may also be done manually by one of the nurses or attendants. In the event of dislocation, the jaw may be replaced before the patient regains consciousness. A simple presumptive test of dislocated jaw after a therapeutic convulsion is to observe whether the mouth is still open or whether the gag can be easily removed after the clonic phase. In the latter case it is to be strongly suspected that the jaw is dislocated, and attempts at relocation should be started immediately.

To point out briefly the possible preventive measures against so-called inflammatory complications, we must consider first that the absolute and relative contraindications are important to exclude before treatment is undertaken. The patient must be carefully examined for any evidence of illness, laboratory examinations must be complete, and thoracic roentgenograms, as well as electrocardiograms, made if at all indicated.

The occurrence of pulmonary abscesses (in 0.1 per cent) are thought to be due to aspiration, infarction and transitory pulmonary edema during the convulsions. If the treatments are administered to a healthy person (free from cardiac and respiratory disease of any type) and if an absorbent gag, made of cellulocotton or a similar substance to absorb orotracheal secretions, is employed, this complication ought to be minimized. In several hospitals either a hard rubber gag is used or one made of several wooden tongue depressors wrapped in gauze; both of these are believed inadequate. Another precaution is to give the treatments only if the stomach is empty, preferably before breakfast, to avoid the aspiration of regurgitated material. Some workers placed the blame for the pulmonary complications (and possibly the cerebral in one case) on the loosening of a thrombus from the antecubital veins, which became inflamed as a result of the treatment or possibly of local mechanical irritation because of the struggles of the patient against injections. This factor cannot be overlooked.

The occurrence of gluteal abscesses in the course of camphor therapy is understandable because of the large amounts of camphor in oil solution necessary to produce the camphor effect. However, their occurrence is greatly reduced if the area of skin is prepared as though for a surgical procedure and thorough deep massage administered locally for at least fifteen to thirty minutes. Hot sitz baths several times daily during the treatment are also helpful.

There were noted one case of nonfatal and two of fatal acute camphor intoxication (0.1 per cent). From the experience of one of us a suggestion is offered to avoid a fatal outcome. The patient will display extreme lassitude, the pulse and the respiratory rate

<sup>6</sup> This suggestion was offered on consultation with Dr. S. A. Thompson of Greenwich, Conn.

will become markedly increased, persistent leaden cyanosis will be noted and physical examination usually will reveal evidence of bronchiolar or pulmonary inflammation (The chief route of excretion of camphor is believed to be the respiratory tract.) All these symptoms come on gradually over a period of several days. Relatively rapid antidotal action was noted to follow utilization of oxygen (tent) and intravenous administrations of hypertonic dextrose solution.

The cause of the acute (myocardial) collapses, non-fatal, is at present unknown to us. Numerically they play a rather insignificant role (0.06 per cent).

The mortality rate of 0.29 per cent and the causes of death have been mentioned. The possibility of reducing mortality to a minimum by following the listed and implied contraindications is self evident. Even as it stands, however, the mortality rate is entirely negligible.

#### TECHNIC

It is assumed that the reader is already familiar with the technical details of the metrazol therapy and the camphor-metrazol irritative modification which have appeared in previous papers.<sup>6</sup> However, certain recent developments have been noted especially in the field of concurrent psychiatric management, which in turn revolves about the associated anxiety on the part of the patient against the treatment and the personal contacts that the patient has with the treating physician. Before taking up these questions, we will outline some recent administrative features of the treatment.

From the experiences of a number of workers with the metrazol convulsive therapy it was felt that once the convulsive responses were established they should be kept up throughout the course of the treatment. In other words, it is believed harmful if the patient does not experience a grand mal type of reaction at each period of treatment. This conclusion was arrived at after a number of patients who were progressing nicely suddenly had relapses after subconvulsive or "petit mal" doses. For this reason the present technic was outlined as follows:

The initial dose of the 10 per cent aqueous solution of metrazol is from 3 to 5 cc intravenously. If a convulsion does not take place within a minute, another injection of 1 cc more than the original amount is given. If again a seizure does not result, the treatment is taken up the following morning, beginning with 1 cc more than the last dose. This procedure is repeated until a convulsion results. Third injections are usually not given unless there is a great degree of psychic upheaval or considerable "death anxiety." Even in cases of the most resistive type a convulsive reaction will occur on the third or fourth day of treatment at the most. As high as 46 cc has been given in a single period in increments of 16 + 16 + 14 cc without deleterious effects on the cardiovascular system, but the case was one of extreme resistance. To the physician already well acquainted with the various phases of the convulsive therapy more latitude is offered. In the latter instance larger increments are injected if no signs of a forthcoming seizure are noted. For example, if after a 5 cc injection no pupillary dilatation or tremors of the orbicular, oral or facial muscles are noted, and if there is no alteration in the consciousness of the patient, another injection of 6.5, 7 or even 8 cc may be given within the next minute. However, the latter more flexible procedure of judging the increments by the signs displayed by the patient should be

employed by physicians who have already had considerable experience with the convulsive therapy. It is urged that physicians who are just beginning to employ this treatment should follow a rather rigid rule of increasing doses, as mentioned in previous papers.

The procedure employed by some workers in allowing the needle to stay in the vein and raising the dose by increments of from 2 to 3 cc until a seizure results is regarded as somewhat hazardous from the standpoint of producing mechanical inflammatory changes, leading to thrombosis.

The use of an absorbent cylindric mouth gag about 15 cm long and the thickness of the finger is advocated. The protection of the patient's limbs has already been mentioned. It is further to be noted that the patient's head is not resting on the hard bed supports before the injection is given.

The use of sedatives during the treatment should be restricted only to cases of repeated convulsions either with metrazol or with camphor. If the general condition of the patient appears satisfactory, three or four individual convulsions are not regarded by us as harmful. If the convulsions tend to continue beyond this number or if they tend to merge, intervention is necessary. This may be controlled by the intravenous use of standard barbituric derivatives, hypodermic administration of morphine and atropine, rectal administration of ether or avertin with amylene hydrate or inhalations of ether, chloroform or ethyl chloride.

The anxiety of the patient against the treatment is frequently mentioned by various workers, the reasons are numerous. As inner causes there are the feelings of impending death and sudden annihilation during the phase of the aura. It is found that most patients will have rather complete amnesia for all this anxiety after a grand mal reaction but that the anxiety will often persist if the patient does not undergo a convulsion. Preliminary work of a varied nature is being carried on in a number of centers with the goal of eliminating this aura phase. Some workers combine insulin with the metrazol for this purpose, others administer nitrous oxide, analgesia and still others give scopolamine. Withal there is this point to recall. It is not known what particular phase of this therapeutic convulsive syndrome plays the important role in producing remissive changes in the psychotic organism. It is not altogether excluded that this very anxiety and fear might possibly be just as important as the other phases of the convulsion. In line with this are the experiences of one of us with the camphor routine. Beneficial effects with this drug have been noted without actual motor phenomena and with the predominant features of anxiety mounting to panic. Another interesting point we offer is that ambulant patients have been treated, some even coming distances of 30 to 125 miles to the hospital willing to receive the treatments. Home treatment has also been administered but is not recommended for general application because of the existing hazards already mentioned and the relative impossibility of managing postconvulsive excitement.

It is considered rather unwise from the standpoint of the anxiety of the patients to treat them singly in separate treatment rooms. It is felt that under such conditions the patients fear the going or being forced to go into this room. The various fears and forebodings inherent in the psychosis become prominent when the patient is led or dragged into a room where several

persons await him, he is put into a bed, and a table with various instruments is prepared. He undergoes a terrifying experience during the treatment and finally awakes in another room.

A suggested procedure used in the Angyalfold Institute, Budapest, may be described. The patients are led in a group of about twenty into a large ward. They all lie down in beds and wait for a little while. The physicians and necessary attendants come into the room and in an entirely matter of fact almost banal manner treat the patients in turn. The whole procedure should be calm and commonplace. No remarks with regard to the condition of the patient should be made by either the physician or attendants within the hearing of the patient. Naturally, it is unwise for one patient to see another during the convulsion, and for this purpose a simple portable screening arrangement is used. To the sides of the bed posts are attached tin sockets so constructed that a supporting rod may be inserted at the foot and head posts, between which a canvas curtain may be stretched. This appliance is attached to the beds on each side of the one in which the patient is being treated. A removable foot board partition is put in and there is completed the so-called metrazol room, which is movable from patient to patient and gives sufficient room to work around each. Without any haste, even taking into consideration the factor of repeated injections in some cases, twenty patients may be treated in an hour.

The frequency of the injections, as gleaned from the different workers, varies from daily to weekly. From our experiences and those of others, it is recommended that at least two convulsive reactions a week be induced. In many instances remissive changes do not become manifest until the second day after the convulsion—after the immediate effects of the convulsion have worn off. This event ought to be awaited in the proper management of the frequency of injections. If the patient does not respond or if he responds only for a brief interval after the injections (less than twenty-four hours) the injections may be given every other day. If a response indicative of remissive changes in the motor or psychic manifestations endures for a longer period than mentioned, convulsive reactions ought to be induced less frequently, but responses ought to be obtained at least twice weekly.

The question arises as to the number of seizures necessary before treatment is terminated. For this no definite answer is available. It is naturally not advisable for a fixed number of convulsions to be predetermined for a given patient. Yet, in spite of the fact that there is no analogy for this in the field of medicine, some workers have actually stated that a given patient will get only a certain number of seizures (five or ten) and no more. If the patient relapses in these instances the treatment (again predetermined) will be resumed. As a general rule it has been found helpful to induce a minimum of about twenty-five reactions of grand mal type before abandoning treatment in cases of failure to respond. Patients who respond should be treated until the maximum improvement or remission can be noted. Then, it is believed, three or four additional seizures should be induced to prevent the possibility of a relapse.

A few technical remarks of general and practical nature in the management of camphor therapy may be given at this point. Whereas the routine dosage has been previously mentioned, the general condition of the

patient with special reference to the cardiovascular and the respiratory system should be observed—undue fatigue, prolonged cyanosis and associated signs—before the dose is increased as rapidly as previously designated (1 to 2 Gm of amorphous camphor daily in two doses). Furthermore the occurrence of gluteal abscesses must be suspected if rise in temperature occurs during the treatment, temperature should therefore be taken at least three times a day. Other recommendations are deep muscular injections after careful preparation of the skin and deep kneading massage after the area has been covered with an alcohol-soaked cloth. After the massage the patient must be protected against assaultive or suicidal attempts due to the camphor effects. This is accomplished usually by moderate restraint (shoulder and foot type), somewhat loose so that the limbs will have enough play during the convulsive reactions and yet tight enough to prevent a sudden lurch or leap from the bed. This restraint is necessary for at least three hours after each injection. Meals should consist of liquids in the morning and evening, the "heavy" meal should be at noon. Additional nourishment (if the patient is underweight) may be given late in the evening.

In the face of the foregoing data and statements, we do not purport to state or imply that the convulsive irritative procedure is *the* method of treatment of the psychoses. It is not forgotten for an instant that the schizophrenic (and the affective) psychosis has psychopathologic and pathophysiologic components. It is taken for granted that the psychiatrist will enroll the patient in the various occupational, recreational, reeducational routines as soon as it is deemed advisable. The factor of psychotherapy likewise is not discarded and the patient left to work out his difficulties by himself, even though many will say that this will cloud the real therapeutic factor. A full or complete remission cannot be said to have occurred unless there is complete insight and until the patient has satisfactorily worked out and assumed a critical attitude toward his pathologic experiences. This working out of the pathologic experiences is the main purpose of the psychotherapeutic procedures, about which in turn, revolves the great difference in rates of remission reported by different workers. It was noted that many patients, particularly with the acute type, appear to be able to and actually do, work out their psychologic difficulties to a satisfactory and socially acceptable conclusion. However, this chance should not be taken, because too many known psychologic factors are interwoven with the psychotic disease process. Much informative data which may later be employed in the after-care of the patient can be obtained in the concurrent psychotherapeutic interviews. The character of these interviews is bound to differ in the hands of different workers so that specific formulations cannot be given and only some workable suggestions are offered. Psychotherapeutic advances should not be forced on the patient, rather these advances should lag behind the progress of the patient. The phenomenon of temporary amnesia for recent psychopathologic manifestations on the part of the metrazol-treated patient should be taken into consideration and on the basis of previous experiences should not be forcibly penetrated nor should the patient be subjected to rigid cross examination as to his past behavior. Even the most delicate resistance by the patient should not be overcome by direct means, he should be approached

with caution until ready and awaiting explanations and even then should not be shocked or startled by the physician's answers or explanations. As already reported by one of us,<sup>7</sup> the patient comes to the office for psychotherapy at every four to five seizures. The first period is usually given over to orienting the physician by superficial, general questions as to whether any alteration has occurred in the psychic status of the patient. If no change can be detected the interview is terminated in a few minutes. If the patient brings up any information relative to any alterations, the discussion proceeds according to the nature and intensity of these changes. For example, if the patient comments or shows that he no longer has auditory hallucinations, he is asked how this happened. For this there is usually no answer and it is then explained that if he actually "heard sounds," one could not have caused their disappearance with injections. In this way a causal association between any improvement and the injections is fostered. In subsequent interviews the character and makeup of hallucinatory and delusional data are brought up and thoroughly discussed, with such technique as the physician has generally used in individual cases. Pathologic experiences are explained gradually to the patient instead of his being allowed to explain them to the physician. It is usually noted that the hallucinations and then the delusions of reference disappear first. If the predominant picture was one of autism or rigid catatonia, these features usually become replaced at first with flightiness or anxiety. Some of the explanations offered by patients during these interviews are to the effect that they "feel as though awakened from a dream." They compare the illness with a "visit to the theater," recognizing some of the unrealities at times by "feeling as though every one were playing a part, acting, and so on." In many other ways it is evident that they try to avoid or ease themselves out of an apparently disgraceful state of mind. The physician, then, has to strive until the goal of "mental illness" is established in the patient's mind. Much reassurance, symptomatic explanations on the basis of "functional disturbances" and, above all, a strongly hopeful attitude are all in order.

#### THEORETICAL CONSIDERATIONS

It is useful in this section to differentiate between established facts and theoretical conjectures. Both are necessary in the development of a therapeutic procedure, but it is somewhat difficult to delineate between the two. Almost since the beginning of the application of the convulsive therapy to the psychoses, it has come frequently to our attention that this therapy ought to be widely applied in the field of psychopathology as an agent to "frighten a patient to his senses" or to "scare the devil out of him." To the scientific minded this expression harks back to medieval times and ought not to be employed in scientific discussions.

The fundamental basis of the convulsive-irritative therapy is the statistically significant biologic antagonism between the epileptic state and schizophrenia previously reported.<sup>8</sup> The basis of this therapy has become much contested of late, many physicians recalling from their experience many cases and instances that would tend to disprove the theory. However, at the present time no definite factual evidence has been offered that

would displace this concept. Whatever might be the biochemical significance of this apparently reversible antagonism is as yet unknown. The actual underlying biochemical processes responsible for the epileptic state and the pathobiology of the schizophrenic state are alike enigmatic.

Whereas it has not yet been proved or disproved how the psychobiologic factors of shock to the organism act, these factors are of themselves somewhat abstract and equivocal. Various types of shock procedure have been used in the past to alleviate the psychotic illness, with indeterminate and nonprecise effects. Some patients have improved after undergoing various physical illnesses, the great majority of psychotic patients who undergo the same illnesses do not appear to be helped. Just what are the healing factors in these illnesses and the shock procedures used in the past is difficult to ascertain. Psychiatrists have repeatedly stated that if a patient is threatened with death and annihilation all the "imaginary" symptoms will disappear and efforts will be made on the part of the organism to protect itself—this feature is the most fundamental law of life and forms the basis of efforts at reconstruction. Others have struck at the problem analytically and brought up theories of satisfaction of sadistic-masochistic tendencies and parent transferences in seeking the aid of the physician to help the patient maintain his existence. Other theories parallel those aforementioned and describe the psychobiologic reaction of the seizure as carrying the partially fulfilled death wish of the patient to a satisfactory symbolic conclusion, whereat reconstruction begins. It is, however, impossible in the scope of this paper to discuss all these and we must therefore restrict ourselves to more of a physiologic explanation of what happens to the central nervous system during metrazol (and camphor) therapy and then draw theoretical deductions therefrom.

Instead of the attempts to localize the action of metrazol as selective of the frontal pole (von Angyal<sup>9</sup>) or by vasospastic-anoxic cortical changes noted in insulimized animals (Stief<sup>10</sup>), it is correct to note that the pharmacologic action of metrazol is that of medullary stimulation and irritation, autonomic response and dilatation of the blood vessels of the brain (Fischer and Lowenbach, Hildebrandt<sup>11</sup>). Also, according to the works of Hildebrandt, metrazol produces an increase of discharges from the cerebrum and improved circulation in the brain independent of changes in blood pressure. Metrazol is believed also to have as its action the release of certain elements of the reflex arc, which action is believed to occur in the arc element preceding the

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10. Stief Alexander. The Mechanism of Action of the So-Called Convulsive Therapy with Particular Reference to the Insulin Shock Procedure. *Psychiatr. neurol. Wechnschr.* 39: 225-229 (May 22) 1937.

11. Fischer M. H. and Lowenbach H. Action Currents of the Central Nervous System Under the Influence of Metrazol. *Arch. f. exper. Path. u. Pharmacol.* 17: 4: 502-516 (March) 1934.  
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Hildebrandt F. Pentamethylenetrazol (metrazol) in *Heftler's Handbuch der experimentelle Pharmacologie* vol. 5. Berlin: Julius Springer 1937. pp. 151-183.

7. von Meduna László. On the Most Common Errors in the Convulsive Therapy. *Psychiatr. neurol. Wechnschr.* 10: 87-90 (Feb. 19) 97-100 (Feb. 26) 1938.

pyramidal tract In patients in whose blood the venous oxygen content is reduced metrazol has been found to increase this by improving the circulation and respiration by stimulation of the vasomotor and respiratory centers in the medulla<sup>11</sup> Pathologic examinations of animals deliberately poisoned with metrazol (von Meduna<sup>12</sup>) showed diffuse cellular changes, most prominent in the medulla and then in order of severity in the cells of the spinal cord, midbrain and cortex The vascular system was intact It was concluded that metrazol acts primarily as an ectodermotropic drug by direct cellular action Recent work on the respiratory metabolism of brain tissue showed that metrazol produced a temporary oxygen deficiency of the brain cells and that its convulsive action is dependent on this feature<sup>13</sup>

From these data, together with the observation of certain workers that schizophrenia is associated with a low rate of oxygen consumption<sup>14</sup> and relatively sluggish autonomic activity, it is possible to theorize that the medullary irritation with resultant respiratory, vasomotor and autonomic responses is the basis of the metrazol convulsive therapy The vasomotor response in particular seems to be the subject of relatively insufficient attention In line with this thought it is to be recalled that recent studies on the action of carbon dioxide on the central nervous system showed it to be primarily a vasodilator and circulatory stimulant (to provide more oxygen to more brain tissue by enlarging the vascular bed and volume of blood in the brain<sup>15</sup>) This in itself may possibly be the basis of the transitory improvement noted in schizophrenia after inhalations of carbon dioxide If now we consider that the underlying action of metrazol is in part that of dilatation of the blood vessels of the brain, the mechanism of influence would be similar to that of carbon dioxide but more profound In addition there is also a direct stimulating action on the cellular elements of the central nervous system, so much so that the patient cannot of his own volition control his thoughts and actions under the influence of high doses

The action of camphor is less clearly defined In the aforementioned studies of cellular metabolism and pathology this action was observed to be entirely similar to that of metrazol When given intravenously, camphor also produces epileptiform convulsive reactions<sup>16</sup> Yet clinically by intramuscular injections camphor has a decidedly different action Anxiety mounts to panic and is associated with assaultive or suicidal behavior a rather typical deliriform confused state in which reactivity to vivid motile hallucinations may occur Patients who are undergoing camphor therapy often lose all semblance of a fixed schizophrenic state and display a picture more closely resembling the acute psychotic

pattern All of this may possibly be a drawn-out convulsive effect resulting from slower absorption of the camphor It is believed that the "slow motion" picture of the convulsion appearing with camphor will prove valuable in studying the phases of the seizure that may be the basis of the healing factor in the convulsive-irritative therapy

How these data may be applied to the use of convulsive therapy in the affective psychoses is problematic It is known that persons with some affective reaction types become afflicted with schizophrenia—or, in the minds of some workers, the disorder was basically schizophrenic It is also known that many schizophrenic features are shown by many affective psychotic patients indicating vaguely a common psychopathologic basis in these instances An interesting recent chemotherapeutic development was the finding that many schizophrenic patients displayed typical affective reactions in the form of hypomania, agitation, depression and the like as early transitional phenomena before remission How much these pertain to the treatment of affective disorders is at present not known

## VESICAL DIVERTICULUM

### A FEATURE STUDY

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AND

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LOS ANGELES

The importance of vesical diverticulum is emphasized by the fact that badly infected, poorly draining diverticula, with the resulting stagnation and eventual ammoniacal urine, give rise to subjective symptoms not exceeded in severity by those of advanced vesical tuberculosis, carcinoma or calculus

Vesical diverticulum is a form of herniation through points of weakness between muscular fibers interlacing at approximately a right angle These so-called weakened spots may be due to embryologic defects or, presumably, may result from pathologic changes in the bladder wall produced by infection, inflammatory changes and back pressure In practically every case there is evidence of increased intravesical pressure over a long period, almost always caused by obstruction at the bladder outlet With few exceptions prostatic in one form or another, is present and accounts for the back pressure, without which there would be no diverticulum The dictum that two factors, weak spots and obstruction, are necessary for the production of diverticula is well borne out In the rare cases in which an obstruction cannot be diagnosed there is a probability that abnormal intravesical pressure on voiding is nevertheless present

Of our sixty-nine patients forty-two had contracture of the bladder neck, twenty-five benign hypertrophy, one congenital valves in the posterior portion of the urethra and one (a syphilitic female) a filiform stricture in the urethra The slow long-continued and milder obstruction due to contracture of the bladder neck or median bar is much more apt to result in

12 von Meduna, Laszlo. Experimental Camphor Epilepsy. Arch f Psychiat **102** 333-339 (Sept.) 1934

13 Wortis, S. B. Effect of Insulin, Metrazol and Camphor on the Metabolism of the Central Nervous System. Proc. the New York State Med Soc. section on Neurology and Psychiatry, May 12, 1938. Himwich, H. F., Bowman, R. M., Fizekas, J. F. and Orenstein, L. L. Effect of Metrazol Convulsions on Brain Metabolism. Proc. Soc. Exper. Biol. & Med. **27** 359-361 (Nov.) 1937

14 Many papers have been written on the rate of oxygen consumption in schizophrenia by the Worcester, Mass. research group; some of these have been referred to in footnote 5

15 Schmidt, C. F., Cobb, S. and others. Symposium on the Circulation of the Brain and Spinal Cord. Section on Physiology. Eighteenth Annual Meeting of the Association for Research in Nervous and Mental Diseases. Dec. 28, 1937

16 Wortis, S. B. Experimental Convulsive Seizure. J. Nerv. & Ment. Dis. **77** 233-245 (March) 1933. Coomb, H. C. and Pike, F. H. Monobromated Camphor. A Standardized Convulsant. Arch. Neurol. & Psychiat. **26** 1-6 (July) 1931

Owing to lack of space this article has been abbreviated by omission of several illustrations. The complete article appears in the author's reprint.

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diverticulosis than is the large adenomatous prostate. Although statistics differ somewhat it may be stated that approximately 95 per cent of all vesical diverticula are complications of prostatism while the remaining 5 per cent occur in women and boys. Urethral stricture in women and congenital valves and other obstruc-

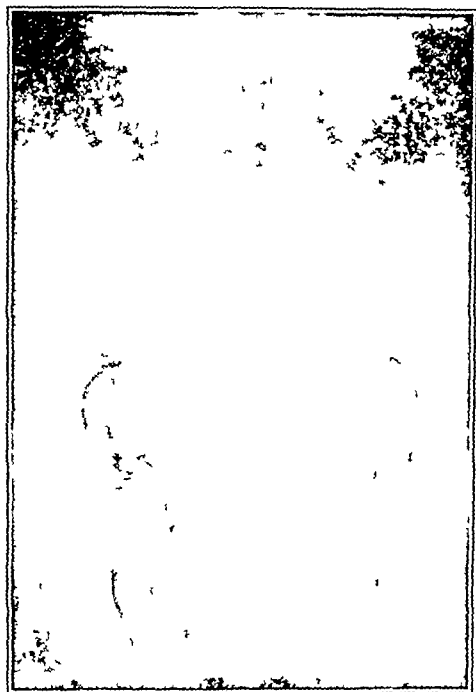


Fig. 1 (case 1)—Two large diverticula; the upper is intraperitoneal and the lower overlaps the bladder.

tions of the posterior part of the urethra or bladder neck in boys are the determining factors.

Diverticula differ widely in many of their anatomic characteristics. They may be single or multiple. Sixty-eight per cent of Judd and Scholl's 133 patients had only one diverticulum; 12 per cent had two and 7 per cent had three. This is important because the results of excision are not good if more than two sacs are resected.

In approximately 75 per cent of cases the orifice is situated from 1 to 3 cm above the interureteral ridge, either mesal or lateral to the ureteral meatus. In other cases it may be high up laterally or in the dome.

The sacs vary from hazel-nut size to giant diverticula with a capacity of 2 liters or more. Small diverticula are of little importance if the obstructing lesion is overcome, otherwise they grow though slowly. The most important factor is drainage, that is to say how well the sac empties during the act of voiding. There is some stasis in all diverticula which have attained considerable size. Large sacs with relatively small orifices however empty so poorly that they are termed retention diverticula; the stasis predisposes to infection, especially when one of the urea-splitting organisms is involved.

In contradistinction to the site of the orifice, the direction of the protrusion varies. The sacs may extend between the rectum and bladder nearly as far as the subpubic ligament and in addition well up on the superior surface of the bladder. In one patient with two large sacs one rose vertically upward in the peritoneal cavity like an inverted pear and was completely and intimately covered by a peritoneal coat

(fig. 1). Another unusual type is a small shallow diverticulum (presumably arising from an accessory ureteral bud), situated just a few millimeters lateral to one ureteral meatus. In one case what appeared to be a sclerotic process in a small, wide open depression of this kind was believed to be the obstructing factor producing a large hydronephrosis on that side.

Diverticula with openings high up sometimes suggest the hourglass type (figs. 2 and 3). Usually the walls are composed of all the coats of the bladder, whereas sacs arising near the ureteral meatuses tend to have fibrous walls lined with epithelium.

In one typical hourglass bladder (fig. 2) a carcinoma developed in the upper segment. In one patient with a very small shallow diverticulum, one could visualize through the cystoscope a papilloma a little larger than a pea. Radon seeds were implanted in the papilloma. This patient was apparently cured, having been lost sight of after one year. All told, we encountered intradiverticular neoplasms in four cases.

In three cases one or more intradiverticular calculi occurred, and in two others calculi were found in both bladder and diverticula.

The symptoms of diverticulosis are varied and are not pathognomonic. Ordinarily pronounced prostatism with infection stands out. When a patient voids and in a short time is again able to void a considerable amount of diverticulosis is suggested. If there is little or no residual urine, there is no diverticulum of consequence. If every patient with a urologic complaint is accorded a urologic examination which is adequate, comprehensive, methodical and in keeping with the complaint, there will be few mistakes as to either the underlying or the associated lesions. With diverticulosis one is almost certain to encounter considerable residual urine. In men this usually spells prostatism, and every patient with prostatism should at some suitable time have a cystogram.

In order to obtain optimum visualization a series of cystograms are helpful, viz. (1) a plain anteroposterior exposure of the bladder distended with radiopaque solution, (2) a contrast cystogram and (3) an oblique view. Sometimes an air cystogram is revealing and has the advantage of outlining the prostate. Simple cystoscopic examination, a routine procedure for almost all urologic

ills, completes the diagnosis and also reveals the nature, size and location of the obstruction. The clinical signs of prostatism are usually present—nocturia, hesitancy and small stream. Infection is often superimposed, resulting in various degrees of pyuria, frequency and dysuria. Sometimes a cystic tumor can be felt in the abdomen. Once infection occurs, especially with a urea-splitting organism, the

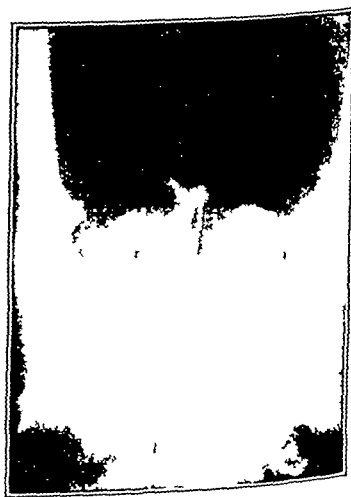


Fig. 2 (case 2)—Hourglass bladder with carcinoma in the upper segment.

disuria may become as severe as that associated with advanced tuberculosis, carcinoma or large calculus of the bladder

#### TREATMENT

The first and fundamental consideration is the surgical relief of the obstruction. After this has been accomplished, the diverticulum will seldom increase in size whereas there is a progressive enlargement of the sac if this is neglected. If the sac is not large, empties fairly well and is not badly infected, diverticulectomy is unnecessary in many instances. On the other hand, if the diverticulum is of the retention type or is large, excision is indicated provided the patient is a fair surgical risk. Advanced myocardial or cardiovascular disease, extensive kidney damage with markedly lowered function, asthma and bronchiectasis are contraindications to diverticulectomy.

Almost every author cites a patient or two with a giant diverticulum who suffered little and went along for years with little or no therapy. One must bear in mind, however, that in such cases (with the diverticulum usually associated with contracture of the bladder neck rather than with benign hypertrophy) there has been no infection. Giant diverticula like giant hydronephrosis, attain such great dimensions because they have escaped infection for a long period. If infection occurs, subjective symptoms begin, peridiverticulitis ensues and the patient promptly seeks relief. All diverticula become infected sooner or later, and the optimum time to excise large sacs is before they become badly infected. Our experience has been that the very large diverticula are easily removed because of absence of peridiverticulitis and firm adhesions. In excising a diverticulum the sac is freed by blunt gauze dissection just as is the sac of an inguinal hernia. We have discovered no easier method. This operation is often most difficult because of dense adhesions. When the sac is freed all around down to the neck or diverticular orifice, it may be inverted into the bladder and excised and the rent sutured with chromic gut. If inversion should prove difficult, it may be excised extravasically. An abundance of rubber drains (rubber tissue or Penrose) should be inserted between the bladder and the peritoneum and laterally. Gauze packs will often be necessary to control the oozing. The cystostomy opening in the bladder should be partially closed by suture.

In many cases a three stage operation is advisable, that is to say, a preliminary cystostomy drainage is performed with or without drainage of the diverticulum itself by means of an accessory Pezzer catheter introduced through the diverticular wall. In due course this is followed by diverticulectomy and finally by the surgical attack on the obstruction. The order of the last two procedures may be reversed. In most instances we feel that it is unwise and an unnecessary surgical risk to excise the sac and attack the obstructing lesion at the same sitting, so to speak. When both diverticulectomy and a prostatic operation are done it is often a problem to decide on which to do first. From a purely technical consideration primary excision of the sac is the logical procedure, but in many cases preliminary cystostomy drainage spells a lowered mortality rate. When cystostomy has been done on a previous occasion, it may prove troublesome because of the inability to find and enter the plane of cleavage between the sac and the surrounding structures. Again, with a cystostomy and a collapsed bladder the diverticular orifice is practically closed (partly by contrac-

tion and partly by collapse and distortion), and as a result the diverticular contents in the retention type become truly putrid in a few days. Hence, especially when dealing with huge sacs, we have introduced an additional drainage tube into the sac itself at the most easily accessible site. One way to avoid the necessity of direct tube drainage of the sac itself is to adopt the trocar method of preliminary cystostomy. With the Day trocar, a 22 Pezzer catheter is easily introduced into the bladder with the aid of local anesthesia. With this technic there will be absolutely no leakage around the catheter even when the bladder and diverticulum are filled to capacity. This having been done, the bladder and diverticulum are distended with a dilute solution of one of the organic silver compounds and the fluid is allowed to drain, this procedure is repeated at least three times. It is advantageous to have the nurse perform such irrigations twice a day.



Fig. 6—Giant diverticulum

Squire's operation is a relic of pioneer days and is no longer employed by its originator. It has given poor results at our hands.

Divulsion of the orifice and its resection with a McCarthy loop, cautery or scissors are mentioned only to be condemned. Such procedures invite urinary extravasation and panpelvic sepsis. Moreover, if the patient escapes these complications little benefit can be expected and this only temporarily.

We have studied sixty-nine cases of vesical diverticulosis in twenty-five years. In fifty-one operation was performed for relief of obstruction at the bladder neck and in thirty-two diverticulectomy was performed. Of the latter prostatectomy was done in seventeen, resection of the bladder neck in fourteen and electrodestruction of congenital valves in one. The resections of the bladder neck included both open operations with Young's punch and transurethral resection with a McCarthy loop. It is amazing to observe the degree of sclerosis at the vesical outlet in patients with giant

**diverticula** The bladder neck is like cartilage, sclerotic tissue having replaced the internal sphincter and adjacent prostatic tissue to such an extent that when sufficient tissue to relieve the obstruction has been excised the patient may be left with a measure of incontinence.

There were three deaths, and in three other cases the results were poor. In one of these cases the ureter



Fig. 8 (case 6)—Stone formation in sac eight years after prostatectomy.

opened into the diverticular sac, and in another four diverticula were excised, leaving a small contracted bladder.

Diverticulectomy often proves to be a very difficult operation and to be followed by a stormy convalescence, although the mortality should be less than 10 per cent. Most deaths occur in the urologist's first half dozen cases. His mortality will drop with technical experience, especially when he has learned which patients are not suitable candidates for this operation. The good results have been permanent, some of our patients were living fifteen or more years after excision of a large diverticulum.

#### SUMMARY AND CONCLUSIONS

1 Obstructions should be looked for in every instance of vesical diverticulosis. Surgical relief of the obstruction is the prime consideration. In about 95 per cent of cases either a benign hypertrophy or contraction of the bladder neck is found and must be overcome by prostatic resection or prostatectomy. Congenital valves in boys are easily destroyed through a McCarthy miniature cystoscope. Most obstructions in the female urethra are easily dealt with.

2 If the sac is large or of the retention type, diverticulectomy should be performed in addition to surgical relief of the obstruction. Otherwise the patient is condemned to endure one of the most distressing of all urologic ills.

3 Diverticulectomy is apt to be followed by poor results when a ureter opens in the sac or when more than two sacs are excised. Small diverticula should not be resected.

4 Notwithstanding every effort in the matter of preoperative preparatory treatment, many patients continue to be such poor surgical risks that operative measures, especially diverticulectomy, must be abandoned. One must then resort to such palliative measures as fit the case.

5 Because of the technical difficulty and oftentimes stormy postoperative course, diverticulectomy is a much neglected operation. Due consideration of the patient's well being calls for a certain degree of boldness.

#### REPORT OF CASES

**CASE 1**—J. F., a mining engineer aged 62, had all the symptoms of advanced prostatism. Cystoscopic examination revealed contraction of the bladder neck and two diverticula. The orifice of one sac was situated near the left ureteric meatus, the sac itself protruding over the posterosuperior surface of the bladder. The second diverticulum opened into the dome and protruded directly upward into the peritoneal cavity and was everywhere covered by an intimately attached peritoneal layer (fig. 1). A suprapubic incision was made down to, but not into, the bladder itself. From a study of the cystogram (fig. 1) an unusual type of protrusion was suspected, which led us at the very outset to explore from within the peritoneal cavity before opening the bladder. The sac was found to be entirely intraperitoneal and surrounded everywhere by an intimately attached peritoneal coat. This coat was circumcised at the diverticular neck and the sac inverted into the bladder. The bladder and peritoneum were separated from each other for a distance of about 3 cm. from the diverticular neck. Both openings in the peritoneum were then sutured and the bladder was opened. The second diverticulum was then freed everywhere down to its neck and inverted into the bladder. Both sacs were excised from within the bladder and the openings closed with chromic gut. The sclerotic bladder neck was then attacked with a cold steel punch (Young's) until the obstruction was overcome. A small Pilcher bag was introduced to control hemorrhage and the cystotomy incision partially closed. Rubber tissue drains were introduced extravasically both laterally and on the superior surface of the bladder. The patient was completely cured and has had no urinary disturbances during the intervening four years.

**CASE 2**—G. L. T., a cinema director aged 39, first seen Sept. 7, 1920, had had frequent urination, dysuria and occasional gross hematuria with clots for several years. For the past three years he had suffered from pain on the right side low in the flank which became progressively worse. The urine contained albumin, pus and a green streptococcus. Stereocystograms (fig. 2) demonstrated an hourglass bladder, with the upper half set at approximately a right angle forward to the lower half, in just about the same space relation that a normal uterus bears to the vagina.

Study of the kidneys disclosed a pyonephrosis on the right side. Nephrectomy on the right side, to be followed in a few weeks by amputation of the upper segment of the hourglass bladder, was advised and was performed.

Five weeks later ureteral obstruction on the left side had developed, accompanied by pain, tenderness, severe constitutional symptoms and almost complete anuria. The ureter was blocked at its intramural portion owing (as was later discovered) to carcinomatous infiltration.

Feb. 4, 1921, through a perirectus incision the left ureter was transplanted into the skin of the abdomen. The ureter was distended to the size of a thumb above an area of stenosis and contained purulent urine. After the transplantation, the phenolsulfonphthalein output rose rapidly. Three weeks later a



Fig. 9 (case 7)—Diverticulum on right side due to congenital valves.

mass developed which could be easily palpated above the pubis and bimanually with a finger in the rectum. The bladder was occluded at the constricted site of the hourglass and the upper segment filled with exudate, which under pressure periodically discharged into the lower segment. March 8 the upper half of the bladder was resected and found to be grossly carcinomatous, with thick, irregular outgrowths from the mucous membrane, which infiltrated the wall of the upper half of the hourglass and histologically was medullary carcinoma. Seven months later the patient died of carcinomatosis.

CASE 3—C C W, a physician aged 66, first seen Dec 19 1921, with a temperature of 102 F, had had symptoms of prostatism for several years and difficulty in urination for the past ten days, after catheterization and prostatic massage performed elsewhere. The bladder could be felt suprapubically nearly to the umbilicus principally on the right side. The patient himself had suspected for some time that this mass was a hydronephrosis, although it was low. He was hospitalized and the bladder gradually decompressed by an indwelling catheter. December 17 a cystogram (fig 3) was made; the diverticulum apparently was situated anterolaterally. The afternoon temperature remained above 102 F for ten days notwithstanding the use of an indwelling catheter. A mass the size of a goose egg persisted on the right side, although the bladder was kept empty after the first two days. After a rigid examination it was believed that the constitutional symptoms were caused by the retained contents in the diverticulum. Accordingly on the following day suprapubic cystotomy and excision of the diverticulum was performed. The wall of the diverticulum was thick and contained all the coats of the bladder. The sac contained 70 cc of purulent urine and the opening into the bladder was so constricted that it could not drain. The fever promptly subsided and prostatectomy was done one week later. The patient was alive and well four years later.

CASE 4—F P, a man aged 44, seen in consultation with Dr Buie Garstang and Dr Eugene Hoffman had badly infected and ammoniacal urine. The nonprotein nitrogen content was persistently above 50 mg despite drainage with an indwelling catheter for six weeks. The phenolsulfonphthalein output was low and there was a marked lag. He had two large sacs (fig 4) with an estimated capacity of 350 cc each. We felt that a transurethral resection would be fatal and diverticulectomy was absolutely taboo not to mention ureteral transplantation into the sigmoid. We did feel that the patient could survive cystostomy, local infiltration anesthesia being used but this would have resulted in a collapsed bladder with consequent retention and stasis in the diverticula. We agreed that infection in the bladder and diverticula could be cleared up if we sidetracked these structures by means of bilateral extraperitoneal ureterostomy to the skin. As in this operation there is no exposure or handling of any viscus it is practically without shock and no appreciable amount of blood is lost. A small rubber catheter introduced into each ureter up to the renal pelvis draining into a thin-walled pure gum bag keeps the patient dry and is the surest way of eliminating renal infection. This operation was subsequently performed by Drs Garstang and Hoffman with complete relief of the distress.

CASE 5—W T, a man aged 54 consulted his brother who is a physician, because of a painless cystic mass in the abdomen. After palpating and percussing the abdomen the doctor introduced a catheter and withdrew 2,400 cc of clear urine. Cystoscopic and cystographic examination revealed a giant diverticulum (fig 5) and obstruction of the bladder neck.

With local anesthesia and through a suprapubic incision one Pezzer catheter was introduced into the bladder and another into the diverticulum through its wall. Eight days later the diverticulum was excised and the bladder neck resected by means of a cold steel punch. Because of the friability resulting from the preliminary drainage operation there was some difficulty in finding the plane of cleavage. Once it was found, however, there was surprisingly little difficulty in

freeing the sac. The internal sphincter was invaded and replaced by rigid scar tissue and because of its cartilaginous density was resected with difficulty. Microscopic examination of the tissue resected from the bladder neck revealed an almost complete absence of muscle fibers. The patient resumed his occupation in due course but wears a rubber urinal during the daytime because of incontinence.

CASE 6—J M, an attorney aged 64, seen Dec 8, 1919, presented on the right side of the trigon, mesially to the right ureteral meatus a small shallow diverticulum with a relatively large neck, through which the distal wall could be plainly viewed. There were several cellulæ on the left side. Cystographic examination likewise showed only a small diverticulum. The residual urine amounted to 160 cc. The prostate was much hypertrophied. The patient postponed prostatectomy for eighteen months. Cystograms made at intervals during this period showed a gradual increase in the size of the sac. March 20 1921, prostatectomy was performed. Five years later he appeared with two calculi of buckshot size which he had voided. Roentgenographic examination disclosed about twenty calculi of like size but cystoscopic examination showed only two in the bladder. Through a catheter his bladder was distended and he was caused to assume a knee elbow position for a few moments. By this means, most of the calculi escaped into the bladder and were easily removed. Repetition of the procedure enabled us to recover the remaining calculi. After a few months the same sequence occurred. He later made a trip abroad, and on his return he had approximately twenty good-sized calculi in the diverticulum, they were too large to pass through the diverticular opening into the bladder (fig 8). In November 1929 diverticulectomy was performed, after which he had no residual urine until January 1937, when he suffered mild hemiplegia. He now has 25 cc of residual urine. He is 83 years of age.

CASE 7—N W, a boy aged 5½ years who had been treated for enuresis for several weeks in the outpatient department of the Los Angeles County Hospital, gave a history of being unable to void at will, of wetting the bed and of pain in the end of the penis. This condition was sometimes worse and sometimes better but in the last few weeks the enuresis had become markedly worse. The abdomen was of the protruding type but there were no tender areas. Percussion and palpation revealed a distended bladder. A small catheter was passed with difficulty and 450 cc of residual urine was obtained. Cystourethroscopic examination revealed valves in the posterior portion of the urethra, and a cystogram demonstrated a large diverticulum on the right side (fig 9) but no ureteral reflux. The kidney function was low and the patient was suffering from what in effect was prostatism. Drainage was continued for a number of weeks by an indwelling catheter until the kidney function was normal. Feb 2 1926, the bladder was opened suprapubically, the diverticulum freed and excised and the posterior portion of the urethra dilated with a small uterine cervix dilator. Later, when the suprapubic opening became small the remnants of the valves were destroyed by means of high frequency current through a No 16 McCarthy cystourethroscope introduced through the external meatus into the posterior portion of the urethra. The boy made a good recovery, emptied his bladder, had clear urine and in 1927 had more than made up the year in school which he had lost by reason of his illness. This is the only case, so far as we know from the literature available in which diverticulum resulted from congenital valves. This patient now 18 years of age has clear sparkling urine and no residue.

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**Relative Weights of Atoms**—By careful experiments the relative weights of the different atoms have been established, the atom of hydrogen—the lightest of all—being taken as unity. Thus the atom of nitrogen weighs 14 times that of hydrogen, the atom of oxygen 16 times, the carbon atom 12 times. Examples of heavy atoms are platinum 198, gold 199, lead 207, uranium—the heaviest of all—238—Bosanquet W Cecil Meditatio Medici Aldershot Gale & Polden, Ltd, 1937

## LARGE SOLITARY SEROUS CYSTS OF THE KIDNEY

REPORT OF THIRTY-TWO CASES INCLUDING TWO  
CASES CURED BY ASPIRATION AND INSTILLATION  
OF 50 PER CENT DEXTROSE SOLUTION

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Cysts of the kidney vary from microscopic to tumor-like proportions. The cysts with which I am here concerned are solitary cysts which vary from 6 to 28 cm in diameter, contain clear fluid and are situated in or on the parenchyma of the kidney. They have an irregular lining of low cuboidal epithelium and are in no demonstrable way connected with the pelvis, calyx or ureter of the kidney in which they are found. Hemorrhagic, multilocular, hydatid or retention cysts due to obstruction of calices or other pathologic conditions are not considered nor is cystic degeneration of the newborn or polycystic kidney disease.

The historical and literary background of such cysts is interesting. Cystic disease of the kidney was noted 300 years ago, but no clear-cut classification of the various types was made until 1876. In spite of the comparative rarity of the condition, more than 700 men have written about it. Pathologic studies, clinical observations and extensive reviews of the literature form the bulk of the material. Experimental studies

the earlier years, leads one to exclude more than half as not complying with my definition.

The cause of solitary cysts is uncertain. Three outstanding theories, supported by experimental work and embryologic investigation, are current: (1) congenital origin (Kampmeier, 1923), (2) vascular damage plus tubal blockage (Heppler, 1930) and (3) embryonal rests (Latteri, 1930).

Heppler and Latteri have experimentally produced cysts similar to those in man. None of these theories, however, seems to cover all the possibilities, and as it is not my intention to give a detailed discussion of etiology

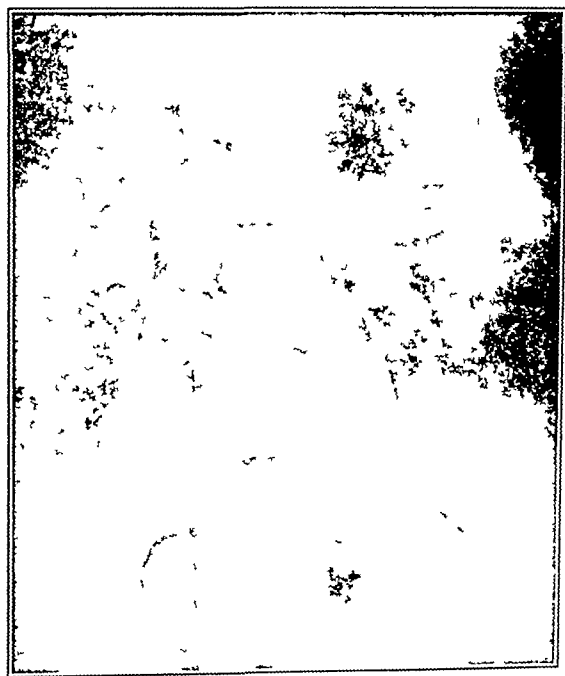


Fig. 1 (case 11)—Bilateral pyelogram showing large cyst in the upper pole of the left kidney with compression and distortion of the calices (Aug. 27, 1934).

make up but a small part. Moreover, although 300 solitary cysts have been reported, careful examination of the reports, particularly of autopsy reports made in

From the Squier Urological Clinic, Presbyterian Hospital, Columbia University.

This series comprises private and ward cases; my colleagues of the clinic allowed me to use their cases.

Read before the Section on Urology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.



Fig. 2 (case 11)—Renal cystogram and pyelogram showing cyst after withdrawal of 360 cc of fluid and injection of air (Sept. 10, 1934). Air injection was for the purpose of determining rate of refilling—not as a diagnostic or therapeutic procedure.

I shall sum up by quoting a physician who, with enlightful but questionable logic, said that "the origin was multiple."

The pathologic anatomy is of interest. The majority of the cysts are closely adherent to, and often partially surrounded by, renal tissue. They are rarely completely lined with epithelium, and when present it is usually of a low cuboidal type. The remainder of the cyst wall is composed of fibrous tissue consisting of several layers of cells, not well supplied with blood vessels, and occasionally calcified. The renal tissue in contact with the cyst wall usually shows atrophic changes or evidence of low grade chronic irritation. The cyst wall is almost without exception densely adherent to the kidney substance, a matter of some importance from the therapeutic standpoint. The content of the cyst is usually a clear amber fluid with a specific gravity of from 1.002 to 1.010. It contains chlorides, albumin, globulin, epithelial cells, a few lymphocytes, leukocytes, and occasionally a few red cells. There may be faint traces of urea. These observations have been reported, and my own corroborate them.

### GENERAL CONSIDERATIONS

**Incidence**—This is extremely variable. For years no solitary cyst may be seen in one locality or clinic, and then unexpectedly a few are encountered. None, for instance, were seen at the Brady Institute of John-

Hopkins Hospital in 12,500 urologic cases up to 1926. My associates and I, on the other hand, observed thirty-two between May 1928 and May 1938. These were encountered in a group of 11,879 urologic cases, in 4,011 of which the involvement was renal.

*Age*—The youngest patient in our series was 19 and the oldest 72. In the literature one finds cases of solitary cyst of the fetus reported, and patients have been as old as 92. The average age in our group was 53, which corresponds with that in other reported series.

*Sex*—The condition has been slightly more common in females than males in previously reported series. In our series the incidence was about equal in the two sexes.

*Site*—The predominant location is the lower pole. Our observations agree with those of other clinicians in this respect. We observed fifteen cysts in the lower

except in one case in which there was marked ptosis of the kidney, were absent.

Three patients themselves noted a mass in the abdomen. Examination revealed a mass in the kidney region or below it in eight other cases. In the remaining twenty-one cases no mass was palpable.



Fig 3 (case 11) —Lateral view of renal cystogram showing slight fluid level.

pole, eight in the upper pole and nine in the central portion of the kidney. The number for the central portion is larger than has been reported elsewhere. Fourteen cysts were found in the right kidney and eighteen in the left. In two cases the involvement was bilateral.

*Size*—The largest cyst in the series contained 10 liters and the smallest approximately 350 cc.

#### SYMPTOMATOLOGY

The duration of the symptoms varied from one day to twenty years. About one half of our thirty-two patients had symptoms referable to the cyst, which is unusual as compared with other reports. The predominant symptom was pain or discomfort on the affected side. Other symptoms were those usually associated with any large abdominal or retroperitoneal mass, i. e. gastrointestinal disturbances of varying degrees. Urinary symptoms directly referable to the cysts,



Fig 4 (case 11) —Normal outline of kidney and expansion of calices (Oct 6 1937). Exploration with an aspirating needle resulted in a dry tap.



Fig 5 —Pyelogram of right kidney showing a tremendous cyst of the lower pole of the kidney and medial displacement of the organ with compression and distortion of the calices (August 1937) the patient was a woman.

#### DIAGNOSIS

In every case in our series there was evidence of disease in the affected kidney. This evidence consisted of (1) change in the outline of the kidney, (2) a smooth,



usually globular, shadow at the top, middle or bottom of the kidney in some cases of less density than the kidney shadow itself, (3) change in shape of the calices in the form of compression or clubbing, and increase in the size of the pelvis, (4) abnormal motility of the kidney (five cases), and (5) change in position of the normal axis of the kidney, or partial rotation

## COMMENT

In view of the foregoing facts, three questions present themselves 1 Can a positive preoperative diagnosis of solitary cyst ever be made? 2 What is the best form of treatment? 3 From what types of surgical procedure may one choose?

According to my experience the answer to the first question is no

Operation is the treatment of choice except when contraindicated by associated disease which makes a

able information as to the rate of refilling of the cysts I used this treatment for the first time in 1934 and for the second time in 1936 Both patients were cured

Excision was used in seventeen of our cases, nephrectomy in ten and aspiration in two In three cases no



Fig 6 (same case as in figure 5)—Renal cystogram and pyelogram showing air filled cyst after withdrawal of 1200 cc of fluid and injection of air (August 1937) After a diagnostic renal cystogram 100 cc of 50 per cent dextrose was injected into the cyst Within a few days the cyst partially refilled in large part because of the action of the dextrose Five hundred cc of fluid was aspirated A dry tap was performed in February 1938

major operation inadvisable Surgical intervention obviates the possibility of mistaken diagnosis and eliminates any risk that an unrecognized tumor in the cyst will be overlooked

The exact procedure to be employed will of course depend on the operative appearances, but in the vast majority of cases simple excision of the free portion of the cyst wall and treatment of the adherent remainder by phenolization or the use of Zenker's solution will be sufficient

When a kidney badly damaged by infection or other pathologic change is encountered, nephrectomy is the obvious procedure

Aspiration, followed by the instillation of a sclerosing material, such as 50 per cent dextrose, gives excellent results when operation is not deemed advisable It brings about immediate relief of pain and in two of our cases resulted in cure Our cases of cyst treated by aspiration are illustrated in figures 1 to 7 and give valu-



Fig 7 (same case as in figures 5 and 6)—Pyelogram of kidney with normal outline of kidney and normal position and expansion of calices (February 1938) Exploration with an aspirating needle resulted in a dry tap



Fig 8—The patient was a woman A few red blood cells were found on routine urinalysis The history was unimportant Pyelograms made at intervals over three months showed no change in the size of the mass at the upper pole or in the outline of the calices At operation a malignant carcinoma was found and nephrectomy was performed

treatment was given, because of the presence of other more serious conditions The nephrectomies were done in the early years of the series With an increasing knowledge of the pathologic process and the clinical progress, they became less frequent

The extreme difficulty of making a preoperative diagnosis is well exemplified by the case illustrated in figure 8, in which the clinical history, roentgenograms and laboratory examination all pointed to the presence of a cyst. Operation disclosed a highly malignant carcinoma of the upper pole of the kidney.

Operation when feasible is indicated and when contraindicated, exploration of the suspected cyst with the aspirating needle through the loin should be done, aspiration offering relief of symptoms, and the possibility of cure should a solitary cyst be found. The danger of spreading a malignant process or producing infection with the aspirating needle is negligible.

### ABSTRACT OF DISCUSSION

ON PAPERS OF DRS DAY AND MARTIN AND DR FISH

DR ALFRED I FOLSOM, Dallas, Texas. A few fundamental matters in handling diverticula are their size, the size of the opening, the infection and the coexistent urethral obstruction.

is generally fibrous. Crenshaw stated the opinion that three women compared to ninety-seven men have diverticula. I have had three patients within the last few years who must have had the diverticula occur within twelve hours previous to reporting, for they gave a history of straining to void, followed by severe pain over the region of the bladder, and the passage of bloody urine. Cystoscopic examination showed blood-stained edematous mucosa surrounding a diverticular opening. A man of 22 was seized during sexual intercourse with a severe pain in the region of the bladder. Morphine gave him no relief. Cystoscopic examination at the hospital showed multiple diverticula, one in the prostatic urethra extending under a prominent median bar. Draining his bladder through the cystoscope gave no relief, and it is interesting that suprapubic cystotomy gave no relief, for he came from under the anesthetic in as much pain as before the bladder was opened. It was noted in draining the bladder suprapubically that the wall had excessive muscular development, and exploration of the different diverticular openings showed the one opening on the right wall of the bladder near the ureteral orifice to grip down like a rectal sphincter when the finger was introduced. I concluded that the diverticulum on that side could not empty

### Summary of Cases

Case	Date	Age	Sex	Site*	Symptoms and Signs	Duration	Treatment	Results
1	1928	50	♀	LC	Frequency and burning not associated with cyst	1 yr	Nephrectomy	Cure
2	1928	58	♀	LLP	Tumor mass in left upper quadrant	3 yr	Nephrectomy	Cure
3	1929	40	♀	LC	Hematuria and dysuria not associated with cyst	1 wk	Nephrectomy	Cure
4	1929	54	♀	LLP	Pain in left lower quadrant due to cyst	1 yr	Nephrectomy	Cure
5	1930	66	♀	LLP	Enlargement of abdomen due to cyst	8 mo	Excision	Cure
6	1930	33	♀	RUP	Hematuria not associated with cyst	8 days	Nephrectomy	Cure
7	1931	59	♀	LLP	Loss in weight	1 yr	Excision	Cure
8	1931	61	♀	RC	Pain in left flank	7 yr	Nephrectomy	Cure
9	1933	55	♀	LLP	Pain in left flank due to cyst		Excision	Cure
10	1934	52	♀	RUP	Pain in right upper quadrant and severe vomiting due to cyst	1 day	Excision	Cure
11	1934	58	♀	LUP	Pain in left upper quadrant due to cyst	1 wk	Aspiration	Cure
12	1935	51	♀	RLP	Dragging down pain in right lower quadrant due to cyst	30 yr	Excision	Cure
13	1935	62	♀	RUP	Hematuria epigastric distress due to cyst	28 yr	Excision	Cure
14	1936	56	♀	RLP	Epigastric pain radiating to back, palpable mass, nausea	10 wk	Excision	Cure
15	1936	51	♀	RLP	Mass in right side	20 yr	Excision	Cure
16	1936	70	♀	RC	Nocturia	23 yr	Nephrectomy	Cure
17	1936	33	♀	LLP	Mass in left side found at examination for attack of grip	8 mo	No treatment	
18	1936	30	♀	RC	Mass noticed dull ache	10 mo	Nephrectomy	Cure
19	1937	60	♀	LLP	Cramping intermittent pain in epigastrium and right upper quadrant	3 days	Nephrectomy	Cure
20	1937	70	♀	LLP	Gastrointestinal upsets with eructation and jaundice	4 mo	No treatment	
21	1937	54	♀	RC	Burning and frequency not associated with cyst	3 mo	Excision	Cure
22	1937	74	♀	RLP	Mass found at routine physical examination		Excision	Cure
23	1937	72	♀	RUP	Pain in right flank due to cyst	7 mo	Aspiration	Cure
24	1937	41	♂	LLP	Severe pain in right groin radiating to the testicle followed by RCVA and low backache	2 yr	Excision	Cure
25	1937	59	♀	RLP	Increase in size of abdomen due to cyst	3 wk	Excision	Cure
26	1937	44	♀	LC	Hematuria following severe LCVA pain one night due to cyst	1 mo	Nephrectomy	Cure
27	1938	69	♀	LUP	Frequency burning and nocturia not associated with cyst	1½ yr	Excision	Cure
28	1938	52	♀	LC	Ache in left flank with postural changes due to cyst	8 mo	Excision	Cure
29	1938	58	♀	LC	Mass in left flank found on routine examination	3 mo	Excision	Cure
30	1938	74	♀	LUP	Pain in left lumbar region due to cyst	1 yr	No treatment	
31	1938	42	♀	LLP	Sense of fullness in left flank due to cyst	2 mo	Excision	Cure
32	1938	50	♀	RUP	Mild gastrointestinal upsets due to cyst	20 yr	Excision	Cure

\* LC = central portion of left kidney. RC = central portion of right kidney. LLP = lower pole of left kidney. RLP = lower pole of right kidney. LUP = upper pole of left kidney. RUP = upper pole of right kidney.

They decide one's course of handling the condition. The wide open rather shallow diverticulum which is frequently seen situated to the left and to the right of the ureteral openings should not be treated. The question of the handling of the ureter in these cases is one of extreme importance. At operation it is well if one can, to identify the ureter before one operates by the passage of a ureteral catheter. The same thing holds true here as with panhysterectomy that one should get close to the pelvic wall and use an indwelling ureteral catheter to prevent damage to the ureter. It not only will do that but will in some cases furnish a clue as to whether the ureter will require treatment in the steps subsequent to diverticulectomy. Where the diverticulum has the ureteral opening in it, transplantation should be done. It is remarkable if this is done carefully and simply with not too much sewing and not too much stitching how sometimes one gets away apparently with murder.

DR T. LEON HOWARD, Denver. Delbert said that diverticula probably had their origin in the bud of a nondeveloped double ureter. Ward expressed the belief that they are congenital, with obstruction of the neck of the bladder. I have never seen a diverticulum without obstruction of the neck of the bladder whether in male or in female, and this obstruction

and was keeping up his pain, for it was over this area that he located his distress. A second operation was done immediately, and this diverticulum was exposed and opened and a permanent drain put in. This gave him permanent relief for at least a pint (475 cc) of serosanguineous fluid was released from a tense diverticular sac. I have encountered diverticula in the bladder in patients of all ages, both male and female but, as stated, have never seen one in which some form of obstruction at the neck of the bladder was not demonstrable. To remove a diverticulum without removing that obstruction, either previous to or at the time of the resection of the sac is only to court trouble and should never be done. Except in rare cases the obstructing cause should be removed first, and it is surprising in how many cases no further surgical measures will be required.

DR THOMAS E. GIBSON, San Francisco. Dr Fish deserves credit for presenting a practical contribution to the treatment of solitary cysts of the kidney, namely their cure by aspiration and injection of a sclerosing solution of 50 per cent dextrose. The members will all agree that this treatment should be reserved for those cases in which surgical intervention is not feasible. Operation obviates the danger not only of mistaken diagnosis but of overlooking possible associated malignant

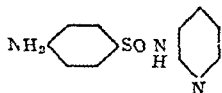
growths either within the cyst or on the kidney itself. Another point of value which Dr Fish emphasized is that in most cases in which surgical measures are used simple excision of the free portion of the wall of the cyst and phenolization of the adherent portion are all that are necessary. Excision of the entire cyst cannot be performed without encroaching on a certain amount of adjacent parenchyma, which may involve troublesome bleeding and require control by mattress sutures. It is important to conserve all renal tissue possible, because the cyst itself may have destroyed from one half to three fourths of the kidney. Sometimes also the wall of the cyst approaches so close to a calyx that total excision may result in opening into it, thereby adding to the surgical problem, so the phenolization of the adjacent sac appeals to me as a good simple plan.

DR ROBERT V. DAY, Los Angeles. The fundamental thing in treatment of diverticula is to remove the obstruction at the neck of the bladder or, as happens occasionally, in the urethra. That is important. I think urologists are neglecting a lot of cases in which operation should be done. If they drain, the amount of drainage depends on the relative size of the cystic sac.

## THE TREATMENT OF PNEUMOCOCCIC INFECTIONS IN INFANTS AND CHILDREN WITH SULFAPYRIDINE

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AND  
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ST. LOUIS

Whitby,<sup>1</sup> in May 1938, reported experiments showing that 2-(*p*-aminobenzenesulfonamido) pyridine (M & B 693, T 693, Dagenan, referred to in this report as sulfapyridine<sup>2</sup>) is chemotherapeutically active in experimental infections in mice against pneumococci of types I, II, III, V, VII, VIII and particularly against types I, VII and VIII, protecting against 10,000 lethal doses of type I. In Whitby's experience, it was the one compound observed to be effective against the pneumococcus in the assessment of more than sixty-four compounds related to sulfanilamide. He reported also that this drug is as effective as sulfanilamide against hemolytic streptococci and meningococci. This compound is a white, crystalline almost tasteless solid, soluble in water at ordinary temperatures to the extent of approximately one part in 1,000. It has the constitutional formula



From the formula, it will be

seen that the compound differs from sulfanilamide in that one hydrogen of the sulfamide group is replaced by a basic pyridine group. Wien<sup>3</sup> investigated the toxicity of sulfapyridine and determined that the average lethal dose for mice and rats was about four times that of sulfanilamide. He showed also that, in contrast

to sulfanilamide, which caused a large increase in the excretion of urinary porphyrin accompanied by a decrease in the red blood cell count and deposition of hemosiderin in the spleen,<sup>4</sup> this drug had no such effect on the hemopoietic system in causing a disturbance in pigment metabolism, even when given in twice and four times the dose of sulfanilamide. He concluded from his observations that this drug was much less toxic than sulfanilamide. Fleming<sup>5</sup> confirmed Whitby's observations in regard to the effectiveness of the drug against pneumococci and hemolytic streptococci. Maegraith and Vollum,<sup>6</sup> in *in vitro* experiments, found the drug to be an efficient bacteriostatic agent against *Streptococcus viridans* in dilutions up to 1 in 60,000, whereas sulfanilamide and "Soluseptazine" were ineffective in dilutions above 1 in 2,000. They reported also the effectiveness of the drug *in vitro* against meningococci and gonococci.

In June 1938, Telling and Oliver<sup>7</sup> reported recovery in a case of massive pneumonia, type III, with massive collapse, treated with the drug. In July 1938, Evans and Gaisford<sup>8</sup> reported 100 cases of lobar pneumonia in which the drug was used and 100 control cases, alternate hospital admissions being chosen for the treated group. By comparison of the temperature curves, the clinical courses, and the mortality rates in the two groups, they concluded that the drug had a definite beneficial effect on the course of the disease. They reported also the use of the drug in forty cases of bronchopneumonia in children. Many clinical reports concerning the use of the drug in pneumonia have appeared in the British literature<sup>9</sup> following these earlier experimental and clinical papers on the use of the drug. Four recoveries from pneumococcal meningitis<sup>10</sup> are reported, as well as satisfactory results in the treatment of gonococcal ophthalmia,<sup>11</sup> gonorrhea,<sup>12</sup> pneumococcal septicemia,<sup>13</sup> staphylococcal septicemia,<sup>14</sup> chronic meningococcal septicemia,<sup>15</sup> intranasal furuncle<sup>16</sup> and pemphigus<sup>17</sup> and clinical improvement with

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16 Dimson S B. Chronic Meningococcal Septicaemia Treated with 2-(*p*-Aminobenzenesulfonamido) Pyridine. *Lancet* 2 424-426 (Aug 20) 1938.

17 Barber H W. Facial Carbuncle Treated with Frontol Album A. Personal Experience. *Lancet* 2 668 670 (Sept 17) 1938.

17 Barber H W. Pemphigus Treated with M & B 693. *Lancet* 2 750 751 (Sept 24) 1938.

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Owing to lack of space this paper is abbreviated in THE JOURNAL by the omission of nine of the protocols. The complete article appears in the authors' reprints.

1 Whitby L E H. Chemotherapy of Pneumococcal and Other Infections with 2-(*p*-Aminobenzenesulfonamido) Pyridine. *Lancet* 1 1210 1212 (May 28) 1938.

2 This name has been recommended by the Council on Pharmacy and Chemistry of the American Medical Association as satisfactorily descriptive of the chemical composition of this drug and meets the approval of Merck & Co. who supplied the material used in this study.

3 Wien R. The Toxicity of 2-(*p*-Aminobenzenesulfonamido) Pyridine, *Quart J Pharm & Pharmacol* 11 217 224 (April June) 1938.

out cure in subacute bacterial endocarditis<sup>18</sup> At the time of this writing, the only report in the American literature of its use is that of Flippin and Pepper,<sup>19</sup> who reported favorable results in the treatment of four cases of lobar pneumonia in adults

Up to the present time we have treated twenty-three hospital patients with sulfapyridine Our reason for reporting on such a small number of cases is that our clinical and laboratory data are confirmatory of the observations and conclusions of the British workers referred to Our series includes fourteen cases of pneumonia, three of which were complicated by the presence of empyema, one being further complicated by purulent pericarditis, four cases of bronchitis, three cases of pneumococcic peritonitis, one case of influenzal meningitis, and one case of subacute bacterial endocarditis (*Streptococcus viridans*) The clinical pictures in each of these patients, with the exception of the two last mentioned, suggested the presence of pneumococcic infections Such an etiology was confirmed by culture in the cases of empyema and those of peritonitis but in only two cases of pneumonia The diagnosis of pneumonia in every case was confirmed by either x-ray or fluoroscopic examination

#### PROTOCOLS

Sulfapyridine was determined in the blood, urine and other biologic fluids by the method of Marshall<sup>20</sup> for the determination of sulfanilamide as modified by Marshall and Litchfield<sup>21</sup> Sulfapyridine replaced sulfanilamide in the standards Methemoglobin was determined by the spectroscopic method described by Wendel<sup>22</sup>

CASE 4—D C, a white boy, aged 5½ years, entered the hospital Nov 23, 1938, with the history of an earache beginning November 18 There were no associated symptoms, however, until the day of admittance, when the patient was found

#### Blood in Case 4

Date	Sulfapyridine Mg per 100 Cc		Methemo- globin per Cent Total Pigment	Red Blood Cells Millions	Hemo- globin Gm per Cent	White Blood Cells
	Free	Total				
11 23 38					13.5	30 300
11 28-38	1.3	3.0	No band seen			

to have a temperature of 40 C (104 F) On admittance he appeared acutely ill, with a temperature of 39.8 C (103.6 F) which rose to 40.1 C (104.2 F) eight hours later Signs of a left otitis media were found, and although there were no abnormal physical signs in the chest a definite shadow was noted in the middle of the lower right lobe both under the fluoroscope and on an x-ray film Three hours after admittance a left myringotomy was done under sedation with sodium propyl methyl-carbonyl allyl barbiturate-Lilly (seconal), and pus was obtained, the culture from which was reported as yielding no growth A blood culture at this time was also reported sterile Ten hours after admittance at which time the temperature was 40.1 C, the patient was given 0.6 Gm of sulfapyridine, followed by 0.6 Gm every four hours Fourteen hours after the initial dose had been given the temperature was 36.8 C (98.2 F) and the patient appeared greatly improved Vomiting, present before and during the first administration of the drug, subsided after the temperature had

become normal X-ray examination November 26 showed complete clearing of the pneumonic consolidation

CASE 5—K B, a white boy aged 5 years, entered the hospital Nov 27, 1938, with the history of fever and cough for six days, accompanied by dyspnea and pain in the chest Twelve hours before admittance he had become extremely cyanotic and almost pulseless, with very irregular respirations Artificial respiration and circulatory stimulants were given, following which he revived somewhat On admittance he was comatose and appeared moribund The temperature was 40.6 C (105.1 F), the pulse rate 156 and the respiration rate 60 Consolidation of the right upper lobe was present One half

#### Blood in Case 5

Date	Sulfapyridine, Mg per 100 Cc		Methemo- globin per Cent Total Pigment	Red Blood Cells Millions	Hemo- globin Gm per Cent	White Blood Cells
	Free	Total				
11 27 38						12 400
11 28-38	5.4	8.3	8	4.76	12.8	11 500
11 29 38	2.0		7			
11 30-38				5.03	12.7	11 300

hour after admittance the patient was given 1.2 Gm of sulfapyridine This dose was repeated at four hour intervals for two more doses, following which the patient received 0.6 Gm every four hours The temperature of 40.8 C (105.4 F) four hours after admittance fell to 37.7 C (99.9 F) twelve hours after the initial dose of the drug, and the patient showed marked general improvement The temperature remained normal until November 30, at which time the drug was discontinued During this time, and for several days following although the physical and fluoroscopic examination of the chest revealed gradual clearing of the pneumonic process, the patient remained listless, irritable and somewhat unresponsive Twelve hours after the drug had been discontinued the temperature rose to 38 C (100.4 F) and ranged between 37.2 C and 38.2 C (99 F and 100.8 F) until December 4, at which time the drug was given again in doses of 0.6 Gm every four hours for three days The temperature then again became normal and remained so Cultures taken from blood and material from the throat on admittance were both reported as yielding no growth

CASE 6—R D, a white boy, aged 16 months, weighing 7.8 Kg, entered the hospital Nov 28 1938, with a history of cough and fever for seven days, associated with dyspnea for three days before admittance On admittance he appeared acutely ill, with a temperature of 40.2 C (104.4 F) and physical and x-ray signs of a lobar pneumonia involving the entire left upper lobe There were also acute otitis media and nasopharyngitis A blood culture grew pneumococcus type XIV Immediately after admittance he was given 0.6 Gm of sulfapyridine and then 0.3 Gm two hours later, repeated every

#### Blood in Case 6

Date	Red Blood Cells Millions	Hemoglobin Gm per Cent	White Blood Cells
11 28-38	4.47	10.0	18 000
11 30 38	4.87	9.7	10 400

four hours Seventeen hours after the initial dose of the drug had been given the temperature had fallen from 40.1 C to 37.6 C (104.2 to 99.7 F) and remained normal thereafter The patient required therapy in an oxygen tent until the fall in temperature The general appearance improved rapidly, and the pneumonic consolidation showed rapid resolution A second x-ray examination December 1 revealed marked clearing of the involved area

CASE 8—R L, a white boy aged 7 years weighing 20 Kg, entered the hospital Dec 1, 1938 with the history of an illness beginning November 23 with rhinitis and cough November 26, five days before admittance, he began to complain of earache and fever, and there was an increase in the severity of the cough On admittance the patient appeared only moderately ill, but the respiratory rate was rapid and the temperature 39.5 C (103 F) There was a purulent discharge from

18 Whitty I E H Chemotherapy of Bacterial Infections Lancet 2 1095 1103 (Nov. 12) 1938

19 Flippin H F and Pepper D S The Use of 2 (p-Aminobenzene sulfonamido) Pyridine in the Treatment of Pneumonia A Preliminary Report Am J M Sc 196 509 513 (Oct) 1938

20 Marshall E K Jr Determination of Sulfanilamide in Blood and Urine Proc Soc. Exper Biol & Med 36 422-424 (April) 1937

21 Marshall E K Jr and Litchfield J T Jr The Determination of Sulfanilamide Science 88 85 83 (July 22) 1938

22 Wendel W B Methemoglobin Determination J Lab & Clin Med 24 96 101 (Oct) 1938

both ear drums, which were dull and full, and there were physical and fluoroscopic signs of a lobar pneumonia involving the right lower lobe. *Pneumococcus* type III was recovered from the aural discharge, but no pneumococci were recovered on culture from material from the throat or the blood stream.

Blood in Case 8

Date	Sulfapyridine, Mg per 100 Cc		Methemo- globin, per Cent Total Pigment	Red Blood Cells Millions	Hemo- globin Gm per Cent	White Blood Cells
	Free	Total				
12 1-38				4.93		24,000
12 2-38	7.0	7.0	7	4.48	13.9	26,700
12 3-38	6.2	7.4	14			
12 4-38	6.0	7.2	13			
12 5-38	8.1		13	5.33	14.0	9,900
12 7-38	5.6		8	5.96	13.0	11,300
12 9-38	7.0			4.39	12.2	7,600
12 12-38	Trace	Trace				

56 hrs after last dose  
of drug

On December 1 the patient was given 12 Gm of sulfapyridine as an initial dose, followed by 0.6 Gm every four hours. Fifteen hours after the initial dose of the drug the temperature had risen to 40 C (104 F), but eight hours later it was 38 C (100.4 F), following which it soon became and remained normal. December 3 an x-ray film still showed complete opacity of the right lower lobe of the lung. Immediately after the fall in temperature, however, the patient showed general improvement, and December 6 the chest appeared clear on fluoroscopy. The drug was discontinued December 10, after which the temperature continued to be normal.

CASE 9—J. D., a white boy, aged 29 months, weighing 12.3 Kg, entered the hospital Dec. 3, 1938, with the history of earache four days before admittance. On the day before he was brought to the hospital fever, cough and dyspnea had rather suddenly developed. The day of admittance he had become considerably more prostrated. On admittance he was listless, dyspneic, slightly cyanotic and quite prostrated with

Blood in Case 9

Date	Sulfapyridine, Mg per 100 Cc		Methemo- globin per Cent Total Pigment	Red Blood Cells, Millions	Hemo- globin Gm per Cent	White Blood Cells
	Free	Total				
12 3-38				5.19	13.0	31,000
12 4-38	9.0		3			
12 5-38	5.0	6.7	11	4.60	12.1	28,000
12 6-38	2.1	3.5	No band seen	4.59	12.1	37,000
12 7-38	2.6		No band seen			
12 8-38	4.6		8			
12 9-38	5.1			4.28	11.0	29,900
12 10-38	4.8		14			
12 12-38	5.9		12	3.13	11.6	6,700
12 13-38	4.2		10			
12 14-38	3.5	5.4	8	3.92	11.2	7,900

a temperature of 39.8 C (103.6 F). Examination revealed a perforation of the right ear drum and there were both physical and fluoroscopic signs of lobar pneumonia involving the right upper lobe. December 3 the patient was given two doses of 0.3 Gm of sulfapyridine four hours apart. He then received a single dose of 0.6 Gm, which was followed by 0.3 Gm every four hours. The temperature of 40.6 C (105 F), present when the first dose of the drug was given, fell to 37 C (98.6 F) twenty-six hours later. The patient continued to look quite toxic, however, and after the temperature had been normal for fourteen hours it again rose to 38.4 C (101.1 F) and remained between 38 C and 40 C (100.4 and 104 F) until December 7. December 5 a bilateral myringotomy was done and gram-positive, encapsulated diplococci were seen, but no organisms were recovered on culture. *Pneumococcus* type XIV had been recovered from the blood stream of R. D. (case 6), the brother of this patient. Throughout the period of temperature elevation subsequent to the initial fall the patient continued to appear pneumonic, and the physical signs persisted. December 7 the dosage of sulfapyridine was increased to 0.6 Gm every four hours, and six hours later the tempera-

ture, previously 39.4 C (102.9 F), was again normal for the first time since the initial fall. December 8 the temperature again rose sharply to 40.2 C (104.4 F), following which it became and remained normal, and the patient showed marked clinical improvement, and resolution of the pneumonic process occurred.

CASE 10—J. B., a white boy, aged 8 years, weighing 21.8 Kg, entered the hospital Dec. 13, 1938, with the history of a slight cold which developed December 9, with no associated symptoms, however, until December 11, at which time he began to complain of pain in the chest and headache. These symptoms were followed by a rise in temperature and dyspnea, and December 12 he had a severe chill. He became more dyspneic and finally became semistuporous and irrational. On admittance he looked acutely ill, with a temperature of 39.8 C (103.4 F), and showed marked prostration and moderate dyspnea. Physical and fluoroscopic signs of lobar pneumonia involving the right middle lobe were present. Culture of material taken from the larynx by direct laryngoscopy on the night of admittance grew *pneumococcus* type I. Blood cultures December 13 and 14 were sterile. An x-ray film of the chest taken December 14 showed complete opacity of the right upper lobe. On this day the patient was started on sulfa-

Blood in Case 10

Date	Sulfapyridine, Mg per 100 Cc		Methemo- globin, per Cent Total Pigment	Red Blood Cells Millions	Hemo- globin Gm per Cent	White Blood Cells
	Free	Total				
12 14-38	7.1		4	4.07	12.0	16,000
12 15-38	12.0		9			
12 16-38	14.3	20.0	15	4.19	12.0	8,900
12 17-38	14.9		15			
12 19-38	6.4	7.9	14	4.19	12.4	7,600
12 20-38	1.5	1.9	5			

pyridine, receiving two doses of 12 Gm three hours apart, followed by 0.6 Gm every four hours. The temperature, which at the beginning of the treatment was 40.5 C (104.9 F) fell to 37.8 C (100 F) twenty-six hours after the initial dose had been given and remained normal after this time. With the fall in temperature there was rapid clinical improvement and prompt resolution of the pulmonary changes. A cutaneous test made with specific soluble substance of *pneumococcus* type I showed only a slight erythema. December 15 but there was a definitely positive reaction with wheal formation December 18.

During the first two days of drug therapy the patient exhibited rather marked mental symptoms with gross disorientation and restlessness, but these subsided although the drug was continued in the same dosage.

CASE 14—M. B., a white girl, aged 6 weeks, weighing 4.2 Kg, entered the hospital Dec. 4, 1938, with the history of rhinitis, cough and fever beginning December 2. December 4 there was progressively increasing dyspnea, and on the morning of admittance she had become cyanotic. On admittance she looked almost moribund. Cheyne-Stokes respiration was present, and the pulse was rapid and weak. The temperature was 38.4 C (101.1 F). There were fine rales throughout.

Blood in Case 14

Date	Sulfapyridine, Mg per 100 Cc		Methemo- globin per Cent Total Pigment	Red Blood Cells Millions	Hemo- globin Gm per Cent	White Blood Cells
	Free	Total				
12 4-38				4.50	14.0	20,000
12 9-38	10.5		32			

After methylene blue  
6

both lung fields. The right ear drum was full and bulging. The patient was placed in an oxygen tent immediately and given stimulants. A myringotomy was done, the smear from which showed gram-positive encapsulated diplococci, identified later on culture as *pneumococcus* type XIX. December 5 the patient was given an initial dose of 0.3 Gm of sulfapyridine, followed by 0.15 Gm every four hours. The temperature was

within normal limits when the drug was started and, except for a rise to 38.5 C (101.3 F) December 7, did not become elevated. By this day, the patient had shown marked improvement with clearing of the pulmonary condition. December 9 there was again very marked cyanosis, and the concentration of methemoglobin was found to be 32 per cent of the total pigment. The cyanosis almost completely disappeared shortly after the intravenous administration of methylene blue. The drug was discontinued December 13.

CASE 17—L. S., a white girl, aged 5 years, weighing 17 Kg., entered the hospital Nov. 13, 1938, with a history of fever and vomiting since November 3, associated with cough and rapid respirations since November 6. There had been no period of clinical improvement during the course of the illness. On admittance the patient was acutely ill, with a temperature of 40 C (104 F). There was marked dyspnea and some cyanosis, and there were physical and fluoroscopic signs of lobar pneumonia involving the right upper lobe. The patient was given 12 Gm of sulfapyridine four hours after admittance, followed by 0.6 Gm every four hours. After four hours the temperature was 37.6 C (99.7 F) and four hours later 37.2 C (99 F), and the patient showed marked clinical improvement. There was then an elevation of the temperature to 38.6 C (101.5 F) during the next twelve hours, following which it became and remained normal until November 21. The drug was continued in the same dosage until November 18, at which time it was discontinued. During the period of administration of the drug the patient appeared clinically much improved, although the physical signs in the chest persisted. November 21 there were physical and x-ray signs indicating encapsulated accumulation of fluid, and on thoracentesis 60 cc of thick fluid was obtained, the culture from which showed pneumococcus type I. On this day, three days after the drug had been discontinued, elevation of the temperature again occurred, and the patient began to have daily spikes up to 39.4 C (102.9 F). November 25 sulfapyridine was again started in dosage of 0.6 Gm every four hours. The next day thoracostomy with

CASE 18—H. R., a white boy, aged 10 years, weighing 24.4 Kg., entered the hospital Nov. 23, 1938, with the history of an illness diagnosed as lobar pneumonia which began eighteen days before admittance. The symptoms had continued for twelve days, following which the temperature was normal for five days and the patient somewhat improved. The cough, however, continued, and he still appeared ill. On the day of admittance the temperature rose to 38.9 C, the cough became

Blood in Case 18

Date	Sulfapyridine Mg per 100 Cc		Methemo- globin per Cent Total Pigment	Red Blood Cells Millions	Hemo- globin Gm per Cent	White Blood Cells
	Free	Total				
11 23 38						
11 24 38	3.6	4.0	<4	5.03	13.5	20,400
11 26 38	4.2	4.7	4	4.35	13.0	14,400
11 28 38	5.6		10	4.52	12.7	11,700
11 29 38	8.3		9	4.47	12.1	
12 1 38	7.2		7	4.18	13.0	7,400
12 2 38	6.0	6.3	7	4.41	12.9	14,700
12 3 38	8.3	9.4	8			
12 5 38	7.7			4.13	12.0	8,100
12 7 38	9.0		8	3.61	12.0	4,800
12 8 38						10,000
12 9 38	1.7	22.5 hrs. after last dose of drug				

more severe and he seemed generally worse. On admittance he looked moderately ill. The temperature was 39 C (102.2 F), the pulse 120 and the respiratory rate 36. Physical examination and fluoroscopy revealed the presence of unresolved pneumonia in the left upper lobe of the lung and a greatly enlarged pear-shaped heart shadow. A pericardial tap was made soon after admittance, and thick pus was obtained which on direct smear showed gram-positive encapsulated diplococci, the culture from which was later reported as sterile. Immediately after the diagnostic pericardial tap the patient was given 0.6 Gm of sulfapyridine, which was followed by 0.6 Gm every four hours and was continued until November 24, on which day operation was done for drainage of the pericardial empyema. Pus was obtained at operation, the culture from which was reported as pneumococcus type I. The temperature of 39 C on admittance and at the time the drug was started had fallen to 37.5 C (99.5 F) twenty hours later, at which time the operation was done. The drug was started again November 25 and the patient received 0.6 Gm every four hours until December 8. On the first day after operation the temperature rose to 38.6 C (101.5 F), after which it became and remained within normal limits until December 4, and then daily spikes to 39.5 C (103 F) occurred for two days. Following this, the temperature again became normal and the patient showed marked clinical improvement.

During a period of six days, beginning two days after administration of the drug was started, he excreted in the urine from 1.7 to 2.5 Gm a day, with a total of 12.1 Gm during which time he received a total of 21.6 Gm of sulfapyridine (3.6 Gm daily). The excretion during the period amounted to 56 per cent of the quantity administered. From 51 to 61 per cent of the drug appearing in the urine was present in the free form.

CASE 19—D. R., a white boy, aged 3 years, weighing 16 Kg., entered the hospital Oct. 22, 1938, with the history of puffiness of the eyelids first noticed eight weeks before admittance, associated during the two weeks prior to admittance with swelling of the abdomen, edema of the ankles and decreased urinary output. There had been no known preceding infection, and the patient had eaten and felt well throughout the course of the illness. Examination on admittance revealed no evidence of active infection, there was generalized edema with ascites. The urine contained much protein many red blood cells, white blood cells and casts. The blood showed no retention of nitrogen but markedly lowered serum protein values, particularly the albumin fraction, and the patient was considered to be in the chronic active stage of glomerulonephritis with nephrotic tendency. There was no hypertension. For the first eight days in the hospital the patient gained weight slowly and began to eat poorly. Because of the gradually increasing ascites

Blood in Case 17

Date	Sulfapyridine Mg per 100 Cc		Methemo- globin per Cent Total Pigment	Chest Fluid Sulfa- pyridine Mg per 100 Cc	Red Blood Cells Millions	Hemo- globin Gm per Cent	White Blood Cells
	Free	Total					
11 14 38					3.96	11.0	26,100
11 15 38	9.5	11.9					
11 16 38	9.4				3.24	9.0	20,000
11 17 38	11.9						
11 18 38	6.5				3.68	9.5	21,800
11 21 38	Trace			2.0	3.13	8.5	20,000
11 22 38							
11 24 38					5.04		10,500
11 26 38					4.09	9.8	10,500
11 27 38	5.0	5.8					
11 27 38	7.2	7.3					
11 28 38	6.0	6.1	Less than 5		2.91	9.2	8,600
11 29 38	11.1		10				
11 30 38					3.29	8.9	6,600
12 1 38	6.7		8				
12 2 38					3.36	10.4	14,000
12 3 38	14.3	14.9	16				
12 5 38	10.2	11.0	14		2.89	8.5	31,100
12 7 38	7.0		No band seen				

drainage of the empyema was done. The temperature rose sharply again on the following day and then became and remained normal. The drug was continued in the foregoing dosage until December 7 and then was again discontinued, and the patient appeared practically well.

During a period of four days, beginning four days after administration of the drug was resumed she excreted in the urine from 1.6 to 2.4 Gm a day, with a total of 7.8 Gm of sulfapyridine during which time she received 14.4 Gm (3.6 Gm a day), the excretion amounting to 54 per cent of that administered. From 61 to 71 per cent of the drug appearing in the urine was present in the free form.



abdominal paracentesis was done October 30 and 250 cc of clear fluid was removed which contained no cells and the culture from which was reported as no growth. The following day, October 31, the patient began to complain of abdominal pain, and the temperature, previously normal, rose to 39 C (102.2 F) and four hours later to 40.3 C (104.5 F). An abdominal paracentesis was immediately done, which yielded cloudy fluid containing many polymorphonuclear cells, the culture from which on the

#### Blood in Case 19

Date	Sulfapyridine Mg per 100 Cc		Methemo- globin per Cent	Asclitic Fluid Sulfapyridine Mg per 100 Cc		Red Blood Cells Millions	Hemo- globin Gm per Cent	White Blood Cells
	Free	Total		Free	Total			
10 23 38						4 18	11 4	8 400
11 1 38	0 9	1 6	No band seen	0 9	1 5			
11 2 38	5 3	7 3	No band seen	5 8	7 7	3 41	11 8	13 700
11 3-38	9 4	12 7	0	8 3	13 9	3 48	11 6	10 400
11 7 38	5 2	8 2	13			4 00	12 0	9 100
11 9 38						4 97	12 4	12 200

following day showed type XV pneumococci. A blood culture taken at this time also grew type XV pneumococcus. Although no organisms could be seen on smear at the time of the paracentesis, two hours after the elevation of temperature the patient was started on sulfapyridine, being given 0.6 Gm as an initial dose, followed by 0.3 Gm every three hours. Six hours after the initial dose the temperature had fallen to 38.4 C (101.1 F) and eight hours later was 37.6 C (99.7 F). Culture of material taken from the throat the day of onset showed a pneumococcus which was not of the same type as that recovered from the ascitic fluid and blood. Cultures of the blood and ascitic fluid on November 1 were again reported as positive for type XV pneumococci. On this day the dose of the drug was increased to 0.3 Gm every two hours (0.22 Gm per kilogram in twenty-four hours). During the day the temperature rose to 38.6 C (101.5 F) for a period of twelve hours, following which it became and remained normal. The patient showed marked clinical improvement within fourteen hours after the drug had been started. The blood and ascitic fluid were both sterile November 2 and 3, on the latter day the ascitic fluid being again clear.

CASE 20—F F, a white girl, aged 6 years, weighing 24.2 Kg, entered the hospital Dec 2, 1938, with the history of having been well until November 22, at which time puffiness of the lids was noted. This was followed by gradually increasing generalized edema, with ascites also, during the last three days preceding admittance. The urinary output had been decreased

#### Blood in Case 20

Date	Sulfapyridine Mg per 100 Cc		Methemo- globin per Cent Total	Red Blood Cells Millions	Hemo- globin Gm per Cent	White Blood Cells	Blood Cultures
	Free	Total					
12 2 38	1 0		No band seen	4 76	15 5	38 800	Positive
12 3 38	6 5		No band seen	4 33	12 0	18 300	Negative
	6 8	7 1	Less than 3				
12 4 38	10 5	10 9	Less than 3				
12 5-38	14 1		11	4 43	15 3	11 900	Negative
12 6-38	14 9	10 2	20				
12 7 38	11 5		27	4 82	15 0	20 000	
12 8-38	8 1	9 3	16	4 60	14 5		
12 9 38				4 19	14 0	19 100	
12 10-38	8 0	8 8	16				
12 12 38	6 3	7 5	13				
12 13 38	6 7	7 4	11				
12-14 38	5 5		8				
12 16 38	9 2	10 1	6				
12 20-38	5 2		No band seen				

Twelve hours before admittance the temperature had been taken and was said to have been normal. On admittance the patient, while not acutely ill, had a temperature of 38.8 C (101.8 F). Generalized edema, moderate injection of the tonsils and posterior pharynx and tenderness over the right kidney region were noted. The urine contained much protein occasional red blood cells, white blood cells and many casts. There was no hypertension. Serum proteins were markedly decreased, particularly the albumin fraction, there was no retention of nitrogen. Fifteen

hours after admittance the temperature had risen to 39.8 C (103.6 F) and a blotchy, morbilliform rash was noted over the right side of the abdomen, with cutaneous hyperesthesia and some deep abdominal tenderness. At this time an abdominal paracentesis was done, which yielded 100 cc of grossly clouded fluid, which contained leukocytes and from which pneumococcus type XXIII was recovered on culture. Cultures of material from the nose, throat and blood stream all yielded the same organism. Immediately after the paracentesis sulfapyridine was given in doses of 1.2 Gm at two hour intervals for the first three doses, followed by 0.6 Gm every four hours for four doses, after which it was increased to 1.2 Gm every four hours. During the first twenty-four hours after the initial dose the temperature remained markedly elevated, and the patient appeared acutely ill and toxic. There was severe abdominal pain. The pulse rate was very rapid and the quality poor. An erysipeloid eruption appeared on the abdomen and spread down to the thighs. After twenty-four hours the patient was given 100,000 units of broad coverage (DRI) antipneumococcus rabbit serum, and on the following day an additional 60,000 units was given. The patient received blood transfusions also on these days. The temperature remained elevated and the child remained critically ill until December 5, at which time the temperature became normal and she seemed somewhat improved. The temperature remained within normal limits after the fall December 5, on which day the dosage of the drug was reduced to 0.6 Gm every four hours. December 6 the patient began to have marked distention with severe vomiting and gastric distress. These symptoms were relieved by continuous duodenal suction, and she then showed marked clinical improvement. While the large doses of the drug were being given cyanosis developed, which disappeared with the intravenous administration of methylene blue.

CASE 21—D V, a white girl, aged 10 years, weighing 30 Kg, entered the hospital Dec 7, 1938, with the history of having had abdominal pain for four days. She went to school December 5,

#### Blood in Case 21

Date	Sulfapyridine Mg per 100 Cc		Methemo- globin per Cent Total	Red Blood Cells Millions	Hemo- globin Gm per Cent	White Blood Cells	Blood Cultures
	Free	Total					
12 8 38				3 63		22,500	Positive
12 9 38	5 9			3 49	11 0	27,800	Positive
12 10-38	10 9		8			14 100	
12 11 38						13 600	
12 12 38	12 5	18 5	13	4 05	12 0		
12 13 38	10 5		13				
12 14 38	4 8	7 2	No band seen				
12 15-38	0 0	1 0	46 hrs after last dose of drug				

but that evening the pain became more severe, she had begun to have fever, and there was some nausea. December 6 she became definitely worse, first vomiting and then severe diarrhea developed. On admittance she appeared very ill, she was quite toxic and dehydrated, with a temperature of 40 C (104 F) and a pulse rate of 160. There was tenderness in the lower part of the abdomen and some resistance, and exquisite tenderness was elicited on rectal examination. She was given fluids parenterally and on the following morning, December 8, appeared generally better, but the abdominal tenderness had become more marked, there was also definite rigidity of the lower part of the abdomen, more marked on the right side. An exploratory laparotomy was done, at which time peritonitis was found with a large amount of thick pus in the pelvis. This was evacuated and the appendix, which was found to be intact, was removed. Smear of the pus revealed gram positive encapsulated diplococci. On this day a blood culture taken the day previously was reported positive for pneumococcus type I, this organism was also recovered from pus obtained at operation. December 8, immediately following operation, the patient was given three doses of 1.8 Gm each of sulfapyridine in a period of seven hours, followed by 0.9 Gm every four hours. The temperature of 40.6 C (105.1 F) at the time the drug was started fell to 37.8 C (100 F) eleven hours later and after a single rise on the following day to 38.5 C (101.3 F) became normal. The signs of toxicity were greatly alleviated after the fall in temperature, the abdomen became soft with but very slight tenderness, and the amount of drain age from the wound rapidly diminished during the next five days. The drug was discontinued December 13, at which time

the patient appeared quite well. The temperature remained normal until the evening of December 15, at which time it again became elevated and ranged between 37 C and 39 C (98.6 and 102.2 F) until December 20, when it rose to 40.6 C. During this time the patient continued to feel fairly well, but December 18 she complained of some abdominal cramping, and a rectal examination at this time revealed a large, tender mass in the culdesac. December 20 the patient was again given sulfapyridine, starting with an initial dose of 18 Gm, followed by 0.9 Gm every four hours. December 21 the temperature continued to remain elevated, and incision and drainage of the culdesac abscess through the vagina was done, approximately 500 cc of pus being obtained, the culture from which grew pneumococcus type I.

CASE 22—P. H., a white girl, aged 11 years, weighing 23.6 Kg, who was known to have subacute bacterial endocarditis, reentered the hospital Dec. 9, 1938, for sulfapyridine therapy. She had first been seen by us July 11, 1938, at which time she gave a history of having had intermittent attacks of migratory polyarthritides and palpitation and dyspnea on exertion for five years and anorexia with loss of weight and strength for three months. On physical examination at that time the child was moderately emaciated, thin and pale and looked chronically ill. The outstanding physical changes were a markedly enlarged heart with signs of advanced mitral stenosis and an enlarged spleen, palpable 3 cm below the left costal margin. During that hospital stay she had an intermittent fever (37-39 C or 98.6-102.2 F). Blood cultures taken July 12, 14, 17, 19 and 22 all

#### Blood in Case 22

Date	Sulfapyridine Mg per 100 Cc		Methemo- globin per Cent Total Pigment	Red Blood Cells Millions	Hemo- globin Gm per Cent	White Blood Cells
	Free	Total				
12 10 38				4.19	11.4	10,600
12 16 38	13.3 (serum)			3.89	10.0	7,900
12 17 38	12.8	19.2	No band seen	4.34	10.8	7,500
12 18 38	12.9	14.3	No band seen	3.89	11.0	8,100
12 19 38	10.3	12.8	No band seen	4.43	11.0	13,200
12 21 38	10.1	11.5	No band seen	4.26	10.8	9,300

grew *Streptococcus viridans*. The patient was discharged July 22 as unimproved, with the diagnosis of subacute bacterial endocarditis engrafted on a rheumatic heart lesion. During the interval between this discharge and the present admission the patient had had intermittent periods of elevation of temperature up to 39 C (102.2 F), which usually lasted for from six to seven days, following which she was apparently afebrile for from seven to ten days, although the periods and intervals occurred with no definite regularity. During the periods of elevation of temperature the patient ate poorly, had considerable malaise and remained inactive. During the intervals also her appetite was also poor, but she enjoyed a certain amount of limited activity, which included short walks and automobile rides. At no time had she been completely bedridden. The patient had had two mild attacks of joint pains. She had lost 4 pounds (1.8 Kg). On the present admission she presented a picture similar to that already described but appeared more emaciated. During the first six days in the hospital she had regular daily elevations of temperature to 39 C, the temperature becoming normal between the spikes. Blood cultures December 9, 11, 13 and 14 were all positive for *Streptococcus viridans*. Those taken December 10 and 12 yielded *Staphylococcus aureus*, which was believed to be a contaminant, since the organism did not ferment mannite. December 15, at 10:30 a.m., the patient was given 18 Gm of sulfapyridine, followed by 18 Gm at 12 noon and 0.9 Gm every four hours beginning at 2 p.m. The blood culture taken at 4:30 p.m. December 15 and daily blood cultures taken until December 21 have all been sterile. During this time there has been no elevation of the temperature, and, except for some mild nausea and vomiting during the first twenty-four hours of treatment, the patient has felt and appeared definitely improved generally. December 18 the dosage of the drug was decreased from 0.9 to 0.6 Gm every four hours.

CASE 23—H. G., a white boy, aged 10 months, weighing 8.6 Kg, entered the hospital Aug. 28, 1938, with the history of stupor and fever of four days duration. The diagnosis of influenza meningitis was established at this time, and during the next fifty-two days the patient was treated with anti-

influenza serum, sulfanilamide and prontosil (the disodium salt of 4-sulfamido-phenyl-2'-azo-7'-acetyl-amino-1'-hydroxynaphthalene-3',6'-disulfonic acid), given by all suitable routes until the time at which sulfapyridine was tried. The patient throughout this time had shown several periods of improvement, but the cultures of the spinal fluid still showed growths of *Haemophilus influenzae*. October 18 the patient was given 0.6 Gm of sulfa-

#### Blood in Case 23

Date	Sulfapyridine Mg per 100 Cc		Methemo- globin per Cent Total Pigment	Spinal Fluid Sulfapyridine Mg per 100 Cc		Red Blood Cells Millions	White Blood Cells
	Free	Total		Free	Total		
10-20-38	6.5						
10-21-38	6.2	6.7					
10-22-38	7.0	7.3					
10-23-38	4.9	4.9		3.2	3.3		
10-24-38	7.0	8.1		5.1	5.3		
10-25-38	4.0		12	3.7	3.7		
10-26-38	6.2		13	4.0			
10-27-38	4.9			3.7	5.3	4.79	16,200
10-28-38	7.5	7.5		6.9	6.9		
10-29-38	6.2			5.4	5.4		
10-30-38	5.1	6.3		4.3	4.3		
10-31-38	4.0	4.5	18	3.8	4.0		
11-1-38	3.4	4.0	16	3.1	3.1	4.60	27,000
11-2-38	3.1		19	1.9	1.9		

pyridine as an initial dose, followed by 0.3 Gm every four hours. This dosage was continued for sixteen days until November 2, during which time the patient received a total of 30 Gm of the drug. There was no demonstrable effect of the drug on the clinical course of the disease or on the bacteriologic picture.

#### COMMENT

As soon as we were assured of an adequate and uninterrupted supply of sulfapyridine for investigative purposes it seemed best to us for several reasons to attempt no selection of cases but instead to treat with the drug as soon as possible without waiting for reports on cultures all cases of infections of the lower part of the respiratory tract, on the assumption that most of them would prove to be pneumococcal in origin. The almost certain advantages of early treatment would in this way not be denied any patient, and

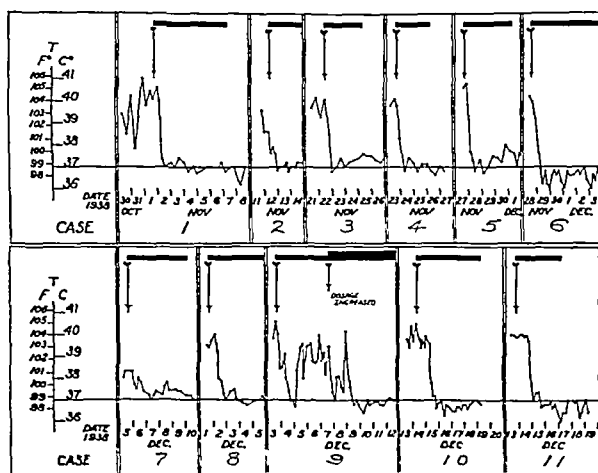


Chart 1—Relationship of fall in temperature to administration of sulfapyridine in cases of pneumonia

for this reason also it was decided not to attempt to secure a "control" group of untreated cases, as might have been done if, for instance, we had selected for treatment only alternate cases. We were anxious also to observe the effects of treatment in as many cases as possible throughout the entire winter season to note whether any substantial difference in response occurred

as the winter progressed and the incidence and severity of "secondary" pneumonias increased. The fact that St Louis was one of the cities selected by the U S Public Health Service for the study of type incidence and serum (horse) therapy and that a special study of the value of immune rabbit serum therapy was being conducted simultaneously by the Department of Internal Medicine of the Washington University School of Medicine also contributed to our decision to confine our study largely to sulfapyridine. At a later date, therefore, we should be able to compare results of different methods of treatment of essentially similar infections. Our observations in this preliminary report should be considered only as indicative of what might be expected from this new drug.

CLINICAL RESULTS

**Uncomplicated Pneumonia**—The difficulty in demonstrating the efficacy of any therapeutic agent in primary pneumonia of the lobar type is apparent. The low mortality of this disease in children, usually quoted as from 3 to 5 per cent, is well known, and other criteria by which types of therapy can be judged are difficult to evaluate. The temperature curves of the patients treated with the drug are shown in chart 1. The possibility cannot be eliminated that the dramatic fall in temperature, which, as can be seen, has occurred in every case of pneumonia thus far coming under treatment with the drug within twenty-eight hours after the initial dose, might have been due to a spontaneous crisis. Each one has occurred at a time when a spontaneous crisis might have been expected, and it is certainly not unusual for the crisis to occur within the first twenty-four hours after the patient enters the hospital, since the increased toxicity developing prior to the crisis is often the very reason that the patient is brought to the hospital. Nevertheless, a mere inspection of statistics relative to the day of crisis in lobar pneumonia<sup>23</sup> would make it most unexpected even in only eleven cases for this to occur so regularly, and if it is found to occur in a much larger number of cases more substantial importance may be attributed to it. Evans and Gaisford state

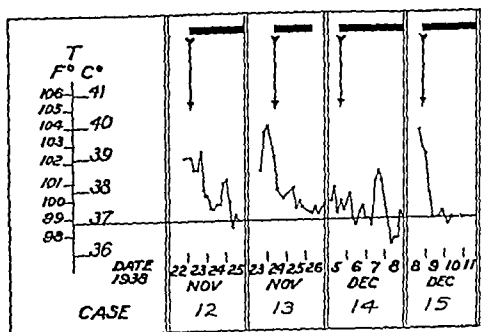


Chart 2—Relationship of fall in temperature to administration of sulfapyridine in cases of bronchitis

that in adults the clinical improvement after the fall in temperature in patients treated with the drug is more gradual than in those in whom a spontaneous crisis occurs, but in our experience the fall in temperature is followed by as rapid clinical improvement as we are accustomed to see in untreated cases. In only one case did the temperature again become elevated after the initial fall during the time that administration of the

drug was continued. In this case (case 9) both the physical signs and the clinical appearance of the patient suggested a continuation of the pneumonic process and were quite typical of pneumococcic lobar pneumonia, although the organism responsible for the infection was not recovered. It may be that we were dealing with a type of pneumococcus less susceptible to the action of the drug, although type XIV pneumococcus was cul-

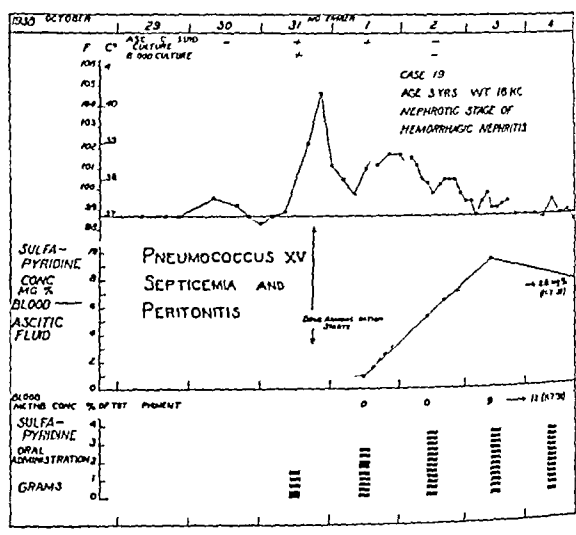


Chart 3 (case 19)—Recovery from pneumococcic septicemia and peritonitis with sulfapyridine alone

tured from the blood stream of the brother of this patient, who was in the hospital at the same time and whose course was similar to those of the other patients treated. Another possibility which suggests itself from the blood concentrations of the drug is that the dosage was inadequate, since the initial fall in temperature occurred when the blood concentration was 9 mg per hundred cubic centimeters, the blood concentration during the later rise of temperature being 53 and 20 mg, the second fall in temperature occurred promptly after the dosage was increased.

**Pneumonia with Empyema**—Two of the cases of pneumonia which were complicated by empyema are particularly interesting in regard to the bacteriologic data obtained. Both of these were due to type I pneumococcus, and in both there were signs of the presence of empyema before the drug therapy was started. In case 16, particularly, it was interesting that, in spite of the fall in temperature, the decreased toxicity and the general improvement of the patient, the collection of fluid in the pleural cavity seemed to continue unabated, the fluid appeared to thicken more slowly than usual and the cultures from it remained positive, as did those also in case 17. Resections of ribs with open drainage of the empyema were done in both cases, and the patients made uneventful recoveries.

**Pneumonia with Pericarditis**—This was also due to the type I pneumococcus. The clinical course of the case was satisfactory, but the role of the drug therapy was difficult to evaluate.

**Bronchitis**—Four cases of bronchitis were selected for sulfapyridine therapy because of the probability of their being due to a pneumococcic infection either (as in case 13) because of contact with a case of lobar pneumonia or (as in the case of M. B.) because of the presence of otitis media from the pus in which pneumococci were recovered on culture. The fall in

23 Holt L. E. Jr and McIntosh Rustin. *Holt's Diseases of Infancy and Childhood*, ed 10. New York: D. Appleton Century Company, 1936, p. 429.

temperature shown in chart 2 and the clinical improvement were quite striking in each of the four cases

**Pneumococcic Peritonitis**—This type of pneumococcic infection, next to that of meningitis, lends itself the most easily to the evaluation of a type of therapy. Particularly when it occurs in patients with active nephrosis or chronic nephritis with marked nephrotic tendency, in which cases it is so common and so often fatal, it can very readily be diagnosed by abdominal paracentesis, treatment may be instituted early and the course of the disease followed bacteriologically by subsequent abdominal paracenteses. In the two cases of this sort that we have treated, 19 with sulfapyridine alone and 20 by a combination of the drug and antipneumococcus rabbit serum—the results were very satisfactory. The control of the infection in the first patient, as contrasted to the usual stormy course that these children have if they do survive, is most striking. No less so is the clinical course of patient 21, who

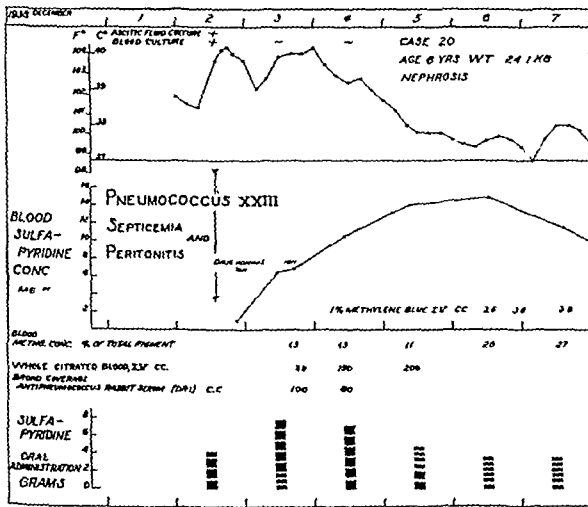


Chart 4 (case 20)—Recovery from pneumococcic septicemia and peritonitis with sulfapyridine plus antipneumococcus rabbit serum

had a primary pneumococcic peritonitis with septicemia. Charts 3, 4 and 5 show the essential observations made in these three cases

**Subacute Bacterial Endocarditis (*Streptococcus Viridans*)**—The results thus far obtained in the single case of this disease which we are treating are shown in chart 6. The immediate cessation of the rises in temperature with sterilization of the blood stream are confirmatory of the results obtained by Whitby,<sup>18</sup> who observed also that the fever recurred when drug therapy was discontinued and could again be promptly controlled on resumption of administration of the drug. With these two objective indications of the effectiveness of the drug, the patient has shown apparent improvement in her general condition. The effect of sulfapyridine in this disease, in our experience, is in marked contrast to that of sulfanilamide, with the use of which, in three cases, we were unable to find any indication of improvement even when very large doses were given and the blood concentration maintained at a level as high as 50 mg per hundred cubic centimeters.

**Influenzal Meningitis**—In the single case of this disease in which we have given sulfapyridine, no effect was observed on either the clinical course of the disease or the bacteriologic changes. The drug had no effect on the fever in this case.

# TOXICITY

Concerning the toxicity of the compound, Wien's<sup>9</sup> studies in the lower animals already have been mentioned. Whitby states that in his clinical experience he has as yet observed no more serious toxic effects than cyanosis, nausea and sometimes troublesome vomiting, of which the last is a particular disadvantage because the low solubility of the drug would seem to

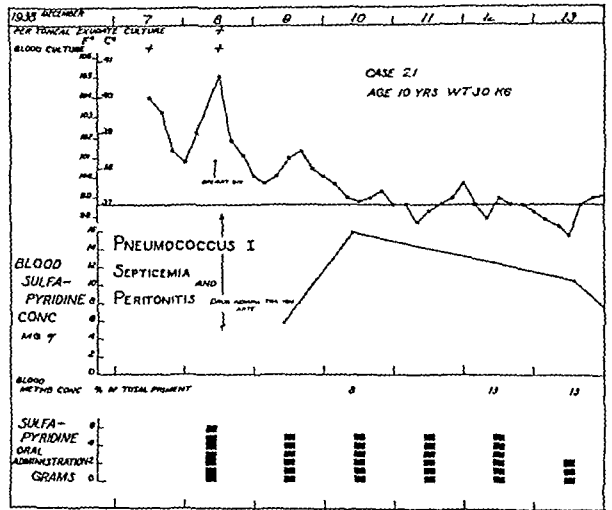


Chart 5 (case 21)—Recovery from pneumococcic septicemia and peritonitis with sulfapyridine alone

preclude the possibility of adequate parenteral administration. Whitby feels that the vomiting is not of central origin. Lloyd, Erskine and Johnson<sup>24</sup> believe that clinically the toxic results are comparable to those of sulfanilamide, given in equal amounts, but that lower doses of sulfapyridine are effective. To the toxic manifestations mentioned by Whitby, they add the occur-

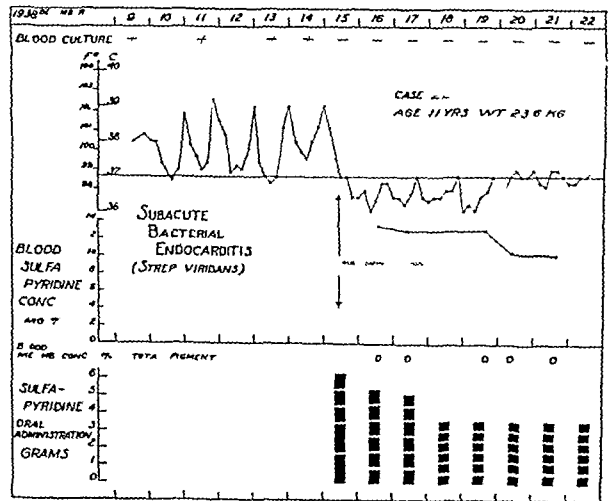


Chart 6 (case 22)—Remission of bacteremia and fever induced by sulfapyridine in case of *Streptococcus viridans* subacute bacterial endocarditis

rence of cutaneous rashes in six out of 108 cases, and the occurrence of headache, dizziness, fainting or depression in ten of the 108 cases. Other investigators,<sup>25</sup> however, agree with Whitby that clinically the toxic results are few and definitely less marked than

24 Lloyd V E, Erskine, D and Johnson A G. Chemotherapy of Gonorrhea with M & B 693. *Lancet* 2: 1160-1163 (Nov. 19) 1938.  
25 Duke and Reid. *Prebble* 12.

those due to sulfanilamide. Nausea and vomiting, which could be directly attributed to the drug, have not seriously complicated its use in any of our patients thus far treated. As is true with sulfanilamide, such toxic effects as these may be less prominent in children than in adults. As in the case of sulfanilamide therapy, cyanosis due to the accumulation of methemoglobin occurs quite frequently during the administration of sulfapyridine and may be prevented or controlled by the use of methylene blue.<sup>26</sup> This becomes of more clinical significance in cases of pneumonia, since it is of importance to determine whether existing cyanosis is of pulmonary or of cardiac origin or due merely to unnecessary and controllable excessive methemoglobinemia. The possibility of the development of a large amount of methemoglobin is particularly demonstrated by M. D., who was quite cyanotic on admittance to the hospital because of extensive capillary bronchitis. This cyanosis was relieved when the patient was put into an oxygen tent, but several days later, after the patient had been receiving sulfapyridine, and when otherwise she seemed greatly improved, an intense cyanosis was again noted. Her methemoglobin concentration at this time was 32 per cent of the total pigment, and after methylene blue was given intravenously the cyanosis disappeared and her color became in accord with her general improved clinical condition. Mental confusion, similar to that occurring during the administration of sulfanilamide, has been noted in several patients receiving sulfapyridine. As can be seen from the protocols, in no instance has there occurred a fall in the red blood cell count which could be attributed directly to the drug. In one case of empyema and in one case of peritonitis anemias developed which required transfusions, but the anemias were not severe, were easily controlled and were no more striking than the fall in the red blood cell count which so often occurs in any severe infection. In the other cases, even in those

The data that we have obtained concerning the absorption and excretion are presented in the protocols. The highest blood concentration of the free form of the drug observed with the dosages which we have employed is 15.9 mg per hundred cubic centimeters, the concentrations more often ranging between 5 and 10 mg. Besides the quantity of the drug administered, other factors will influence its concentration in the blood, particularly the fluid intake and output and any factors interfering with absorption from the gastrointestinal tract. As can be seen from the protocols, in several instances traces of the drug were detected in the blood as long as forty-eight hours after administration of the drug had been discontinued. In the single case

TABLE 2—Sulfapyridine Dosages for Infants and Children

Age	13 mos	6 mos	1 yr	2 yrs	3 yrs	12 yrs
Dosage	0.15 Gm every 4 hours	0.3 Gm every 4 hours	0.3 Gm every 3 hours	0.6 Gm every 4 hours	0.9 Gm every 4 hours	0.9 Gm every 4 hours

of meningitis in which this treatment was given, the data suggest that the concentration in the spinal fluid is roughly about 60 per cent of that in the blood, which may mean only that changes in the spinal fluid concentration may lag behind those in the blood. Cunningham,<sup>27</sup> however, reports that he found the concentration of the drug in the spinal fluid to be only about one half that of the concentration in the blood in contrast to the more even distribution of sulfanilamide. In the cases that we have studied the concentration in empyema fluid was as great as and in most instances somewhat greater than that obtained simultaneously in the blood. It is interesting to note that in case 17 sixty hours after administration of the drug had been discontinued, and at a time when the blood showed only a trace of the drug, the chest fluid still contained 2 mg per hundred cubic centimeters.

With a constant intake of the drug, the percentage recovered in the urine from three patients in whom complete twenty-four hour urine specimens were obtained over periods of several days ranged from 54 to 59 as shown in the protocols. The fraction of the drug in the urine presumed to be the free form, since it can be determined colorimetrically without preliminary hydrolysis, as can be seen from table 1, varies considerably in a given person, but some persons tend rather consistently to conjugate a relatively larger proportion than others.

## DOSAGE

In adults, Whitby<sup>18</sup> recommends giving 5 Gm in the first twelve hours in lots of 2 Gm, 2 Gm and 1 Gm, at intervals of four hours, followed by 1 Gm every four hours. The approximate doses of the drug which we have employed are as indicated in table 2 and are approximately those recommended by Evans and Gaisford<sup>8</sup> for children. We have in all cases given at least a single initial double dose. In certain severe known pneumococcic infections, as can be seen from the protocols, the usual dosage has been increased. Because of the relative insolubility of the drug, all our patients have been treated by oral administration only. So far, we have administered the drug in powder form suspending it in water, milk or fruit juices. When vomiting was present, mixing the drug with apple sauce or a small amount of jelly proved helpful.

TABLE 1—Ratio Free Total Sulfapyridine in Urine

Case	Range per Cent	Average per Cent
5	9.34	17
7	40.56	47
8	47.72	57
10	48.54	51
16	42.68	57
17	11.33	18
18	58.71	64
20	42.72	58
21	37.79	53
22	54.56	55

in which rather large amounts of the drug were given over considerable periods of time, no tendency toward anemia was noted.

## ABSORPTION AND EXCRETION

According to Whitby,<sup>18</sup> sulfapyridine despite its relative insolubility, is readily absorbed, even more rapidly than sulfanilamide, and it is excreted somewhat more slowly. He states that after the initial dose has been given and followed by administration at intervals of four hours, the maximum blood concentration is obtained in about twelve hours. He states also that the blood contains no drug twenty-four hours after treatment has ceased but the urine contains traces for some forty-eight hours. According to his data, the drug is excreted in about equal proportions of free and conjugated forms.

26 Hartmann, A. F., Perley, Anne M. and Barnett, H. L. A Study of Some of the Physiological Effects of Sulfanilamide. II. Methemoglobin Formation and Its Control. *J. Clin. Investigation* 17: 699-710 (Nov.) 1938.

27 Cunningham, A. A. Pneumococcal Meningitis Treated with Sulfanilamide and M. & B. 693. *Lancet* 2: 1114-1116 (Nov. 12) 1938.

## SUMMARY AND CONCLUSIONS

1 The clinical results were observed in the treatment of twenty-three infants and children with sulfapyridine [2-(*p*-aminobenzenesulfonamido) pyridine]. These patients included fourteen with pneumonia, three with empyema, four with bronchitis, three with pneumococcal peritonitis, one with influenzal meningitis and one with subacute bacterial endocarditis. Despite the small number of patients treated, our results, confirmatory of the reports concerning the use of the drug in adults, are encouraging and should prompt its early use, particularly in suspected pneumococcal infections. If definite improvement should not occur in twenty-four to thirty-six hours, specific serum therapy, if available, should be instituted if the clinical condition indicates its use.

2 The toxic symptoms encountered following the administration of the drug were mild nausea, vomiting and slight mental confusion, all of which usually subsided even with continued administration of the drug and none of which were ever sufficiently severe to interfere with the treatment.

3 Cyanosis due to the accumulation of methemoglobin was encountered in most of the intensively treated cases and was readily controlled by the use of methylene blue.

## ADDENDUM

Since submitting this report, we have treated fifty-seven additional cases with sulfapyridine. These have included twenty-six cases of pneumonia, seven cases of bronchitis, four cases of meningitis, two cases of peritonitis and seventeen miscellaneous cases. Except for three fatal cases (two of these patients were infants with bronchopneumonia not proved of pneumococcal origin and one older child with lobar pneumonia complicated by severe laryngotracheitis and dying twelve hours after treatment was begun) the pneumonias have had courses very similar to those described, as have had the cases of bronchitis. The types of pneumococci isolated in these cases were I, IV, VI, XI and XIV. Two patients with pneumococcal meningitis, proved by culture, were treated. One of these, whose spinal fluid teemed with organisms (type V pneumococcus), recovered. The second patient, with meningitis due to a type XIV pneumococcus, died sixteen hours after the drug therapy was started. A third patient with purulent meningitis, believed to be pneumococcal from examination of a stained smear but unproved by culture, was treated successfully. A second patient with influenzal meningitis was treated without demonstrable effect. The miscellaneous group in which the drug was used comprised a variety of cases, including staphylococcal infections, dysenteries and one case of tuberculous meningitis. No beneficial effects from the drug were observed in the treatment of these cases.

We have recently taken advantage of the greater solubility of the sodium salt of sulfapyridine, the preparation of which was described by Marshall and his co-workers,<sup>28</sup> by administering the drug in this form in a 2 per cent solution by rectum. By this method rapid absorption occurs, and we have also been able to maintain adequate blood concentrations. From observations made thus far, we are hopeful that nausea and vomiting due to the drug can in this way be largely prevented. We feel that this method of administration may prove quite helpful when vomiting from any cause prevents adequate oral administration.

<sup>28</sup> Marshall E K Jr, Bratton A C and Litchfield J T Jr. The Toxicity and Absorption of 2 Sulfanilamidopyridine and Its Soluble Sodium Salt. *Science* 88: 597-599 (Dec 23) 1938.

Two cases of agranulocytosis occurring during the administration of sulfapyridine have been reported in the British literature.<sup>29</sup> In case 21 of our series, three days after the drug had been discontinued for the second time the patient had a white blood cell count of 1,700. She developed a severe angina, and despite blood transfusions and other forms of treatment the white blood cell count continued to fall during the next four days, when it was counted as 75 cells per cubic millimeter with complete agranulocytosis. Two days following, the count began to rise, and continued to do so, reaching 22,500 on Jan 16, 1939. During this time, however, the patient developed extensive neck abscesses and a septic pneumonia, and on January 17 she had a sudden and fatal hemorrhage from the pharynx and the side of the neck where previous drainage had been instituted. This patient received a total of 80.9 Gm of sulfapyridine during seventeen days over a twenty-six day period. She was to all appearances well over her original infection several days before the agranulocytosis became manifest.

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THE TREATMENT OF VENEREAL  
LYMPHOGRANULOMA WITH  
SULFANILAMIDE

ALVA A KNIGHT, M D

AND

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CHICAGO

Our experience in the treatment of venereal lymphogranuloma has been largely in the management of rectal strictures, although we have had under our observation and care lesions involving the soft parts, the floor of the mouth and the colon. The literature<sup>1</sup> lists many methods of treatment including administration of quinine, iodides, emetine, preparations of antimony, arsenicals, methylene blue, copper ammonium sulfate and chiniofon, inoculation with vaccines from the pus from buboes, x-ray and radium therapy, injections of tuberculin, of milks, of Frei antigen and of glycerin, and many others. Surgery was formerly advocated for removal of the infected glands and for radical removal of the rectum, but recurrence was the rule. Dilatation of the rectal stricture has not resulted in permanent relief. Colostomy for the rectal stricture has given the most outstanding relief, though the disease itself is not cured.

We have used many of these therapeutic measures on a large group of rectal strictures resulting from

<sup>29</sup> Johnston F D. Agranulocytosis Following Treatment with M & B 693. *Lancet* 2: 1200 (Nov 19) 1938. Coxon R V and Forbes J R. Agranulocytic Angina Following Administration of M & B 693. *ibid* 2: 1412-1413 (Dec 17) 1938.

<sup>1</sup> This includes

LeSueur Florent A F E. *Arch de med nav et colon* 66: 64 (July) 1896.  
Nicolau C T. *Bull Soc. med hop. Bucarest* 14: 39-51, 58 (1932).  
Ravaut P. *Bull et mem Soc. med d hop de Paris* 45: 865 (June 10) 1921.  
Destenaf F and Vaccarezza R F. *Presse med* 35: 1378 (Nov 12) 1927.  
Lohe H and Roenfeld H. *Med Klin* 28: 895 (June 24) 1932.  
de Araujo. *Ann braz dermat syph* 4: 16 (1928).  
Froment and Carnot. *Paris med* 1: 223 (March 8) 1924.  
Delbet P. *Bull Acad de med* 97: 453 (April 5) 1927.  
Nicolae J and Favre M. *Compt. rend Soc. d biol* 85: 432 (July 4) 1921.  
Kleeberg L and Lowenstein L. *Deutsche med Wchnschr* 56: 1824 (Oct 24) 1930.  
Kleeberg L. *Dermat. Wchn chr* 91: 1376 (Sept. 13) 1930.  
Ruge H. *Dermat. Wchn chr* 90: 1 (Jan 4) 1930.  
Heisterstrom. *Bull Soc franç de dermat. et syph* April 1931 p 560.  
Kalz F. *Dermat. Wchn chr* 95: 1839 (Dec 17) 1932.



venereal lymphogranuloma but have had no especial success with any of them. The most helpful in our hands have been colostomy and the intravenous use of antimony and potassium tartrate or the subcutaneous use of fuadin. Neither of these methods, however, has been curative, and we had reached a rather fatalistic attitude toward the clinical cure of the disease until our experience with sulfanilamide, which we believe should be given a thorough trial in all recognized lesions of this disease. The following reports are the basis for our enthusiastic advocacy of sulfanilamide.

G F, a man, came to Dr Knight Dec 8 1934, with a small anal ulcer and slight enlargement of the right inguinal gland. He entered Presbyterian Hospital December 26, at which time the anal canal was dilated by Dr Bevan, disclosing a large, flat, comparatively clean ulcer 8 mm in diameter situated on the anterior anal wall just inside the mucocutaneous line. After the anal sphincter was dilated an iodoform pack was inserted. The patient was discharged December 31 with the ulcer healing slowly.

He was seen Jan 4, 1935, in the office, at which time the anal ulcer was almost completely healed, but the right and left inguinal glands were moderately enlarged and hard but not tender. A digital examination of the rectum disclosed suggestive firm nodules along the left seminal vesicle.

The Wassermann reaction was negative. The tuberculin test was negative. Roentgenograms of the chest were negative, the Frei test gave positive results. The temperature was 99.4 F, white blood cells numbered 20,000 and the differential count was within normal range. The Frei test was rechecked with the antigen of the patient against a proved case of venereal lymphogranuloma. Intramuscular injections of fuadin were begun three times a week in doses of one ampule each and were continued without intermission until Aug 1, 1937, with the exception of a period of approximately three months, during which time Frei antigen was given intracutaneously twice a week. The patient continued to work throughout this period but remained thin and complained of easy fatigability and lack of pep and of a frequent desire to defecate. Stools during this period occurred from six to twelve times a day and contained much mucopurulent material.

Proctoscopic examinations were done on the average of once a month throughout this period. This revealed a gradually extending process regardless of treatment and resulting in gradual narrowing of this area with the maximum annular constriction occurring at a depth just reached with the tip of the index finger and barely admitting the tip of the finger through the constriction.

August 1, sulfanilamide was started in doses of 10 grains (0.65 Gm) the first day with an increase of 10 grains each day until a maximum of 60 grains (4 Gm) was reached, followed by a rest period of ten days, after which the course was repeated.

August 16, he wrote "I feel 100 per cent better and have a movement only twice a day." August 28, proctoscopic examination showed considerable improvement over the preceding examination. The sulfanilamide was continued on the basis of 30 grains the first day, 40 grains the second day, 50 grains the third day, 60 grains the fourth day, 50 grains the fifth day, 40 grains the sixth day and 30 grains the seventh day, with an interval of from ten days to two weeks between courses of treatment. Improvement continued until October 2, when a perianal abscess developed, which was drained by Dr David. The patient returned to work after two days with instructions to continue the sulfanilamide as previously outlined, except that the dose was to be increased until 90 grains was reached, after which it was to be stepped down as before. Frequent blood checks showed no disturbance in hemopoietic function.

Proctoscopic examinations at monthly intervals continued to show improvement until April 3, 1938. At this time the mucosa of the intestine appeared perfectly normal, the point of maximum stricture now admitting the passage of the proctoscope. The patient had gained 20 pounds (9 Kg) and stated that he had never felt better in his life. May 21 the fistulous tract was dissected out. The patient was discharged May 28 with

healing nearly completed. Healing progressed rapidly to completion. The patient has remained symptomatically well since that time. He was carefully examined in August, there was no induration in the mucosa, the stricture had disappeared and the fistulous tract was completely healed with continence of the sphincter.

At the same time at which this unusual result was achieved, we had in our service a most distressing case of progressive venereal lymphogranuloma in which the right ischio-rectal region, the scrotum and the adductor region of the right thigh were involved, with marked destruction of the soft parts and associated with profound constitutional effect.

A P, a white man aged 27, who entered our service at the Presbyterian Hospital Sept 18, 1936, had first noticed pain in the rectum, constipation and bleeding at the time of bowel movements in June 1936. A surgeon operated on the rectum (for fissure?) and thereafter he felt improved. He complained of pain in the right ischio-rectal fossa July 15 and a swelling developed which ruptured through the skin. This abscess was opened for further drainage. He then became violently ill with pain and elevated temperature and was taken to the hospital. An extensive incision was made in the right ischio-rectal fossa. Pain and induration had continued for the past six weeks.

When he entered the Presbyterian Hospital he was thin and in pain and had a slight elevation of temperature in the evening. There was no general adenopathy. The inguinal glands were not enlarged. The general examination was negative. The genitalia and the rectum were normal. The Wassermann reaction of the blood was negative. The blood pressure was 108 systolic, 70 diastolic. Examination of the urine was negative. The hemoglobin content was 87 per cent, red blood cells numbered 4,740,000, white blood cells 11,100. The bleeding time was sixty seconds and the coagulation time was thirty seconds. On the right ischio-rectal fossa there was a draining sinus leading into an open wound 4 inches (10 cm) long which was lined with pus-covered redundant granulation tissue. Posterior to the sinus was an abscess with marked induration over it. More as a matter of curiosity than anything else we had the Frei test made with three different antigens. They were all strongly positive.

October 12 fuadin 5 cc subcutaneously was given daily for ten days.

October 19 he was operated on and a sinus reaching anteriorly to the base of the scrotum was incised as well as one running laterally from the old incision. The lining of the old sinus was taken for microscopic examination. Acute chronic granulation tissue was reported.

Material from the wound was cultured on Herrold's medium for tubercle bacilli. There was no growth and smears from the pus showed no acid-fast organisms. Cultures showed no hemolytic streptococci. (A guinea pig was inoculated with the material November 1 and it died November 27. There were no lesions of tuberculosis.)

October 21, packs saturated with diluted solution of sodium hypochlorite were used in the wound because of marked necrosis in the depth of the wound, but without much avail. The temperature ranged from 99.4 to 101.8 F for ten days.

From November on he was given more injections of fuadin. By April 2, 1937, he had gained some strength and weight. The wound on the right buttock was swollen but by no means healed. There was undermining of the skin to the base of the scrotum with several discharging sinuses over it. The rectum was normal. The sinuses were again opened for better drainage and at the operation we decided to remove the lesion completely. The dissection was carried down to the gluteus muscles on the right, the fascia over it being removed. The lesion extended close to the intestine but did not involve it. Microscopic examination of the tissue removed showed chronic granulation tissue and fibrosis.

The patient left the hospital May 10 and returned September 13. The wound had remained open and was draining. An abscess cavity was found under the adductor muscles of the right thigh which connected with the abscess in the right ischio-rectal fossa. There was another abscess in the fold

between the right thigh and the scrotum. These abscesses were opened and to get adequate drainage it was necessary to divide some of the adductor muscles of the right thigh. The day after operation he lost about a pint of blood from hemorrhage from the wound. On September 18 he was given 115 grains (75 Gm) of arsphenamine, this dose was repeated September 27. On September 28 his temperature was 103 F, he was uncomfortable and was unable to sleep.

October 5 his general condition was about the same, but the suppurative process in the right ischio-rectal fossa extended deeply into the pelvis between the rami and the pubes and extended anteriorly into the adductor region and into the scrotum. (From November 8, roentgen therapy of the wound was carried out for ten days without apparent effect.) It was really a pitiable situation and the family was informed that we had carried out all the measures we could think of to help the situation, without avail. Zinc peroxide was used in the wound in the form of powder without apparent effect. At the lowest hour in the course of this particular lesion the report of the remarkable improvement of the first patient reached us, and we immediately began the use of sulfanilamide as outlined in the accompanying table.

At the time this treatment was started the wound was suppurating freely and extending, and the general condition of the patient was gradually getting worse. He was getting sedatives day and night.

By December 8 he no longer needed sedatives. The wound was covered with red granulation tissue. The discharge was serous and was increased at the time of administration of the sulfanilamide. The effect on his general well being was remark-

#### *Course of Administration of Sulfanilamide*

Date	Dose in Grains Three Times a Day
12/ 6/37 to 12/14/37	20
12/11/37 to 12/16/37	10
12/16/37 to 12/18/37	5
12/21/37 to 12/28/37	20
1/ 3/38 to 1/ 4/38	10
1/ 4/38 to 1/ 6/38	15
1/17/38 to 1/19/38	20
1/26/38 to 2/ 2/38	20

able in that his appetite improved, he gained weight and on December 24 was up and around the ward. Jan 1, 1938, he was discharged. His wound was five-sixths healed, there was little discharge and no pain. By March the wound was healed completely. The patient was demonstrated at the meeting of the Society of Clinical Surgery held at the Presbyterian Hospital in May 1938, at which time the treatment of venereal lymphogranuloma with sulfanilamide was advocated.

In July we received the announcement of the patient's wedding.

In addition to these two patients we have had several others suffering with venereal lymphogranuloma who have responded dramatically to the use of sulfanilamide, but for the purpose of this communication the careful observation and study of these two patients and the result of their treatment is sufficient evidence to make the point that sulfanilamide should be given a thorough trial in this type of infection. Why it should help we do not know, since venereal lymphogranuloma is probably a virus disease and as far as we know is the first disease of this type to be beneficially affected by the drug.

Since the writing of this report an article on the same subject by Dr George Shroppshear<sup>2</sup> of Chicago has appeared in the *Illinois Medical Journal* in which are given his experiences with the use of sulfanilamide in venereal lymphogranuloma affecting the rectum. He reports general improvement of the patients and of the inflammatory process in and about the rectum.

59 East Madison Street

2 Shroppshear George. *Illinois M J* 74: 153 (Aug) 1938

## THE TREATMENT OF PNEUMOCOCCIC PNEUMONIA WITH SULFAPYRIDINE

### A PROGRESS REPORT ON OBSERVATIONS IN 100 CASES

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The encouraging results of sulfanilamide therapy in infections due to the hemolytic streptococcus, gonococcus, meningococcus and *B coli* have permitted an expectation that eventually there would become available a similar compound which would be effective in the treatment of pneumococcic diseases. This hope has been fortified because of the effects which sulfanilamide itself has been shown to have against the pneumococcus in studies both in vitro and in vivo. Domagk,<sup>1</sup> in his original publication of experimental observations with prontosil, had indicated a belief that this dye was moderately effective against pneumococci, especially of type III. The studies of Nitti, Bovet and Depierre<sup>2</sup> in vitro and of Buttle<sup>3</sup> in mouse peritonitis had suggested that sulfanilamide would act on the pneumococcus, but in a degree which was considerably below its effect on hemolytic streptococci. Moreover, Heintzelman, Hadley and Mellon<sup>4</sup> of Pittsburgh reported some success with the use of sulfanilamide in pneumococcic pneumonia of type III and Finland, Brown and Rauh<sup>5</sup> attributed to sulfanilamide a favorable effect on pneumococcic meningitis when the drug was used in conjunction with other forms of therapy. However, there has been little reason to believe that the specific effects of sulfanilamide on the pneumococcus were of a sufficiently high order to cause, through its general use in all types of pneumonia, any very significant reduction in the mortality or morbidity of this disease.

There are a number of sound theoretical reasons for predicting therapeutic success in pneumococcic pneumonia for any compound which, while pharmacologically similar to sulfanilamide with respect to absorption, toxicity and diffusibility, would at the same time show a higher experimentally demonstrable effectiveness against the pneumococcus. Among these are

1 The bacteriologic similarity of the pneumococcus and the hemolytic streptococcus, so close that Topley and Wilson<sup>6</sup> in their authoritative textbook include them within the same taxonomic group.

2 The absence of extensive tissue breakdown in the area of inflammation in pneumococcic pneumonia, rendering the tissue environment for drug action similar

Dr I S Ravdin showed constant interest and gave helpful suggestions in the conduct of this study.

From the Medical Clinics of the Hospital of the University of Pennsylvania and the Philadelphia General Hospital and the Laboratory of Surgical Bacteriology of the Harrison Department of Surgical Research of the Schools of Medicine, University of Pennsylvania.

1 Domagk, Gerhard. *Deutsche med Wchnschr* 61: 250 (Feb) 1935

2 Nitti F, Bovet D and Depierre F. *Compt rend Soc de biol* 124: 16 1937

3 Buttle G A H. *Proc Roy Soc Med* 31: 154 1937

4 Heintzelman J H I, Hadley P B and Mellon R R. *Am J M Sc* 193: 759 (June) 1937

5 Finland M, Brown J and Rauh A. *New England J Med* 218: 1033 (June 23) 1938

6 Topley W W C and Wilson G S. *The Principles of Bacteriology and Immunity* ed 2. Baltimore: William Wood & Co 1936

in this respect to that obtaining in the types of hemolytic streptococcal diseases which are most susceptible to sulfanilamide.<sup>7</sup>

3 A similar immunologic process of host resistance in the two types of diseases. This is illustrated by the increased bactericidal power of the blood against the infecting organism which has been shown to occur in the majority of cases coincident with recovery from streptococcal puerperal sepsis<sup>8</sup> and from pneumonia.<sup>9</sup>

TABLE 1—Types of Cases Treated \*

Type	Number	Deaths	Type	Number	Deaths
I	26	0	XIV	5	0
II	9	0	XV	2	0
III	14	3	XVI	1	0
IV	5	1	XVII	2	0
V	9	0	XVIII	2	0
VI	5	0	XIX	4	0
VII	9	0	XX	1	0
VIII	6	0			
Total			100	4	

\* Three fatal cases treated for less than twelve hours are not included

A drug which could be shown to elevate rapidly the bactericidal power of blood and the bacteriostatic power of serum against the pneumococcus, which would be similar to the rise in streptococcal power induced by sulfanilamide<sup>10</sup> might reasonably be expected to bring about a therapeutic response in pneumococcal infection quite analogous to that which attends the use of sulfanilamide in acute hemolytic streptococcal diseases.

Sulfapyridine [2-(*p*-aminobenzenesulfonamido) pyridine] is a compound first prepared by Ewins and Phillips<sup>11</sup> in the course of a search for a substance having a greater experimental effectiveness against the pneumococcus than sulfanilamide and with a sufficiently low toxicity to justify its use in pneumococcal pneumonia. The experimental and clinical use of this compound has already been the subject of a number of highly encouraging reports in the English medical literature. Lionel Whitby<sup>12</sup> has recently presented an admirable review of these studies in his Bradshaw lecture delivered before the Royal College of Physicians of London, and we will offer in the present paper only a brief summary of some of the more significant data which have been published thus far.

Whitby<sup>12</sup> reported that sulfapyridine was chemotherapeutically active in experimental infections in mice against pneumococci of types I, II, III, V, VII and VIII and that sulfapyridine was as effective against hemolytic streptococci and meningococci as sulfanilamide. He further noted a low toxicity of the drug for animals.

Fleming<sup>13</sup> published evidence that sulfapyridine added in vitro (in concentrations which could be obtained therapeutically) would greatly increase the killing power of normal human blood against pneumococci and streptococci. These observations have been confirmed by one of us (J. S. L.) and will be reported on in a later publication.

According to Whitby,<sup>12</sup> the absorption of the drug from the gastrointestinal tract is somewhat more rapid than is that of sulfanilamide, but it is excreted more slowly and in about equal proportions of the free drug and the conjugated acetylated form. Stokinger<sup>14</sup> has found great variation in the proportion of the drug acetylated in different individuals, ranging from 90 per cent to 25 per cent.

Most of the published clinical reports have consisted of presentations of one or two cases in which recovery has taken place under treatment with the drug in the face of types of pneumonia having a generally poor prognosis. However, Evans and Gaisford<sup>15</sup> were able to treat approximately alternate cases in a group of 200 patients with pneumonia admitted to the Dudley Road Hospital, Birmingham. The mortality in the 100 control cases was 27 per cent, which suggests that the type of disease encountered was of at least average virulence. In the 100 treated patients the mortality was 8 per cent, and six of these patients failed to receive an amount of the drug which they considered to be adequate. Some criticism of this report has been made on the ground that typing of the pneumococci was not carried out, and therefore it is possible that the control group was heavily weighted with the more serious types of the disease.<sup>16</sup> However, a fair statistical consideration of the alternate case method of distribution which they used would seem to allow full justification for a belief that the drug might be useful in treating pneumococcal pneumonia.

The possible toxicity of the drug for human beings has received some attention from Marshall.<sup>17</sup> His animal experiments have shown that there is some difficulty in controlling the circulating blood level of the drug and that raising the dose does not result in quantitative increase in blood concentration, which is probably due to erratic absorption of this rather insoluble drug. Sulfapyridine is only sparingly soluble in water (0.1 per cent) and its relatively low toxicity might therefore be explained on the basis of a limited and slow absorption. However, its presence in the blood may be detected as soon as thirty minutes after ingestion.<sup>12</sup> Marshall<sup>17</sup> reported that administration of

TABLE 2—Age Distribution

Age Group Years	Number of Patients
12-19	13
20-29	19
30-39	28
40-49	18
50-59	13
60-69	5
70-79	4

the soluble sodium salt of sulfapyridine to animals resulted in the rapid development of high and acutely toxic blood concentrations. It was not shown that the administration by mouth of sulfapyridine itself (the preparation now being used for clinical studies) would produce toxic levels of drug absorption in animals. Rather did it appear that limited absorption of sulfapyridine might result in failure in some individual instances to build up a therapeutically effective blood

7 Lockwood J. S., Coburn A. F. and Stokinger H. E. Studies on the Mechanism of the Action of Sulfanilamide. *J. A. M. A.* 111: 2259 (Dec. 17) 1938. Lockwood J. S. *J. Immunol.* 35: 155 (Sept.) 1938.  
8 Hare R. *J. Path. & Bact.* 38: 129 (March) 1934. 41: 61 (July) 1935.  
9 Sia R. H. P., Robertson O. H. and Woo S. T. *J. Exper. Med.* 48: 513 (Oct.) 1928.  
10 Colebrook, Leonard, Buttle G. A. H. and O'Meara R. A. Q. *Lancet* 2: 1323 (Dec. 5) 1936. Lockwood J.  
11 Literature supplied by Messrs. May and Baker Ltd. of England.  
12 Whitby Lionel. *Lancet* 2: 1095 (Nov. 12) 1938.  
13 Fleming Alexander. *Lancet* 2: 74 (July 9) 564 (Sept. 3) 1938.

14 Stokinger H. E. Personal communication to the authors (to be published).

15 Evans G. M. and Gaisford W. F. *Lancet* 2: 14 (July 2) 1938.

16 Pneumococcus Antigen in CCC Camps—Sulfapyridine in Pneumonia. Queries and Minor Notes. *J. A. M. A.* 112: 76 (Jan. 7) 1939.

17 Marshall E. K. Jr. *Science* 88: 597 (Dec. 23) 1938.

level Evans and Gaisford<sup>15</sup> did not study blood sulfapyridine concentrations in their patients. The toxic effects which they noticed were generally mild and consisted of cyanosis associated with methemoglobinemia, nausea and vomiting.

Encouraged by the report of Evans and Gaisford,<sup>16</sup> and impressed by the experimental and theoretical considerations favoring a trial of this drug, we commenced in the summer of 1938 a systematic study of the therapeutic possibilities of sulfapyridine in the treatment of pneumonia. Clinical material for this study was obtained

TABLE 3—Race and Sex Distribution

White		Negro	
Males	Females	Males	Females
51	18	20	11

from the Philadelphia General Hospital, the Hospital of the University of Pennsylvania, the Graduate Hospital of the University of Pennsylvania and several other Philadelphia hospitals.<sup>18</sup> A preliminary report of this study has already been published by two of us.<sup>19</sup>

## ORGANIZATION OF THE STUDY

The first consideration in reaching a proper evaluation of this new chemotherapeutic agent was to obtain a large volume of clinical material which could be uniformly controlled. It was obvious that no one hospital would afford the number of cases which was required for a comprehensive study. Therefore, arrangements were made with individual clinicians and chiefs of service in the several hospitals previously mentioned to permit us to administer the drug to such patients coming under their charge as could be shown to qualify under the criteria of selection which we laid down at the beginning of this study and which will be described in a later paragraph. We considered an attempt to employ the alternate case method of selection, but in view of the basis on which our study was conducted this method seemed to be neither practical nor justifiable.

In all the cases which we accepted for treatment we were able to satisfy ourselves as to the accuracy of the diagnosis, and owing to the fine cooperation which we received we were able to direct the entire course of treatment and to obtain such laboratory data as were required.

We accepted for treatment only such cases as conformed to the following conditions:

1. That a diagnosis of pneumonia could be definitely established by the clinical history and physical examination. An attempt was made to type sputum from each patient, and only the cases in which pneumococci could be typed from sputum or blood culture are included in the present report. In 64 per cent of the cases the diagnosis was confirmed by x-ray examination. In the remaining cases the severity of the illness and the lack of portable x-ray apparatus prevented roentgenologic study. Blood cultures were taken in all but four of the cases, but some of these were not obtained until a few hours after treatment had been started.

2. That the patient should be sufficiently accessible so that he could be followed personally with daily visits

from one or more members of the group. In only three instances did we take the responsibility for permitting other physicians to manage the course of therapy, and in these cases there were extenuating circumstances.

Several patients who had received large doses of serum without apparent effect were given sulfapyridine and recovered, but these cases are not included in the group now being reported. We instituted treatment in every case of pneumonia yielding typable pneumococci in which we were consulted, regardless of complications or the apparent terminal condition. In the compilation of our results, however, we excluded patients who did not live at least twelve hours after the beginning of treatment.

Determinations of the amount of free sulfapyridine in the blood of patients under treatment were carried out in the great majority of cases.<sup>20</sup> These determinations were made by Marshall's<sup>21</sup> method for sulfanilamide, a solution of sulfapyridine being used as a standard.

## DOSAGE

In the majority of cases an initial dose of 2 Gm was followed by 1 Gm every four hours until a total of 25 Gm had been administered. This is the dose schedule recommended by Evans and Gaisford.<sup>15</sup> We attempted to adhere rather closely to this dose schedule in our cases and exceptions were made only in those cases in which severe toxic reactions occurred. On the basis of our experience thus far, however, we are inclined to modify this dosage in cases in which therapy is commenced after the fifth day of the disease. Less drug seems to be required in such cases in order to achieve and maintain recovery, and with suitable exercise of clinical judgment we believe that the treatment may be stopped after a total of only 15 Gm has been given. We plan for the time being to continue the original dose schedule in cases in which treatment is begun before the fifth day of the disease.

## THERAPEUTIC RESULTS

The results of sulfapyridine treatment in the 100 cases of typed pneumococcal pneumonia are indicated in table 1. We have excluded from this report the patients who received the drug for less than twelve

TABLE 4—Toxic Reactions in Series

Toxic Reactions	Number
Nausea	56
Vomiting—troublesome	30
severe	10
Dermatitis	1
Acute hemolytic anemia	1
Leukopenia	1
Drug fever	1

hours. Among these were three fatalities in terminal cases, two of these patients lived long enough to receive only 3 Gm of sulfapyridine in two doses, and one 4 Gm in three doses.

Blood cultures were positive in eight of the cases. Two of these occurred in each of types I and II, and one each in types III, IV, XV and XXIX. Of the eight patients with bacteremia only the one with type IV infection died.

18 The Mount Sinai Presbyterian Jewish St Agnes Womens Miteri Cordia and Mercy Fitzgerald hospital

19 Flippin H F and Pepper D S. The Use of 2 (p-Aminobenzene sulfonamido) Pyridine in the Treatment of Pneumonia. *Am J M S*. 196: 509 (Oct.) 1938

20 Miss Helen Lynch of the Harrison Department of Surgical Research and George R. Kingsley, M.S. of the Philadelphia General Hospital performed most of these determinations.

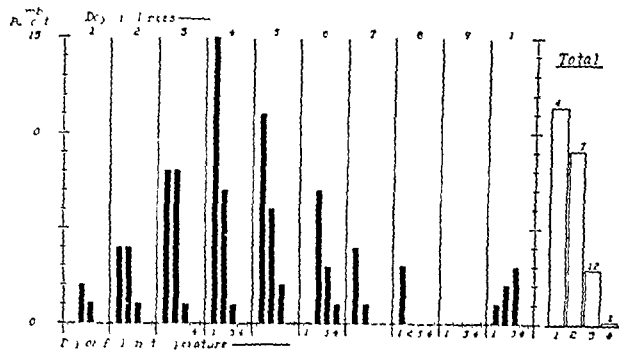
21 Marshall F K Jr. *J Biol Chem* 122: 263 (Dec.) 1937  
Marshall E K Jr and Hutchfield J T Jr. *Science* 88: 85 (July 22) 1915

## ANALYSIS OF DEATHS

It is appropriate to call special attention to the fact that three of the four deaths occurred in the type III cases, a mortality rate for this group of 21.4 per cent. This would suggest that in type III pneumonia the combination of sulfapyridine with specific antibacterial antiserum might prove to be the therapeutic method of choice. A decision on this point must be reached with caution however because it is conceivable that in man the effects of rabbit or horse serum and sulfapyridine might oppose each other. It would be unwise without further study to take it for granted that specific serum plus sulfapyridine would be better than the drug alone.

We present, herewith, brief abstracts of the four fatal cases, with postmortem observations in three of them.

**CASE 1**—W. J., a Negro aged 62 years, admitted to the Philadelphia General Hospital Sept. 21, 1938, had been ill for six days prior to admission. On examination he was acutely ill and had signs of pulmonary consolidation involving both lower lobes. On admission the temperature was 102, the pulse rate 140 and the respiratory rate 48. Laboratory studies showed a leukocytosis of 19,000 with 91 per cent polymorphonuclears and 9 per cent lymphocytes. Hemoglobin was 59 per cent



Time of temperature drop in relation to day of disease on which sulfapyridine treatment commenced

(Sahli) and red blood cells 3,480,000. The blood culture was positive for type IV pneumococcus. The patient received a total of 11 Gm of sulfapyridine without improvement and died on September 23. Postmortem examination revealed confluent lobular pneumonia of both lower lobes, acute myocardial degeneration, toxic splenitis, and cloudy swelling of the liver and kidneys. The gastrointestinal tract was essentially normal.

**CASE 2**—E. G., a Negro woman aged 47, admitted Oct. 30, 1938, to the Philadelphia General Hospital, was unconscious at the time of her admission and no history was obtainable. Physical examination, aside from the loss of consciousness, was essentially negative, except for consolidation in both lower lung fields. The temperature was 101, the pulse rate 122 and the respiratory rate 42. The leukocyte count was 32,000, with 94 per cent polymorphonuclears and 6 per cent lymphocytes. Hemoglobin was 52 per cent (Sahli). The red blood cell count was 3,100,000. The sputum showed a predominance of type III pneumococci and the blood urea nitrogen was 70 mg per hundred cubic centimeters. Sulfapyridine was given for a total of 19 Gm with no improvement in the patient's condition. Postmortem examination showed bilateral lobular pneumonia and acute pulmonary edema. There was an acute pericarditis, acute mitral and aortic bacterial endocarditis and marked myocardial degeneration. The kidneys showed severe toxic nephrosis and there was cloudy swelling of the liver. The gastrointestinal tract was essentially normal except for some mucosal atrophy of the stomach.

**CASE 3**—J. S., a white man aged 68, admitted Dec. 5, 1938, to the Graduate Hospital of the University of Pennsylvania, on about the sixth day of his illness, was extremely ill and emaciated and there were signs of consolidation of the left lower lobe, observations which were confirmed by x-ray study. The temperature on admission was 103, the pulse rate 118 and the

respiratory rate 40. Leukocytes numbered 11,800 with 94 per cent polymorphonuclears and 6 per cent lymphocytes. Hemoglobin was 69 per cent (Sahli) and the red blood cell count 3,900,000. The sputum contained many type III pneumococci. Sulfapyridine therapy was instituted and the patient showed some improvement within forty-eight hours but developed signs of acute cardiac failure and died after 21 Gm of the drug had been given. Autopsy was not permitted.

**CASE 4**—D. C., a white man aged 57, admitted to the Graduate Hospital of the University of Pennsylvania Dec. 24, 1938, with somewhat indefinite history as to the onset of acute symptoms, had suffered an upper respiratory infection about two weeks prior to his admission, which was followed closely by chest pain and a productive cough. Some ten years previously he had undergone a left nephrectomy, presumably for calculi. The patient was acutely ill and unconscious. A definite pericardial friction rub and signs of consolidation of the right middle lobe were confirmed by x-ray study. The temperature was 103 F, the pulse rate 128 and the respiratory rate 40. Laboratory studies showed 27,000 leukocytes, 85 per cent polymorphonuclears and 15 per cent lymphocytes. Hemoglobin was 54 per cent (Sahli). Red blood cells numbered 3,400,000, blood urea nitrogen 48 mg per hundred cubic centimeters and blood chlorides 49 milliequivalents. The urine showed abundant albumin, many red blood cells and many granular casts. The sputum was loaded with type III pneumococci. The patient was placed on sulfapyridine two days after admission but succumbed after 25 Gm of the drug had been given. The picture was that of a progressive renal failure, the blood urea nitrogen reaching 105 mg per hundred cubic centimeters. Postmortem study revealed an acute pericarditis and marked myocardial fibrosis. The lungs showed gray hepatization of the right middle lobe, bilateral adhesions and acute pulmonary edema. The right kidney presented many pus pockets with no normal tissue remaining, marked cloudy swelling, and subacute glomerulonephritis. The gastrointestinal tract was essentially normal.

## INFLUENCE OF THE DRUG ON THE COURSE OF THE DISEASE

In evaluating any therapeutic agent, one must consider the effect of the agent on the course of the disease as well as its influence on the final mortality. From the very beginning of this study we have been impressed as were Evans and Gaisford,<sup>10</sup> by the striking frequency with which the initiation of drug treatment was followed within twenty-four hours or less by a critical drop in the patient's temperature. This temperature drop was not immediately accompanied by any significant change in the lung signs but always reflected a marked improvement in the toxemia and the general well-being of the patient. Resolution of the pneumonia then followed within a variable period of days. We are unable to say at this time whether resolution is hastened or retarded by the fall in temperature. There is no reason to believe that the temperature drop is a consequence of any ordinary "antipyretic" process as exercised through the heat regulatory centers. The clinical improvement which accompanied the cessation of fever points rather to the probability that it is a consequence of rapid termination of the invasive or toxemic promoting elements in the infection. The relationship between the temperature drop and the day of disease on which therapy was started is indicated in the accompanying chart.

In several instances there was a recurrence of low grade fever persisting for several days after the initial critical drop. It cannot yet be stated whether continuation of drug therapy beyond the usual four day period is called for in such cases. In our experience, however, clinical recovery did take place without resumption of drug administration, the temperature tending gradually to become stabilized at the normal level as resolution progressed.

In pneumonias from which pneumococci may be typed, the drug has seemed to be quite uniformly effective, though perhaps less effective in type III than in all other types encountered

#### COMPLICATIONS

1 *Empyema*—We have been especially interested in attempting to determine the possible influence of sulfapyridine on the incidence of empyema. This complication was not encountered in any of the cases included in this report, but in a case of type I pneumonia now under treatment an empyema has developed necessitating open drainage

2 *Other Complications*—There were three cases of phlebitis, with recovery in all. The most severe of these was in a patient with a type XXIX infection with bacteremia and bilateral lower lobe consolidation, who was desperately ill on admission. The phlebitis was recognized four days after cessation of treatment, when an unexpected rise in temperature occurred. The patient was able to leave the hospital ten days later without the necessity for a secondary course of treatment

No other complications attributable to pneumococcal infection were encountered. Such complications as might have been due to the drug itself are described in the section on toxicity

#### PHARMACOLOGIC OBSERVATIONS

1 *Toxicity*—The toxic reactions which we observed are indicated in table 4. The untoward effect most frequently encountered was gastric irritability. Nausea was very frequent and was most intense and most likely to produce vomiting during the first twenty-four hours of therapy. In ten cases the vomiting was so severe that it was necessary to stop treatment altogether, but in no case was this done until 12 Gm had been administered. None of these patients died. In thirty cases the vomiting was a source of distress to the patient but was not sufficiently severe to require total cessation of therapy. We experimented with several different methods of controlling the nausea and vomiting

The administration of small amounts of sodium bicarbonate an hour after ingestion of the tablets

Mixing of ground up sulfapyridine tablets with water, fruit juices or milk. The administration of a glass of cold water containing the white of an egg and the juice of a lemon one-half hour before giving the drug. In individual cases each of these adjuvants appeared to improve the tolerance for the drug

The passage of a Jutte tube into the duodenum, permitting the introduction of the drug into the small intestine. This was done both with persistent vomiting and with extremely sick patients who could not take the drug by mouth

Omission of the drug for one or two doses, followed by its resumption. The temporary relief of gastric irritability so achieved often resulted in cessation of vomiting

The introduction of sodium chloride and dextrose intravenously, which is advisable in all patients who show nausea or vomiting. This appears to be a valuable method of minimizing these symptoms as well as of restoring normal fluid and electrolyte balance in the patient who is vomiting. In three instances of severe vomiting we encountered marked depletion of serum chlorides. One patient, a woman of 75 with type IV pneumonia involving the right upper lobe had a drop in temperature in twenty-four hours from 102.3 to 98.7. However, she vomited so much that the drug had to be stopped after only 12 Gm had been given. She became comatose and developed anuria which lasted for fifty-eight hours and the blood urea nitrogen rose to 48 mg per hundred cubic centimeters. Eight hours following the administration of 3 per cent salt solution intravenously she started to void and twenty-four hours later she was completely recovered from the pneumonia

The extreme insolubility of the drug has made impractical its administration through the rectum. We expect in the near future to be able to estimate the value of administering the drug by mouth in an enteric coating

As will be seen in table 4, the other toxic reactions which we have encountered are similar to those associated with sulfanilamide treatment, and are probably manifestations of idiosyncrasy. It has seemed to us that these reactions are not likely to occur as frequently with sulfapyridine as with sulfanilamide. The patients received frequent blood counts and routine urinalysis during the course of treatment. In the majority of cases the white blood cell count tended to drop during the first forty-eight hours coincident with the usual drop in temperature but no cases of agranulocytosis were encountered. In one instance a leukopenia of 1,800 was observed with a normal differential. The red count and hemoglobin likewise fell in a number of cases, but in view of the marked dehydration of most of our patients on admission it has been difficult to evaluate this apparent secondary anemia. As is noted in table 4, we had only one case of acute hemolytic anemia, but in several instances there occurred a drop in the red cell count of over two million, with reduction in hemoglobin of as much as 40 per cent. The urine studies failed to show any signs which would be inconsistent with patients suffering with any febrile illness

2 *Blood Levels*—No data have yet been made available to indicate what constitutes an effective blood level of sulfapyridine in pneumococcal pneumonia. In this study our schedule of dosage was therefore selected empirically on the basis of the work of Evans and Gaisford<sup>16</sup> and this schedule was applied in almost all the cases, regardless of body weight. We made estimates of blood sulfapyridine concentration in most of the cases not for the purpose of influencing dosage but rather to obtain information on (a) the variability of drug absorption in different subjects receiving a uniform dose and (b) the correlation or lack of correlation between the blood sulfapyridine level and therapeutic effect. There was great variability in the concentration of free sulfapyridine among individuals receiving the same dose schedule. The lowest estimate was 1 mg per hundred cubic centimeters and the highest was 18 mg. As suggested by Stokinger,<sup>14</sup> this variability may derive from wide differences in drug conjugation between different subjects. We did not perform determinations of total sulfapyridine (free and conjugated) in these cases. Many patients with blood levels which apparently remained below 3 mg per hundred cubic centimeters enjoyed satisfactory recoveries from pneumonia. The blood levels in three of the patients who died were 12, 15 and 5 mg respectively per hundred cubic centimeters

#### IS THERE CORRELATION BETWEEN BLOOD LEVEL AND RAPIDITY OF RECOVERY?

We have analyzed our data in an attempt to determine whether any correlation would appear to exist between the rapidity of recovery and the concentration of free sulfapyridine in the blood. It would be an important practical consideration in therapy if the failure to establish an "adequate" blood level in a given patient could be shown to militate against achieving a good result. The eleven patients showing blood concentrations of sulfapyridine from 1 to 28 mg were



compared to the eleven patients with blood levels of from 10 to 18 mg per hundred cubic centimeters, affording the "lowest" and "highest" groups. Nine of the eleven patients in the low group showed a drop in temperature within twenty-four hours, while only six of the eleven patients in the "high" group showed this prompt response to treatment. The average duration of disease from the onset of symptoms to the time of temperature drop was 6.25 days for all the patients in whom blood levels were recorded. The same figure for the "low" group was 6.7 days and for the "high" group 6.0 days. It would seem improbable, therefore, that the development of a blood concentration of free sulfapyridine of 10 mg per hundred cubic centimeters or above causes any more rapid primary chemotherapeutic effect than that which occurs with a blood concentration of from 1 to 2.8 mg. We do not believe that these data are sufficiently complete yet, however, to warrant reducing dosage in individuals who show a higher degree of distribution of free sulfapyridine, or increasing dosage in patients who show less complete drug absorption.

## COMMENT

It is a matter of some interest that the reduction in mortality of pneumonia reported by Evans and Gaisford,<sup>16</sup> and by ourselves in this report, corresponds rather closely with the reduction in mortality of hemolytic streptococcal puerperal sepsis reported by Colebrook<sup>22</sup> with prontosil, which was the first sound clinical evaluation of a sulfanilamide derivative in streptococcal disease. Colebrook then recognized the possibility that his results might have been influenced by a possible reduction in the severity of streptococcal infection during the season covered by his study. Similarly we must admit that a possibility exists that the pneumonias we have treated in the fall and early winter of 1938-1939 might not be typical of the disease in its severest form. However, subsequent experience all over the world has tended to confirm the original impression of Colebrook as to the value of sulfanilamide in hemolytic streptococcal infections. Similarly we fully believe that the results of sulfapyridine therapy in pneumonia so far reported are probably representative of its true value in this disease.

## SUMMARY

1 Sulfapyridine therapy for more than twelve hours has been carried out in 100 cases of typed pneumococcal pneumonia in several Philadelphia hospitals.

2 There were four deaths in the series, three of which were in type III infections.

3 There were eight cases of bacteremia with one death.

4 A conspicuous effect of the drug seemed to be its ability to bring about, within twenty-four to forty-eight hours, a critical drop in temperature followed by prompt clinical improvement.

## CONCLUSIONS

Sulfapyridine is an effective drug in the treatment of pneumonia caused by pneumococci which are susceptible of being typed. If sulfapyridine is used with regard for its toxic possibilities, and if the patients in whom it is used are thoroughly studied and carefully followed, it is a therapeutic agent with a satisfactory margin of safety.

## CHRONIC LEAD POISONING

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This paper, written at the request of a number of my professional friends, will place on record the facts regarding several cases of chronic lead poisoning which occurred in my own family. The reason for adding another case record to the already large literature of lead poisoning is twofold. In the first place it seems still to be the general impression of the majority of the medical profession that chronic lead poisoning is characterized always by the classic features of constipation, colic, motor paralysis, blood changes and lead line on the gums. There is, however, a type much more chronic, resulting from a very small intake of lead over a long period of time and eventually showing effects mainly on the nervous system which may mimic almost any of the well known disturbances of that system and may or may not be accompanied by blood changes or other of the signs usually associated with chronic lead poisoning. While there is no sharp line of demarcation between the two types, it would seem to me desirable to speak of the classic type presenting colic, constipation and motor paralysis and coming on after a few weeks' or at most a few months' exposure as subacute lead poisoning.

The second and more important reason for placing the facts of these cases on record is that it was forunately possible to make a thorough study of the situation with careful chemical analyses. Though the results are based on only three people information on the amount of lead competent to produce nervous lesions when taken over a period of several years is so meager that it is believed the information gained from this study may prove helpful.

## LEAD POISONING

In 1931 I came into possession of a very old colonial house at Greenwich, Conn. In modernizing the plumbing system a copper hot water tank was installed for storage of domestic hot water. This was supplied for a year from a shallow well. The following year a deep well was drilled and a large iron storage tank for cold water installed into which water is pumped against air pressure. In the autumn of 1933 I noticed difficulty in maintaining balance while walking on a rough road in the dark. The difficulty seemed less a simple incoordination than a positive disturbance initiated by pressure of the feet against the roughnesses of the road. With rest and attention to general hygiene the condition improved and nothing more was thought of it. The following year, while the family was away on vacation, two Airedale dogs were boarded at a kennel. On our return we were informed that the older dog had been observed suddenly to act queerly and pay no attention to attendants or to offered food. He was isolated and on the following morning he was found totally oblivious to his surroundings, pawing continuously on the concrete floor of his pen. He had pawed the surfaces from the front paws, and arterial blood was spurting from small vessels. A veterinarian was called and gave the opinion that the dog was rabid and advised shooting him without approaching him. This was done and the dog was buried without examination. Other dogs are buried in the same place and it is now unfortunately impossible to identify his bones for examination.

During the following winter I had unusually numerous and trying duties and in the spring found great

<sup>22</sup> Colebrook, Leonard and Kenney. Meave. *Lancet* 1: 1279 (June 6) 2: 1319 (Dec. 5) 1936.

difficulty in reading the examination papers of students. The difficulty was to remember what was contained in any given paper and avoid charging mistakes encountered in earlier papers or crediting previous good performance to the particular one in hand. This really constituted a defect of memory for recent events of a grade so marked that it now seems strange that its significance passed unnoticed. That fact is itself significant of the beginning of a considerable impairment of cerebral function. With the melting of the snow came the realization that walking on a rough road in the dark produced disturbance of the kind noted earlier, but of higher degree. It was also remembered that there had been collisions with furniture in the house when making a sudden turn without taking definite thought and also that on numerous occasions ecchymoses had been observed for which no cause could be assigned. These came to be connected with the accidental collisions mentioned. It now became evident that there was some serious impairment of the nervous system and on the basis of such information as was available without a neurologic examination I proceeded to eliminate one after another the possibilities until I arrived at multiple sclerosis, which, I was not happy to realize, seemed to fit the picture fairly well. It seemed proper to enter a hospital for observation and on explaining the situation, without emphasis on its ultimate significance, to my wife, I elicited the following information. She had observed the incoordination and general clumsiness and had not failed to note the impairment of memory. She had further noticed that the family cat had developed an incoordination of the same type. In fact this cat had fallen a considerable distance the day before from a pergola when he had tried to jump a short distance to a window sill, a thing he had long been in the habit of doing with ease. She further remarked that for some time her fingers had been numb and that she could hardly hold a needle to sew. She had regarded this as one of the unavoidable consequences of the march of time until the housekeeper began to complain of numbness of the legs and she had gradually begun to connect this with my behavior and with that of the cat. This information at once suggested a toxic agent to which we might all have been exposed.

A few months previously Dr. Cassius Watson of the American Telephone Company had called on me and told of a case at first believed to be transverse myelitis, which had occurred in an employee at the Lawrenceville transatlantic sending station. It had been feared that the condition might have been due to exposure to powerful radiation, but at the New York Neurological Institute it had been found that his secretions contained an abnormal amount of lead and under appropriate treatment he recovered. I expressed great surprise that such an effect should occur without the usual classic signs of lead poisoning and learned with interest that a considerable number of such cases were on record.

The remembrance of this conversation suggested an examination for lead and on the following day a twenty-four hour specimen of urine was taken to my colleague Prof. Frederick B. Flinn with a request for a lead determination. It was found that the twenty-four hour elimination of lead in the urine was 0.21 mg. Kehoe<sup>1</sup> gives the normal excretion by this channel as from 0.02

to 0.08 mg. Twenty-four hour specimens showed an elimination of 0.18 mg. by the housekeeper and 0.16 by my wife. When the deep well was drilled, shining particles were observed in the drillings which were thought to be mica. They were. The recollection now suggested the possibility of lead bearing pyrites and a specimen of water from the well was taken. The possibility that the plumber had used lead paint in making up pipe joints suggested the propriety of taking a sample from the storage tank and then for completeness a specimen from the copper hot water tank was taken. No lead was found except in the hot water specimen, which contained 0.18 mg. per liter. Several successive analyses were made, each time with the same result. It was at once suspected that this came from lead paint used on pipe joints and it seemed desirable to determine if possible what the lead content of the water might have been in 1931. This might be done by determining the rate of decrease in concentration.

It may be explained here that this hot water had been used for boiling vegetables, as that saved time and no reason was known for not doing so. Vegetables boiled in water containing small amounts of lead in solution will extract the lead almost quantitatively. The cat was fed some of the cooked vegetables. The dog which died had eaten dog food cooked with this hot water every day for two years except for the time he was at the kennel. His behavior is strongly suggestive of lead encephalopathy. This dog had been vaccinated against rabies within a year.

Having ascertained these facts, I was eager to establish the case as completely as possible before approaching my neurologic colleagues. I carried out a procedure which was recognized treatment for lead poisoning some years ago but is now known to be very dangerous, though I was unaware of this. I took five drops of potassium iodide solution three times daily for a week, at the end of which time the twenty-four hour excretion in the urine had increased to 0.50 mg.

I then entered the Neurological Institute and was examined by Drs. Casamajor and Tilney, who found general impairment of superficial sensation all over the body but more in the lower extremities. Vibratory sensation was completely lost in the feet and very much impaired elsewhere. Temperature and pain sensation were also impaired, but there was no motor disturbance. There was a marked Babinski reflex. At the time I failed to recognize the significance of this in connection with the incoordination in walking, which seemed to be a positive disturbance as well as a matter of lack of afferent impulses. I believe that stimulation of the soles of the feet provoking this reflex was the cause of the exaggeration of the difficulty of walking when the road was rough. There was a well defined Romberg sign. A complete neurologic examination revealed nothing except a multiple neuritis affecting mainly the afferent nerves, though the impairment of memory indicates a beginning effect on the central nervous system and the ultimate outcome suggests that there may have been some cord involvement. An examination of the blood had previously shown no changes. This and the presence of abnormal quantities of lead was confirmed by examination at the institute. It was decided to delead by means of a ketogenic diet as nearly lead free as possible and administration of ammonium phosphate in increasing doses. This was carried out and analyses made afterward showed the elimination in the urine of only traces of lead.

1. Kehoe, Robert A., Thammann, Frederick, and Cholak, Jacob. On the Normal Absorption and Excretion of Lead. II. Lead Absorption and Excretion in Modern American Life. *J. Indust. Hyg.* 15: 257 (Sept) 1934.

The disturbance being less urgent in the cases of my wife and the housekeeper, it was decided not to delead but to trust to gradual elimination on a diet reasonably free of lead.

#### POISONING FROM LEAD ARSENATE

Following the deleading I was advised to eat freely of green vegetables in order to replace calcium. Improvement was rapid and steady for a time. I spent five weeks in the Adirondacks, and green vegetables there were raised locally and required no spraying.

In November I was knocked down by a truck at a street crossing in New York and suffered a simple fracture of the fibula, which healed without deformity. The necessity of going on crutches and of bearing weight exclusively on one foot and the injury to the other are responsible for the fact that I failed for a long time to notice a gradually increasing numbness of the hands and feet. However, in the spring of 1936 it became very noticeable and at length the sensation of numbness of the feet was replaced by a feeling of their entire absence. Examination of the urine now showed a large elimination of arsenic on the part of the entire family. Specimens of the same kind of green vegetables which we had been getting in the market were procured and analyzed by Dr. Flinn. Spinach examined contained lead arsenate corresponding to a concentration of 2 mg. of lead per pound of spinach. String beans carried half that amount. A 5 gallon stone crock was obtained and 3 gallons of 1 per cent hydrochloric acid placed in it. All green vegetables were immersed for one minute, timed with a clock and then thoroughly washed. Three weeks later none of the family were excreting arsenic, though all were still eating green vegetables. I have never recovered from the numbness of the extremities which developed at this time, though it became much less. Numbness was the only complaint of the two women but was never noticeable to me until after the deleading and never a great inconvenience until after the spray residue poisoning.

The use of water from the copper tank was discontinued except for cleaning purposes and the tank was left for a year. At the end of that time the concentration of lead in the water was found to be exactly the same as in 1935 and this was checked by four analyses. The tank was then taken down and all pipe fittings were disconnected and cleaned. It was found that the plumber who put in this tank had used lead paint on the pipe joints. A considerable amount of sludge was found in the bottom of the tank and this was found to contain 339 mg. of lead per gram of the dried sludge. The pipe fittings were pickled in acid and the inside of the tank rinsed with acid and then all was thoroughly washed out. The tank was returned to service and after a week an analysis of the water showed lead in higher concentration than ever before. A consultation was now held with the Copper and Brass Research Association. As a result the tank was removed and examined by the Whitehead Metal Products Company and by the American Brass Company. It appears that the maker had used a light gage copper and to prevent failure on the pressure test he had reinforced all the points where the copper had been perforated for pipe connections with a liberal coating of wiping solder. In some places this was a quarter of an inch thick. The water from the well is very soft and in common with most deep well waters contains a large quantity of carbon dioxide. Its  $pH$  as drawn from the well is about 6 and after boiling it is around 8. It is therefore a

highly corrosive water and from the nature of the water system the dissolved gas could not escape when the water was heated in the copper tank, so that the conditions for solution of lead were favorable. Wiping solder is two-thirds lead. It is not expected that a serious lead hazard will be found to exist in copper hot water tanks. Had this tank been used with a less corrosive water supply the amount of dissolved lead would certainly have been less. It is my understanding that the makers of nonferrous tanks have now agreed not to use any lead alloys in their products. The point of reporting these cases is to emphasize the danger of relatively small amounts of lead when taken over a period of years and the fact that serious damage may result without any of the classic clinical manifestations recognized for years as associated with a more acute poisoning.

The real point of the paper is the light it sheds on the amount of lead required to produce nervous lesions.

It has been shown by Kehoe<sup>2</sup> that the normal American adult excretes daily about 0.3 mg. of lead, principally in the feces. This can only mean that the average intake is of this order of magnitude and if it is not exceeded presumably the bulk of the lead is excreted without ever being absorbed. None of my family suffered from any nervous disturbance prior to 1931. From the amount of water used in cooking vegetables it is possible to deduce that not more than 0.2 mg. of lead was added to the diet from this source. The conclusion seems to be that if the average intake of lead by our population was to be doubled there would be grave danger of a serious occurrence of nervous disorders due to this cause. It might be inferred that the family obtained more lead from spray residues than the average. This may be true, but it is to be remembered that such food was being served in unusual amount at the time of the second disturbance. Also it was definitely the added amount from the water that determined the onset.

Lead arsenate spray is being used not only on fruit but on nearly every kind of vegetable. It is far and away the most effective agent and, all things considered, the most economical. Its use is rapidly extending and there is real danger that unless control measures are instituted the average individual lead intake from this source may reach the danger point in a few more years. Farmers are apt to resent investigations of spray residues. They argue that, since they and their families eat the food products they market and are not poisoned, all talk of danger from that source is nonsense and the investigators are meddling busybodies. However, no one knows how many members of farmers' families may be suffering from disabilities regarded as the act of God or the unavoidable result of age which are really due to this cause. Information supplied to me by a large apple grower indicates that many farmers use lead arsenate in an injudicious manner, employing more than necessary and sometimes spraying only a short time before produce is to be taken to market. He assures me that this is not necessary and that his own apples are perfect with but a small residue remaining at the time of harvesting. In some regions, however, it appears to be necessary to spray seven or eight times in order to secure good results. Sometimes lead arsenate powder is dusted on fruit and vegetables from a dredge box and if this is done shortly before harvest the contamination is liable to be heavy. There is on record

<sup>2</sup> Kehoe, Thamann and Cholak. On the Normal Absorption and Excretion of Lead. p. 285.

a case of fatal poisoning from a single portion of berries which had been so dusted a week before. Unfortunately I do not have the references to this case at hand.

Lead arsenate is practically insoluble in water. In order to avoid having it removed mechanically by wind and rain, various substances are now used to cause it to adhere tenaciously. Ordinary washing with water will not free fruit and vegetables from the residue. It can easily be removed by immersion for one minute in 1 or 2 per cent hydrochloric acid and then washing thoroughly in water. This is being done on a large scale with apples, machinery having been specially designed to perform the operation. This procedure is not applicable to all produce prior to marketing as it results in deterioration of some products, for example lettuce.

Information is urgently needed as to the amounts of spray residue on produce offered for sale and also on human tolerance. It is most important that the safest effective method of using lead arsenate should be determined and that farmers should be induced to cooperate with health agencies in working out a procedure which will result in good produce without a serious hazard. Modern rapid transportation facilitates the spread of insect pests, calling for more extensive use of poison. It also facilitates transport of fresh fruits and vegetables so that they are now being consumed the year round. Instead of a seasonal hazard there is now a continuous one. It is important to know just how far we are from a general threat to health and that careful watch be kept for signs that we may be approaching the danger point.

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## Clinical Notes, Suggestions and New Instruments

### TESTOSTERONE PROPIONATE IN THE TREATMENT OF FUNCTIONAL UTERINE BLEEDING

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Because it was observed that repeated injections of testosterone propionate inhibited the growth of the graafian follicle and definitely inhibited ovulation in the albino rat, and because when this hormone was given to the male it failed to lead to hirsutism,<sup>1</sup> it was deemed safe to study its effect in a case of functional uterine bleeding.

A white married woman aged 35 had been obese for five years and had had excessive vaginal bleeding for about ten years. Her family history was irrelevant. She had been stout as a child but had otherwise been healthy. Menstruation began at the age of 13 and had recurred every twenty-eight days for a duration of three days with neither pain nor discomfort until ten years before. At that time the duration began to increase, and after a few months each period lasted nine days, although the twenty-eight day cycle was maintained. For the past seven years the menses had been very irregular, recurring twice monthly on many occasions and lasting from ten to twelve days with staining almost continuous.

The patient married at 18 and lived compatibly with her husband in spite of a sexual frigidity which had existed for the duration of her marriage. There had been four pregnancies. The first occurred fifteen years, the second thirteen years and the third nine years before. These three ended in stillbirths because of a narrow birth canal. Six months before she had

given birth through cesarean section to a girl weighing 5 pounds 4 ounces (2,381 Gm.), who is developing normally.

She spontaneously associated her menstrual irregularity with her obesity, stating that before this irregularity she weighed 129 pounds (58 Kg.). She was 61.8 inches (157 cm.) tall. Her weight gradually increased until she weighed 195 pounds (88 Kg.).

A review of her diet revealed that she ate no more than the average woman. There were no digestive upsets, but constipation was severe. There was excessive thirst, so that she drank about ten or twelve glasses of water daily, but polyuria was moderate. There were no nervous symptoms, and a psychiatric survey failed to disclose any marked emotional or content disorder and revealed no psychogenic basis for her frigidity.

At examination the temperature was 96.2 F., the pulse rate 72, the respiratory rate 18 and the blood pressure 140/70. She was obese, the fat being distributed over the shoulder girdle, upper part of the back, breasts, abdomen, thighs and pelvic girdle. The wrists and ankles were thin.

The distribution of hair was feminine; the hair on the scalp was coarse but not brittle. The eyes, sinuses, nose and mouth showed no pathologic changes. The thyroid gland was small but definitely palpable when the patient swallowed. It contained no nodules or other abnormalities.

The chest was rather emphysematous, with shallow expansion. The breasts were pendulous but contained neither abnormal masses nor regional lymphadenopathy. The heart and lungs were normal. The abdomen possessed a panniculus adiposus and a midline scar (cesarean) just distal to the umbilicus.

Neurologic survey gave normal results. The superficial abdominal reflexes could not be elicited, however. This was obviously due to the obesity.

Laboratory studies of the blood and urine revealed no deviation from the normal. The basal metabolic rate, however, was found to be minus 13 per cent and specific dynamic action<sup>2</sup> was found to be 7 (somewhat depressed). In addition, microscopic examination of a biopsy specimen, performed by Dr. Emil Novak, disclosed a nonsecretory, interval type of endometrium.

Because of these observations the diagnosis was (1) hypopituitarism with functional bleeding, (2) secondary hypothyroidism and (3) chronic constipation.

The patient was placed on a restricted diet (protein 50 Gm., carbohydrate 90 Gm., fat 60 Gm., calories 1,100), and her constipation was combated through establishment of habit, regulation of diet and cascara. Thyroid  $\frac{1}{2}$  gram (0.03 Gm.) three times a day was given because of her low basal metabolic rate, this dose being quickly raised so that at the end of two weeks it was 2 grains (0.13 Gm.) three times a day. Within one month the basal metabolic rate had risen to plus 4 per cent and the weight had been reduced 8 pounds (3.6 Kg.), but the vaginal bleeding persisted.

March 16, 1938, 5 mg. of testosterone propionate (perandren-Ciba) was given subcutaneously. A similar dose was given March 20. On March 22 bleeding stopped. Injections were given twice weekly for the next three weeks but were discontinued during the fourth week. On April 21 the patient began to menstruate, this period lasting five days. There had been no staining from March 22 until the onset of this period. Two days after cessation of the menstrual flow, treatment was resumed, two injections being given for one week after menses and one injection weekly for the next two weeks. Injections were discontinued thereafter so that menstruation could occur unimpeded. On May 19 the patient began to menstruate this period lasting five days.

The same procedure, i.e., two 5 mg. injections for one week and one 5 mg. injection for the next two weeks with a treatment-free interval thereafter, was followed. On June 16 menses occurred normally. There was a moderate flow for two days.

From the Research Laboratory, Surgical Division, Sinai Hospital City Pharmaceutical Products, Inc. partially defrayed the expense involved in this study.

<sup>1</sup> Rubinstein, H. S. The Induction of Sexual Maturity in the Centrally Hypoplastic Adult. *J. A. M. A.* 111: 1818 (Nov. 12) 1918.

<sup>2</sup> Goldzieher, Max A. *Practical Endocrinology*. New York: D. Appleton-Century Company, 1937.

which gradually diminished until June 20, when it stopped completely. The patient is now being maintained on the same regimen.

## COMMENT

It is difficult in the present state of knowledge to explain exactly why the testis hormone has favorably influenced the functional bleeding in this patient. Chemically, testosterone propionate (perandren Ciba) is similar in structure to progesterone<sup>3</sup> and like progesterone<sup>4</sup> has been found to retard follicular maturation and to inhibit ovulation.

2349 Eutaw Place

## Council on Pharmacy and Chemistry

### PRELIMINARY REPORT OF THE COUNCIL

THE COUNCIL HAS ADOPTED THE DESIGNATION SULFAPYRIDINE AS A NONPROPRIETARY NAME FOR THE DRUG 2 (PARA AMINOBENZENE SULFAMIDE) PYRIDINE OR SULFANILAMIDOPYRIDINE (THE JOURNAL JANUARY 7 P. 49). THE COUNCIL HAS ALSO GIVEN CONSIDERATION TO A REPORT ON THE STATUS OF THIS DRUG PREPARED BY DR. PERRIN H. LONG OF THE JOHNS HOPKINS MEDICAL SCHOOL. THE COUNCIL AGREES WITH DR. LONG'S CONCLUSIONS. IT FEELS THAT IN THE LIGHT OF AVAILABLE EVIDENCE THE GENERAL USE OF THE DRUG DOES NOT SEEM TO BE WARRANTED AT THE PRESENT TIME. THE COUNCIL FEELS THAT BECAUSE OF THE DEFINITELY EXPERIMENTAL STATUS OF THE DRUG IT SHOULD BE USED ONLY BY PROPERLY QUALIFIED PERSONS FOR INVESTIGATIONS OF ITS VALUE IN PNEUMOCOCCIC, SEVERE STAPHYLOCOCCIC AND TRIPYLANDER'S BACILLUS INFECTIONS. THE COUNCIL EXPRESSES ITS APPRECIATION OF DR. LONG'S AID AND AUTHORIZES PUBLICATION OF HIS REPORT AS A PRELIMINARY STATEMENT ON THE STATUS OF SULFAPYRIDINE.

PAUL NICHOLAS FEECH, Secretary

### SULFAPYRIDINE

PERRIN H. LONG, M.D.

BALTIMORE

In the May 28, 1938, *Lancet*, Whitby<sup>1</sup> reported that sulfapyridine (2 [para aminobenzene sulfamide] pyridine, "M & B 693," "Dagenan") was an efficient chemotherapeutic agent in the treatment of experimental hemolytic streptococcal, meningococcal and pneumococcal infections in mice. The therapeutic activity of this compound seemed to be especially noteworthy in experimental infections produced by types I, II, III, V, VII and VIII pneumococci. Subsequently Whitby<sup>2</sup> stated without giving experimental detail that sulfapyridine was also an active chemotherapeutic agent in the treatment of staphylococcal infections in mice. My associates and I<sup>3</sup> have, in the main, confirmed Whitby's experimental observations regarding the therapeutic efficiency of sulfapyridine in experimental hemolytic streptococcal, pneumococcal, meningococcal and staphylococcal infections and in addition have found that this compound is also effective in experimental Friedlander's bacillus and *Clostridium welchii* infections in mice. Our experience would lead us to believe that the drug is about as efficient as is sulfanilamide in the treatment of experimental streptococcal, meningococcal and *Clostridium welchii* infections in mice and somewhat superior to sulfanilamide in the treatment of experimental pneumococcal, Friedlander's bacillus and staphylococcal infections in mice. While the results noted in the treatment of the three latter experimental infections are better than we have

observed with any other chemotherapeutic compound, they do not approach the brilliant results which have been noted when sulfanilamide has been used in the treatment of experimental streptococcal infections in mice.

Whitby<sup>1</sup> stated that sulfapyridine had a low toxicity for animals and Wien<sup>4</sup> has reported that the L.D. 50 of the drug is 166 Gm. per kilogram for mice and 15 Gm. per kilogram for rats. We<sup>5</sup> were unable to obtain an L.D. 50 in mice and concluded that its low acute toxicity for animals resulted from the fact that very little of the drug was absorbed. Wien<sup>4</sup> also stated that large doses of the drug did not bring about changes in the blood or urine of animals. Marshall, Bratton and Litchfield<sup>6</sup> have noted that the administration of increasing doses of sulfapyridine in acacia suspensions to mice "yielded blood values of increasing amount but these values were not at all proportional to the dose." They next prepared the soluble sodium salt of the drug and found that with moderate doses the blood levels attained in mice were roughly proportional to the dose. Even more interesting was their finding that the drug when absorbed (as occurs when its sodium salt is administered) was more toxic than sulfanilamide. This is definite proof of the invalidity of Wien's observations and again shows the futility of accepting data regarding the toxicity of a poorly soluble compound when such results are unaccompanied by observations concerning the absorption of such a compound.

Whitby<sup>2</sup> has reported that "despite its relative insolubility, the drug is rapidly absorbed, even more rapidly than sulfanilamide and it is excreted somewhat more slowly." We are somewhat at variance with Whitby on this point. In our experience<sup>7</sup> sulfapyridine is irregularly absorbed in man and animals and in comparison with sulfanilamide is also more slowly and definitely less well absorbed. We agree with Whitby<sup>2</sup> that the drug is excreted slowly. We have noted that, following the administration of single doses of 0.05 or 0.10 Gm. of sulfapyridine per kilogram of body weight to human beings, from 39 to 79 per cent of the drug was excreted in the urine in from three to four days. We have found that the concentrations of the drug in the blood of both man and animals are better sustained following the administration of single doses of sulfapyridine than is the case when comparable doses of sulfanilamide are given. Our experience leads us to believe that in certain individuals much more sulfapyridine is present in the blood in the conjugated form than one would expect in the instance of sulfanilamide. The drug seems to pass over into the spinal fluid or into exudates in from one half to three fourths of its concentration in the blood.

Whitby<sup>8</sup> has stated that in experimental pneumococcal infections the drug acts by bringing about degenerative changes in the capsular material of the pneumococcus. Telling and Oliver<sup>9</sup> believe they have confirmed this. However, Fleming<sup>10</sup> and we<sup>5</sup> have been unable to see specific changes in the capsules of pneumococci observed in peritoneal exudates obtained

3 Fieser, L. F. *The Chemistry of Natural Products Related to Phenanthrene*, ed. 2. New York: Reinhold Publishing Corporation, 1937.

4 Makepeace, A. W., Weinstein, J. L., and Friedman, M. H. *The Effect of Progesterone on Ovulation in the Rabbit*. *Am. J. Physiol.* **119**: 512 (July) 1937.

From the Biological Division, Department of Medicine, Johns Hopkins Medical School.

1 Whitby, L. E. H. *Lancet* **1**: 1210 (May 28) 1938.

2 Whitby, L. E. H. *Lancet* **2**: 1095 (Nov. 12) 1938.

3 Bliss, Eleanor A., and Long, P. H. *Proc. Soc. Exper. Biol. & Med.* to be published. Unpublished data. Long, Bliss and Feinstone.

4 Wien, R. *Quart. J. Pharmacol.* **11**: 217 (April-June) 1938.

5 Long, P. H., Bliss, Eleanor A., and Feinstone, W. H. *Pennsylvania M. J.* to be published.

6 Marshall, E. K., Jr., Bratton, A. C., and Litchfield, J. T. *Science* Dec. 23, 1938, p. 597.

7 Long, P. H., and Feinstone, W. H. *Proc. Soc. Exper. Biol. & Med.* to be published. Long, Bliss and Feinstone. Unpublished data.

8 Whitby footnotes 1 and 2.

9 Telling, M., and Oliver, W. A. *Lancet* **1**: 1391 (June 18) 1938.

10 Fleming, A. *Lancet* **2**: 74 (July 9) 564 (Sept. 3) 1938.

from mice in which sulfapyridine had been used in the treatment of experimental pneumococcal peritonitis. Both Fleming<sup>10</sup> and we<sup>11</sup> have noted that the multiplication of susceptible organisms is hampered both in vivo and in vitro following the administration of sulfapyridine to mice or culture mediums. We have been unable to confirm Whitby's<sup>8</sup> observation that mice infected with pneumococci and treated with sulfapyridine are immune on recovery to subsequent infection with the homologous organism.

Soon after Whitby's original communication, Telling and Oliver<sup>9</sup> reported on the successful use of sulfapyridine in a patient severely ill with type III pneumococcus lobar pneumonia. Then Evans and Gaisford<sup>12</sup> described the effects of the drug in the treatment of 100 cases of pneumococcal lobar pneumonia in which the case fatality rate was 8 per cent as compared with 27 per cent in a control series observed at the same time. While these investigators presented little data regarding the pneumococcal types encountered in their patients, and no information regarding the incidence of bacteremia, their results suggest that sulfapyridine therapy altered the course of the disease and its fatality rates in their patients. Subsequently other observers<sup>13</sup> have reported on the use of the drug in the treatment of pneumonia but, because of the small numbers of patients treated, no significant data have been added by these reports. Our own experience with the use of sulfapyridine in the treatment of lobar pneumonia has been limited, but in certain instances the drug has seemed to have a beneficial effect on the course of this disease. However we feel that, until there is evidence that sulfapyridine is as valuable as specific antipneumococcus horse or rabbit serum in the treatment of lobar pneumonia, the use of potent types I to VIII and type XIV serum should not be abandoned.

Several papers<sup>14</sup> have been published concerning the successful use of sulfapyridine in the treatment of pneumococcal meningitis. Dr Horace Hodes of Sydenham Hospital of Baltimore has treated four such patients with this drug. One patient recovered and, of the three who died, life seemed to be definitely prolonged in two.

The drug has been used with some success in the treatment of staphylococcal infections associated with bacteremia.<sup>15</sup> We have noted that the institution of sulfapyridine therapy was followed by a rapid sterilization of the blood in three of five patients ill with staphylococcal bacteremias.

Dimson<sup>16</sup> reported that treatment with sulfapyridine brought about a prompt recovery in a patient suffering from chronic meningococcemia. Hobson and McQuaide<sup>17</sup> noted recovery in six of six patients ill with meningococcal meningitis and treated with the drug.

Durel<sup>18</sup> in a series of articles has stated that sulfapyridine is at least as effective as sulfanilamide in the treatment of gonorrhea. McElligott<sup>19</sup> and Lloyd,

Erskine and Johnson<sup>20</sup> have reached the same conclusion. Prebble's<sup>21</sup> results, when sulfapyridine was used in the treatment of gonorrhea, do not seem to be as good as one would expect from the use of sulfanilamide, and Cokkinis<sup>22</sup> is definitely of the opinion that the superiority of sulfapyridine over sulfanilamide in the treatment of gonorrhea has yet to be proved. A review of these reports leads us to conclude that, while the drug has certain beneficial effects in the treatment of gonorrhea, claims of its therapeutic superiority are undoubtedly premature.

The toxic manifestations of sulfapyridine therapy in man are essentially those observed when sulfanilamide is used, with the possible exception of acidosis, which as yet has not been described. We have seen nausea, vomiting, dizziness, headache, fever, morbilliform rashes and tingling of the extremities in patients who were under treatment with the drug. Dr Colin McLeod of the Hospital of the Rockefeller Institute has observed two cases of acute hemolytic anemia in which sulfapyridine was being administered at the time the blood dyscrasias developed. Johnston<sup>23</sup> has reported the occurrence of agranulocytosis in a patient receiving sulfapyridine, and we have seen one patient in whom the development of agranulocytosis seemed to be related definitely to sulfapyridine therapy.

#### CONCLUSIONS

1 On the basis of the available experimental and clinical evidence, careful therapeutic trials of the effects of sulfapyridine in pneumococcal, severe staphylococcal and Friedlander's bacillary infections seem warranted.

2 Good evidence is not at hand that the drug is as effective as, or superior to, sulfanilamide in the treatment of hemolytic streptococcal, meningococcal, gonococcal or Welch bacillus infections.

3 The drug is irregularly absorbed and slowly excreted.

4 The toxic manifestations of the drug seem to be no less severe and no less frequent than those witnessed in the course of sulfanilamide therapy.

5 Rational schemes of therapy with this drug have not as yet been presented.

#### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary

#### ANTIPNEUMOCOCCIC SERUM, TYPE II (See New and Nonofficial Remedies, 1938, p. 399)

The Gilliland Laboratories, Inc., Marietta, Pa.

*Antipneumococcal Serum Refined and Concentrated Type II*—Prepared by immunizing horses with intravenous injections of the virulent and avirulent cultures of type I and type II pneumococci. Trial bleedings are made at frequent intervals and when the serum has reached a sufficient degree of potency for type II pneumococci the horses are bled aseptically and the serum is refined and concentrated by the method of Lloyd D. Felton (*J. Infect. Dis.* December 1928, p. 543). The concentrated product contains type I pneumococcus antibodies but not in therapeutically important amounts. After concentration sterility tests are carried out in the manner prescribed by the National Institute of Health and safety tests are carried out by injection into white mice and guinea pigs. The potency of the product is expressed in terms of the unit described by Felton (*Boston M. & S. J.* May 15, 1924, p. 819; *J. Infect. Dis.* September 1925, p. 199; October 1925, p. 309), the unit being 1/100 cc. of the control serum (P 11) distributed by the National Institute of Health. Marketed in packages of one syringe containing 10,000 units and in packages of one syringe containing 20,000 units each accompanied by a vial of dilute serum (1:10) for the sensitivity test.

20 Lloyd D. E. Erskine David and Johnson A. G. *Lancet* 2 1160 (Nov. 19) 1938

21 Prebble E. E. *Lancet* 2 1163 (Nov. 19) 1938

22 Cokkinis A. J. and McElligott G. L. M. *Lancet* 2 1264 (Nov. 26) 1938

23 Johnston F. D. *Lancet* 2 1200 (Nov. 19) 1938

11 Bliss Eleanor A. and Long P. H. *Proc. Soc. Exper. Biol. & Med.* to be published

12 Evans G. M. and Gaisford W. F. *Lancet* 2 14 (July 2) 1938

13 Flippin H. F. and Pepper D. S. *Am. J. M. Sc.* 196 509 (Oct.) 1938

14 Dyke S. C. and Reid G. C. K. *Lancet* 2 1157 (Nov. 19) 1938

15 Reid G. C. K. *Lancet* 2 619 (Sept. 10) 1938 Roberton K.

*ibid.* 2 728 (Sept. 24) 1938 Cunningham A. A. *ibid.* 2 1114 (Nov. 12) 1938

16 Fenton W. J. and Hodgkiss F. *Lancet* 2 667 (Sept. 17) 1938

17 Maxwell J. *ibid.* 2 1233 (Dec. 3) 1938 O'Brien E. J. and McCarthy C. T. *ibid.* 2 1232 (Nov. 26) 1938

18 Dimson S. B. *Lancet* 2 424 (Aug. 20) 1938

19 Hobson F. G. and McQuaide D. H. G. *Lancet* 2 1213 (Nov. 26) 1938

20 Durel P. *Bull. Soc. franc. dermat. et syph.* 6 960 1938 *Pres. med.* 46 13 5 1938 *ibid.* 48 16 12 1938

21 McElligott G. L. M. *Brit. M. J.* 2 905 (Oct. 29) 1938



# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY FEBRUARY 11, 1939

## SULFAPYRIDINE—THE NEW SULF- ANILAMIDE DERIVATIVE

For more than two years the drug sulfanilamide has attracted more interest than any other therapeutic agent, because of the spectacular results which followed its use in many conditions including certain specific effects in infections with the beta strain of the hemolytic streptococcus. The extensive employment of the remedy has indicated not only the truly remarkable results of the drug but also its decided toxicity. Repeatedly *THE JOURNAL* and the Council on Pharmacy and Chemistry have warned against indiscriminate administration.

As always happens after a new discovery in the field of medicine, chemists everywhere, particularly in the employ of pharmaceutical houses, have been stimulated to attempt to find derivatives of sulfanilamide which might be still better than the parent compound. A host of such products has been announced in the chemical and pharmacologic literature. Most have been disappointing in results and frequently more toxic than sulfanilamide. Early in 1938 Whitby<sup>1</sup> reported that the pyridine derivative of sulfanilamide (2-[para-aminobenzenesulfonamido] pyridine) had promise of being efficient in the treatment of experimental hemolytic streptococcus, meningococcus and pneumococcus infections in mice. Moreover, the product apparently has superiority over sulfanilamide in experimental infections with pneumococcus, particularly of types I, II, III, V, VII and VIII. Elsewhere in *THE JOURNAL* is a preliminary report of the Council on Pharmacy and Chemistry on sulfapyridine prepared by Dr. Perrin H. Long.<sup>2</sup> While this report is favorable, it is conservative. The reports of the effects of sulfapyridine in pneumococcal, severe staphylococcal and Friedlander's bacillus infections seem to warrant its use under carefully controlled conditions. The drug is apparently not as effective as sulfanilamide or superior to it in the treatment of hemolytic streptococcus, gonococcus, meningococcus or Welch bacillus infections. Sulfapyridine is irregularly absorbed but slowly excreted, as

shown by the work of Marshall.<sup>3</sup> The toxic manifestations of the drug are as severe and as frequent as those witnessed in the course of sulfanilamide therapy. Indeed it may be expected that in some cases the toxicity will be greater because of the presence of the additional pyridine molecule. Much investigative work remains to be done to work out rational schemes of therapy with this drug. Its use in pneumonia, however, as reported from investigators in the field, is frequently more startling than sometimes follows the use of sulfanilamide in severe hemolytic streptococcus infections.

In this issue of *THE JOURNAL* appear also articles by Barnett, Hartmann, Perley and Rihoff of St. Louis (page 518) and by Flippin, Lockwood, Pepper and Schwartz of Philadelphia (page 529) on the treatment of pneumococcal pneumonia with sulfapyridine. In general their results are in keeping with Dr. Long's observations as outlined in the preliminary report of the Council. The St. Louis investigators tried the drug on twenty-three infants and children, including fourteen who had pneumonia. Their results on these young patients were in general confirmatory of the results which have been obtained from the use of the drug in adults. They report that cyanosis due to the accumulation of methemoglobin was encountered in most of the severe cases. In an addendum to their article the St. Louis group states that fifty-seven additional cases have been treated with sulfapyridine, including twenty-six cases of pneumonia. The results in pneumonia were similar to those already mentioned. Beneficial results were not observed by them in treatment of seventeen miscellaneous cases of staphylococcal infections and dysenteries. The Philadelphia workers report a reduction in mortality in pneumonia following the use of this drug. Of 100 cases of typed pneumococcal pneumonia, they report four deaths in the series, three of which were in type III infections. From eight cases of bacteremia they report one death. However, they, like others, warn concerning its toxic possibilities and caution that the patients on whom it is to be used should be carefully studied.

Others feel less optimistic about the value of the drug based on present evidence. Bullock, Plummer and Finland have sent a communication to *THE JOURNAL* (this issue, page 570) on the present status of sulfapyridine in the therapy of the pneumonias.

During the past year sulfapyridine has been introduced into the therapy of pneumonia in England, and this drug is now having a number of clinical trials in this country. The earliest clinical reports and subsequent ones from England were made without proper controls and the data presented were grossly inadequate for any evaluation. Those who have spent many years in the study of pneumonia will testify to the difficulties in assessing the value of any agent in this disease before a large number of cases have been accumulated, each properly studied with respect to etiology, bacteremia and the clinical factors affecting death rates. The untoward effects and possible dangers of the remedy must also be assessed. It would be unfortunate if the appearance of a new therapy, no matter

<sup>1</sup> Whitby, L. E. H. *Lancet* 1:1210 (May 28) 1938.  
<sup>2</sup> Long, P. H. *Sulfapyridine* this issue, p. 538.

<sup>3</sup> Marshall, E. K. Jr. *Science* 88:597 (Dec. 23) 1938.

how promising, were to cause the abandonment of agents whose curative efficacy and life saving qualities have become established. In the case of pneumonia, sulfapyridine must still be considered as an experimental drug and, as such, should be used only under controlled conditions.

While there is no reason to suspect the purity of sulfapyridine, standards have not yet been published for determining the identity and purity of the product, the pharmacologic and clinical data are insufficient.<sup>4</sup>

In the light of evidence now available, the general use of sulfapyridine does not seem to be warranted at present. Because of its definitely experimental status, the drug should be used under conditions of controlled investigation. Under the new law passed by Congress in 1938 a new drug may not be released for interstate sale until it has been licensed. Under the regulations, manufacturers of new products may obtain permission for properly qualified workers to investigate the preparations. The Food and Drug Administration has a great responsibility. It has not released sulfapyridine for general sale in interstate commerce and for this action it deserves commendation. The law gives opportunity for the first time for a drug to be tried *first* in hospitals which have facilities for observing all its manifestations. Such a procedure is established in the interest of the public and is much preferable to the former custom of frequently placing the drug on the market before adequate tests had been made. Most likely sulfapyridine will be released, but it is a wise course to withhold it from general distribution until observations now under way are completed.

#### 'PRESUMPTIVE,' 'EXCLUSION' AND 'SCREEN' TESTS FOR THE SERODIAGNOSIS OF SYPHILIS

An increasing widespread use is apparent of tests for syphilis said to be so sensitive that a negative result "excludes" syphilitic infection<sup>1</sup> while a positive result is "presumptive" evidence of syphilis.<sup>2</sup> Confirmation by a less sensitive and more specific procedure is, of course, necessary before such tests can be considered of diagnostic significance. Several aspects of these tests should give pause to serologists and physicians alike, for they promise to cause serious errors, both of omission and of commission, in the diagnosis and treatment of syphilis.

The first criticism concerns nomenclature. Not merely does no laboratory test yet devised "exclude" syphilis, but no laboratory test even excludes the presence of serum reagin.<sup>3</sup> Moreover, it is not necessarily true that a serum giving a negative Kline exclusion or Kahn presumptive result will be negative by every other

technic used. In any extended series of tests, certain syphilitic serums are detected only by an ordinarily less sensitive procedure. These paradoxical results are particularly common when both a flocculation and a complement fixation test are used. Finally, the flocculation phenomenon is peculiarly susceptible to zone reactions, i. e. false negative results caused by the presence of excessive amounts of reagin. A serum may be negative with any flocculation test, screen tests included, when tested as whole serum, yet the complement fixation test may be clearly positive and the flocculation procedure may be similarly positive if the serum is tested in 1:10 or 1:20 dilutions. For these several reasons it is clear that the term "exclusion" test is misleading. It would seem preferable to call these procedures "screen" tests, for such they are, and thus to avoid the present confusing terminology.

A far more important criticism applies not to the tests but to the manner in which they are used. Certainly it was not the intention of their originators that these tests were to be used as diagnostic measures, yet reports as difficult to evaluate as "exclusion test positive, diagnostic test doubtful," presented without explanation to the physician, invite the possibly mistaken diagnosis of syphilis. In the hands of experts these exclusion procedures may be highly specific. In the average laboratory they are often not specific, and experience has shown a general average of false positive reactions ranging from 1 to 10 per cent. When a laboratory obtains a positive "exclusion" or "presumptive" result, the burden of proof rests on the laboratory that such a result is not due to laboratory error but reflects the actual presence of reagin.

Indeed, one might properly insist that the clinician be not informed of the result of a hypersensitive screen test unless it is negative, for the weeding out of negative serums is its only proper function. No matter what result is obtained when a positive or doubtful screen test is checked by one or more specific diagnostic tests, only the latter should be reported by the laboratory, and the result of the "exclusion" or "presumptive" test should be withheld. The objection may be raised that a report "exclusion test positive, diagnostic test negative" is a valuable guide to treatment in cases of known syphilis and that such a result indicates the persistent presence of traces of reagin. That point of view is debatable. To the extent that the "exclusion" test may be false, it may be as much in error with syphilitic serums as with nonsyphilitic serums. More important, antisyphilitic treatment is not directed against the presence of serum reagin, it is directed against the spirochete. The modern treatment of syphilis properly pays little heed to the serologic response and more to the patient.<sup>4</sup>

Used solely as an intralaboratory procedure to facilitate the recognition of negative serums, the hyper-

<sup>4</sup> The drug is being manufactured in this country by Merck & Co. New York (under license from May and Baker of England) and also by Calco Chemical Company of Bound Brook, N. J. There are patent difficulties yet to be solved by the two firms.

<sup>1</sup> Kline, B. S. Microscopic Slide Precipitation Tests for the Diagnosis and Exclusion of Syphilis. Baltimore: Williams & Wilkins Company, 1932.

<sup>2</sup> Kahn, R. I. A Practical Guide. Baltimore: Williams & Wilkins Company, 1928.

<sup>3</sup> Eagle, Harry. The Laboratory Diagnosis of Syphilis. St. Louis: C. V. Mosby Company, 1937.

<sup>4</sup> Moore, J. E. and Padgett, Paul. The Problem of Serologic Treatment of Syphilis. J. A. M. A. 110: 96 (Jan. 8) 1938.

sensitive screen test may fill a useful function, but to report positive or doubtful screen tests to the physician as quasidiagnostic tests which he must weigh and interpret cannot fail but cause confusion and invite the mistaken diagnosis of syphilis

### HEALTH PROGRESS THROUGH EDUCATION

In recent years a steady trend toward a return of preventive medical practice to the family physician and the family dentist has become apparent. Among the leaders in this trend has been the W. K. Kellogg Foundation of Battle Creek, Mich. A summary of the reports of the Michigan Community Health Project<sup>1</sup> involving seven counties in Michigan, namely Allegan, Barry, Branch, Calhoun, Eaton, Hillsdale and Van Buren, has just been issued. This community health project was begun in 1931, when approximately \$12,000 in grants was made to a single community, in 1937-1938 the grants had grown to \$617,211. In cooperation with the county boards, the county medical societies, the dental organizations and citizens' groups, the foundation has assisted in providing community health organization, postgraduate education, camps, library facilities and aid to hospitals, schools, youth organizations, recreation and libraries.

The community health organizations are typical county health units with full time medical directors and the necessary accessory personnel. They are operated in cooperation with the county board of supervisors, the state department of health and the Kellogg Foundation but in close cooperation with medical and dental societies, hospitals, school boards and other professional groups. Educational activities are emphasized. Thus, postgraduate courses have been provided at various universities for seventy-three physicians, forty-five dentists, twenty nurses, 559 teachers, 154 ministers and eighteen veterinarians, as well as for 161 school directors, eighty township supervisors, seventeen editors, twelve social workers and three laboratory technicians. This contribution to training of personnel already at work in the communities in most instances is a fundamental feature of the Kellogg plan which gives it far reaching significance. The education which these men and women have received has qualified them for continuance of work even if the support of the Kellogg Foundation should be withdrawn. The mere underwriting of services put into effect by enticing well trained personnel from other fields does not go to the root of the matter as effectively as does the Kellogg Foundation through its educational approach.

The service activities of the community health departments are designed largely for educational purposes and for arranging help before and after the birth of a baby, for medical, dental and special examinations,

for immunization against communicable disease, for the correction of physical defects and for talks to study groups and meetings.

Other avenues over which existing community resources have been built up are indicated in the following items selected more or less at random from the report. Library technicians are provided in eight hospitals, and two libraries became self supporting during the year, x-ray equipment, oxygen tents, fracture tables, respirators and other special equipment were provided eight hospitals, three hospitals were given grants for buildings, as were nine major school building projects.

The support of the project is summarized in the following statement: "The challenge is to see whether local leadership so stimulated can develop really effective methods to meet community needs and thus advance the cause of child health, education and welfare over many fronts, local, state and national."

### Current Comment

#### THE MULTIPLE ACCIDENT DRIVER

A recent study<sup>2</sup> of the accident repeater is based on the reports of more than 40,000 accident drivers in the Chicago parks over a three year period. Approximately 1,000 of these were repeaters. As far as the figures would allow, it was concluded that the accident repeater is a driver who is more likely to have accidents in the future than the average driver. Furthermore, the repeater's accidents occur closer together and he accumulates more personal injury accidents and is more often "at fault" than the average single accident driver. He is more likely to be a man than a woman, but he has his accidents under about the same light, weather and road conditions as the nonrepeater. The taxi or bus driver repeater varies little from a private car driver on a mileage exposure basis, although at first glance his record seems distinctly worse. Suggestive information on other characteristics was obtained but for various reasons was not available for detailed analysis. It was recommended in part as a result of this report that the accident repeater be considered as one of the most important elements in the accident picture, that state drivers' license laws empower the proper officials to suspend or revoke the licenses of habitual accident repeaters, that civic authorities maintain a properly indexed file of traffic accidents and that drivers of commercial vehicles, especially those carrying paying passengers, be selected with the greatest of care as to their mental and physical capabilities and their records as "safe drivers." It is felt, indeed, that drivers' license laws should require that the examination for drivers of vehicles carrying paying passengers be made more rigid than the general driver's examination because of the fact that the ability of the commercial driver has a direct relation to the safety of his passengers.

<sup>1</sup> W. K. Kellogg Foundation Michigan Community Health Project  
A Summary of the Reports

<sup>2</sup> I. A. Traffic Survey The Accident Repeater Chicago Traffic Engineering Section of the Chicago Park District 1938 vol. XI part 1

# ORGANIZATION SECTION

## AMERICAN MEDICAL ASSOCIATION STUDY OF MEDICAL CARE PROVIDENCE MEDICAL ASSOCIATION'S REPORT

### PROVIDENCE, RHODE ISLAND

The Providence Medical Association is a district society made up of physicians located in the cities and towns listed in table 1, which are included in the survey

Table 2 lists the number of questionnaires distributed and the number returned and used in the study of the need and supply of medical care in this district. The percentage of returns shows that the welfare and relief agencies, the nurses' organizations and the health departments—the three organizations that are in daily contact with the people who are least able to pay for medical services—are well represented in this study. These organizations are in almost complete agreement on the question of the need and supply of medical care. Their answer was that they knew of no instance in which a person in need of medical services of any kind was unable to obtain the necessary service. They also reported that they were able to arrange for needed medical, dental or hospital care for all persons who requested aid in obtaining such care.

The committee appointed by the Providence Medical Association to conduct the survey prepared a very comprehensive and concise report of the data that was recorded on the returned forms. This report summarizes the information included in the complete study so well that it is given below without any further discussion.

The Committee for the American Medical Association Survey of the Need and Supply of Medical Care has carried on the task of canvassing the district included by this association, covering a population area of 353,197 persons. Survey forms were sent out with return enclosures to every physician, dentist, hospital, nursing agency, health department, welfare

TABLE 1—Places Included in the Survey

Name	Population
City of Providence	243,006
City of Cranston	44,533
Town of Barrington	5,501
Town of Bristol	10,885
Town of East Providence	30,113
Town of North Providence	11,770
Town of Warren	7,389
Total	353,197

and relief agency, school department (as well as private school), college and pharmacy.

The returns on these surveys have been practically 100 per cent in the case of the smaller groups, 42 per cent for the doctors and 24 per cent for the dentists. The committee has recognized the difficulty encountered in so many instances in the efforts of the physicians to give exact and complete statistics as required by the survey forms and is appreciative of the conscientious effort made by those who returned the forms to provide the basis for this tabulation of the district.

This report is intended as a brief summary of the findings of the committee to date and will be supplemented by a final report later in the year.

The matter of medical facilities was of first consideration, and the statistics compiled show there is a doctor available to every 774 persons in the district, a dentist to every 1,576, and a nurse to every 500. [The greatest distance the nearest physician would have to travel to reach persons in this district is 5

TABLE 2—Distribution of Forms

	Number Sent	Forms Returned and Used in Study	
		Number	Per Cent
Physicians	456	191	42
Dentists	224	55	24
Hospitals	9	9	100
Nurses' organizations	11	11	100
Health departments	4	2	50
Welfare and relief agencies	34	27	80
Schools (includes departments)	16	13	81
Colleges	6	6	100
Other organizations	0	0	0
Pharmacists *			

\* The survey of the pharmacists was conducted by the Rhode Island Pharmaceutical Association for the whole state. It is impossible to separate the data reported by the pharmacists in this district from the state report.

miles.] Every type of hospital accommodation is available, and the district hospital facilities report a total bed capacity of 1,813.

Clinic, outpatient and dispensary service is complete, and some indication of this provision is evidenced by the fact that there were 204,875 visits made to the hospital outpatient departments, clinics and dispensaries in 1937.

The health service in the public schools is exceptionally well organized, with periodic checkups and complete protection for all pupils. The parochial school system is under the supervision of the city health department, and most of the private schools have reported suitable medical supervision of their students.

Naturally much of the emphasis of recent times has been placed on the care, or lack of it, for the indigent and for the low income group. That this problem exists in our community we all know, but that the medical profession has contributed and is contributing more than its share of the burden of health protection for such groups is evidenced by the facts compiled in this survey.

From the physicians answering the survey forms it has been learned that 16,286 persons were given free services at home, in the office or in the hospital and that 31,022 hours were devoted to the care of free ambulatory patients in outpatient departments, dispensaries and clinics.

This means that each of the doctors answering the survey averaged eighty-five free patients during the year 1937. If we may be allowed to use this figure as a norm it would appear that the physicians in the entire area cared for 10 per cent of the entire population.

tion free, and the part pay group of the low income class, and the indigent group cared for by public welfare departments and state unemployment relief are not included in this 10 per cent. Besides, 135 of the 191 physicians who sent in returns are engaged to some extent in preventive medicine.

At the same time the hospitals report 486,440 patient days of hospital care, and of this number only 41 per cent were pay or part pay patient days—the rest being free patient days or public charges. The city of Providence for the fiscal year ended Sept. 30, 1937, spent \$595,551.46 for expenses at the City Hospital, for maintenance of the city health department, for appropriations for hospitals, for the district nursing association and to one dispensary.

During the fiscal year ended Dec. 31, 1937, the state unemployment relief agency paid \$25,992.05 for hospitalization, \$28,597.62 for medical services and \$7,923.94 for medication.

Such a tabulation would indicate that there is little need for medical care because of refusals to grant such or because of the lack of facilities to provide it. Very few instances were reported of persons seeking medical attention and not receiving it. Such instances were mostly of those persons who refused to accept clinic service or free ward service.

However, two paramount issues were outstanding in the question of medical care need. First, it is apparent that the towns and communities outside the

Providence City area are shirking their duty in not appropriating proper funds for the care of their own indigent who have need to be hospitalized and must be taken to a hospital in the Providence City district. The responsibility for such problems rests with the individual communities, and it is hardly fair to complain against the hospital which refuses such cases, except in an emergency, unless the town accepts its share of the expense burden. Secondly, from school reports, as well as from welfare and similar agencies, there is a strong emphasis on the need for dental care for all classes. The hospital dental clinic in the district necessarily confines its work to minors and thus only partly satisfies the need of the community.

The apparent trouble today is the placing at the door of medicine the health problems arising from economic conditions, and the lack of public education in available health facilities. The decrease in private income has had its subsequent effect on individual health, but the main difficulty lies in the fact that the average individual is reluctant to budget his income, limited though it may be, to include medical service, placing it secondary to luxuries and pleasures. There is also further need for public education in health principles and health facilities of the community. Figures clearly indicate that no person in this area should want for medical attention. However, the public at large needs to be better directed in ways and means to obtain such service.

## OFFICIAL NOTES

### ANNUAL CONGRESS ON INDUSTRIAL HEALTH

*First Annual Meeting held in Chicago Jan. 9 and 10, 1937*

*Continued from page 421*

DR. HARVEY BARTLE, Philadelphia, in the Chair

MONDAY, JANUARY 9—AFTERNOON

#### The Program of the American College of Surgeons in Industry

DR. FREDERIC A. BESIFY, Waukegan, Ill. The American College of Surgeons in June 1926 appointed a Committee on Traumatic Surgery, which selected from its membership a research group, composed chiefly of industrial surgeons and representatives of indemnity companies, to survey conditions in the treatment of accident victims. The committee's report showed that traumatic injuries, in general, were not being cared for by the best qualified surgeons. This condition resulted partly from short sightedness by insurance carriers and by employers, who were considering chiefly the first costs, and partly from lack of interest by the better qualified surgeons in this practice. Unethical procedures were resorted to by some doctors, who were aggressively soliciting this character of work, some of whom were aided by claims adjusters and others who expected rebates from physicians for referring work. The report also showed that the physical well-being of workers and of those injured in industry, in particular, was affected by a strong tendency toward a commercialization of medical service in industry, also that a desire to obtain more experienced surgeons and to use better hospital facilities was being displayed by carriers of workmen's compensation insurance and by large employers of labor.

It became clear that the starting point in a program to assure the best care of the worker and of the injured was not when the surgeon was called or when he began to treat the injury but far before the injury occurred, when control over conditions which might have caused the accident was possible. The first point of attack in an effort to improve conditions, the leaders in

the College program decided, was in industry, where workers were already assembled into groups and where circumstances were forcing employers to assume responsibility for the care of injured workers and sufferers from occupational disease. Investigation of the quality of these services disclosed that conditions were chaotic. It was apparent that the legal and financial factors were occupying a dominant position in the administration of industrial medical service and that the medical factors, which should have been the primary consideration, were often given incidental attention. Early analysis should have shown the employer and the insurance carrier that good medical service would reduce the legal and financial burdens. The College program in industry thus broadened from an attempt to improve the care of the injured workman to include the preservation of the workman's health through prevention of disease and injury. The College drew up a Minimum Standard for Medical Services in Industry, much the same in character as its Minimum Standard for Hospitals. This minimum standard embodied the essential principles which could readily be adapted to any circumstance, and it was welcomed by industry as evidence of the cooperation of the profession in conserving the health and lives of its employees. The five principles of the Minimum Standard for Medical Services in Industry stipulate, in substance, that there should be definite organization of the medical service; a competent medical and surgical staff; adequate records; the use of approved hospitals and medical supervision of all health measures indicated within the industrial organization.

From 1926 to 1933 the College carried forward extensive educational work among employers and physicians in the fundamental principles of supplying proper care to the injured workman. By December 1933 it was possible to publish a list of services which could be classed as approved on the basis of compliance with the minimum standard. This first list bore the names of 518 industrial establishments. Each year since 1933 a new approved list has been issued. The last one, published in October 1936, bore the names of 880 industrial establishments. Since the standardization of medical services in industry depends on voluntary acceptance by the industrial organizations themselves, industry had to be convinced of the advantages of turn-

ing acceptable service. The arguments for economy to be effected through salvaging workmen's lives and capacities to produce had to be presented, with facts and figures to support them. The idea of "safety first" had to be enlarged to include "safety afterward" in order that employers and insurance carriers might appreciate that there was a direct reduction in lost time and in accident compensation costs when the quality of medical service provided was improved. The College was compelled to create in the mind of the employer a different conception than he at first had concerning the place of the doctor in industry. The repairman concept of the physician and surgeon prevailed too strongly in the consideration of this problem by the industrial executive. The difficulty was not lessened by the fact that the employer was taking the doctor at his own estimate, since the profession in general was inclined to look down on the so-called industrial surgeon. It has probably been easier to prove to the employer by research and actual figures showing that good medical service is good business than it has been to attract to industrial medicine and surgery the highest type of physicians. This fact, coupled with the desire of claim adjusters and the personnel directors to run the medical service, is the reason why the medical services were usually subordinate to some other departmental chief. This tendency in organization continued to keep the more able physicians out of industry. This condition has been partially rectified by the insistence in the minimum standard that the physicians on the industrial medical staff have certain qualifications and that the supervision of sanitation of the plant and of all health measures for employees be vested in the physician in charge.

Industry had no generally accepted guide in establishing and conducting medical services until the College formulated its minimum standard and issued a digest which included a plan for organization and an outline of the functions of an industrial medical service. It has been shown that those medical services function most efficiently whose director reports to a major executive, thus assuring a favorable administrative relationship from the standpoint of the physician.

The evils which existed in medical and surgical practice in industry twelve years or more ago have not all been eradicated, but medical departments are much more efficiently run than they used to be and a greater number of more competent physicians are devoting themselves to this type of service. On the whole the worker in the larger plants is now well protected. A grave deficiency still exists in industrial establishments having less than 500 employees, in which 62 per cent of the total number of factory employees work. These establishments do not commonly employ full time industrial surgeons. Conditions are particularly bad in plants which have less than 100 employees, which represent 30 per cent of the factory workers. National Safety Council figures show that in 1936 relative to hours worked there were 62 per cent more lost time injuries in the small plants than in the large ones and that the severity rate was 11 per cent higher in the small plants.

The per capita cost of furnishing medical service to the employee rises sharply as the number of employees decreases so that the plant having 200 or 300 employees or less cannot be expected to maintain its own medical department. The medical profession is obligated to cooperate with industry in devising means of grouping establishments together for service of this kind. The formation of industrial medical services by individual doctors or groups of doctors solves the problem only if arrangements are definitely made for medical supervision within the plants in addition to caring for the sick and injured who visit or are sent to the clinic.

#### Uniformity in Workmen's Compensation Procedure

MR VOYTA WRABETZ, Madison, Wis. The major part of the burden caused by industrial accidents and diseases is an obligation which must be borne by industry. Benefits for disability or death the result of accidents and of occupational diseases arising in the course of employment are the inherent right of workmen. To insure that these benefits will be provided, workmen's compensation laws were enacted and to carry them out a proper administration not merely by the industrial accident boards and commissions but by employers by insurance carriers and by the medical profession is necessary.

Prior to the days of compensation laws recovery for industrial injuries was determined on the principles of the old English

common law. Not only was litigation lengthy and expensive but recovery was doubtful. If a favorable verdict for the employee was obtained, his ultimate recovery was frequently so small that the disabled employee remained a burden on society. The increased use of machinery, the organization of factory production and the increase in employees in one plant made the common law procedure intolerable. To remedy this situation, workmen's compensation laws were enacted.

Uniformity in workmen's compensation laws is desirable, but such uniformity is not absolutely essential and probably not altogether desirable in all aspects. Because of the large area of the United States and of the diversified industries, a different approach to the workmen's compensation problems in particular states is probably justified. At any rate it would be the height of optimism to expect uniform compensation laws in all states.

However, the goal is the same in all the states although the rewards may be unequal and the path not always the same. Uniformity is one feature of workmen's compensation laws which lends itself to ready attainment is adequate medical care and treatment in all its phases.

May I make some observations on what I consider adequate provisions in a compensation law for medical and surgical care? The most important consideration at the time of injury and thereafter is the physical restoration of the disabled employee. The return to full earning capacity is of tremendously greater value to a worker than any amount of compensation benefits that might be paid. It is therefore evident that the medical profession is a controlling factor in a compensation case. The first consideration which the attending physician should give in the treatment of his case is to furnish treatment that is most likely to result in the best possible physical restoration. To this end everything reasonably necessary should be done. It should be the aim of all concerned to rehabilitate the disabled employee to economic and social well-being as rapidly and completely as possible. Limitation in medical and surgical care in either time or money will not accomplish such objectives. It seems almost incredible that a number of states still limit medical benefits to ninety days following the injury and in amounts limited to \$300. In serious cases consultation is desirable. As a part of treatment, curative workshops may be valuable.

No plan can be complete without preemployment and periodic medical examinations. Organized labor has objected to medical examinations which have not been limited to one or more of the following objectives: (a) To place workers in occupations susceptible of being efficiently carried on considering the physical well-being of the examined employee. (b) To place workers in occupations where physical or mental handicaps will not constitute a hazard to themselves, their fellow employees or the public. (c) To place workers in occupations where physical handicaps will not constitute a continuous hazard to the physical property of the employer or fellow workers. (d) To eliminate from employment applicants or workers with contagious or communicable diseases.

An examination program designed solely to select only those with a high degree of physical fitness or for mere medical defense against possible claims is against public policy. Many occupational diseases can never be successfully controlled without proper medical examinations of all exposed persons and of all those who are to enter service in work entailing the breathing of deleterious dusts or fumes. Representatives of organized labor favor a properly designed physical examination program. We are working on such a plan in Wisconsin through a committee representing industry and labor assisted by a special committee of physicians. When adopted, it will provide for the placement of employees in work commensurate with their health will safeguard them against accidents and diseases to which they might be more prone and will provide an adequate system of medical control of accidents and diseases as a necessary supplement to engineering control. On the other hand it will provide against oppressive examinations and against the improper use of the information obtained through such examinations. As a whole it will permit the early treatment of diseases caused by occupational exposure and lead to the discovery of such diseases and their causes. It will reduce the cost of labor turnover and of absenteeism and produce happier and more efficient workers.

In the satisfactory disposition of most compensation cases the attending physician has an important role. This is par-



ticularly true at the end of the healing period and in the final determination of questions of permanent disability. The physician should always have this critical time in mind in the treatment of his patient. To meet this crisis the attending physician must gain the confidence of the patient. When an injured employee returns to work, the physician has two definite obligations. The first is to the injured employee, who should be advised of the class of work he is able to do and more particularly of the kinds of work he should refrain from doing. The physician's second duty is to give the same instructions to the employer either directly or through a representative of the insurance carrier. The foreman should be impressed with the fact that the injured employee still has physical handicaps which may limit his efficiency and that only through patience will his rehabilitation be successful.

It may not be out of place for a layman to give a word of caution on the handling of cases involving emotional instability. Neurosis almost always represents a difficult and pitiable condition. Often it is brought about by some indiscreet suggestion, perhaps even by attending physicians. The compensation law provides for the payment of compensation not only during the period of temporary total disability but also for permanent disability in the determination of which all interested parties must depend on the opinion of the physician. The compensation law aims to give to the injured employee adequate compensation for the disability occasioned by injury. When this question is being considered, the surgeon should not forget that he is still the physician of a particular patient and in estimating disabilities should never take into account the fact that he is being paid for his services by the employer or insurer. May I suggest that the surgeon should not be too sanguine in judging the results of his work. The results may have been the best obtainable but it does not follow that an injured member has been restored to perfect normality. The surgeon should be particularly alert therefore to be fair in appraising the disability. Physicians should become thoroughly familiar with the compensation law of their state and with its administration, so that their reports and opinions convey a proper meaning. In estimating disabilities the surgeon should never take into account the amount of money which is to be paid. "Let the chips fall where they may." Estimates of disability should not be predicted but should be determined scientifically after maximum recovery has been attained. The schedules contained in most compensation laws usually include amputations and the loss of vision and hearing. Any injury short of amputation is compensated for on the basis of a relative loss, that is, the loss is estimated as a certain percentage of the allowance contained in the schedule for the next greater rated disability. For instance, a disability limited to the function of the forearm from the elbow to the tips of the fingers is comparable to the loss of an arm at the elbow and not to the loss of an arm at the shoulder. Within limitations, it is possible to establish by custom or rule the related disability applicable to a given handicap. The Industrial Commission of Wisconsin, after many hearings in cooperation with the state medical society, adopted a schedule of related disabilities to serve as a guide. For example limitation of active elevation of the arm in all directions to 90 degrees, but otherwise normal, is a loss of 20 per cent of the arm at the shoulder. If other conditions exist, the percentage of disability varies more or less as the disability varies from this standard.

Workmen have complained that doctors whose bills are paid by employers or insurance companies have discriminated unfairly against the workmen in underestimating the degree of disabilities. Contrary complaints are made by employers against doctors who are retained by workers. After years of experience and seeing probably as many actual cases as any one physician may see, it would be strange if those who administer compensation laws did not have some fairly good ideas as to how disabilities should be measured. It is soon discovered whether or not a physician is giving that unbiased study which enables him to estimate disabilities fairly. Members of the medical profession usually give honest judgments as to disabilities and their estimates of disabilities are usually accurate and in agreement with one another.

The question whether or not the disability is the result of accident or occupational disease offers more difficulty. There are still many problems which medicine has not solved and the cause and effect are still controversial. Opinions based purely on conjecture have no probative force. The scientist in any given set of facts will always give the reasonable probabilities from which a determination can be made. Fancy theories that a condition is not the result of a definite injury in the face of a definite chain of events or that a disability may be due to injury when more reasonable causative factors are present are of no particular value in the determination of medical questions. However, difference of opinion should never degenerate into partisanship, for then the physician ceases to be impartial and the value of his service in the administration of workmen's compensation laws becomes practically nil. For the determining of medical issues, either as a witness or when appointed to make independent examinations, the members of an old and honored profession should always give opinions independent of their source of employment and purely on the reasonable scientific probabilities applicable to the given situation. The whole success of compensation legislation depends on him and the future well-being of thousands of men injured each year depends on his skill and his judgment. It is to the credit of the medical profession that compensation laws have generally worked out as successfully as they have. But it is desirable that the profession weed out its undesirable members and so far as the compensation laws are concerned give that quality of judgment and attitude which will gain the fullest confidence of injured men and render to employees and employers uniformly impartial service.

#### The Basis for Cooperation Between Insurance Companies and the Physician in Industry

MR AMBROSE B KELLY, Chicago. The question of medical care for those in the lower income brackets is much before the public, yet it is seldom remembered that the working population in all states but two is provided with medical care for injury or disease arising out of employment. More than 700,000 persons received such medical attention annually at a cost of more than \$25,000,000. The insurance companies furnish the organization through which the funds to make such payments are collected from industry and they supervise these medical expenditures. I come before you as a representative of one branch of the medical profession's largest single customer, the compensation insurance companies. Let us determine the objective and the procedures of the insurance company handling workmen's compensation coverage to find a basis for cooperation with the physician.

Under the workmen's compensation acts the employer is responsible for any injury and in some cases any occupational disease suffered by his employees in the course of and arising out of their employment. The law requires the employer to guarantee that this obligation will be carried out either by furnishing evidence of insurance in an admitted company or by establishing his own ability to act as a self insurer.

The employer makes a contract with an insurance company under which, in return for a premium, it assumes his statutory obligations. Acting for the employer, the insurance company is generally required to pay a stated scale of benefits in the event that injury or disease disables the worker and also provide medical service to those injured or disabled within the qualifications set forth in the law. Since most compensation acts provide a waiting period ranging from a few days to a few weeks before benefits are paid, there are hundreds of thousands of cases in which the medical expense of treating a slight injury is the only expenditure made by the insurance company as the result of an accident. In more serious cases the medical and hospital expense of a single individual often amounts to thousands of dollars. The percentage of the compensation payments which is used for medical care is constantly growing. Under current conditions the amount paid for medical service is a considerable part of the total expenditures made by the compensation carrier. The premium charged the employer is regarded by him as one of the items of operation expense and is passed on to the ultimate consumer of his product as a part of its price. Employers anxious to hold down compensation costs have been paying close attention to the rise in medical cost.

The compensation carrier gives the employer all possible assistance in a safety campaign designed to prevent accidents or occupational disease, provides adequate medical care and treatment for those injured or sick from occupational disease and pays any benefits due to the employee under the act. In the event of disagreement between the adjuster, representing the insurance carrier, and the employee as to the extent or existence of disability or as to whether the injury received was within the protection afforded by the compensation act, machinery is provided for a hearing and a determination of the disputed question, with expert medical testimony introduced by both parties.

At every step in this program the compensation carrier depends on the experience and ability of doctors for advice and service.

In most states the employer required to furnish medical service has the right to choose the physician, with qualification that in an emergency the employee may choose his own physician and hospital and, of course, he may do so when the employer has refused to provide medical service on demand. When the employer is insured, he looks to the insurance carrier for advice with reference to the name of a doctor to handle injuries. The insurance carrier is guided by the following considerations: 1 The doctors chosen must not only be competent and of good reputation but must have had experience in the type of case which will probably arise out of the plant. 2 It is desirable that the doctor have a properly equipped office with some one available at all times, convenient to the insured plant. 3 He should be in constant touch with all developments in the field of industrial surgery, particularly the field of rehabilitation. 4 He should be familiar with the workmen's compensation law of his state and be in a position to prepare the various forms and reports required. 5 He must be willing to call on specialists for consultation.

The medical profession can be proud of the service which the injured workman receives under the compensation acts. A survey, made a few months ago, disclosed that competent doctors were doing industrial work from coast to coast. With the exception of a few rural areas where the volume of industrial practice was not sufficient to provide experience and justify special study, our companies reported that they were satisfied with the service rendered. It is interesting that the bulk of this service has been and will be rendered by general practitioners, with the industrial specialist confined to the metropolitan areas. This record made over a period of twenty-five years, demonstrates that the medical profession has the ability to handle a problem of real social significance without any sacrifice of the basic principles on which the profession has been built. However, improvement is not only possible but necessary and, since the objective of better medical care to the patient is common to both doctors and insurance companies, cooperation between them is natural and should be effective.

Comparatively little attention is given to industrial medicine and surgery in our leading medical schools. The almost complete lack of graduate instruction is deplorable. It is hoped that the growing recognition of the importance of industrial medicine, of which the Council on Industrial Health and this congress are sufficient proof, will soon be felt in the field of medical education. A harder problem is the necessity of providing facilities for keeping practicing physicians in touch with new developments in the field of industrial medicine. Too often it seems to us from the sidelines, the large place of industrial practice in the medical picture is not realized when programs and clinics are being arranged. Any comprehensive program which might be developed by the Council on Industrial Health and placed in effect by the state and county medical societies will have the enthusiastic support of the insurance companies.

The greatest single cause of friction between the insurance companies and the medical profession is the controversy over the selection of the doctor to treat the employee. Under the workmen's compensation acts of thirty-nine states the responsibility for providing medical service and the right to select the physician who shall render that service are given jointly to the employer and to his insurance company. This has sometimes resulted in an attempt by either self-insured employers or insurance companies to concentrate all their industrial medical work in the hands of a few doctors, and occasionally clinics have been set up to handle industrial cases on a mass production low cost basis. In consequence there has been agitation against any inter-

ference by the employer with the selection of the physician, by the employee, and the legislatures of a number of states have considered bills which would give to the employee "free choice" of doctors. Such measures, although generally introduced at the request of local or state medical societies, have often secured labor support and such groups as chiropractors and osteopaths are always enthusiastically behind them.

There is a growing realization on the part of many insurance companies that an undue concentration of industrial work is undesirable. It is conceded by claims men everywhere that the doctor in general practice is fully competent to handle much of the medical service which arises from compensable injuries and there is a growing feeling that an employee who has gone to his own physician for treatment of a compensation injury should continue under the care of that doctor unless there are complications which take the case out of his experience and make consultation or a change in doctors necessary. The practice of indiscriminate "lifting of cases" from the hands of able doctors so that they may be treated at lower cost per visit by other physicians is generally condemned by the insurance companies and within a short time it should cease to be a problem. Even though it is admitted that there is room for improvement in the methods of the insurance companies, they have opposed unlimited free choice because of their conviction that it lowers the quality of medical service rendered to the injured person. Free choice will continue to be opposed until a plan can be worked out under which the insurance companies will feel reasonably sure that the doctors handling industrial cases will be skilled, experienced men. Work on such plans is going forward now. A cause of friction is the problem of determining the proper fee for a doctor who has treated a compensation case. In a few states an attempt has been made to handle the situation by enacting a statute which gives the industrial commission or some other body the power to set up a fee schedule. The insurance companies regard a rigid fee schedule as objectionable, because the very nature of medical service would seem to require that the charge correspond with the ability, the experience and the service which were required in an individual case. Under a fixed fee schedule the same standardized amount will be paid to a capable doctor who has secured an excellent result and to another doctor of less skill who has secured an unsatisfactory result. The medical profession seems to agree that a standardized fee schedule would be undesirable in general practice and the insurance companies feel that the same reasoning is entirely applicable in industrial medicine.

It has been proved again and again and in every section of the country that there is no issue now in controversy between the medical profession and the insurance companies which will not yield when attacked by conference committees representing both groups. It has been my pleasure to take part in many such conferences and invariably an answer satisfactory to both groups has been found. The medical profession will find the insurance companies always ready to consider with them any problem in which the two are jointly concerned, from a national question to the smallest local dispute. I think that, on behalf of the insurance companies, I can pledge our willingness to go more than half way in adjusting any situation which is of present concern.

The true basis for cooperation between insurance companies writing workmen's compensation insurance and the physician in industry lies in their joint determination to bring about the recovery of the patient in the shortest possible time with the best possible result. The insurance companies will support in every way in which they can every effort of the medical profession that is aimed at bettering the quality of medical care in compensation cases. It is inconceivable that we should not join hands in a cooperative program which will establish a quality of medical service far above that now reached and demonstrate the ability of medicine and industry to handle a problem of this scope and significance with an efficiency attainable in no other way.

#### A Program for Committees on Industrial Health in the State Medical Societies

DR A D LAZARUS, Baltimore. This is an industrial nation. The huge population which makes its living in mechanical and manufacturing pursuits is exposed to many environmental factors in places of employment inimical to health. There are more

than 900 occupational exposures to toxic substances and conditions that may impair the health of the worker. Disabling illness is 76 per cent higher among nonskilled labor than in the so-called nonindustrial group and the death rates are 24 per cent higher in the former than in the latter. True, not all of the disease and death in this class of the population is due to occupational conditions. Much is due to ailments that are the heritage of mankind. The health of the industrial worker is precious to him and to society is a direct responsibility of the medical profession and has been neglected in the past by both the industrialist and the profession. The leadership in industrial health conservation which should have been assumed long since by the medical profession is now being usurped by the industrialist. The time has come when the organized medical profession must manifest a constructive interest in the problems of industrial health, must realize their fundamental importance and must actually do something about it or else relinquish leadership to industry.

What must the state medical society do to capture the position and responsibility that rightfully belongs to the physician? Conditions vary so in the various states that a cut and dried program is impossible. The industrial physician is primarily a diagnostician, a sanitarian, a man highly versatile in medicine and in the industry he serves. He is a therapist only secondarily. It is his task to appraise the physical quality of the working personnel, to see through his own knowledge of the various jobs and men available that jobs and men are suitably matched, that neither may suffer through the shortcomings of the other, to discover toxic substances, fumes and vapors, to instruct the engineers in their avenues of entrance into and exit from the body, their effect on the body in their passage through and their residence within and assist in creating means for their exclusion from the vulnerable zone of the worker. The industrial physician must study the sanitation of the plant, the lighting, ventilating, heating, cleanliness, fatigue, monotony and all those environmental conditions that go for the promotion of health and efficiency. The problem of absenteeism, discovery of its causes and removing them with the aid of the family physician are an important phase of his work. He must take an active part in programs of accident prevention, health education and environmental improvement, and in various local activities that may be created for the maintenance of good morale and good physical and mental hygiene. In activities such as these, the industrial physician has not encroached in the least on the rightful preserves of the private practitioner.

Perhaps the first task that confronts the state medical society in meeting this challenge is a realization of the ignorance that exists in medical circles concerning the problem of occupational diseases. We have no real statistics on the actual prevalence of occupational disease in this country, even though in many states such diseases are reportable under the law. Let us acknowledge honestly that this situation exists not because physicians merely overlook the legal requirements for reporting such cases but because they all too often actually fail to recognize them.

We cannot ignore the cry that the medical curriculum is overcrowded and that there is no time for the teaching of industrial hygiene even as an elective subject to undergraduate students. Possibly the best we can hope from the medical schools for the present in teaching is emphasis on the occupation of the patient in history taking and general diagnosis, and the showing of cases of industrial diseases as they appear in the wards and clinics. It is certainly not too much to ask that faculties of medicine at least give undergraduate students an awareness that occupation and disease are often closely related. It is hoped that teaching hospitals in industrial centers may, as interest develops and realization deepens, establish beds, outpatient and laboratory facilities for the adequate study and treatment of industrial diseases. This needs the sustained interest of the organized profession.

Social advance has reached the point where diseases due to specific occupational exposures are being placed in the almost identical category with industrial injuries. The physician can no longer remain in ignorance of those diseases and do honor to his calling. The medical society meeting is the proper place to which the general practitioner should turn for acquisition of knowledge and the stimulating of interest in new and timely

subjects. I urge the development of programs and symposiums dealing with industrial medicine. Too frequently the occasional industrial program given by the average medical society tends to lay undue emphasis on the surgical or economic angles of the problem. We must focus our interest on man the worker and on all the forces, chemical, physical, mental and spiritual, that may tend to affect him adversely.

Perhaps the fundamental function of the physician is as a teacher. Prevention of disease, as the true basis of medical practice, receives its primary impetus through education. To whom then should the industrialist, who is responsible for plant environmental conditions, turn for knowledge? The only answer is to the medical profession through its organized bodies. Industry has taken the initiative in many instances, and much of the constructive work dealing with industrial health conservation has originated not in medical circles but in business itself. Let us establish cordial relations with associations of commerce, trade and labor groups, manufacturing associations and insurance groups so that we may better function in our fundamental role as teacher. I suggest the sponsorship of joint meetings with such groups, that problems of mutual interest dealing with occupational disease, accident prevention and industrial hygiene may be discussed.

There is a definite place for the doctor in every industrial plant, large and small, in an important capacity. Until industry and labor are taught to recognize that place and until the actual cash value of intelligent health conservation is demonstrated comparatively little progress can be made. The task is ours. Let us not overlook the need in small industry for medical guidance. Of the manufacturing establishments of this country 80 per cent employ less than 100 persons and about one fifth of our industrial population is employed in such establishments.

Perhaps the local medical society is the place where organized courses in industrial medical problems might be given for interested physicians, especially younger men. Even though the participants in such courses may never establish definite relationships with industry, the knowledge gained and the visits that would be paid to manufacturing plants should broaden points of view and sharpen diagnostic acumen.

In most of the states, workmen's compensation laws have arisen to replace the old common law relations of master and servant in injuries of occupation. From their very onset they involved changes in methods and philosophies of medical practice, in physician and patient relationships and in methods of remuneration for professional services. The approach of the new law has seemed stealthy only because the organized medical profession slumbered. Partly as a result of this indifference workmen's compensation neither started nor developed as auspiciously as might have been the case had the more thoughtful minds in medicine been interested. At the outset the regulation of the medical aspects of the law was placed in the hands of lay industrial commissioners, lay insurance adjusters and a substratum of the medical profession more interested in personal gain than in scientific or humanitarian excellence. This situation has not been fully eradicated. However, relations under the various workmen's compensation acts have improved vastly in the last decade. There seems to be a renaissance of interest in industrial injuries and diseases by the better qualified in medicine and the injured worker is the beneficiary.

The study of social legislation such as workmen's compensation laws should engage almost every state medical society. Investigations of workmen's compensation laws have been undertaken by medical groups. Some have been fruitful but most have been futile and some even ridiculous. The error has usually been fundamental ignorance on the part of the investigators of the philosophy back of these laws. A study of existing laws should be undertaken in singleness of purpose and sincerity of heart. The purpose should be the physical and social well-being of the industrial worker and his influence on the rest of society.

The question of free choice of doctor in cases of industrial injury is worthy of careful but objective study by organized medicine. The judgment of medical investigators here may be tempered by prejudice or tradition, for there is much in the philosophy of workmen's compensation that is contrary to past experience. Points of view may be unconsciously distorted by thwarted personal desires to participate to a larger

extent in the surgery of industry and to share in the financial rewards. Passions may have been aroused by apparently unwarranted acts of unfairness by insurance adjusters or plant executives. Our problem must be, however, a dispassionate, informed, reasonable study of the existing laws, with their social and economic backgrounds, and the reasons for certain techniques that have developed in their administration. We must never lose sight of the party of prime interest, the injured worker. This is a workmen's compensation law. It is not a doctor's compensation law, an employer's compensation law or an insurance company's compensation law.

It is possible that in certain states, injured employees can to advantage be given free choice of doctor. In other states, circumstances may be such that greater limitations are necessary to assure competent and prompt surgical care of injured men. It is my belief, based on observations extending over many years, that the finest surgical care is not received by the industrially injured under a system permitting unrestricted free choice of doctor. I realize fully the abuses under the system delegating the choice of physician to the employer or his insurance company, however, if this choice be motivated by the highest ideals the abuses are fewer and the final results in human suffering and wastage infinitely smaller than if the worker is free to go his way unguided. It is most probable that an effective compromise could be had, however, by the development as between medicine and insurance of statewide programs of cooperation where a much wider and freer choice of doctor could be allowed the injured worker.

In all parts of the country, existing workmen's compensation laws have been or are in process of being extended to cover occupational disease as well as injury. Let us not overlook the profound influence that such legislation may have on medical practice. By legal enactment such laws may often be extended to include all the ailments to which mankind is heir. Proper though it is to impose on industry the burdens of those physical ills that industry inflicts, it is not socially sound to thrust on industry the entire health problem of society or even a substantial part of it. This is not good for society in general or for the physician in particular. I suggest that the local medical society scrutinize closely all such pending or existing social laws.

Workmen's compensation administration involves the payment of variable cash benefits for varying degrees of disability and creates generous opportunity for differences of medical opinion not merely as to degrees of disability but as to causal relationships between injuries and disabilities. This requires the frequent attendance of the physician before judicial or quasijudicial bodies. One expects differences of opinion to exist with honesty between physicians but one does not expect such absolutely variable opinions on such relatively simple issues as are not infrequently heard in legal controversy today. Let our local medical societies turn the light of publicity and condemnation on the few of its members who are willing to sell their priceless birthright for a mess of pottage. In workmen's compensation matters fulfillment would not be possible without the application of the insurance principle in some form. It seems certain, however that medicine and insurance must lie down together in the same pasture. It seems logical that a common meeting ground be sought, a place where points of view can be clarified understood and reconciled where objectives can be unified where sympathetic cooperation can be created. I suggest the conference table as the place to seek these happy ends. Insurance is administered by reasonable men, just as is medicine. The state medical society will find it worth while to maintain close contact with local insurance organizations, claim associations and similar lay groups. Such a contact will do much to eliminate the abuses which often occur in both sides. We must acknowledge that the doctor is not always blameless. Abuses and exploitation usually melt when subjected to illumination. When they do not, legislation with medical sponsorship must be adopted.

I urge on us the need for an aggressive policy in approaching the problems of health in industry. It is for us to take the initiative in making constructive advances lest they be thrust on us under the leadership of industrialists, chemists and welfare workers. Let us recognize our responsibilities.

establish an enlightened point of view and do our part with a singleness of purpose in the full knowledge and realization that we, as a profession can advance and prosper only as society advances and prospers.

#### DISCUSSION

DR H. H. KESSLER, Newark, N. J. I should like to endorse the remarks made by Mr. Wrabetz. There are many difficulties which face the physically handicapped individual and one of those is that there are only twelve or thirteen compensation laws that include artificial limbs in their requirements for medical and surgical care. Another question is that of uniformity and the determination of permanent disability as end results of industrial accidents. We use the word 'scientific' loosely. Perhaps there are scientific methods we might apply to estimate disability, and in the eye and ear they are easier of achievement. With the rest of the body I find it difficult. It is very difficult to determine a man's capacity to work and to define what his functional limitations are. I once certified a man as totally and permanently disabled. He, an iron worker, fell from a height, sustaining a fracture of the spine, with cord injury and spastic paraplegia. He returned to me five years later with a spastic gait, without the aid of canes, and said 'I am looking for a job as a structural iron worker.' He had credentials to indicate that he had been employed as a structural iron worker following his accident. He had worked for one employer who knew what his capacities and limitations were.

MR E. T. BUCKINGHAM, Bridgeport, Conn. In Connecticut the doctors complain that the reports they have to make out are very complex. Has any attempt been made to simplify the reports the doctor has to make to the insurance carrier?

MR AMBROSE B. KELLY, Chicago. The question of the forms to be used in making medical reports has been considered by a committee of the National Council on Compensation Insurance, which has attempted to secure uniformity throughout the United States in the medical reports used. If the present reports are of concern because of their complexity, the situation might be considered with the committee of the national council, which would be receptive to suggestions with reference to the simplification of reports. The insurance business is essentially a paper business, built on files, reports and forms. The people in the business realize the desirability of keeping the forms as simple as they can, provided the basic information which we must have either to satisfy the administrative body which is handling the compensation act or to prepare the necessary statistics of our own office is provided.

DR A. S. LEVEN, Chicago. With reference to the economic situation, I think the controversy arises not only from the fact that the insurance companies have the privilege, which is justly theirs, of assigning the various physicians in the respective territories to the various companies but also from the point of view of the medical bills. The organized physician in industry today is a much underpaid man, whether or not today medicine is a competitive system. But no matter how good you are or how bad you are, you compete with the next fellow—and this is where the point comes in. The insurance company and the firm are there for a purpose which is to make as much profit as possible and the doctor gets it in the neck.

MR KELLY. The contacts that we have made with the medical profession in the past year would seem to indicate that much of our trouble arises from the lack of contact between the doctor and the insurance company's representatives. We have criticized the representatives of the companies whom I represent for their lack of a sympathetic understanding of the problems faced by the doctors in their field and we hope they will take more interest in your problems and work closer with you. At all times here we have two large groups—both sincere, both with definite social objectives which they are doing their best to attain—who can get much further if they work together. If we admit from the beginning that we are honest on both sides that we are sincere that we are trying to do a good job and sit down together to consider our respective problems we shall find that those which seem difficult are not so hard after all.

MR MARSHALL DAWSON, Washington, D. C. The employers and insurance carriers and the compensation administrations of the United States have been pretty well sold on the possibility of great savings through the engineering phases of accident prevention, but the state administrations are almost unaware of the vast savings in costs that can be effected through an improved type of medical care. So far as I have learned, there is almost a complete dearth of statistical information in the offices of the state compensation administrations that would enable the state administrators to check on the competence of medical care. I am speaking now of a statistical check. I hope you will encourage the state compensation administrations to collect more data relating to the type and quality of medical care of workers, especially relating to end results, a thing which will enable the compensation administrators to have a fairly correct idea of what results should be expected in treatment especially as measured by the duration of temporary disability. In reading the publications of the American College of Surgeons, I inferred that because of the great progress in surgical operative methods during the last fifteen years there has been a marked reduction in the periods of temporary disability, which would be found in certain types of disabilities, in what we call temporary or total compensation, and the temporary disability preceding permanent disability. The publications of the College of Surgeons indicate that the period of temporary disability has been reduced, but the compensation reports of the state of New York indicate that from 1932 to 1936 the duration of temporary disability increased. From one point of view this would indicate that medical science and practice are going backward rapidly. Compensation administrators can explain this situation to a certain degree but with all due allowance for the reluctance of workmen to say they are cured when they have no jobs to return to, this thing ought not to be. If any of you have information indicating either progress or retrogression in the average duration of temporary disability, I should much like to get it.

DR O. J. LA BARGE, Salt Lake City. I came here as the chairman of the Section on Industrial Hygiene of the Utah State Medical Association. In Utah, aside from self insurers, the patient has the right to choose his own physician and we have a fee schedule. During the last five sessions of the legislature we fought the self insurers on that proposition. We found that the choice of a physician or the employer's choice of a physician was often predicated on the recommendations made by the field agents of the insuring companies. We have some pretty big families in Utah. It is remarkable how often Brother Jim or Cousin Bill is the best doctor in the community and succeeds in getting all the industrial work. We have a committee of the state medical association that

cooperates with the state insurance fund. If bills come in that seem excessive, they go to the advisory committee, and the advisory committee has authority to recommend a cut. Also if patients do not seem to be getting along as well as they could, the advisory committee of the state medical association can advise consultation or can transfer the patient from one physician to another. It has worked well, and we believe our fee schedule has maintained the economic status of the physician. We are getting case per case, at least 25 per cent more than our brother physicians in the great state of California, where the self insurers and the carriers choose the physician. It is out of place to adopt a selfish attitude. We all ought to be unselfish but I fully believe the medical association has to look out for their economic welfare in a changing world.

DR A. D. LAZENBY, Baltimore. Beyond thanking the gentlemen who discussed my paper, I advocate nothing except study, dispassionate, free honest study of all facts that are available. If we will approach that study from the standpoint not of having our local medical society the best paid in the country but from the standpoint of having our injured workers the best treated in the country, I think our study will probably be more fruitful. (To be continued)

### RADIO BROADCASTS

The fourth series of programs broadcast in dramatic form portraying fictitious but typical incidents of significance in relation to health by the American Medical Association and the National Broadcasting Company, entitled "Your Health," began Wednesday October 19 and will run consecutively for thirty-six weeks. The program is broadcast each Wednesday over the blue network of the National Broadcasting Company at 2 p. m. eastern standard time (1 p. m. central standard time, 12 noon mountain time, 11 a. m. Pacific time).<sup>1</sup>

These programs are broadcast on what is known in radio as a sustaining basis, that is, the time is furnished gratis by the radio network and local stations and no revenue is derived from the programs. Therefore, local stations may or may not take the program at their discretion, except those stations which are owned and operated by the National Broadcasting Company.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

February 15	Healthy Hearts
February 22	Cancer Can Be Cured
March 1	Diabetes

1. Owing to program conflicts there will be no Chicago broadcast of the network program. Instead a recording of the program will be broadcast over station WGN at 8 p. m. each Wednesday. This recording will be an identical rebroadcast of the network program broadcast earlier the same day.

## GRADUATE MEDICAL EDUCATION: ARKANSAS

A PROGRESS REPORT OF THE FIELD STUDY ON GRADUATE MEDICAL EDUCATION IN THE UNITED STATES  
BEING CONDUCTED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

In 1936 the Arkansas Medical Society began a semiannual two day course of postgraduate instruction in Little Rock. The state society's committee on postgraduate study was formed with Dr. D. A. Rhinehart as chairman and fourteen other members from various parts of the state. This committee invites from two to four out of state speakers to participate in each session. Arkansas physicians supplement guest speakers on the program. Lectures and round table discussions of not more than two general subjects of medicine feature each meeting. The facilities of the University of Arkansas School of Medicine are placed at the disposal of the state medical society. A registration fee of \$5 is charged to provide travel expenses for guest speakers. Announcements are sent to every member of the state medical society and to the secretaries of county medical societies.

In 1936 pneumonia and heart disease were considered. One hundred and forty-nine practicing physicians registered. In January 1937 the medical and surgical aspects of gastroenterology were discussed. Eighty-three physicians were in

attendance. In September 1937 gynecology and fractures featured the program and the attendance totaled eighty-four physicians. The fourth session, held in January 1938, was devoted to pediatrics and genito-urinary disease, with a total registration of 113. In October 1938 the recent advances in medicine were emphasized. At this meeting patients were shown and the attendance totaled 128 physicians.

Beginning in January 1937 the Arkansas Medical Society and the Arkansas State Board of Health sponsored a series of six consecutive lectures in obstetrics in six cities of the state. An out of state physician was employed as instructor with funds provided by the Children's Bureau of the United States Department of Labor. The state society's special committee on child and maternal welfare was composed of fifteen members and represented the profession in the various parts of the state. This committee planned the itinerary of the instructor. Announcements were prepared by the secretary of the state medical society and mailed to all physicians in Arkansas. Approximately 200

attended the illustrated lectures, which were held usually in civic buildings. In each town the local member of the maternal and child welfare committee was responsible for publicity and local arrangements.

In May and June 1938 a similar series of six lectures and clinics in pediatrics were held in six towns. Again an out of state physician was engaged, but in this course the instructor visited each town once a week and spent the afternoon and evening so that cases might be presented and round table discussions might be held. Two hundred physicians registered with the secretary of the state medical society for this course. Notices

appeared in the state medical journal and announcements were made as for the previous series.

One month courses in the venereal diseases have been sponsored and financed by the state board of health at the United States Public Health Service Venereal Disease Clinic at Hot Springs, Ark. One physician is selected in each county of the state by the respective county medical society. His travel expense is paid, in addition to a stipend of \$150 or \$200 a month.

There are 1,850 physicians in Arkansas, 1,032 of whom are members of the Arkansas Medical Society.

## LEGISLATION OF INTEREST TO PHYSICIANS CONSIDERED BY STATE LEGISLATURES IN 1938

*Prepared by T. V. McDavitt of the Bureau of Legal Medicine and Legislation*

This survey attempts to report as briefly as possible what are deemed to be the more significant legislative proposals considered by state legislatures in 1938<sup>1</sup>—significant from the standpoint of public health and the medical profession. As will be noted, not only are actual enactments enumerated in a more or less arbitrary arrangement of subjects and topics but discussion is also made of bills that did not become law. To expedite perusal for those more interested in ascertaining what the legislatures have perpetrated in the name of legislation than what could have been or may in the future be, enactments are printed in larger (ten point) type while proposals failing of enactment and footnotes are printed in the usual type of the survey (eight point and six point).

### I. LEGISLATION RELATING TO LICENSES TO PRACTICE THE HEALING ART

#### A. Legislation with Respect to Corporate Practice

**HOSPITAL SERVICE PLANS**—Laws were enacted in Kentucky<sup>2</sup> and New Jersey<sup>3</sup> authorizing the formation of corporations to provide on a so-called "non-profit basis" "hospital care" to their members or subscribers. The activities of such corporations under these laws would seem to be limited to the rendition of hospital care and not to include medical or surgical care. A new Louisiana law<sup>4</sup> provides for the formation of so-called service companies, authorized to make agreements with members or subscribers to furnish hospitalization and incidental drugs on the occurrence of sickness or other physical disability of a member or subscriber. Whether such companies may also contract to furnish medical care is not clear from a perusal of the law.

An unsuccessful attempt was made in South Carolina<sup>5</sup> to permit hospital members of the South Carolina hospital association to operate hospital service plans on an insurance basis.

An unsuccessful attempt was made in Mississippi<sup>6</sup> to amend the Mississippi law permitting persons, associations or corporations to engage in the business of making contracts in advance of sickness or illness to furnish or pay for hospitalization so as to permit such firms, associations or corporations also to contract to furnish or pay for medical and surgical service.

Two bills were killed in Mississippi<sup>7</sup> which proposed to prohibit a corporation operating a hospital department for its employees and making deductions from their pay to cover medical and hospital services, from contracting with a particular physician or hospital for the rendition of such services without a favorable referendum vote of the employers.

**CORPORATE PRACTICE IN GENERAL**—A bill considered in New Jersey<sup>8</sup> which was not enacted, proposed, among other things, specifically to prohibit the corporate practice of medicine but to legalize such practice by (1) a corporate employer in connection with the treatment of employees injured in the course of their employment or in examining applicants for employment, (2) an educational corporation in the rendering of medical care to and examination of pupils, and (3) an insurance corporation in examining applicants for insurance.

#### B. Changes in Medical Practice Acts Affecting Nonsectarian Practitioners

**BOARDS OF MEDICAL EXAMINERS**—The Massachusetts legislature rejected a proposal<sup>9</sup> to eliminate the requirement in the medical practice act that not more than three members of the board of registration in medicine shall be members of any one chartered state medical society.

**CONDITIONS PRECEDENT TO LICENSURE—Educational Qualifications**—A law enacted in Massachusetts in 1936,<sup>10</sup> to become effective in 1939, requires every applicant for a license to practice the healing art to have completed two years of premedical collegiate work and to have graduated from a chartered medical school approved by the secretary of the board of registration in medicine, the commissioner of education and the commissioner of public health. A new law adopted this year<sup>11</sup> postpones until Jan. 1, 1942, the effective date of the 1936 law.

Two attempts to nullify the effects of the 1936 law failed of enactment.<sup>12</sup> These proposals sought to require the board of registration to examine any applicant who had obtained a degree from any medical college authorized by Massachusetts to confer degrees.

Two laws were enacted in New Jersey<sup>13</sup> which seem to permit particular individuals without meeting the educational qualifications required of other applicants to be examined for licenses to practice medicine. One of these laws<sup>14</sup> authorizes the board of medical examiners to examine any person who has matriculated at a

<sup>1</sup> During 1938 the legislatures of Kentucky, Louisiana, Massachusetts, Mississippi, New Jersey, New York, Rhode Island, South Carolina and Virginia met in regular sessions. In addition there were one or more special sessions of the legislatures of Arizona, Arkansas, California, Georgia, Illinois, Indiana, Kansas, Kentucky, Massachusetts, Michigan, Mississippi, New Mexico, North Carolina, Ohio and Pennsylvania. Altogether there were a total of twenty-eight legislative sessions.

<sup>2</sup> Ky. Laws 1938 c. 23 (a companion bill S. 70 died in the Senate).

<sup>3</sup> Laws N. J. 1938 c. 366.

<sup>4</sup> La. Acts 1938 Act No. 136.

<sup>5</sup> S. C. S. 1863 H. 2519.

<sup>6</sup> Miss. H. 371.

<sup>7</sup> Miss. S. 131 H. 226.

<sup>8</sup> N. J. A. 511.

<sup>9</sup> Mass. H. 43.

<sup>10</sup> Mass. Laws 1936 c. 247.

<sup>11</sup> Mass. Laws 1938 c. 259.

<sup>12</sup> Mass. H. 1195 H. 1341.

<sup>13</sup> N. J. Laws 1938 c. 121 and c. 144.

<sup>14</sup> N. J. Laws 1938 c. 121.



legally chartered medical college in the United States now in good standing, has therein attended four full courses of lectures over four years, has completed an eighteen months internship in an approved hospital in the state and has thereafter continued to serve at least fifteen years as a resident member of the staff of an approved hospital in the state. The other law<sup>15</sup> requires the board of medical examiners to examine for a license to practice medicine and surgery any person more than 21 years of age, of good moral character, a citizen of the United States and a resident of the state, who has graduated from an approved high school, subsequently completed a four year course in a college or school of arts and sciences approved by the commissioner of education, has subsequently completed a four year course of study in a legally incorporated medical or professional college, receiving therefrom the degree of Doctor of Medicine, has subsequently served as an intern for at least one year in a hospital approved by the board, and has been licensed by the medical licensing board of another state of the United States.

**Citizenship Requirements.**—Bills were killed in New York<sup>16</sup> to limit licensure to citizens of the United States or to persons who had declared their intention of becoming citizens.

**Revocation and Suspension.**—*Causes.*—Laws were enacted in Mississippi<sup>17</sup> and New York<sup>18</sup> setting out causes for the revocation, suspension or refusal of licenses in addition to the causes stated in the medical practice acts prior to the enactment of the laws in question. The new Mississippi law<sup>17</sup> adds the following causes: the habitual personal use of a narcotic drug, administering, dispensing or prescribing any narcotic drug otherwise than in the course of legitimate professional practice and for the prevention, alleviation or cure of disease or for the relief of suffering, and not primarily for the purpose of catering to the cravings of an addict, conviction of a violation of any federal or state law relating to narcotic drugs, conviction of a misdemeanor involving moral turpitude or of a felony, and fraud or deception in obtaining a license to practice. The new New York law makes it a ground for the revocation or suspension of a license for the licensee to have "advertised for patronage by means of handbills, posters, circulars, letters, stereoptical slides, motion pictures, radio or magazines."

A bill was killed in New York<sup>19</sup> to make it a ground for the revocation of a license for a licensee to furnish or contract to furnish medical diagnosis or treatment of any kind or nature by or through any other person, whether such other person is licensed or not licensed except when the medical services are to be rendered without charge to the recipient.

**Power of Board to Reinstate Revoked License.**—A new Massachusetts law<sup>20</sup> authorizes the board of registration in medicine at any time after the expiration of one year following the revocation of a certificate issued by it to reissue the certificate and to reregister the affected physician.

**Procedure.**—The Massachusetts law just referred to<sup>20</sup> also specifically requires the board before revoking any certificate issued by it to afford due notice and hearing. The previous law provided for a *hearing* only, so far as specific language is concerned. The new

Mississippi law previously referred to<sup>17</sup> specifies a procedure which the board of medical examiners must follow in revoking or suspending a license and gives the board power in such proceedings to subpoena persons and papers, to administer oaths and to compel testimony. The law also provides that every order of the board is to take effect immediately on its promulgation unless the board fixes a different date and is to continue in effect notwithstanding an appeal to the court.

**ANNUAL REGISTRATION.**—The Massachusetts legislature rejected a proposal<sup>21</sup> to require all licensed practitioners of medicine to register annually with the board of registration in medicine and pay an annual license fee of \$1.

**PERSONS OR ACTS EXCLUDED FROM THE PROVISIONS OF THE MEDICAL PRACTICE ACT.**—An unsuccessful attempt was made in Massachusetts<sup>22</sup> to exempt from the provisions of the medical practice act "dentists, optometrists or chiropodists (podiatrists) when duly registered by their respective boards of registration and practicing as authorized by their certificates of registration."

**MISCELLANEOUS.**—Extensive amendments to the New Jersey Medical Practice Act were proposed in a bill considered in 1938.<sup>23</sup> Among other things the bill, if enacted, which it was not, would have (1) vested in the board of medical examiners the power to examine and license applicants for licenses to practice medicine and surgery, osteopathy, chiropractic, chiropody or optometry, and eventually would have permitted all the practitioners indicated, except optometrists, to practice medicine generally, (2) specifically prohibited the corporate practice of medicine and (3) permitted the use of the injunctive process to restrain the unlicensed practice of medicine.

A series of bills considered and killed in New York<sup>24</sup> under took to treat the practice of radiology as something distinct and apart from the practice of medicine. The bills defined radiology and proposed to prohibit such practice except by a person licensed under the provisions of the medical dental or chiropody practice acts "subject to the conditions and limitations of his license." The bills moreover proposed to authorize municipal corporations to grant permits to physicians, dentists, chiropodists and osteopaths to conduct places for the practice of radiology.

An unsuccessful attempt was made in Massachusetts<sup>25</sup> to provide (1) that the phrase "rendering medical service" as used in the medical practice act should include any treatment of one person by another, by the use or disuse of any means for the purpose of diagnosing, preventing, relieving or curing any deviation from normal condition of mind or body, or for the purpose of preventing, diagnosing or interfering with pregnancy, and (2) that a person should be regarded as holding himself out as a practitioner of medicine if he announced a readiness to practice medicine either directly or indirectly or if he opened an office for the practice of medicine or if he appended titles, words or letters to his name tending to suggest or designate him as a practitioner of medicine in any of its branches.

### C Legislation Affecting Cult Practitioners

**OSTEOPATHS.**—A law was adopted in South Carolina<sup>26</sup> setting up a separate osteopathic practice act and creating a state board of osteopathic examiners to examine and license persons to practice osteopathy. "Osteopathy," the law reads, "shall be defined as a complete system of therapeutics embracing all scientific subjects pertaining to the healing art except Materia Medica. Instead it places emphasis on structural integrity as a major essential to health and that [sic] any derangement of structural integrity is a fundamental cause of disease, by interfering with the natural

15 N. J. Laws 1934 c 154  
16 N. Y. S 1111 and A 1463  
17 Miss. Laws 1934 c 120 approved August 10 introduced in the first special session as H 120  
18 N. Y. Laws 1938 c 669  
19 N. Y. A 2408  
20 Mass. Laws 1938 c 210

21 Mass. H 41  
22 Mass. H 40  
23 N. J. A 511  
24 N. Y. A 157 A 1294 S 117 S 701  
25 Mass. H 39  
26 S. C. Acts 1938 Act No 991

function of immunity and nutrition Practice consists principally in the correction of all structural derangement by manipulative measures including physio and electro therapy, minor surgery, diet, hygiene and obstetrics"

A resolution was adopted in Massachusetts<sup>27</sup> which directs a special unpaid commission, for the purpose of informing the legislature, to investigate the advisability of establishing a board of examination and registration in osteopathy and of having on the statute books an osteopathic practice act The commission is also to consider the advisability of establishing a single board for the examination of applicants for registration to practice any of the healing arts

This resolution was a redraft of a number of proposals pending before the Massachusetts house and senate, some of which<sup>28</sup> proposed to enact a separate osteopathic practice act and to create an independent board of examination and registration in osteopathy to examine and license persons applying for licenses to practice osteopathy

The governor of New Jersey vetoed two bills which, if they had become law, would have conferred stated rights on osteopaths One of these bills<sup>29</sup> would have permitted osteopaths to be employed by boards of education as medical inspectors The other bill<sup>30</sup> would have required that at least one member of the state board of health be an osteopath

**CHIROPRACTORS**—The Massachusetts resolution previously referred to<sup>27</sup> also directed the special commission it created to investigate the advisability of establishing a board of registration of chiropractors and of enacting a separate chiropractic practice act

A similar resolution was killed in New York<sup>31</sup>

Unsuccessful attempts were made in three states<sup>32</sup> to enact separate chiropractic practice acts and to create independent boards of chiropractic examiners to examine and license persons to practice chiropractic

Unsuccessful attempts were made in Kentucky<sup>33</sup> and Rhode Island<sup>34</sup> to amend existing chiropractic practice acts The Kentucky bills proposed to require all licensed chiropractors to renew their licenses annually and to make it a condition precedent to obtaining such annual renewal that a licensee present satisfactory evidence that he had in the preceding year attended the two day educational programs as approved by the Board [of chiropractic examiners] and conducted by the Kentucky Association of Chiropractors The Rhode Island bill proposed that a certificate to practice chiropractic should confer on the holder the right to practice chiropractic in all its branches as taught and practiced in recognized colleges of chiropractic It also proposed that a licensed chiropractor would be a registered physician subject to the same duties and liabilities and entitled to the same rights and privileges which may be imposed by law or regulation upon physicians of any other school of medicine except the practice of major surgery, obstetrics and the writing of prescriptions for drugs for internal medication"

**MISCELLANEOUS CULTS**—Unsuccessful attempts were made to enact separate practice acts and to create independent examining and licensing boards for the cults indicated in the following states magnetic healing, Massachusetts,<sup>35</sup> naturopathy New Jersey<sup>36</sup> and Virginia<sup>37</sup> physiotherapy New York<sup>38</sup> and electrolysis, New York<sup>39</sup>

<sup>27</sup> Mass Laws 1938 c. resolve 53

<sup>28</sup> Mass H 759 and S 282 for example

<sup>29</sup> N J A 224

<sup>30</sup> N J A 223

<sup>31</sup> A resolution introduced in the New York Assembly March 17 by Peter on and referred to the Committee on Rules

<sup>32</sup> Mass H 854 N J A 135 A 689 N Y A 20<sup>38</sup>

<sup>33</sup> Ky S 147 H 246

<sup>34</sup> R I S 31

<sup>35</sup> Mass H 1210

<sup>36</sup> N J A 318 A 320

<sup>37</sup> Va H 264

<sup>38</sup> N Y A 233 S 1924

<sup>39</sup> N Y S 388 Electrolysis defined as the permanent removal of superfluous hair by means of a needle or needles with the use of electric [sic]

## II RIGHTS AND DUTIES OF PRACTITIONERS

### A Rights and Privileges

**INSURING PAYMENT OF MEDICAL BILLS**—The Virginia lien law was so amended this year<sup>40</sup> as to provide that where a personal injury results in death the lien of a physician, hospital or nurse caring for the decedent can be asserted against either (1) a judgment or compromise because of the injuries and death or (2) the general estate of the decedent, but not against both

Proposals to grant physicians treating persons injured through the negligence of others liens on any claims, rights of action, judgments, compromises or settlements accruing to the injured persons by reason of their injuries were killed in New York<sup>41</sup>

An unsuccessful New Jersey bill<sup>42</sup> proposed that in the distribution of the assets of an insolvent decedent the claims of physicians and nurses for services rendered during the last illness should be on a par with judgments entered against the decedent in his lifetime, funeral expenses and hospital bills and should have precedence over all other claims The Virginia house killed a bill<sup>43</sup> which proposed that the proceeds of a judgment based on a wrongful death should be paid to the personal representative of the decedent and after the payment of the costs of suit and reasonable attorney's fees, there should be paid the charges of hospitals, physicians and nurses incurred during the last illness of the decedent but not to exceed \$200 in the case of a hospital and \$50 to each such physician or nurse

Proposals to assure physicians of compensation for treating certain indigent patients were killed in Massachusetts and New York The Massachusetts bill<sup>44</sup> proposed to permit any person not in an institution and receiving public support who is in need of the services of the physician to employ, at the expense of the appropriate town, any physician who is registered for the purpose with the department of civil service A New York bill<sup>45</sup> proposed to permit any physician licensed to practice for five or more years to register with the state commissioner of health or the commissioner of health of the city of New York and thereafter be paid an annual compensation for treating such indigent persons as might be referred to him by the political subdivision in which he resides or maintains his office The bill proposed to permit any municipality to make available not exceeding \$750 per annum for each physician such municipal corporation desired to have appointed to furnish professional services to indigent persons

**PRIVILEGED COMMUNICATIONS**—Two bills were killed in Kentucky<sup>46</sup> which proposed that a physician should not be required to testify concerning a communication made to him in his professional character, by his patient, or his advice thereon, without the patient's consent An unsuccessful attempt was made in Mississippi<sup>47</sup> so to amend the law making communications made to a physician by a patient privileged as to provide that the law should not apply to criminal causes or to civil causes in which it was claimed that the patient's condition was caused by the negligence of any person and where that condition was put in issue

Another unsuccessful Mississippi bill<sup>48</sup> proposed to declare void a waiver of the privileged communications statute contained in any insurance policy

**EXPERT WITNESSES**—Two bills were killed in New York<sup>49</sup> which proposed that if in a criminal action issues arose on which the court deemed expert evidence desirable it might appoint one or more experts not exceeding three on each issue to testify at the trial Such experts were to be subject to cross examination and the fact that they were appointed

<sup>40</sup> Va Law 1938 c. 374

<sup>41</sup> N Y A 858 S 869

<sup>42</sup> N J A 23

<sup>43</sup> Va H 177

<sup>44</sup> Mass H 765

<sup>45</sup> N Y A 1312

<sup>46</sup> Ky H 12 S 10

<sup>47</sup> Miss H 656

<sup>48</sup> Miss H 626

<sup>49</sup> N Y S 532 A 24

by the court should be made known to the jury. Any party to the proceeding was to be privileged to call also other expert witnesses but the court was to be authorized to impose reasonable limitations on the number of witnesses so called.<sup>50</sup>

**VENEREAL PROPRIETARIES**—A new Kentucky law prohibits the retail sale or distribution of appliances, drugs or medicinal preparations intended or having special utility for the prevention of venereal diseases, except by licentiates of the state board of pharmacy and licentiates of the board of medical examiners regularly licensed to practice medicine.<sup>51</sup>

A similar bill failed of enactment in Mississippi.

**MISCELLANEOUS**—A bill proposing to prohibit the display of the insignia of a physician on a motor vehicle except on the motor vehicle of a licensed physician failed of enactment in Massachusetts.<sup>52</sup>

The Massachusetts legislature also killed a bill<sup>53</sup> to require any chartered hospital in the commonwealth to accept any patient on the request of a licensed physician. An attempt to make exempt from seizure under execution or attachment the instruments of surgeons and dentists used in their profession, not exceeding one thousand dollars in value, was rejected in Mississippi.<sup>54</sup>

### B. Duties and Liabilities

**TREATMENT OF PREGNANT WOMEN**—Laws were enacted in New Jersey,<sup>55</sup> New York and Rhode Island<sup>56</sup> to require a physician attending a pregnant woman to take a sample of her blood and to make or cause to be made a standardologic test for syphilis.

**REPORTS OF DEATHS, DISEASES AND DEFECTS**—A new Louisiana law<sup>57</sup> requires a physician having first knowledge of the death of any person who has died suddenly, accidentally, violently or as a result of any suspicious circumstance, or without medical attendance within thirty-six hours of death, or from an abortion whether self induced or otherwise, to notify the coroner and the district attorney.

Bills to require a physician treating a patient for venereal disease to notify the appropriate health authorities failed of enactment in Georgia<sup>58</sup> and New Jersey.<sup>59</sup> Unsuccessful attempts were made in Massachusetts<sup>60</sup> to require a physician attending or called to attend a case of induced abortion to report the facts at once to the appropriate police authorities and to the appropriate medical examiner.

The New York legislature killed two proposals<sup>61</sup> to require every physician to give notice immediately to the appropriate health officer of every case of cancer or other malignant tumor coming to his attention.

**DESIGNATION OF SCHOOL OF PRACTICE**—An unsuccessful attempt was made in Rhode Island<sup>62</sup> (1) to prohibit the use of the title "doctor" or "physician" in any occupation pertaining to the public health except by practitioners of medicine licensed by the board of examiners in medicine and (2) to require all practitioners of the healing art to "display, in letters not less than half the size of those used in said person's name, the particular branch or type of the healing art practiced, on every sign, advertisement or public notice."

<sup>50</sup> These bills were practically identical with the Uniform Expert Testimony Act prepared by the National Conference of Commissioners on Uniform State Laws except that the uniform act is designed to apply to both civil and criminal proceedings whereas the New York bills were to apply only to criminal proceedings.

<sup>51</sup> Ky. Laws 1938 c. 55.

<sup>52</sup> Miss. H. 261.

<sup>53</sup> Mass. H. 281.

<sup>54</sup> Mass. H. 1194.

<sup>55</sup> Miss. S. 196.

<sup>56</sup> N. J. Laws 1938 c. 41.

<sup>57</sup> N. Y. Laws 1938 c. 133.

<sup>58</sup> R. I. Laws 1938 c. 2606.

<sup>59</sup> La. Acts 1938 Act No. 366.

<sup>60</sup> Georgia first special session S. 90 \.

<sup>61</sup> N. J. S. 168.

<sup>62</sup> Mass. H. 1106 H. 1528.

<sup>63</sup> N. Y. S. 1815 and A. 2241.

<sup>64</sup> R. I. S. 216.

**MISCELLANEOUS**—The legislature of Massachusetts again killed proposals,<sup>65</sup> similar to proposals before it for several successive legislative sessions, to require a physician removing any limb or organ (1) to explain to the patient the nature of the operation and the reasons that made such an operation necessary and (2) to preserve the organ so removed for six weeks unless sooner demanded by the patient. An unsuccessful Mississippi bill<sup>66</sup> proposed to make it unlawful for any physician or hospital to assign any nurse who is not a graduate or registered nurse to a special case unless the nurse receives the compensation paid by the patient for the nursing services.

### III. LEGISLATION RELATING TO ALLIED PROFESSIONS AND SUNDRY VOCATIONS

**CLINICAL LABORATORY TECHNOLOGISTS OR TECHNICIANS, CLINICAL AND BACTERIOLOGICAL LABORATORIES**—A defeated Louisiana bill<sup>67</sup> proposed to prohibit the operation of a clinical laboratory except under the immediate supervision and direction of a licensed physician or of a licensed clinical laboratory technologist. The state board of health was to be authorized to license as a clinical laboratory technologist any person who holds a degree in one or more of the fundamental sciences issued by a recognized institution and passes such examinations as the board may require. The board was also to be authorized to license as a clinical laboratory technician any person whom it found properly qualified. Such a license might be restricted to cover work in any one or more basic sciences or it might cover work in the entire field of clinical laboratory work. A technician in the bill defined as a person who under the direction of a physician or technologist "performs the technical procedure called for in a clinical laboratory," which, according to the bill, was any establishment operated for the practical application of one or more of the fundamental sciences by the use of specialized apparatus, equipment and methods for the purpose of obtaining scientific data which may be used as an aid to ascertain the presence, progress and source of diseases.

An unsuccessful attempt was made in New York<sup>68</sup> to create a board of examiners for clinical laboratory technicians and to prohibit persons from practicing or representing themselves to be licensed as clinical laboratory technicians unless licensed by the board. A "clinical laboratory technician," according to the bill, was to be any person who "performs any technical laboratory procedures, including bacteriology, immunology, serology, biochemistry, hematology, histologic technique and clinical pathology, which are used for the purpose of diagnosing, investigating or treating any disease, illness or infection."

Two bills to prohibit the operation of bacteriological laboratories except by virtue of a license or a certificate of approval from a designated agency failed in Massachusetts<sup>69</sup>. Both bills defined a bacteriological laboratory as "a place or establishment which is advertised, announced or maintained in whole or in part for the purpose of accepting for and subjecting to bacteriological study or analysis specimens of milk, water and foodstuffs or specimens of blood, sputum, urine, feces or other fluids, secretions or excretions of the body of persons ill or suspected of being ill with a disease dangerous to the public health."

**OPERATION OF AMBULANCES**—A new Louisiana law<sup>70</sup> makes it unlawful to conduct or operate an ambulance unless the ambulance is under the immediate supervision and direction of a person licensed to practice medicine and surgery or a person holding a first aid certificate. The act further provides "Nor shall any person be employed in any capacity on any 'ambulance' unless the said person is the holder of a 'first aid certificate' as herein defined." A "first aid

<sup>65</sup> Mass. H. 604 H. 605.

<sup>66</sup> Miss. H. 364.

<sup>67</sup> La. H. 186.

<sup>68</sup> N. Y. S. 1373.

<sup>69</sup> Mass. S. 361 H. 1297.

<sup>70</sup> La. Acts 1938 Act No. 234.

certificate," according to the act, refers "to any certificate issued by either the Bureau of Mines or by the American Red Cross wherein it is stated that the person to whom it is issued has successfully completed the required training and met the established standards of such organizations."

**DISPENSARIES**—The New York law prohibiting the operation of a dispensary without a license so to do was so amended this year<sup>1</sup> as expressly to exempt from the law "the state departments of health, mental hygiene, and education, or any institution subject to their jurisdiction, a local department of health or board of education."

**DENTISTRY**—Amendments to existing dental practice acts were adopted in Kentucky,<sup>2</sup> Rhode Island<sup>3</sup> and South Carolina<sup>4</sup>. Of particular interest to physicians is one of the provisions in the new Kentucky law which prohibits licensed dentists from announcing their profession to the public in any manner other than that set forth in the law. The law specifies that the professional card of a licensed dentist may contain only his name, title (such as D.D.S. or D.M.D.), address, telephone number and office hours. The law, however, permits any dentist who confines his practice to any one branch of dental practice also to specify that his practice is limited to a stated branch of dental practice and to set forth the title of that branch.

An unsuccessful attempt was made to amend the dental practice act of Georgia.

**NURSING**—A new nursing practice act was adopted in New York.<sup>5</sup> The new law prohibits the practice of nursing unless the person is licensed to do so by the department of education as either (a) a registered professional nurse or (b) a practical nurse. The law defines the practice of nursing as the performance for compensation or personal profit (1) of any professional service requiring the application of principles of nursing based on biologic, physical or social sciences, such as responsible supervision of a patient requiring skill and observation of symptoms and reactions and the accurate recording of the facts, and carrying out of treatments and medications as prescribed by a licensed physician, and the application of such nursing procedures as involve understanding of cause and effect in order to safeguard life and health of a patient and others, or (2) of such duties as are required in the physical care of a patient and in carrying out of medical orders as prescribed by a licensed physician, requiring an understanding of nursing but not requiring the professional service as outlined in 1. For an applicant to be licensed as a registered nurse he or she must submit evidence among other things of having completed an approved four year high school course and a course of study in a school of nursing registered by the department. For an applicant to be licensed as a practical nurse he or she must submit evidence of having completed at least the eighth grade or its equivalent and of having completed the course of study in a school for the training of practical nurses giving a course of not less than nine months.

An unsuccessful attempt was made to amend the nursing practice act of Massachusetts.

- 71 N.Y. Laws 1938 c. 123  
72 Ky. Laws 1938 c. 148  
73 R.I. Laws 1938 c. 258  
74 S.C. Acts 1938 Act No. 737  
75 Ca. H. 504 N. (first special session)  
76 N.Y. Laws 1938 c. 472 (Five other similar bills S. 187 S. 243 S. 526 A. 332 A. 1224 were also considered)  
77 Va. H. 1196

Unsuccessful attempts were made in two states<sup>78</sup> to grant to nurses treating persons injured through the fault of others liens on all rights of action, claims or demands accruing to the injured persons by reason of their injuries. Other proposals to give nurses a preferential position with respect to claims for services rendered are discussed under "Insuring Payment of Medical Bills."

**CHIROPODY**—A separate chiropody or podiatry practice act was enacted in Mississippi.<sup>79</sup> The new law authorizes the state board of health to examine persons to practice chiropody or podiatry, which is defined in the law as "the diagnosis and medical, mechanical, electrical and surgical treatment of the ailments of the human foot, such as corns, calluses, warts, arches, ingrowing and abnormal nails, bunions, and similar conditions." Such practitioners are to be permitted to use "such mechanical appliances as may be deemed necessary for the relief or cure of such ailments of the feet, except amputation of the foot or toes, or the use of anesthetics other than local anesthetics related to the part affected used to prevent operative or mechanical pain." Diseases and conditions of the feet produced by kidney, heart or other systemic diseases are not to be treated by persons licensed to practice chiropody or podiatry except under the direction and supervision of a regularly licensed physician.

The chiropody practice act of Rhode Island was so amended this year<sup>80</sup> as to make it illegal and a ground for revocation of a license for a chiropodist to sell or give away any substance or compound containing alcohol or narcotic drugs "for other than legal purposes." The amendment also lays down somewhat rigid restrictions on the advertising activities of licensed chiropodists.

An unsuccessful attempt was made in New Jersey<sup>81</sup> to enact a separate chiropody practice act and to create an independent board of chiropody examiners.

**PHARMACY**—Amendments to the Kentucky pharmacy practice act adopted this year<sup>82</sup> are not of sufficient interest to the medical profession to warrant detailed discussion.

Proposals to amend existing pharmacy practice acts in Mississippi<sup>83</sup> and New York<sup>84</sup> were killed. A proposal<sup>85</sup> failed so to amend the New Jersey pharmacy practice act as, in effect, to permit the vending of patent or proprietary medicines in sealed packages and the vending of commonly used household or domestic remedies in original unopened packages by persons other than registered pharmacists.

**OPTOMETRY**—Amendments to existing optometry practice acts were adopted in Kentucky,<sup>86</sup> Massachusetts<sup>87</sup> and Virginia<sup>88</sup>. The new Kentucky law defines optometry as "the examination of the human eye without the use of drugs, medicines or surgery, to ascertain the presence or defect of abnormal conditions which can be corrected by the use of lenses, prism, or ocular exercises and their adaptation for the aid thereof." The new law also prohibits false misleading or bait advertising by optometrists and authorizes the issuance of an injunction to restrain the violation of any provision of the law relating to optometry. The

78 Va. S. 166 N.Y. A. 1259 S. 876

79 Mi. Laws 1938 c. 189

80 R.I. Laws 1938 c. 2643

81 N.J. S. 237

82 Ky. Laws 1938 c. 54

83 Mi. S. 417

84 N.Y. A. 1293 S. 637

85 N.J. S. 98

86 Ky. Laws 1938 (first special session) c. 11

87 Mass. Laws 1938 c. 434 (Passed over governor's veto)

88 Va. Laws 1938 c. 442

new Massachusetts law strikes out provisions in the prior law which seemed to permit the corporate practice of optometry. The new Virginia law, among other things, imposes certain restrictions on advertising by optometrists.

Attempts to amend the optometry practice act of two other states failed.<sup>89</sup>

An unsuccessful attempt was made in New York<sup>90</sup> to create a state board of dispensing opticians and to regulate the practice of ophthalmic dispensing which, according to the bill,

<sup>89</sup> N. Y. S. 1398 A 1744 R. I. S. 144  
<sup>90</sup> N. Y. A. 711

consisted in "the filling or dispensing to the ultimate consumer of ocular prescriptions involving lenses, spectacles, eyeglasses, optical devices or any ophthalmic appliances except drugs and medicines, as prescribed by physicians and by optometrists, and intended to be used for eyewear or for the aid, correction, relief or treatment of the external features of the face and head of said consumer for the proper designing and fitting required by such prescriptions." An unsuccessful attempt was made in New Jersey<sup>91</sup> to authorize every board of education to employ an optometrist to examine and inspect the eyes of school children.

(To be continued)

<sup>91</sup> N. J. S. 262

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Change in Status*—H. Res. 60 has been agreed to, authorizing the House Select Committee on Government Organization to continue its work begun under authority of a resolution passed by the Seventy-Fifth Congress.

*Bills Introduced*—S. 795, introduced by Senator Pepper, Florida, proposes to authorize an appropriation of \$11,580,000 annually, beginning with the fiscal year ending June 30, 1940, to assist each state to establish, extend and improve services for educating physically handicapped children. The term "physically handicapped" is defined in the bill as including "all children who are crippled, blind, partially seeing, deaf, hard of hearing, defective in speech, cardiopathic, tuberculous, or otherwise physically handicapped, and who for their education require an expenditure of money in excess of the cost of educating physically normal children." H. R. 2725, introduced (by request) by Representative Rankin, Mississippi, proposes to provide benefits to certain veterans and to the dependents of such veterans. Among other things, the bill provides that any person who served in the military or naval forces of the United States during a recognized campaign or expedition, and who was honorably separated from such service, shall be granted hospitalization and domiciliary care by the Veterans' Administration subject to the same restrictions and limitations as are now applicable to World War veterans. H. R. 3043, introduced by Representative Schwert, New York, proposes to provide that on and after the enactment of the bill any World War veteran suffering from paralysis, paresis or blindness, or who is helpless or bedridden as the result of any disability, or who is otherwise totally disabled may be awarded compensation under the laws and interpretations governing this class of cases prior to the enactment of the Economy Act of March 20, 1933. H. R. 3220, introduced (by request) by Representative May, Kentucky, proposes to extend the benefits of the United States Employees' Compensation Act to members of the Officers' Reserve Corps and of the Enlisted Reserve Corps of the Army who are physically injured in line of duty while performing active duty or engaged in authorized training. H. R. 3533, introduced by Representative Sheppard, California, proposes to authorize an appropriation of \$500,000 to construct a 200 bed hospital in the Mojave Desert of San Bernardino or Riverside County, Calif., to provide hospital, domiciliary care and outpatient dispensary facilities to care for "the increasing numbers of disabled veterans of all wars suffering from disease of the chest and to enable the Veterans' Administration to care for its beneficiaries in Veterans' Administration institutions." H. R. 3537, introduced by Representative McReynolds, Tennessee, proposes to extend the facilities of the United States Public Health Service to active officers of the Foreign Service of the United States.

### STATE MEDICAL LEGISLATION

#### California

*Bill Passed*—S. 205 passed the Senate January 23 and the House January 24, proposing to supplement the Business and Professions Code by adding a cosmetology practice act. The bill proposes to permit cosmetologists, among other things, to remove superfluous hair from the body of any person by the

use of electrolysis, depilatories, tweezers, chemicals, preparations or devices or appliances of any kind, except by the use of light waves.

*Bills Introduced*—A. 714 proposes that all persons must, before obtaining a marriage license, present to the county clerk a physician's certificate that each applicant has been given such examination, including a standard serologic test, as may be necessary for the discovery of syphilis, made on any day not more than twenty days prior to the date of application, which certificate also must contain an opinion of the physician that the parties are not infected with syphilis or, if so infected, are not in any stage of that disease whereby it may become communicable. A. 831 proposes to require a physician attending a pregnant woman to take or cause to be taken a sample of her blood at the time of the first examination and to submit the sample to an approved laboratory for a standard serologic test for syphilis. The bill also proposes that every other person permitted by law to attend pregnant women but not permitted to take blood tests cause a sample of the blood of such pregnant woman to be taken by a duly licensed physician and submitted to a laboratory for the test referred to above. A. 1246 to supplement the Code of Civil Procedure, proposes that, whenever it shall be relevant to the prosecution or defense of an action, the court may direct any party to the action and the child of any such party and the person involved in the controversy to submit to one or more blood grouping tests, the results thereof to be receivable in evidence only where definite exclusion is established.

#### Connecticut

*Bills Introduced*—S. 167 proposes to enact a uniform food, drug and cosmetic act and to forbid the sale or distribution of adulterated or misbranded foods, drugs, cosmetics and therapeutic devices. H. 180, to amend the workmen's compensation act, proposes to permit an injured employee to select the physician whom he desires to treat him for his industrial injury and to make the employer liable for such medical and surgical and hospital service as that physician deems reasonable or necessary. H. 297 proposes to prohibit the sale or distribution of dangerous caustic and corrosive substances unless in containers bearing a conspicuous, easily legible label or sticker, containing (a) the name of the article, (b) the name and place of business of the manufacturer, packer, seller or distributor, (c) the word "POISON" in letters of not less than 24 point size, and (d) directions for treating a case of accidental personal injury.

#### Georgia

*Bills Introduced*—S. 28 proposes to require all applicants for licenses to practice any form of the healing art as a condition precedent to examination and licensure by the respective professional boards, to pass examinations in anatomy, physiology, chemistry, bacteriology and pathology to be given by a board of examiners in the basic sciences. No member of the board can be actively engaged in the practice of the healing art or any branch thereof. S. 29 proposes to license to practice medicine to citizens of the United States. S. 42 and H. 222 propose, as a condition precedent to the issuance of a license to marry, that both parties to the proposed marriage present certificates signed by licensed physicians that

they have examined both parties to the proposed marriage and find no clinical evidence of syphilis, that they have performed serologic tests for syphilis as approved by the United States Public Health Service, and that in their opinion the parties are not infected with syphilis as to be now communicable or likely to be communicable. H 227, to amend the workmen's compensation act, proposes to permit injured employees to select, at the expense of the employer and his insurance carrier, any reputable physician or surgeon in good standing to treat their industrial injuries.

#### Indiana

*Bills Introduced*—S 93 proposes to prohibit the employment of persons in public schools unless prior to the beginning of each school year they present certificates signed by licensed physicians that they are free from any transmissible or communicable disease. H 21 proposes to require every physician attending a pregnant woman to take or cause to be taken a sample of her blood "at the time of diagnosis and to submit such sample to an approved laboratory for a standard serologic test for syphilis. This bill was reported favorably to the house January 17.

*Bill Passed*—H 74 passed the house January 27, proposing that any legal resident of the state over 16 suffering from a condition or malady or deformity susceptible of improvement, cure or benefit by medical or surgical treatment or hospital care or by special study and diagnosis may be admitted on the commitment of any judge to any hospital operated by the trustees of Indiana University.

#### Iowa

*Bill Introduced*—S 27 proposes as a condition precedent to the issuance of a license to marry, that each party to a proposed marriage present a physician's certificate that he or she is "either free from syphilis or not in a stage whereby it may become communicable as nearly as can be determined by a thorough physical examination and such standard microscopic and serological tests as are necessary for the discovery of syphilis."

#### Maryland

*Bills Introduced*—S 10 proposes to repeal the Maryland laws relating to coroners and to provide for the creation of a new executive and administrative department to be known as the Department of Post Mortem Examiners. The head of the department is to be a commission consisting of the professors of pathology of the University of Maryland and of Johns Hopkins University, the director of health of the state, the commissioner of health of Baltimore City and the superintendent of Maryland state police. This commission is to be authorized to appoint a chief medical examiner and two assistant medical examiners, all of whom must be licensed doctors of medicine and have had at least two years postgraduate training in pathology. The commission is also to be authorized to appoint a deputy medical examiner, who also must be a licensed physician, for each county of the state. Whenever any person dies as a result of violence, by suicide or casualty, suddenly when in apparent health, when unattended by a physician or in any suspicious or unusual manner it is to be the duty of the police authorities immediately to notify the chief medical examiner or a deputy medical examiner. The medical examiner is then to go to the dead body and take charge of it, investigating the essential facts concerning the circumstances of the death. If in the opinion of the medical examiner an autopsy is necessary it shall be performed by the chief medical examiner, an assistant medical examiner or by such competent pathologists as may be authorized by the chief medical examiner. H 15 and S 12 propose to create a department of professional and vocational licensing to perform all the clerical, secretarial and financial duties of existing boards and commissions examining and licensing persons to practice stated professions and vocations, including the board of dental examiners, the board of commissioners of pharmacy, the boards of examiners of nurses, optometry, osteopathy, chiropody and chiropractic but apparently not including the two boards of medical examiners.

#### Massachusetts

*Bill Introduced*—H 852 authorizes the department of public health to license hospitals, convalescent homes, nursing homes, rent homes and sanatoriums. Presumably if the bill is enacted it will be unlawful to operate any of the institutions referred to unless licensed by the department. H 1220 proposes a tax of 2 per cent on gross income over \$1,000 accruing from any gainful pursuit, which is so defined as to include any occupation, profession, means of livelihood or support, trade or enterprise. H 1265 proposes to direct the state department of public health to furnish not less than two oxygen tents to each hospital in cities of more than 30,000 population. H 1277 proposes to permit persons receiving public support to select, at the expense of the appropriate town, such physicians as they desire to render necessary medical services.

#### Michigan

*Bill Introduced*—S 59 proposes to repeal the uniform narcotic drug act enacted in 1937.

#### Minnesota

*Bill Introduced*—H 234, to amend the workmen's compensation act, proposes to permit an employer to furnish chiropractic treatment to an injured employee.

#### Missouri

*Bills Introduced*—H 39 proposes, as a condition precedent to the issuance of a license to marry, that both parties to the proposed marriage present certificates signed either by licensed physicians or by directors of laboratories approved by the department of health that both parties are free from all venereal disease. Apparently such a certificate cannot be executed until a blood test has been made on the applicant's "venous blood serum" not more than fifteen days before the application in a laboratory acceptable to the state department of health. A license to marry may issue even though a blood test was positive if a licensed physician will certify that in his opinion any venereal disease, if present, is not in a communicable stage. S 5 proposes, as a condition precedent to the issuance of a license to marry, that both parties to the proposed marriage present certificates from licensed physicians that they are free from all venereal diseases as nearly as can be determined by a thorough physical examination. These certificates must be accompanied by "laboratory reports of microscopical examination for the gonococcus for gonorrhea, and the blood Wassermann test or the Kahn test for syphilis, or such other serological tests as shall be approved by the State Board of Health." S 22 proposes to grant to governmental hospitals and hospitals supported in whole or in part by charity treating persons injured through the negligence of others liens on all claims, demand, rights of action, judgments or settlements accruing to the injured persons because of their injuries.

#### Nevada

*Bill Introduced*—A 20 proposes an entirely new pharmacy practice act, proposing to prohibit the sale or distribution, except by licentiates of the State Board of Pharmacy, of drugs and devices, appliances and the medicinal agents used in the prevention of venereal diseases. The bill also proposes to authorize the Board of Pharmacy to adopt and promulgate such standards relating to and governing venereal prophylactics as it deems necessary. The bill specifically provides that Physicians are exempted from the provisions of this act when disposition [presumably of drugs and venereal prophylactics] is made in the regular practice of their profession and to their patients in the manner specified for a license.

#### New Jersey

*Bill Introduced*—A 61 proposes that whenever it is relevant in a proceeding involving parentage of a child the trial court may direct the mother, the child and the defendant to submit to one or more blood grouping tests to determine whether or not the defendant can be excluded from the probability of being the father of the child. Testimony with respect to the results of the tests however is to be receivable in evidence only where definite exclusion of parentage of the defendant is indicated. The bill also proposes to authorize such test whenever it shall be relevant in a civil action to determine the parentage or the identity of any child or other person.



**New Mexico**

*Bill Introduced*—H 58 proposes 'That the making and performing of contracts by Hospitals or Sanatoriums for the furnishing of hospital care, with or without medical or surgical attention, shall not be classified or considered as the writing of insurance or the doing of insurance business, and no law of the State of New Mexico pertaining to insurance shall affect any such contract'

*Bill Passed*—S 8, which was introduced on January 16, passed the senate on January 19, proposing to enact a separate naturopathic practice act and to create a board of naturopathic examiners to examine and license applicants for licenses to practice naturopathy. A license to practice naturopathy under the terms of the bill is to permit the holder thereof 'to diagnose and treat human beings using natural and drugless methods without the use of major surgery, as taught in standard and chartered Naturopathic colleges, schools or universities wherein the curriculum of study includes instructions in the following subjects: Anatomy, Physiology, Pathology, Hygiene and Sanitation, Chemistry, Diagnosis, Symptomatology, Non-Surgical Gynecology, Mid-Wifery, Jurisprudence, First Aid, Physical Culture and Manipulation, Food Sciences and Fasting, Endocrinology, Electrotherapy, Autotherapy, Biochemistry, Phytotherapy, Hydrotherapy, Mechanotherapy, Massage, Psychology and Mental Science, Sun and Air Bathing, and the Philosophy, Theory, and Practice of Naturopathic Therapeutics'

**New York**

*Bills Introduced*—S 337 and A 413 propose to grant to a physician treating a person injured through the negligence of another a lien on all claims, rights of action, judgments or settlements accruing to the injured person by reason of his injuries

**North Carolina**

*Bill Introduced*—H 59, to amend the pharmacy practice act, proposes that "all proprietary drugs, remedies, patented cures, powders and devices containing [opium, acetamide, and cannabis] manufactured and/or sold in this state shall be marked poison in red ink on the container in which they are manufactured and/or offered for sale to the public"

**Rhode Island**

*Bill Introduced*—H 583 proposes to authorize the formation of nonprofit hospital service plan corporations to render, through contracting hospitals, hospital care to subscribers to such hospital service plans

**South Carolina**

*Bill Passed*—H 16 passed the house and senate, proposing to authorize the Charleston County Public Welfare Board to make application to any appropriate agency of the United States for a grant for constructing and equipping a county hospital, nurses' home and such other buildings as are necessary for the operation of a county hospital

**South Dakota**

*Bills Introduced*—H 24, to supplement the osteopathic practice act, proposes to authorize the board of osteopathic examiners under such regulations as it may prescribe to license osteopaths to practice surgery in all its branches. H 47 proposes, in effect, to permit all relief clients in need of medical services to select "any regularly licensed physician or practitioner of the healing arts of his choice." This bill was reported favorably to the house January 25. S 25 proposes that all persons rendering personal service of every kind and description shall have a lien on all the property, both real and personal, of the person or persons employing them and that this lien be subject and inferior only to mortgages and conditional sale contracts properly filed on or before the time when said personal services are engaged

**Tennessee**

*Bill Introduced*—H 392 proposes to enact a separate naturopathic practice act and to create a board of naturopathic examiners to examine and license persons to practice naturopathy. The bill proposes that naturopathy "shall comprehend, embrace and be composed of the following acts, practices and usages

Diagnosis and practice of Physiological and mechanical sciences, and such as mechanotherapy, articular manipulation, corrective and orthopedic gymnastics, neurotherapy, psychotherapy, hydrotherapy and mineral baths, electrotherapy, phototherapy and dietetics which shall include the use of foods of such biochemical tissue-building products and cell salts as are found in the normal body. Provided, however, that nothing in this section shall be held or construed to authorize any Naturopathic Physician licensed hereunder to practice Materia Medica, Major Surgery, or Radium Therapy, nor shall the provisions of this Act in any manner apply to or affect the Practices of Osteopathy, Chiropractic, Christian Science, or any other therapy authorized or provided for by law for the cure and prevention of diseases except that no privilege recorded other Drugless Physicians this State shall be denied to Naturopathic Physicians"

**Texas**

*Bills Introduced*—H 223 proposes to enact a new state sanitary health code, vesting in the State Board of Health and the state and local health officers certain powers and duties with respect to the control and prevention of disease, the reporting and management of communicable diseases, the quarantine of carriers, and matters relating to sanitation in general. H 2 proposes to enact a new law regulating the sale and distribution of foods, drugs, cosmetics and therapeutic devices. H 22 proposes extensive amendments to the Uniform Narcotic Drug Act adopted in 1937. Among other things the bill proposes that while a physician or dentist may prescribe, administer and dispense narcotic drugs in good faith and in the course of his professional practice or he may cause them to be administered by a nurse or intern under his direction, he may do so only after physical examination of the person for whom the drugs are intended, the examination to be made at the time the prescription is issued or at the time the drugs are administered, dispensed, given away or delivered by the physician or dentist. The bill also specifically proposes to make it unlawful for any physician, dentist or veterinarian to prescribe, dispense or administer to himself as a habitual user or merely to satisfy his own craving

**Utah**

*Bills Introduced*—S 20 proposes to enact a new law prohibiting the manufacture, advertising, sale, delivery for sale, or offering for sale of adulterated and misbranded food drugs, therapeutic devices and cosmetics. This bill was reported favorably to the senate January 23. S 86 proposes to impose an excise tax of 15 per cent of the wholesale price on the first sale within the state of all proprietary and "patent medicines"

**Washington**

*Bills Introduced*—S 41 proposes to make it unlawful for any person operating a bathhouse, massage parlor or similar establishment by himself or agent to furnish any bath, massage or other treatment or to attempt to treat any disease, injury or condition of health, unless the person so doing is licensed to practice one of the healing arts authorized by the laws of the state. S 83, to amend the workmen's compensation act, proposes to permit an injured employee to select any licensed practitioner of the healing art to attend him. H 60 proposes to prohibit the sale or distribution of articles or drugs designed, intended or which may have special utility for the prevention and/or treatment of venereal diseases except by virtue of a license issued by the state board of pharmacy. A physician and surgeon, however, may sell or distribute such articles and drugs without obtaining the licenses referred to

**West Virginia**

*Bills Introduced*—S 16 proposes that the provisions of the sales tax law shall not apply to "sales of medicine whose use is prescribed or directed by a duly qualified physician." H 117 and S 63 propose, as a condition precedent to the issue of a license to marry, that both parties present physicians' certificates stating that they have been given such examination, including a standard serologic test, as may be necessary for the discovery of syphilis and that in the opinion of the physicians both parties are either not infected with syphilis or, if so infected, are not in a stage of the disease which is or may later become communicable

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### ARKANSAS

**WPA Hospital Projects in Arkansas**—More than \$1,000,000 has been expended by the WPA on publicly owned hospitals and sanatoriums in the state since the work relief program was inaugurated in Arkansas in 1935, according to a recent report. About \$500,000 has been used toward relieving conditions at state hospitals and for facilities to treat tuberculous patients. Improvements at the state hospital unit in Little Rock accounted for \$274,300 of the total expenditure, not including \$159,000 previously spent by the Civil Works Administration and the federal emergency relief administration. The largest expenditure toward improving facilities for state operated tuberculosis sanatoriums was the donation of the transient camp at Fort Smith as an auxiliary unit of the state tuberculosis sanatorium at Booneville. A total of \$50,000 was spent by the emergency relief administration for construction of the camp, while the WPA spent \$145,000 in remodeling the buildings for hospital use. Work has been started on a \$250,000 unit at Alexander to increase the capacity for the McRae Tuberculosis Sanatorium for Negroes from thirty-one to 150 beds, the state is sponsoring the project. Other expenditures include the construction of 100 portable cottages at Camden, Jonesboro, Searcy, Blytheville, Morrilton, Pine Bluff, Little Rock, Batesville and Monticello for the treatment of patients who have been discharged from the state institutions but who are not sufficiently recovered to receive employment. An additional \$299,000 has been spent for improvements on government operated hospitals. The Veterans' Facility, Fort Roots sponsored projects totaling \$170,000, while a project totaling \$38,000 was begun at the Army and Navy General Hospital, Hot Springs National Park. Other hospitals aided under the program were Henderson State Teachers Infirmary, Arkadelphia \$4,000, new hospital for the State School for the Blind, \$18,500, School for the Deaf Infirmary, \$1,300, Julia Chester Hospital, Hope, \$2,000, Morrilton nurses' home \$5,700, Helena City Hospital, \$82,700, City Hospital, Little Rock \$6,300, City Hospital Conway, \$14,000, Jefferson County Hospital, Pine Bluff \$27,700, and Luvora indigents' home, \$36,500.

### CALIFORNIA

**Outbreak of Septic Sore Throat**—Twenty-four cases of epidemic septic sore throat with two deaths were reported in a southern county, according to *California and Western Medicine*. All the patients were on the same raw milk dairy route. The investigation disclosed that one person with the disease had worked in the dairy a few days before the onset of symptoms in consumers of the milk.

**Course in Ophthalmology and Otolaryngology**—The eighth annual midwinter course in ophthalmology and otolaryngology conducted by the Research Study Club of Los Angeles, January 16-27, included the following instructors:

Dr. Gosta Dohlman professor of otolaryngology Lund University Lund Sweden  
Dr. Edward Jackson professor of ophthalmology emeritus University of Colorado School of Medicine Denver  
Dr. John F. Barnhill emeritus professor of head surgery Indiana University School of Medicine Indianapolis  
Dr. William L. Benedict chief of the department and professor of ophthalmology of the Mayo Foundation Rochester Minn  
Dr. Phillips Thygeson assistant professor of ophthalmology Columbia University College of Physicians and Surgeons New York  
Dr. George N. Horsford San Francisco  
Dr. Augustus Pohlman formerly professor of anatomy Creighton University School of Medicine Omaha  
Dr. Simon H. Jesberg associate clinical professor of surgery (otology, rhinology and laryngology) University of Southern California School of Medicine Los Angeles  
Dr. Louis K. Guggenheim assistant professor of clinical otolaryngology Washington University School of Medicine St. Louis

**Officers Chosen for State Insurance Plan**—Dr. Ray Lyman Wilbur, president of Stanford University and past president, American Medical Association January 29 was elected president of the board of trustees of the California Physicians' Service, the recently adopted statewide health insurance system to work through the California Medical Association. Dr. Morton R. Gibbons Sr. San Francisco was appointed medical director of the system. At this meeting

the board of trustees appointed a committee to visit Seattle and study the King County plan," which provides for medical care for about 35,000 workers in and around Seattle and which resembles the California project, it was stated. With the report of this committee plus other information now being gathered, the trustees will be enabled to decide on the type of service to be offered to the state's population and its cost. Other officers named at the meeting include Drs. Clarence Kelly Canelo, San Jose, and Lowell S. Goin, Los Angeles, vice presidents, Alson R. Kilgore, San Francisco, secretary-treasurer, and Thomas Henshaw Kelly, San Francisco, assistant secretary-treasurer.

### FLORIDA

**Naturopaths Denied Right to Use Narcotics**—Florida naturopaths are not entitled to registration under the Harrison Narcotic Act because they are not authorized to use narcotics by the law under which they are licensed, according to a recent decision of the United States District Court, Southern District, Florida, in two cases consolidated for hearing, *Perry v. Larson*, Collector of Internal Revenue, and *Detwiler* against the same defendant. The court pointed out that whether or not a person is entitled to registration under the Harrison Narcotic Act is not determinable by that act itself but by the law of the state where the person resides. The naturopathic act of Florida authorizes naturopaths to employ, among other things, phytotherapy, which the naturopaths argued embraces all botanical preparations and their compounds, from which they concluded that they are authorized to prescribe and administer morphine, and other narcotics of botanical origin. But, the court said, after authorizing the employment of phytotherapy, the act specifically denies to naturopaths the right to practice *materia medica*, or the right to engage in that branch of medical science which deals with drugs, their sources, preparations and uses. The situation was not altered, the court thought, by the fact that narcotics are used "merely as a palliative [sic] to overcome pain, rather than as a specific treatment for an ailment." Although the Florida naturopathic act refers generally to phytotherapy as embraced within the practice of naturopathy, the course of study prescribed for naturopaths by the act does not include a study of botanical compounds or extracts generally, nor of narcotics. This omission seemed to the court to be significant. A verbatim copy of the decision of the court is printed in the January, 1939, issue of the *Journal of the Florida Medical Association* pages 345-346.

### GEORGIA

**Personal**—Dr. Horace G. Huey, Homerville, has been reappointed a member of the state board of medical examiners. —Dr. Clair A. Henderson formerly of Ashburn, has been elected commissioner of health for Terrell County with headquarters in Dawson.

**Graduate Assembly**—The second Atlanta Graduate Medical Assembly was held in Atlanta January 16-19, with the following participants:

Dr. Walter C. Alvarez Rochester Minn. Useful Hints in the Diagnosis of Digestive Diseases  
Dr. Isaac A. Bigger Richmond Va. Suppurative Pericarditis  
Dr. Paul D. White Boston Heart Attacks  
Dr. Merrill C. Sosman Boston Diagnosis and Treatment of Pituitary Tumors  
Dr. Herman L. Kretschmer Chicago Technique and Results in Transurethral Prostatic Resection  
Dr. Waltman Walters Rochester Minn. Lesions of the Gallbladder and Biliary Tract  
Dr. Louis Hamman Baltimore Bronchial Stenosis  
Dr. Emil Novak Baltimore Gynecologic Endocrinology for the General Practitioner  
Dr. Fred Wise New York The Deeper Seated Affections Caused by the Ringworm Fungi  
Dr. Hugo Roesler Philadelphia Diagnosis of Heart Disease Without Instrumental Aid  
Dr. Edward A. Schumann Philadelphia The Cesarean Section  
Dr. Horton R. Caspary Nashville Tenn. Children's Place in the Tuberculosis Program

### IDAHO

**Society News**—Dr. Richard P. Howard Pocatello discussed Cardiac Irregularities before the Pocatello Medical Society at its meeting at the Rannock Hotel Pocatello January 5.—Dr. Clarence M. Hyland Los Angeles addressed a recent meeting of the Boise Physicians Club on "Use of Convalescent Serum in Treatment of Acute Contagious Diseases."

**County Society Initiates Action for Health Program**—A committee with Dr. Arthur C. Jones in charge has made a vigorous appeal for a revamped and modernized health program for Boise and Ada County, according to *Northwest*

**Medicine** The establishment of a county health unit under the direction of a trained public health administrator and a legal, medical and dental clinic was recommended. Improvement in the care of the tuberculous and better care for indigents were urged. The committee also asked for the cooperation of county commissioners, dentists, lawyers, the state department of public assistance and the state health department.

### ILLINOIS

**Respirators Available to Physicians**—Seven Drinker respirators were turned over to the managing officers of seven state hospitals at appropriate ceremonies in Springfield December 28. The respirators were to be installed at Anna, Alton, Dixon, Elgin, Jacksonville, Kankakee and Peoria and will be available on short notice, so far as practicable, to physicians on request.

**Association for Recovered Mental Patients**—Patterned after the recently organized Association of the Former Patients of the Psychiatric Institute of the University of Illinois and the state department of public welfare associations are being formed at the state hospitals of Chicago, Moline, Kankakee, Alton, Anna and Jacksonville. A similar organization was formed by the recovered patients of the Peoria State Hospital. The initial group publishes its own journal, having as its objective the eradication of the stigma attached to mental patients. Meetings have been held and efforts are under way to bring about legislative action to rid the mental patient and his family of the disgrace of the court record. With a view to introducing legislation to change the existing commitment laws, the Illinois Psychiatric Society has appointed a committee of five to study the situation. Members of the committee are Drs. Francis J. Gerty, David Slight, Thomas M. French, Clarence A. Neumann and Abraham A. Low, who is president of the Association of Former Patients.

### Chicago

**Lectures on Psychoanalysis**—The Institute for Psychoanalysis began a series of lectures at the Chicago Women's Club January 24. The theme of the lectures is the recent progress in psychoanalysis in relation to the following subjects:

Dr. Franz G. Alexander, January 24, Medicine  
Dr. Karl A. Menninger, Topeka, Kan., January 31, Psychiatry  
Dr. Gregory Zilboorg, New York, February 7, History  
Dr. George J. Mohr, February 14, Problems of Children's Behavior  
Dr. Leon J. Saul, February 21, Social Sciences  
Dr. Alexander, February 28, Criminology  
Dr. Helen Vincent McLean, March 7, Literature  
Dr. Thomas M. French, March 14, Social Work

**Dr. Stone Will Lecture on Cancer**—Dr. Robert S. Stone, professor of radiology, University of California Medical School, San Francisco, will deliver the first two lectures of the Educational Association on Cancer Lectureship Fund, February 15-16, in room P 117, Billings Hospital. His subjects will be "The Position of Supervoltage in the Treatment of Cancer with X-Rays" and "Theoretical and Practical Considerations Concerning Fast Neutrons in the Treatment of Cancer." The lectureship is financed by the Education Association on Cancer through the committee on cancer of the University of Chicago. The committee was established in August 1938 and represents various departments in the university.

### MICHIGAN

**Applications for Medical Aid Increase**—A total of 11,574 applications for medical aid are recorded in the annual report on the medical aid department of the Wayne County Probate Court for the fiscal year Dec. 1, 1937, to Nov. 30, 1938. This total compares with 7,257 as of two years previously, according to *Detroit Medical News*. Dr. Paul F. McQuiggan is medical coordinator of the probate court of the county.

**Ballin Memorial Lectures**—Infection will be the theme of the sixth series in the Dr. Max Ballin Memorial Lectures to open at the Detroit Institute of Art, February 15, under the auspices of the North End Clinic. Dr. Plinn F. Morse, Detroit, will deliver the first lecture on "The Diagnosis of Fevers of Unexplained Origin." Other speakers will be:

Dr. Lewis T. Pollock, Chicago, February 22, Infections of the Central Nervous System  
Dr. George A. Myers, Detroit, March 1, Recent Advances in the Mode of Action and Uses of Sulfanilamide  
Dr. Daniel N. Silverman, New Orleans, March 8, The Dysenteries

**Regional Conferences of Health Department**—The Michigan State Department of Health is sponsoring regional conferences of local health departments in cooperation with the full-time health officers to correlate the activities and

improve the services. The meetings are to be held every two months in each of the districts which have been organized on a regional basis, the state medical journal reports. The first conference was held December 7 at Big Rapids with Dr. Max C. Igloe, director of the Mecosta-Osceola health department, as host. Included in this unit are Mecosta, Osceola, Clare, Gladwin, Arenac, Isabella, Midland and Bay counties. The Northern Michigan conference was held December 14.

**Society News**—The Northern Michigan Medical Society was addressed in Petoskey, January 12, by Dr. Henry K. Rancom, Ann Arbor, on "Surgery of the Stomach and Duodenum."—Dr. Sumner L. S. Koch, Chicago, addressed the Genesee County Medical Society, January 25, on "Infections of the Hands."—Dr. William E. Gallie, Toronto, Ont., discussed "Fracture of the Neck of the Femur" before the Wayne County Medical Society, Detroit, January 23, under the auspices of the Michigan Orthopedic Society.—At a meeting of the Detroit Pediatric Society, February 1, Dr. Walter M. Boothby, Rochester, Minn., spoke on oxygen therapy.—Dr. William W. Thoms, Kuwait, Arabia, addressed the Washtenaw County Medical Society, Ann Arbor, January 10, on "Medical Experiences in Arabia."

### NEBRASKA

**Society News**—Dr. Elliott P. Joslin, Boston, addressed the Omaha-Douglas County Medical Society, January 10, on "Treatment of the Diabetic Today."—A symposium on pneumonia was presented before the Five County (Cedar, Wayne, Dixon, Dakota and Thurston counties) Medical Society recently at Laurel by Drs. Winfred R. Blume, South Sioux City, and Allen C. Starr, and Leo L. Wilson, Sioux City, Iowa, Fred G. Dewey, Coleridge, Jerry C. Kildebeck, Emerson, Walter Benthack, Wayne.—Speakers at a meeting of the Madison Six County Medical Society, Norfolk, recently were Drs. Earl E. Pate, on "Some Psychological Aspects in the Treatment of Venereal Disease," Anthony E. Colitti, "Metrazol in the Treatment of Some Psychoses," Charles G. Ingham, "Factors Governing the Use of Insulin in the Treatment of Psychoses," and Gilbert L. Sandritter, "What Can We Do About Mental Illness in the Future?"

### NEW JERSEY

**State Society Studies Cash Indemnity Plan**—A voluntary health insurance program to defray medical costs for the low wage group is under consideration by the Medical Society of New Jersey, it was recently announced. The society's insurance committee is consulting consumer groups, economists, insurance executives and others in an effort to work out a plan that will be acceptable and workable. On the basis of present studies it is thought that 4 cents a day may prove adequate as a premium base. For the indigent, who would not be able to participate in this type of insurance, the society is advocating state financial assistance on the plan that was used in 1934 and 1935, under which the indigent were cared for by their own physicians on a reduced fee basis. The society has also approved hospitalization insurance.

### NEW YORK

**Society News**—Dr. Arthur W. Booth, Elmira, Chairman of the Board of Trustees of the American Medical Association, addressed the Medical Society of the County of Erie, Buffalo, January 16, on recent events relating to medical practice.—Dr. Byron P. Stookey, New York, addressed the Medical Society of the County of Westchester, White Plains, January 17, on "Hermation of the Nucleus Pulposus."—Dr. J. E. G. M. Bullowa, New York, addressed the Medical Society of the County of Nassau in Garden City, January 31, on "Serum Therapy and Chemotherapy in Pneumonia."—Dr. Walter E. Dandi, Baltimore, addressed the Medical Society of the County of Albany in Albany, January 25, on "Diagnosis and Treatment of Lesions of the Cranial Nerves."

### New York City

**Section on Military Medicine Organized**—The Medical Reserve Officers of Kings County have organized a section on military medicine and surgery in the Medical Society of the County of Kings. The first meeting was held in October. At a meeting, January 16, Col. Adelino Gibson, U. S. Army, spoke on "Gas Attacks in Relation to the Civilian Population."

**Society News**—Dr. Eugene F. Traub, addressed the Society of Medical Jurisprudence, January 9, on "Dermatologist in Court, a Discussion of the Hazards Confronting the Dermatologist in His Practice and of His Problems When Testi-

ving as an Expert in Court'—At a meeting of the New York Surgical Society January 11 the speakers were Drs Rupert Franklin Carter, on "The Mikulicz Method Versus End-to-End Suture in Carcinoma of the Recto-Sigmoid" and Drs Howard A Patterson and Alexander Webb Jr, 'The Mikulicz Procedure for Carcinoma of the Colon—Late Results'

**New Health Buildings**—Mayor La Guardia recently laid the cornerstone for the Lower East Side Health and Teaching Center, which will operate in conjunction with New York University College of Medicine. This is the fifth unit in the health department's program to cooperate with the five medical schools of the city in the teaching of public health and preventive medicine. It is the eleventh of the department's district health centers. Three child health stations, two in Brooklyn and one in Queens, were opened in December, bringing the total number of these units to seventy. The buildings were erected by the WPA and the health department at a cost of \$50,000 each.

**New York University Alumni Day**—The Alumni Association of New York University College of Medicine announces its annual Alumni Day February 22. Influenza pneumonia and lung abscess will be discussed at morning and afternoon scientific sessions. The speakers at the morning session will be Drs Irving Graef, George P. Robb, Israel Steinberg, Jesse G. M. Bullock, William S. Tillett and Thomas Francis Jr. At a luncheon in the Wyckoff Memorial Lounge the following will speak: Harry Woodburn Chase, Ph.D., chancellor of the university; Drs Currier McEwen, dean of the medical school, Samuel A. Brown, dean emeritus and Howard Fox, president of the Medical Society of the County of New York. In the afternoon there will be a clinic and case demonstrations at Bellevue Hospital. Drs James Burns Amberson Jr and Thomas J. Galvin will speak on lung abscess and Dr. Charles Hendee Smith on 'Subacute Pneumonia in Children'.

## OHIO

**Personal**—Dr Henry P. Worstell, Columbus has been appointed assistant supervisor of the medical section of the state industrial commission succeeding Dr Roy J. Secrest, who resigned to enter private practice in Columbus.—Dr Sterling B. Taylor, Columbus was honored at a testimonial luncheon January 5 on his retirement as local surgeon for the New York Central Railroad after nearly fifty years of service.

**Society News**—Dr John A. Toomey, Cleveland addressed the Academy of Medicine of Cincinnati January 10 on "Management of Some Acute Contagious Diseases and Their Complications." Dr Karl A. Menninger, Topeka, Kan. will address the academy February 21 on "The Concept of Organic Suicide."—Drs Wyman C. C. Cole and David C. Kimball, Detroit, addressed the Montgomery County Medical Society, Dayton January 20, on "Studies in Neonatal Asphyxia."—Dr Jonathan Forman, Columbus, was the speaker at the annual banquet of the Mahoning County Medical Society, Youngstown, January 17, his address was entitled "Uncle Sam M.D."

**Forum on Allergy**—Physicians interested in allergy were invited to attend the North Central Forum on Allergy in Toledo January 15, arranged by allergy societies of Cleveland, Chicago, Michigan and the Ohio Valley Society of Allergists. The following program was presented:

- Dr Samuel M. Feinberg, Chicago, Diagnostic Measures
- Dr George I. Waldbott, Detroit, Value of Skin Tests in Diagnosis of Food Allergy
- Dr Jonathan Forman, Columbus, Dietary Management of Food Allergy
- Dr John H. Mitchell, Columbus, Drug Hypersensitivity
- Dr Milton B. Cohen, Cleveland, Preparation of Protein Extracts
- Dr Lloyd E. Seyler, Dayton, Preparation of Plant Oil Extracts for Diagnosis and Treatment

It was decided to make the conference an annual affair. The 1940 meeting will be in Chicago under the direction of Dr Tell Nelson. Ninety-nine physicians registered in Toledo.

## PENNSYLVANIA

**State Tuberculosis Meeting**—The annual meeting of the Pennsylvania Tuberculosis Society will be held in Pittsburgh February 14-15. At the first session Tuesday afternoon the topic for discussion will be "The General Practitioner of Medicine in Discovery and Treatment of Tuberculosis" and the speakers include Drs Horton R. Casparis, Nashville, Tenn., Bruce H. Douglas, Detroit, Herbert R. Edwards, New York, and Frank W. Burge, Philadelphia. At a morning session February 15 Mr. Holland Hudson, director of rehabilitation service, National Tuberculosis Association, New York, Mr. Mark Walter, state bureau of rehabilitation, Harrisburg,

and David K. Bruner, Ph.D., department of sociology, University of Pittsburgh, will discuss "Rehabilitation of the Tuberculous." At a luncheon session Drs Clarence D. Selby, Detroit, and Max R. Burnell, Flint, Mich., will speak on "Tuberculosis in Industrial Health Service."

## Philadelphia

**Personal**—Dr Winifred Bayard Stewart, assistant clinical professor of neurology at the Woman's Medical College of Pennsylvania, has been appointed psychiatrist at the Philadelphia General Hospital.

**Hospital News**—A new \$56,000 building for the school of nursing of the Pennsylvania Hospital was recently dedicated. It was named in memory of Dr. Richard H. Harte who died in 1925. The building was made possible by contributions from Dr. Harte's family, from Caroline McKee, a graduate of the school from Mr. William H. Donner and from a bequest from Mrs. E. Walter Clarke.

**County Society Ninety Years old**—The Philadelphia County Medical Society celebrated its ninetieth anniversary at a meeting January 27. Dr. George Morris Piersol, professor of medicine, University of Pennsylvania Graduate School of Medicine, gave an address on "The Importance of Postgraduate Medical Education" and Dr. Wilmer Krusen, president of the Philadelphia College of Pharmacy and Science, a historical address. Greetings were extended by representatives of various Philadelphia organizations.

## Pittsburgh

**New Municipal Hospital Assured**—Donation of a site by the University of Pittsburgh will make possible immediate construction of a new municipal hospital, according to *Pittsburgh's Health*. In May 1938 a bond issue of \$1,350,000 was voted and subsequently a PWA grant of \$578,000 was obtained. It is planned to have the laboratory of the public health department in the new hospital.

**Graduate Courses**—Eight graduate courses of from three to seven sessions each have been announced by the Allegheny County Medical Society for its thirteenth series. They began early in February and will continue with lectures once or twice a week. The subjects and instructors are:

- Dr. Stuart N. Rowe, Neurosurgery
- Dr. Howard G. Schleiter, Clinical Electrocardiography
- Dr. Curtis C. Meehling and associates, Office Proctology
- Drs. Joseph A. Hepp and Elvin J. Biteman, Office Gynecology, Including Practical Endocrine Therapy
- Dr. Watson Marshall, Diseases of the Ear, Nose and Throat
- Drs. Murray B. Ferderber, George G. Burkley and James A. Mansmann, Pneumonia and Its Management
- Dr. Robert C. Grauer, Diagnosis and Treatment of Endocrine Disorders
- Dr. Robert L. Anderson and associates, Diseases of the Male Genito-Urinary System

**Society News**—Dr. Priscilla D. White, Boston, was the guest speaker before the Allegheny County Medical Society January 17 on "Diabetic Children." Dr. Maud L. Menten spoke on "Studies on Immunization Against Scarlet Fever" and Dr. Jessie Wright on "The Use of the Hypertonic Salt Water Pool in the Treatment of Osteomyelitis."—At a meeting of the Pittsburgh Academy of Medicine January 24 the speakers were Drs. Nelson P. Davis and Howard H. Permar on "Primary Tumor of the Spleen," Harry R. Decker, "Foreign Bodies in the Heart" and Earl Vandegriff Wilkinsburg, Pa., "Congenital Deformities." Dr. Adelbert Boyd Miller Jr. presented a case report on osteomyelitis of the skull.—The problem of osteomyelitis was considered at a meeting of the Pittsburgh Orthopedic Club January 26 by Drs. Robert C. Grauer, George W. Grier, George V. Foster and Paul B. Steele.

## TEXAS

**Specialty Societies Meet**—The Texas Orthopedic Society met in Houston in November with Dr. Fremont A. Chandler, Chicago, as guest speaker. Dr. Chandler discussed cases presented by Houston physicians.—The Texas Neurological Society held its semiannual meeting Nov. 7, 1938 at the Terrell State Hospital, Terrell. The speakers, all of Austin, were Drs. Montelle I. Brown, on sterilization of the unfit, Emmett G. Ward, the work of the state school for the feebleminded, and Charles M. Covington, typhoid vaccine therapy in the treatment of dementia paralytica. Drs. Theodore S. Howell and Roy C. Sloan of the hospital staff presented cases from the institution.—At a meeting of the Texas Pediatric Society in San Antonio in October the guest speakers were Dr. Horton R. Casparis, Nashville, Tenn., on "Behavior Problems in Children" and "Tuberculosis" and Maurice L. Blatt, Chicago, on "Diarrhea in the Neonatal Period and Treatment and Care of the Premature Infant."—The annual meeting of

the Texas Radiological Society was held in San Antonio recently. Among speakers on the program were Drs Roy G. Giles, San Antonio, on "Roentgen Therapy in Essential Hypertension", Thomas B. Bond, Fort Worth, "X-Ray Treatment of Pneumonia" and Mr Mac F. Cahill, executive secretary, Intersociety Committee for Radiology, Chicago, "Economic Problems of Radiology." Dr Carroll F. Crum, Corpus Christi, was named president elect and Dr Jerome H. Smith, San Angelo, became president.

### WASHINGTON

**Dr Penney Honored for Service as Secretary**—The Pierce County Medical Society gave a banquet January 10 in honor of Dr Warren B. Penney, Tacoma, who is retiring after more than twenty years as secretary of the society. Dr Albert E. Hillis, Tacoma, presided and Drs Wilmot D. Reid, Joseph P. Kane and Edwin W. Jones spoke. Dr Penney was presented with a motion picture camera. He has been president of the Washington Tuberculosis Association and is a director of the National Tuberculosis Association and president elect of the Washington State Medical Association. Dr Blair Holcomb, Portland, Ore., addressed the society after the banquet on "Management of the Diabetic with Protamine Insulin."

### WISCONSIN

**District Meetings**—At a meeting of the First Councilor District of the State Medical Society of Wisconsin in Oconomowoc recently Dr Rogers T. Cooksey, Madison, demonstrated the use of instruments in the peritoneal cavity and Dr Harold E. Marsh, Madison, discussed typing and treatment of pneumonia. Drs William D. Stovall, William S. Middleton and Joseph W. Gale, Madison, presented a symposium on pneumonia at a meeting of the Ninth Councilor District of the State Medical Society of Wisconsin in Wisconsin Rapids recently.

**Personal**—Dr Donald R. Searle, Superior, has been appointed a member of the state board of medical examiners to succeed Dr Charles W. Giesen, Superior. His term will end July 1, 1941. Dr Clarence J. Combs, Oshkosh, was honored with a dinner and special program recently marking his retirement as commanding officer of the 370th medical regiment of the U. S. Reserve Officers Training Corps. Dr William D. Stovall, Madison, has resigned as chairman of the committee on cancer of the State Medical Society of Wisconsin after ten years' service.

### GENERAL

**Examination by Orthopedic Board**—The next examination of the American Board of Orthopedic Surgery will be held in conjunction with the meeting of the American Medical Association in St. Louis in May. Applications must be filed before April 1 with the secretary, Dr Fremont A. Chandler, 6 North Michigan Avenue, Chicago.

**Birth Control Agencies Merge**—The American Birth Control League and the Birth Control Clinical Research Bureau have merged to form the Birth Control Federation of America, following ratification by the league of the action of a joint committee presented at the eighteenth annual meeting of the league in New York January 18. Dr Richard N. Pierson, New York, chairman of the joint committee, was elected temporary president of the new federation and Mrs. Margaret Sanger, honorary chairman of the board.

**Mead Johnson Award in Pediatrics**—The committee on awards of the American Academy of Pediatrics announces rules and regulations governing the Mead Johnson Award for Research in Pediatrics, which was established at the annual meeting of the academy in 1938. Two awards will be given annually at the meetings of the academy, one of \$500 and one of \$300, for research work published during the preceding calendar year. The award is limited to workers in the United States and Canada and to investigators who have not been graduated more than fifteen years. Thus the award in 1939 will be given for research published during the period of Jan. 1 through Dec. 31, 1938, by a graduate of 1923 or later. Communications should be addressed to the chairman of the committee, Dr Borden S. Veeder, 3720 Washington Boulevard, St. Louis, Mo.

**Anthrax Traced to Japanese Shaving Brushes**—The U. S. Public Health Service announced recently that a death from anthrax in North Dakota had been traced to the use of a shaving brush made in Japan. Surgeon General Thomas Parran requested collectors of customs at all ports of entry

to bar such brushes until samples had been tested by the public health service. Tests of some samples showed that the brushes had not been sterilized. According to an announcement issued by the New York State Department of Health January 30 the brushes are 4½ inches long and the handles three-fourths inch in diameter, painted in colors. The lettering "Japan 332" is stamped on the top of each brush and on the sides appear the words "Imperial-Sterilized." Dealers and owners are asked to send any brushes of this description to the department of health.

**International Cancer Congress in September**—The Third International Cancer Congress under the auspices of the International Union Against Cancer will be held in Atlantic City September 11-16 with Dr Francis Carter Wood, New York, as president. The following sections have been proposed: general research, biophysics, genetics, general pathology of cancer, radiologic diagnosis, radiotherapy, statistics and education. Membership in the congress is secured by application to the secretary, Dr Donald S. Childs, 713 East Genesee Street, Syracuse, with remittance of \$15. Membership does not include the right to present a paper unless the paper or an abstract has been submitted to and approved by the program committee. All papers and abstracts as well as questions pertaining to them should be addressed to Dr Wood, 630 West 168th Street, New York. Dr Eldwin R. Witwer, Harper Hospital, Detroit, is chairman of scientific exhibits, and Dr Alfred L. Loomis Bell, professor of clinical radiology, Long Island College Hospital, Brooklyn, is chairman of commercial exhibits and transportation. Thomas Cook and Son—Wagon Lits are the travel agents.

**Changes in Status of Licensure**—The Indiana State Board of Medical Registration and Examination reports the following:

Dr Peter C. Berns, Linton, license restored Aug. 16, 1938.

Dr Sidney J. Eichel, Evansville, license restored Nov. 29, 1938.

The Kentucky State Department of Health recently reported the following action:

Dr William H. Ashby, Iewisport, license restored Aug. 11, 1938.

The State Board of Registration of Medicine of Maine reports the following:

Dr Atherton M. Ross, Farmington, license revoked Nov. 9, 1938, for violation of the state medical practice act.

The Minnesota State Board of Medical Examiners reports the following action:

Drs Kenneth V. Overend and Fred E. Myers, both of Hallock, Minn., licenses revoked Dec. 16, 1938. The evidence disclosed numerous cases of bilateral salpingectomies and other surgical procedures, some of which resulted in the miscarriage of the patients.

Dr Arthur W. Eckstein, Mankato, license revoked Dec. 16, 1938, for procuring and abetting a criminal abortion.

Dr Gottfried Schmidt, Lake City, license suspended for five years Dec. 16, 1938, having been found guilty of advertising professional superiority to and greater skill than that possessed by fellow physicians and surgeons and of conduct unbecoming a person licensed to practice medicine and detrimental to the best interests of the public.

The Board of Medical Examiners of New York recently reported the following changes in status of licenses:

Dr Peter E. de Mattheis, whose last recorded address was 109½ Liverpool Street, Jamaica, N. Y., license canceled because of narcotic addiction.

Dr Julius Miltz, New York, license suspended for one year on the basis of fraud and deceit; he was convicted of conspiracy and petit larceny and received a suspended sentence.

Dr Samuel L. Fruchs, New York, license suspended for one year on the basis of fraud and deceit.

Drs Peter H. Friedman, Deal, N. J., Victor L. Lub, Gross, Joseph A. Zlinkoff, Alexander Reiss and Louis Greiner, all of New York, licenses suspended for varying periods on the basis of offers to perform criminal abortion.

Dr Edmund K. Macomber, whose last known address was 745 New Scotland Avenue, Albany, license revoked Nov. 16, 1938.

The Public Health Council of West Virginia recently reported the following action:

Dr Elias Benjamin Thompson, Williamson, license restored Oct. 31, 1938; it had been revoked March 2, 1937, for violation of the narcotic laws.

Dr Chester D. Wainwright, Charlestown, license revoked Oct. 31, 1938, for commission of a felony.

The Wisconsin State Board of Medical Examiners recently reported the following action:

Dr Raymond J. Henderson, Tomahawk, license restored November 4.

### CORRECTION

**Erythrol Tetramtrate in Angina Pectoris**—In the abstract of this title from *Ugeskrift for læger*, Nov. 17, 1938, which appeared in *THE JOURNAL* January 28, page 374, the dose of erythrol tetramtrate was given as from 7.5 to 15 Gm. three or four times daily. This should have read from 7.5 to 15 mg.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Jan 11, 1939

#### Cancer Research

The thirty-sixth annual report of the Imperial Cancer Research Fund shows important advances

##### CARCINOGENESIS

In 1936 Selbie, working in the laboratories of the fund, published observations on the carcinogenic action of colloidal thorium dioxide which confirmed the observations of French observers. The substance is used by radiologists, who inject it into the veins or into the brain to reveal structures not visible in ordinary roentgenograms. It remains in the body indefinitely after operation. In rats and mice it produces sarcomas at the site of injection in a large proportion of cases. The thirty-fourth annual report contained a warning against the practice of leaving radioactive substances in the human body, because of the danger of producing malignant growths. Dr Leslie Foulds is preparing for publication an account of the production of malignant tumors in guinea pigs by colloidal thorium dioxide. He injected small quantities into the bases of the nipples of females and obtained one carcinoma and three sarcomas. One of these tumors was removed more than three years after injection, when it was still small, and it proved to be sarcoma. Thus the danger of colloidal thorium dioxide may be long delayed even in laboratory animals, which respond much more quickly than man to carcinogens. A period of ten or fifteen years might be expected before colloidal thorium dioxide produces a tumor in man, and since it has not been in use so long it is premature to conclude that it is harmless. In America the danger of thorium dioxide and its disintegration products has been shown by the production of malignant tumors in workers who handle luminous paints.

##### THE DEVELOPMENT OF CANCER PREVENTED BY A HORMONE

The changes in the ductless glands after an animal has been treated with estrone over a long period were recorded in the thirty-fifth annual report. Dr William Cramer and Dr E S Horning have continued their studies of these changes during the past year. Previous observations had shown that prolonged treatment with estrone produces enlargement of the anterior lobe of the pituitary, with disappearance of the granular acidophil cells, degenerative changes in the adrenals and mammary cancer. This suggests a physiologic antagonism between estrone and the hormones produced by the pituitary acidophil cells. Experiments with mice proved this to be correct. The simultaneous administration of the thyrotropic hormone of the anterior lobe and estrone prevented both proliferation of the mammary epithelium and degranulation of the anterior pituitary cells, changes readily produced by estrone alone. These observations were used to prevent spontaneous cancer in a strain of inbred mice with a high incidence—about 60 per cent in breeding females. It was thus proved that the thyrotropic hormone which stops the action of estrone on the pituitary and the mammary gland also prevents the development of cancer.

#### Carcinogenicity of a Tar-Creosote Mixture Used by Fishermen

Dr Stephan Beck, working at the research department of the Glasgow Royal Cancer Hospital, reports in the *British Medical Journal* an experiment with an important practical bearing. Dr C C McKenzie of Campbeltown, Scotland, suspected that a tar-creosote mixture used by the local fishermen was responsible for cases of cancer of the lip. In mending their nets they put the bone or wooden needle, threaded with tarred twine,

between their lips. The carcinogenicity of the mixture was tested by painting it on the interscapular region of thirty mice. After the second application severe dermatitis, ending in ulceration, was produced. After 106 days the first papilloma occurred. In his pathologic report Dr L W Price stated: "This is a keratinizing epithelial papilloma, showing very early malignant change. Eleven papillomas developed in these mice from the 106th to the 349th day. The histology was that of well differentiated squamous carcinoma." It was therefore concluded that the tar-creosote mixture which came into contact with the lips of the fishermen was carcinogenic and that this source of cancer should be eliminated. It is necessary either to produce a non-carcinogenic tar, possibly by distillation at lower temperatures than at present, or to educate the fishermen to abandon the habit of putting the needle threaded with tarred twine between their lips when mending their nets.

#### Medical Demand for Deep Shelters from Air Raids

While all other precautions for the protection of the civil population against air raids are being expedited, little is being done toward providing deep underground shelters. In the cities and particularly in London the difficulty and expense of providing such shelters for the population in general would be immense. The government is proceeding with a scheme for steel shelters which would protect against the blast and fragments from shell explosions but not from direct hits. Twenty-one London hospital physicians have sent a joint letter to the press pointing out that air raids would produce an enormous number of casualties. Great numbers of civilians would be killed or injured by the high explosive bombs, disabled by the shock or concussion, or buried beneath fallen buildings, in which the danger of fire would be considerable. The morale of even highly trained troops cannot be maintained against continuous bombardment without adequate protection. How can women and children be expected to endure similar trials? British physicians probably could not cope with the number of casualties under the present conditions. The signatories hold that fully efficient medical and surgical treatment cannot be given unless adequate bomb proof shelters are provided for those who cannot be promptly evacuated from danger areas. These shelters must be deep enough to prevent penetration and sufficiently numerous to be quickly reached. They could be constructed beneath buildings as well as under squares and open spaces. Some should be designed for medical purposes, as the hospitals may be so damaged as no longer to provide facilities for the treatment of casualties or even for their safety.

##### PSYCHIATRIC CASUALTIES

A committee of the psychiatrists of the London hospitals is considering the effects of air raids on the civilian population. The committee believes that it will be impossible to estimate the number of psychiatric casualties. According to some there are likely to be at first three for every physical casualty. At present there is no official list of psychiatric-trained physicians, and the committee asks that a personnel be trained in time of peace in the elements of mental nursing and the handling of such cases.

##### PSYCHIATRIC WAR PREPARATIONS

What is called civilized war has only increased the horrors of warfare, while man has become more subject to neuroses. In 1918 there were more than 70,000 British patients under treatment. The Tavistock Clinic (Institute of Medical Psychology) has arranged a course of lectures for physicians on neuroses in war time, which is designed to give insight and instruction to those who may suddenly be called on to deal with such problems. The subjects selected for the lectures are 'War and the Civilian Population', 'Conversion Hysteria', 'Physical and Psychotic Syndromes', 'General Etiology and Psychogenesis of the Psychoneuroses', 'Anxiety States' and 'Emergency Treatment of Neurotic States'.



## PARIS

(From Our Regular Correspondent)

Jan 7, 1939

## Medicosocial Aspects of Latent Adrenal Insufficiency

A paper was read at the Dec 6, 1938, meeting of the Académie de médecine de Paris by Drs Pierre and Camille Chatagnon. The authors had the opportunity to observe patients who presented the clinical picture of adrenal insufficiency of congenital origin. Although they are unable to offer microscopic proof of their theory, the results of treatment justify the deduction that the symptoms were the direct result of an adrenal dysfunction.

The only symptom over a considerable period is the inability in both sexes and at all ages to make any sustained effort because of an excessive feeling of fatigue. The patient cannot carry out the physical or psychic efforts which any person of his age and physical development can do without experiencing an abnormal degree of fatigue, which is slow to disappear and necessitates a prolonged period of rest, preferably by lying down. Life expectancy is not interfered with, but such individuals are in a constant state of mental and physical asthenia. When they feel able to be active, they must conserve their strength lest an aggravation of the state of fatigue should occur. The clinical picture of such cases has been accurately described by Brossons. As to the hereditary factor, this seems to be predominantly paternal. One finds a congenital more often than an acquired insufficiency, the latter in the order of their incidence having as causes a typhoidal, tuberculous or syphilitic infection. It is difficult to detect the symptoms of such an adrenal dysfunction until after infancy. At a later period an excessive tendency to fatigue after mental or physical exertion is to be noted. Such children are inclined to be apathetic, and their desire to lead a sedentary existence is in sharp contrast to their apparently normal physical development.

It is especially during the school years that the following two types of latent adrenal insufficiency are to be looked for:

1. The pseudorobust type. The child appears normal but the physical resistance is minimal. Any physical effort is of short duration, accompanied by muscular pain which appears early and recedes very slowly. This physical deficiency is apparent when the child is called on to carry out any exercises, such as others do without any difficulty. The child feels sleepy at all hours and is inclined to lie down. He becomes introspective, even depressed and resigned to lead an inactive life. In their school work such children appear normal so far as the acquisition of knowledge is concerned, but any sustained effort such as an examination tires them much more than it does other children.

2. The pseudolazy type. The sensation of fatigue following any effort causes the child to limit its activity to the minimum, keeping him from joining in games. Such children fall asleep in school or while doing home work and are difficult to arouse in the morning. The adrenal dysfunction is invariably accompanied by disturbances of the genital functions as puberty approaches. Toward middle age there is a repetition of all the symptoms observed earlier, such as the lack of desire to do anything requiring mental or physical effort. These individuals are unable to concentrate and may become melancholic. They often complain of symptoms of vasomotor origin such as headaches, flushes and tendency to perspire easily.

It is of the utmost importance for the educator and social worker to keep these two types in mind and not to ascribe the desire to avoid physical or mental effort to laziness or lack of ambition. The treatment is preventive and includes a mode of living in which there is as little excitement as possible, an ample and carefully selected diet and the administration of adrenal preparations combined or not, according to the individual case, with the use of ovarian or testis preparations and of vitamin C.

## Changes in Paris Hospital Staffs

Owing to the retirement of Prof Georges Marion as head of the urologic department of the University of Paris Medical School, the clinical teaching in this specialty will be given at

the Hôpital Cochin by Prof Maurice Chevassu, who is the successor of Professor Marion. Professor Heitz Boyer, having reached the age limit for associate professors, will also retire and his successor at the Hôpital Lariboisière is Prof Bernard Fey. Dr Gouverneur will take charge of Professor Marion's service at the Hôpital Necker and Dr Louis Michon will replace Dr Gouverneur at the Hôpital St Louis. These changes, which were effective January 1, will interest American urologists who desire to visit the Paris clinics.

## Officers in Paris Societies

At the recent annual meeting of the Académie de chirurgie, Prof Raymond Gregoire was elected president and Prof Pierre Mocquot vice president.

The officers for 1939 of the Académie de médecine are Inspector General Sidur president and Prof Louis Martin, director of the Pasteur Institute of Paris, vice president.

At the annual meeting of the Société médicale des hôpitaux de Paris, Prof Pierre Lereboullet was elected president for 1939 and Professor Laignel-Lavastine vice president.

## BERLIN

(From Our Regular Correspondent)

Jan 2, 1939

## Research on Gifted Persons

The newest aspect of genetic research is so called research on hereditarily gifted persons. Its purpose is to make a systematic selection of the gifted which, independent of the material circumstances of the individual person, makes possible the development of talent appearing anywhere within the nation as a whole. To this end a cooperative organization has lately been established which has at its head the director of the "fostering of talent" department of the "central headquarters of national occupational competition." Uniform standards (political and otherwise) to govern the selection of talented persons who may be aided by the state are to be worked out by this "cooperative association for research on inherited talent." In this activity the new organization collaborates with the racial-political bureau of the Nazi party, the central bureau of race and settlement of the *Schutzstaffeln*, the national public health service commission, the various vocational guidance centers, the German labor front, the national youth movement, the national student aid and the faculties of institutions of higher learning. On the occasion of the last national occupational contest 5,000 persons who qualified as superior workers in their respective occupations were required to fill out special heredobiologic questionnaires containing detailed questions with regard to siblings and parents, general education and vocational training, childhood residence in big city, medium sized city, small town and country, occupational activity, and so on. Information about the grandparents was also requested.

## The Purge of Jewish Dentists

In an early December issue of *Zahnärztlichen Mitteilungen* the question of an expulsion of Jews from the dental profession was discussed. The recent legislation directed against Jewish physicians (*THE JOURNAL*, Dec 24, 1938, p 2405) has not been applied to Jewish dentists. *Zahnärztlichen Mitteilungen* holds it now to be self evident that the problem of the Jewish dentists must also be brought to "a solution compatible with German national sensibilities." Regulation similar to that which has taken place in the medical profession is therefore in order. As of November 9, there were reported to be 211 Jewish dental practitioners in Berlin, these men represented a large part of the 449 Jews registered as dentists in the old Reich. Since the proportion of Jewish dentists is so small, their exclusion from practice will in no way jeopardize the dental care of the nation as a whole. It is impossible at the moment to

state the exact number of Jews actively practicing dentistry in Austria and in the Sudetenland, they are not included among the mentioned 449 Jewish dentists. One cannot doubt the imminence of a purge of the dental profession analogous to that which has already been effected in the medical profession.

#### The Prognosis of Tuberculosis in Infants

Dr Beltle of Munich assembled data on 514 nurslings and infants who had been hospitalized for treatment of tuberculosis of the glands, lungs, hilus, bones or joints. It was possible to make follow-up examinations of 496 of these children from one to eight years after occurrence of infection and after onset of illness. At the follow-up survey, 469 of the 496 children were still living. In 444 children, most of them in a good state of nutrition, the tuberculosis was inactive. In twenty-two children active tuberculosis was observed at the follow-up but in only two cases was the prognosis regarded as unfavorable. Tuberculosis with certainty had caused the deaths of eighteen of the twenty-seven children who died. Dr Beltle submits the following data on the lethality. Of ninety-six children who became tuberculous during the first year of life, eight (8.3 per cent) died, of 133 children infected during the second year, eight (6 per cent) died, of 266 children infected from the third to the sixth year, two (0.75 per cent) died. These investigations show that the prognosis for the tuberculous nursing or infant is much more favorable than is generally assumed on the basis of the literature.

#### Establishment of a National Tuberculosis Council

At the end of November a national tuberculosis council was established for the purpose of a more uniformly organized campaign against the disease. Among the council members are the national minister of the interior representing the reichsführer, the national minister of labor, and the national minister of publicity and propaganda. The presiding officer is Ministerial-Director Gutt, M.D., of the national ministry of the interior. The duty of the new board is to organize a carefully planned nationwide campaign against tuberculosis, to set up cooperative antituberculosis units in the various German states and provinces and in addition to act in a supervisory capacity, namely to see that all suitable measures are carried out.

In Thuringia, Central Germany, a special appropriation has made it possible for the state to assume the entire cost of a course of therapy or hospitalization for needy and uninsured tuberculous patients who belong to the lower economic groups or are impecunious members of the middle class. Adequate treatment is thus assured every tuberculous person in Thuringia. In addition it is planned to place in service a mobile x-ray examination laboratory, the first of the kind in Germany. The home of this traveling unit will be a motor truck trailer. With the x-ray apparatus it will be possible to take some 120 pictures 35 cm by 35 cm within an hour.

#### Campaign Against Contagious Diseases

The national minister of the interior has issued a decree effective January 1 with regard to the campaign against contagious diseases. This legislation contains specific provisions destined to help combat undulant fever, diphtheria, epidemic encephalitis, epidemic cerebrospinal meningitis, whooping cough, puerperal fever, poliomyelitis, trachoma, bacterial food poisoning, malaria, anthrax, paratyphoid glanders, relapsing fever, contagious dysentery, scarlatina, rabies, trichinosis, tuberculosis, tularemia, typhoid and Weil's disease. Similar national legislation heretofore in force dates back to 1900 and is more limited in its scope, being concerned only with the (in general) more dangerous infectious diseases (leprosy, cholera typhus, yellow fever, plague and variola). According as the public health services have become so well stand-

ardized for the entire reich, the moment is propitious for an expansion of the nation-wide legislation initiated by the statute of 1900. Thirty-eight years ago authoritative opinion considered several contagious diseases to be of minor importance and went to appear only in local outbreaks or isolated cases. Accordingly the 1900 statute included no provisions designed to combat these diseases. Today the older view in this regard is no longer tenable. The increase in communications has favored the general diffusion of contagious diseases and as a consequence the transmissibility of many diseases which were not regarded as contagious in 1900 is now conceded. Local regulations are therefore no longer adequate. The new legislation provides unified combative measures against diseases indigenous to Germany as well as those which threaten to enter from abroad. The older statute will still remain in force.

#### BUDAPEST

(From Our Regular Correspondent)

Dec 15, 1938

#### Semmelweis and Cederschjold

In a lecture at the Congress on Puerperal Fever in Strasbourg Aug 2-4, 1923, E. Hauch, professor at the University in Copenhagen, stated that a new discoverer of the cause of puerperal fever had been found in the person of Pehr Gustav Cederschjold. Thereupon Tiborius Gyory, professor of medical history at the University of Budapest, resolved to defend the memory of Semmelweis and the results of extensive investigation into this matter were published recently. Cederschjold was born in 1782 in Lidboholm, Sweden. He studied in Lund, Sweden, where he graduated as doctor of medicine in 1809. For graduate study in obstetrics and gynecology he went to Copenhagen to the institute of Johannes Sylvester Saxtorph. At this time Cederschjold already was studying the question of puerperal fever and in 1811 he published a treatise. Returning to Lund he was prosecutor for a time, in 1813 he moved to Stockholm, where he practiced obstetrics. In 1817 the king of Sweden appointed him extraordinary professor of obstetrics and adjunct of the lying-in hospital Allmänna Barnbordshuset. In 1822 Alm died and Cederschjold became regular professor and director of the lying-in hospital. In 1829 he arranged with king Charles XIV that Swedish midwives be permitted to perform forceps operations in districts where there were no physicians. In his first report he mentioned 140 midwives, who performed forceps operations on 252 women, of whom twenty died. He also wrote an obstetric manual of three volumes which for a long time was used by students. Cederschjold died in 1848.

The devastation of puerperal fever did not spare the Scandinavian countries in the eighteenth and nineteenth centuries, though the mortality did not reach the frightfully high rates for Paris and Vienna. At Allmänna Barnbordshuset, founded in Stockholm in 1775, the mortality from puerperal fever in the first two years was 2 per cent, while in 1777, when the institute occupied a new building, it was 19 per cent. From this time on the disease was constantly present in the institute and it was natural for it to be in the foreground of Cederschjold's interest. In his textbook he wrote: 'It seems that puerperal fever may assume a lasting epidemic character in bigger lying-in hospitals, spread not only by way of a volatile agent through the air or through the ward miasmas, but chiefly when the disease assumes the picture of putrescence of the womb and the more adherent infecting agents or the so called contagions, cleave from the vulva to the nurse, who carries them to healthy mothers in cleaning their vulvae with the same sponge or towel or simply in manipulation without having washed their hands after having dealt with patients suffering from puerperal fever. I myself experienced this several times having seen that almost all lying-in wives fell sick when they were treated by a certain midwife so that I was forced to prohibit her from visiting the

obstetric wards At the same time the morbidity rate for lying-in wives attended by the best of the midwives was unimportant The presence of contagion in the offensive vapor noted at the postmortem examination of those dead of puerperal fever was proved according to my opinion by the speed with which the epidemic increased after postmortem examinations, though performed in far flung localities so that finally postmortem examinations had entirely to be stopped This view has been supported by the observation of my adjunct Idstrom, who once in my absence had to visit five wives at their homes who a short time before had been inmates of the lying-in hospital, all had fallen ill with puerperal fever and only one of them survived"

His belief that the contagion was spread from the vulva induced Cederschjold to supply every patient with a special towel and to oblige the midwives to use separate sponges and towels for each patient The favorable results of this method were seen shortly

In an important chapter in Cederschjold's book he wrote "About the end of 1826 on my repeated request the board of the institute allowed three ground floor wards which were wholly separated from the lying-in institute to be used exclusively for feverish lying in women The wards had nurses and midwives who served them exclusively Since then all wives suffering from puerperal fever have been accommodated there In later times I mixed some chlorine in the water with which the genital parts of the lying-in women were washed" Cederschjold gave an account of his method in the Swedish language in 1839 The discovery by Semmelweis was made in 1847 Semmelweis wrote "In order to crush the cadaver fragments adhering to the hands about the middle of May 1847—I do not remember the exact day—I used chlorina liquida, with which I and all my students had to wash their hands" Doubtless Semmelweis did not know of Cederschjold's work The most northerly follower of Semmelweis was Pippingsskold, obstetrician to the Helsingfors general hospital, to whom Semmelweis referred in an open letter addressed in 1862 to all professors of obstetrics In the book by Heinrichus on the history of obstetrics and gynecology in Finland published in Helsingfors in 1903, mention is made of the fact that Semmelweis could have come in contact with Pippingsskold in 1861, after the appearance of Semmelweis's main work The entire independence of the two discoverers is evident Chlorine lavage had been prescribed by Cederschjold for the washing of the genitals only, while Semmelweis built up a system for disinfection of the hands of those dealing with lying-in women It is certain that Cederschjold deserves a distinguished place in the long line of development, which from the labyrinth of fantastic theories led to the clarification of the prophylaxis and etiology of puerperal fever, at the peak of which is the Hungarian obstetrician Semmelweis

Essen-Moller, professor at the university in Lund, Sweden, devotes the first chapter of his book "Forelasningar i Obstetrik" (1934) to the memory of Semmelweis At the end of the book he mentions Cederschjold as follows "It is probable that it was not so written in the book of stars that the epoch of the history of puerperal fever should take its root in Sweden But as we honor now the work of Semmelweis, perhaps we Swedes have the right with satisfaction to think that in the barren soil of Ultima Thule the seed started to germinate earlier, though it did not grow to such a spreading tree, in the shadow of which mothers with their children can sit now in safety But what does this mean? The nourishment circulating in the tree of science comes from different soils and from different countries, who would dare to separate it into its constituents? Even if the tree casts its branches over the whole earth, we can be sure that the fruits picked from it were produced by common work and were ripened by common supervision Therefore every nation and every man who advanced the work is entitled to a share in the common achievements"

## ITALY

(From Our Regular Correspondent)

Dec 30 1938

### Epinephrine Treatment for Malaria

Prof Maurizio Ascoli, in a lecture at the military hospital, spoke on the treatment of chronic malaria and malarial splenomegaly by means of intravenous injections of epinephrine Clinical observations are made in the Palermo hospital on soldiers as they come home from Africa who are suffering from malaria and who are receiving the epinephrine treatment Satisfactory results from the treatment are reported from Greece, the Belgian Congo, Trans-Jordan, Turkey and Italy The treatment consists of intravenous injections of epinephrine alone or in association with small doses of quinine As a rule the size of the spleen diminishes, the patient gains weight and his general condition improves The action of quinine is strengthened by epinephrine Quinine by itself, which was administered in one case for four consecutive months in daily doses of 1 Gm, failed to control fever When the combined quinine and epinephrine treatment was administered fever disappeared in two days The therapeutic effect of epinephrine does not depend on contracture of the spleen but on the increase of the forces of defense caused by epinephrine Dr Ballero has reported recurrences in 5 per cent of his cases in which the combined epinephrine and quinine treatment was administered as against 40 per cent in the cases in which quinine alone was given When pregnant women with malaria have the combined epinephrine and quinine treatment the latter does not interfere with the normal evolution of pregnancy and the development and health of the fetus The treatment is economical and well tolerated by the patients

### Surgery in Military Hospitals

According to statistics of the General Center of Public Health, 7,623 major surgical operations and 9,657 minor operations were performed in 1937 in Italian military hospitals Operations on the abdomen totaled 3,885 and those for hernia 2,004 Inguinal or inguinoscrotal hernia was complicated by varicocele in 142 cases, by hydrocele in twelve cases, by testicular ectopia in twenty eight cases and by cysts of the spermatic cord in eight cases In the fourteen cases of strangulated inguinal hernia the operation was successful For non-strangulated hernia the mortality was 0.2 per cent Operations on the appendix numbered 1,659, with a mortality of 1.4 per cent and on the abdomen (for gastric and duodenal ulcer, abdominal trauma and diseases of the digestive tract) 140, with a mortality of 19 per cent Of 203 operations on the cranium 174 were for mastoiditis, with a mortality of 2.87 per cent Mammectomy, including axillary dissection, was done in two men suffering from fibroma of the breast with a tendency to degenerate Operations were performed in seven cases of echinococcosis of the lung, in eleven cases of echinococcosis of the liver and in five cases of hepatic amebiasis

## Marriages

JOHN F. SHROTS, Woodstock, Ill., to Miss Olive C. Hosman of Omaha, Neb. in November 1938

EDWARD R. KRUMBIEGEL, Milwaukee, to Miss Callista Purtell of Hartford, Wis., Nov. 24, 1938

ROBERT M. STEWART, Kimball, S. D., to Miss Marjorie Helen Deuth in Chicago, Dec. 10, 1938

ANDREW MORRIS RYAN to Miss Phyllis Jane Bacon, both of San Francisco January 7

FREDERICK J. HOFMEISTER to Miss Viola Seymer, both of Milwaukee, Nov. 19, 1938

GERALD A. HANCUR to Miss Virginia Guido, both of Cicero, Ill. Nov. 26 1938

## Deaths

**John Signorelli** ☉ New Orleans, Tulane University of Louisiana School of Medicine, New Orleans, 1912, clinical assistant in pediatrics at his alma mater, 1912-1914, professor of pediatrics, Louisiana State University Medical Center, at one time professor of pediatrics at the Loyola Post-Graduate School of Medicine, member of the American Academy of Pediatrics, past president of the Louisiana State Pediatric Society, served during the World War, medical director of the parish public school system, served at various times and capacities on the staffs of the State Charity Hospital, Hotel Dieu, Southern Baptist Hospital, French Hospital and St Vincent Infant Asylum, aged 49, died, Dec 13, 1938, of complications following pneumonia

**Lucy Du Bois Porter Sutton**, New York, Cornell University Medical College, New York, 1919 assistant professor of pediatrics at the New York University College of Medicine, secretary of the section on pediatrics, New York Academy of Medicine, member of the American Academy of Pediatrics, chief of the cardiac clinic of the children's medical service, Bellevue Hospital, editor of the *Bulletin of the American Heart Association*, co-author, with Dr Charles H Smith, of a volume on heart disease in infancy and childhood in "Clinical Pediatrics", was known for her work on rheumatic fever and heart disease and for the treatment of chorea by induced fever, aged 47, died, Dec 23, 1938, in the New York Hospital, of monocytic leukemia

**Benjamin Franklin Baer Jr** ☉ Philadelphia University of Pennsylvania Department of Medicine, Philadelphia, 1903, member of the American Academy of Ophthalmology and Otolaryngology, associate professor of ophthalmology at his alma mater, and formerly associate professor of ophthalmology at the Medico Chirurgical College, Graduate School of Medicine, University of Pennsylvania, served during the World War since 1924 attending surgeon to the Wills Hospital aged 59, died, Dec 19, 1938, in the University of Pennsylvania Hospital of pneumonia

**Henry Woolfe Berg** ☉ New York, College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1881, instructor in infectious diseases, 1902-1906, instructor in contagious diseases, 1906-1908, instructor in diseases of children, 1908-1910, and associate in diseases of children 1910-1921, at his alma mater fellow of the American College of Physicians consulting physician to the Willard Parker Hospital and physician to the isolation service, Mount Sinai Hospital aged 79, died, Dec 22 1938, of myocarditis

**Frederick J Kalteyer** ☉ Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1895 Jefferson Medical College of Philadelphia, 1899, clinical professor of medicine at Jefferson Medical College of Philadelphia served at various times and in various capacities on the staffs of the Delaware County Hospital, Upper Darby, Pa St Joseph's Hospital, Philadelphia General Hospital, Frankford Hospital, St Mary's Hospital and the Pottstown (Pa) Hospital, died, Dec 20, 1938

**James Edwin Parker Holland** ☉ Bloomington, Ind, Indiana Medical College School of Medicine of Purdue University, Indianapolis, 1906, fellow of the American College of Surgeons, served during the World War ophthalmologist to the Bloomington Hospital university physician to Indiana University, aged 62, died Dec 4 1938, in the Methodist Hospital, Indianapolis, of acute coronary occlusion

**Harry Unger**, Patchogue N Y, Long Island College Hospital, Brooklyn, 1908, member of the Medical Society of the State of New York, served at various times and in various capacities on the staffs of the Jewish Hospital, King County Hospital, Bushwick Hospital and Caledonia Hospital Brooklyn and the Southside Hospital, Bay Shore aged 51, died, Nov 26 1938 of coronary sclerosis

**Victor G Veckl** ☉ San Francisco Medizinische Fakultät der Universität Wien, Austria 1881, member of the American Urological Association an Affiliate Fellow of the American Medical Association, member of the House of Delegates of the American Medical Association, 1913-1916, in 1919 and 1922-1929 aged 80, died Nov 16 1938 of cerebral anemia and arteriosclerosis

**Charles Franklin Applegate**, Los Angeles Medical College of Indiana Indianapolis, 1889, Bellevue Hospital Medical College New York, 1890 member of the American Psychiatric Association, at one time superintendent of the State Hospital Mount Pleasant Iowa, and State Hospital Norwalk Calif aged 73 died Nov 27 1938 of carcinoma of the prostate

**Alfred Frederick Allman**, Philadelphia Jefferson Medical College of Philadelphia 1895, assistant director of the department of public health, formerly assistant diagnostician for the department of health and police surgeon, at one time member of the state house of representatives, aged 73, died, Nov 17, 1938, of coronary obstruction and hypostatic pneumonia

**Wilson Ruffin Abbott**, Chicago, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904, member of the Illinois State Medical Society, at one time connected with the U S Public Health Service, and director of the U S Veterans' Bureau Hospital, number 55, Fort Bayard, N M, aged 65, died, Dec 5, 1938

**Charles Hill Suddarth**, Excelsior Springs, Mo., College of Physicians and Surgeons Medical Department Kansas City University Kansas City, Kan, 1898, member of the Missouri State Medical Association aged 69, medical superintendent of the Excelsior Springs Sanitarium and Hospital, where he died, Nov 25, 1938, of pneumonia

**Charles A Shultz**, Alvarado, Texas, University of Louisville (Ky) Medical Department, 1881, past president of the Johnson County Medical Society, formerly member of the city council, and health officer, at various times member and president of the board of education, aged 83, died Nov 21, 1938, of coronary thrombosis

**Martin W Barr**, Middletown, Del University of Pennsylvania Department of Medicine, Philadelphia, 1884, at one time chief physician to the Elwyn Training School, Elwyn, Pa, author of "Mental Defectives" and co author of "Types of Mental Defectives" aged 78, died, Dec 25, 1938, of cerebral hemorrhage

**Homer Scott**, Little Rock, Ark, University of Arkansas School of Medicine, Little Rock, 1913, member of the Arkansas Medical Society, assistant professor of obstetrics at his alma mater, served during the World War, member of the school board aged 57, died, Nov 1, 1938, of neurosarcoma of the mesentery

**Adelard Bernardin Cotnoir**, Riviere la Madeleine, Que, Canada, M B, Laval University Faculty of Medicine, Quebec, 1906 M D School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1908, aged 54 died in November 1938 of cerebral hemorrhage

**Frederick William Steinbock**, Avon by the Sea, N J, Maryland Medical College, Baltimore 1904, member of the Medical Society of New Jersey, aged 73, superintendent of the E C Hazard Hospital Long Branch, where he died, Nov 7, 1938, of chronic interstitial nephritis, myocarditis and uremia

**John Henry Woodcock** ☉ Hendersonville, N C, Hospital College of Medicine, Louisville, Ky, 1892, past president of the Henderson County Medical Society, served during the World War, formerly county health officer, on the staff of the Patton Memorial Hospital, aged 74, died, Nov 1, 1938

**Eugene E Shutterly**, Evanston Ill, Hahnemann Medical College and Hospital Chicago, 1888, served as health officer of Evanston on a part time basis during the year 1898 member of the first staff of the Evanston Hospital, aged 77, died, Nov 20, 1938, of coronary thrombosis and arteriosclerosis

**Otto Jacob Stein**, Palos Verdes Estates, Calif Missouri Medical College, St Louis, 1891 member of the Illinois State Medical Society, American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otological Society, aged 71, died in November 1938

**Peter Olaf Sundin** ☉ Los Angeles, University of Southern California College of Medicine, Los Angeles 1907, fellow of the American College of Surgeons aged 61, on the staffs of the Florence Crittenton Home and the California Hospital, where he died, Nov 29, 1938 of carcinoma of the stomach

**William A Purifoy**, Chidester, Ark Memphis (Tenn) Hospital Medical College, 1899, past president of the Ouachita County Medical Society, member of the Arkansas Medical Society, bank president, aged 68, died, Nov 25, 1938 in the Camden (Ark) Hospital, of cerebral hemorrhage

**Edward John Witt** ☉ Los Angeles, Rush Medical College, Chicago, 1896 member of the Michigan State Medical Society, formerly member of the board of education in St Joseph Mich at one time on the staff of St Joseph (Mich) Sanitarium, aged 68 died Nov 23 1938 of cerebral thrombosis

**Charles Emmett Jelm** ☉ Akron Ohio Ohio-Miami Medical College of the University of Cincinnati, 1912 member of the American Urological Association, fellow of the American College of Surgeons, on the staff of the City Hospital, aged 51 died Nov 22 1938 of heart disease

**Melville Ross**, Bloomington, Ind., Indiana University School of Medicine, Indianapolis, 1911, member of the Indiana State Medical Association, past president of the Monroe County Medical Society, served during the World War, aged 51, died, Nov 2, 1938, of cirrhosis of the liver

**Edward Everett Shell**, Prescott, Ark., University of Tennessee Medical Department, Nashville, 1894, member of the Arkansas Medical Society, on the staff of the Cora Donnell Hospital, aged 67, died, Nov 18, 1938, in Memphis, Tenn., of injuries received when struck by a truck

**Oscar Merle Shirey** ♂ Cleveland, Western Reserve University Medical Department, Cleveland, 1903, member of the American Academy of Ophthalmology and Oto Laryngology, served during the World War, on the staff of the Polyclinic Hospital, aged 60, died, Nov 20, 1938

**Stanley Wojcik Woyt**, Jackson, Mich., Wayne University College of Medicine, Detroit, 1933, member of the Michigan State Medical Society, aged 32, died, Nov 23, 1938, in the W A Foote Memorial Hospital, of injuries received when his automobile was struck by a truck

**Anthony Wayne Baugh**, Paoli, Pa., University of Pennsylvania Department of Medicine, Philadelphia, 1891, member of the Medical Society of the State of Pennsylvania, member of the House of Delegates of the American Medical Association in 1913, aged 71, died, Nov 8, 1938

**David Charles Simon**, Chicago, University of Illinois College of Medicine, Chicago, 1930, assistant in the department of medicine, University of Illinois College of Medicine, June 13, 1932-Sept 1, 1938, aged 34, died, Nov 17, 1938, of sarcoma of the mediastinum with metastasis

**James William Sullivan Stewart** ♂ 1st Lieut., M C, U S Army, Carlisle, Pa., Cornell University Medical College, New York, 1935, was commissioned a first lieutenant in the army June 2, 1937, aged 29, was killed, Nov 18, 1938, in an airplane accident near La Grange, Ga

**Michael Joseph Sheahan**, New Haven, Conn., Yale University School of Medicine, New Haven, 1896, served during the World War, on the staff of the Hospital of St Raphael, aged 69, died, Nov 13, 1938, of diabetes mellitus, arteriosclerosis and cerebral hemorrhage

**Richard Randolph Daly**, Atlanta, Ga., College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1888, member of the Medical Association of Georgia, served during the World War, aged 72, was found dead in November 1938

**William Field Taliaferro**, Beaumont, Texas, Tulane University of Louisiana School of Medicine, New Orleans, 1902, member of the State Medical Association of Texas, aged 59, died, Nov 21, 1938, in the Brackenridge Hospital, Austin, of coronary thrombosis

**William Edward Youngs**, Independence, Kan., Barnes Medical College, St Louis, 1899, member of the Kansas Medical Society, formerly mayor of Cherryvale, aged 66, on the staff of the Mercy Hospital, where he died, Nov 7, 1938, of coronary occlusion

**Octavius Lamar Williamson** ♂ Marianna, Ark., Tulane University of Louisiana School of Medicine, New Orleans, 1901, past president of the state board of health, past president of the Lee County Medical Society, aged 61, died in November 1938 of heart disease

**Peyton Jarrett Fullingim**, Dallas, Texas, Southwestern University Medical College, Dallas, 1909, member of the State Medical Association of Texas, served during the World War, on the staff of the Methodist Hospital, aged 60, died suddenly, Nov 24, 1938

**Ernest Peyton Jones**, Hermanville, Miss., Medical Department of Tulane University of Louisiana, New Orleans, 1887, member of the Mississippi State Medical Association, member of the board of health, 1899-1907, aged 73, died, Nov 10, 1938, of pneumonia

**John H Hunter**, Houston, Texas, Atlanta Medical College, 1888, member of the State Medical Association of Texas, Civil War veteran, formerly acting assistant surgeon in the U S Public Health Service, aged 86, died in November 1938 in a local hospital

**Joseph C Steuer**, Cleveland, Cleveland College of Physicians and Surgeons, Medical Department of the University of Wooster, 1895, aged 65, died, Nov 25, 1938, in the Mount Sinai Hospital of cholelithiasis, arteriosclerosis and bronchopneumonia

**Charles Wallace Poorman** ♂ Oak Park, Ill., College of Physicians and Surgeons of Chicago, School of Medicine of the

University of Illinois, 1903, on the staff of the West Suburban Hospital, aged 65, died, Nov 13, 1938, of coronary and cerebral sclerosis

**Edward Alfred Poret** ♂ Hessmer, La., University of the South Medical Department, Sewanee, Tenn., 1904, formerly member of the parish school board, aged 60, died, Nov 4, 1938, of carcinoma of the prostate with ulcerated metastasis to the liver

**Ernest Von Quast**, Kansas City, Mo., Missouri Medical College, St Louis, 1877, member of the Missouri State Medical Association, aged 85, on the staff of the Research Hospital, where he died, Nov 11, 1938, of arteriosclerosis and uremia

**Amos W Troupe** ♂ Pine Bluff, Ark., Rush Medical College, Chicago, 1884, president of the Jefferson County Medical Society, on the staff of the Davis Hospital, aged 82, died, Nov 21, 1938, of injuries received when struck by an automobile

**Jesse Andrew Randall**, Old Orchard Beach, Maine, Medical School of Maine, Portland, 1888, member of the Maine Medical Association, for many years member of the board of health, aged 74, died, Nov 27, 1938, of arteriosclerosis

**Willis Terry Zeigler**, Canton, Ill., College of Physicians and Surgeons, Keokuk, Iowa, 1896, member of the Illinois State Medical Society, formerly county coroner, aged 71, on the staff of the Graham Hospital, where he died, Nov 25, 1938

**Richard George Scribner**, Sacramento, Calif., University of California Medical School, San Francisco, 1921, member of the California Medical Association, aged 45, died, Nov 19, 1938, in the Sutter Hospital of coronary occlusion

**Etamar Mower**, Brookline, Mass., St Louis College of Physicians and Surgeons, 1921, member of the Massachusetts Medical Society, aged 43, died, Nov 29, 1938, in a hospital at Cambridge of acute coronary thrombosis

**Samuel M Rosenblum**, Chicago, Friedrich Wilhelms Universität Medizinische Fakultät, Berlin, Prussia, 1890, aged 62, died, Nov 25, 1938, in the Michael Reese Hospital of coronary sclerosis and bronchopneumonia

**Daniel Trigg Jr**, Bristol, Va., Medical College of Virginia, Richmond, 1903, served during the World War, aged 61, medical director and owner of St Ann's Hospital, where he died, Nov 4, 1938, of cerebral hemorrhage

**John Nelson Drury** ♂ Lowell, Mass., University and Bellevue Hospital Medical College, New York, 1904, formerly on the staff of the Bellevue Hospital, New York, aged 57, died, Nov 19, 1938, of coronary occlusion

**Luigi Carlo Paulino**, Los Angeles, Regia Università di Napoli Facoltà de Medicina e Chirurgia, Italy, 1899, aged 66, died, Nov 3, 1938, of acute pulmonary edema and hypertension

**Charles Rosenbaum**, Miami Beach, Fla., Columbia University College of Physicians and Surgeons, New York, 1910, aged 50, died, Nov 5, 1938, of hypertension and arteriosclerosis

**Sidney Burnett Tryon** ♂ Cooperstown, N Y., University and Bellevue Hospital Medical College, New York, 1908, aged 56, died, Nov 23, 1938, of arteriosclerotic heart disease

**Austin L Wray**, Rock Island, Ill., College of Physicians and Surgeons, Keokuk, Iowa, 1880, aged 86, died, Nov 4, 1938, of an infection which developed in an abrasion

**Timothy John Thurston**, Chicago, Dearborn Medical College, Chicago, 1907, aged 69, died, Nov 7, 1938, of endocarditis, diabetes mellitus and chronic nephritis

**Forrest Gabbert**, Louisville, Ky., Maryland Medical College, Baltimore, 1903, aged 67, died in November 1938 in the United States Marine Hospital of pneumonia

**Olive K Beers**, Albany, Ore., Willamette University Medical Department, Salem, 1890, formerly a missionary, aged 77, died, Nov 10, 1938, of mitral insufficiency

**Alvin Alfred Maples**, Clever, Mo., Barnes Medical College, St Louis, 1896, aged 68, died, Nov 24, 1938, of cerebral hemorrhage, arteriosclerosis and hypertension

**Lemuel C Kimberly**, Empire, Ga., Georgia College of Eclectic Medicine and Surgery, Atlanta, 1890, aged 76, died, Nov 11, 1938, of cerebral hemorrhage

**Charles M Beall**, Clarksburg, Ind., Cincinnati College of Medicine and Surgery, 1881, aged 84, died, Nov 15, 1938, of myocarditis and cerebral embolism

**Joseph Eldridge Warbritton**, Crosses, Ark. (licensed in Arkansas in 1903), aged 78, died, Nov 2, 1938, of senility

**Francis Albert Reed**, Eustis, Fla., Cleveland University of Medicine and Surgery, 1890, aged 71, died, Nov 8, 1938

**Harrison T Coop**, Newcastle, Texas, College of Physicians and Surgeons, Dallas, 1906, aged 67, died, Nov 5, 1938

**Andrew S Howard**, Simpsonville, S C., Atlanta Medical College, 1889, aged 77, died, Nov 2, 1938

## Bureau of Investigation

### THE C A WILLIAMS FRAUD

#### A Mail-Order "Cure" for Gonorrhea and Syphilis Barred from the Mails

The United States mails have been closed to the C A Williams Medicine Company of McKamie, Ark. This concern was started in 1929 by C A Williams a 70 year old Negro and in 1936 another Negro, Ples L Lewis, acquired a controlling interest. Apparently, neither man had even a high school education and no physician, pharmacist or chemist was employed in the business. On July 9, 1938, both men were called on to show cause why a fraud order should not be issued against their concern. On August 8 their attorney, Mr Mark P Friedlander, appeared in Washington for the hearing, on August 23 the mails were closed to the company.

The concern sold through the mails a group of alleged medicinal preparations for various diseases. The postal authorities directed their attention to three of the nostrums "Williams' System Tonic No 3," "Williams' Nerve Tonic No 4" and "Williams' Nerve Tonic No 1." The first of these three was represented as a cure for syphilis, gonorrhea, pellagra, "sores," "bad blood," boils, fevers and pains. It was found to be a solution of muriatic (hydrochloric) acid and green vitriol (ferrous sulfate). The second named product was found to be a red, syrupy liquid containing nux vomica, sugar and water. It was sold as a cure for "run down nature," nervous prostration, piles, paralysis, "wandering of mind" and "decline of sex force." The third product was the most expensive and was recommended as a "special" cure for gonorrhea and kidney complaints, it was found to consist of alcohol 42 per cent (the strength of much raw whiskey) with buchu and senna or rhubarb and flavored with cloves.

The concern obtained its victims in the usual manner. As the Solicitor for the Post Office Department put it in his memorandum to the Postmaster General recommending the issuance of a fraud order "Business is solicited by advertisements placed in various newspapers." One such advertisement sent to the Bureau of Investigation by a correspondent read

HEALS THOUSANDS  
Sores Weak Nature Syphilis Pellagra Gonorrhea Bad Skin  
Bad Blood Nervousness Indigestion Kidney Guaranteed Treat  
ment \$1.75 postpaid No C O D s

It was brought out at the hearing that the two Negroes bought their preparations from a St Louis drug company in gallon bottles and then Lewis in his house siphoned off the preparations in smaller bottles when needed.

The viciousness of selling alleged cures for such diseases as syphilis and gonorrhea must be obvious even to those without medical training. Even the attorney for these men admitted at the hearing that if he were buying from his clients' advertisements he "would expect something worthless."

### THE NATHAN PEIKES QUACKERY

#### The Mails Are Closed to a "Lost Manhood" Fraud

Nathan Peikes of Lowell, Mass., according to memoranda of Solicitors for the Post Office Department to the Postmaster General, has for some years past operated and controlled two concerns engaged in crude and indecent quackery of the 'lost manhood' type. Peikes' first company was known as "P P Products Company," which sold 'Nu-Gland Tablets' that were claimed to cure "quickly and lastingly" what Peikes called 'loss of vitality in men.' According to the records in the case business was obtained by means of magazine advertising and circular matter sent through the mails.

More than three years ago—Dec 11, 1935—a hearing was held in Washington in response to a charge by the Post Office Department to show cause why the mails should not be closed to the P P Products Company. Peikes did not appear at the hearing but was represented by his attorney, Mr Eugene C Brokmeyer of Washington D C who presented a written answer denying the charges. Mr Brokmeyer stated that he did not wish to enter on a formal trial of the matter but requested an extension of time to permit him to communicate with his

client with a view to submitting some additional proposal with respect to the disposition to be made in the case.

This was granted and on Dec 16, 1935, Peikes offered, through his attorney, to abandon his scheme and to direct the postmaster at Lowell to treat all mail addressed to the P P Products Company as "Refused" and to refuse to cash any money orders drawn in favor of the Company. As such a stipulation could be repudiated at the will of Peikes, the government refused to accept it. The Solicitor for the Post Office Department (Hon Karl A Crowley) in his memorandum to the Postmaster General recommending the issuance of a fraud order reviewed the evidence in the case and demonstrated the inherent fraudulence of the scheme. It was brought out that Nu-Gland Tablets were essentially a mixture of strychnine, iron, zinc phosphide and glandular material. It also was shown that Peikes was not a physician and had no physician connected with his company. As a result of the hearing a fraud order was issued closing the mails to P P Products Company on Dec 21, 1935.

But Nathan Peikes, figuratively speaking, thumbed his nose at the Post Office Department and by the simple expedient of changing the name of his company continued to swindle the public. The new trade name for Peikes' fraud was "Lee Products Company." He still advertised and sold Nu-Gland Tablets under representations identical with those of the P P Products Company. He also added to his armamentarium of fakery another product that he called "Lee's Vitam Perles" that were said to be "rich in vitamin E"—although government tests showed only a small amount present.

Some of Peikes' advertising matter read as follows:

#### LEES VITAM PERLES

Rich in Vitamin E	The Sex or Anti-Sterility Vitamin	Indications
Lack of Libido	Weak or Absent Erection	Sexual
Neurasthenia	Myasthenia	Gravis
Sterility	Female Sterility	Muscular Debility
		Male

Peikes led his dupes to believe that human beings were in grave danger of a deficiency of vitamin E in their diet. In order to give artistic verisimilitude to a bald and unconvincing narrative Peikes appended to his circulars a list of "Authorities Consulted"—of which the American Medical Association was the first given. Yet the simple facts are that in the 1938 edition of "Useful Drugs" published by the American Medical Association we read

'Vitamin E is present in many common foods but there is no established therapeutic indication for its use'

On July 15 1938, the Lee Products Company of Nathan Peikes was called on to show cause on August 17 why a fraud order should not be issued against it. This time Peikes did not, apparently, think it worth while even to employ an attorney, for no answer whatever was made to the charge and neither Peikes nor any representative appeared at the hearing. The Acting Solicitor (Hon Calvin W Hassell) for the Post Office Department carefully went over the evidence, called into the case physicians of scientific standing, and then in a memorandum to the Postmaster General recommended the issuance of a fraud order. It was issued on Aug 26, 1938 at which time the mails were closed to the Lee Products Company of Lowell, Mass.

The question naturally arises "What can be done to interfere with Nathan Peikes' continuing his quackery under the fiction of still another company?" If the past is any criterion, apparently nothing will be done except to issue another Post Office fraud order against any such company. Such penalties as closing the mails to speciously named companies that are found guilty of fraud is rather in the nature of a mild slap on the wrist.

It seems possible that more aggressive and much more effective action might be taken in this and similar instances. Sec 338 Title 18 U S Code, provides in part as follows:

Whoever having devised or intending to devise any scheme or artifice to defraud or for obtaining money or property by means of false or fraudulent pretense representations or promises shall for the purpose of executing such scheme or artifice place or cause to be placed any letter postcard package writing circular pamphlet or advertisement in any post office or station thereof or street or other letter box of the United States to be sent or delivered by mail shall be fined not more than \$1 000 or imprisoned not more than five years or both.

It is entirely reasonable to ask why the proper prosecuting authorities of the federal government cannot call the facts to



the attention of a grand jury having jurisdiction in the matter, and if indictments can be returned by it, prosecute these cases with the energy and interest it has so often displayed on other occasions. Obviously, the imposition of heavy fines, or, better yet, penitentiary sentences authorized by the section of the criminal code quoted would do much to discourage these ghoulies, and mail-order quackery would cease to be the safe and profitable business it now is. Such action would seem to be entirely in keeping with the federal government's apparent concern over the health of the people.

## Correspondence

### SULFAPYRIDINE IN THE TREATMENT OF PNEUMONIA

*To the Editor*—In recent years many agents, chemical, physical and biologic, have been recommended for the treatment of pneumonia. In each instance the early experiences were brilliant, marked reductions in death rates and striking therapeutic responses being noted. Quinine and its derivatives, intravenous dextrose, nonspecific protein therapy, vaccines, diathermy, pneumothorax and, most recently, deuteroproteose and roentgen therapy are only a few of those which might be mentioned. In most instances the early reports considered too few cases and did not take into account the most important factors influencing the mortality in this disease. Individual cases or small groups of clinical results were reported with great enthusiasm.

The value of some of these agents even now has not been properly assessed. In most instances, however, closer scrutiny and further observations under controlled conditions have shown no particular virtues or life saving values for these various agents and they have not received wide recognition. Most of the early favorable results have been attributed to the antipyretic, counterirritant analgesic or other nonspecific effects of the particular agents used.

In the case of only one group of agents, namely type-specific antipneumococcus serums for the treatment of pneumonia due to certain types of pneumococci, have the experimental and clinical results been consistently favorable. During recent years these serums have received increasingly widespread acceptance coincident with improvements in the quality and potency of the serums produced and particularly with the recent introduction of antipneumococcus rabbit serums and improved efficiency of typing. As far as can be ascertained, all who have had the opportunity and have been willing to use good specific serums under well controlled conditions have been uniformly impressed with the striking clinical responses and with the marked reduction in mortality in the pneumonias due to the types of pneumococci for which specific serums have become available.

During the past year sulfapyridine has been introduced into the therapy of pneumonia in England, and this drug is now having a number of clinical trials in this country. The earliest clinical reports and subsequent ones from England were made without proper controls and the data presented were grossly inadequate for any evaluation. Similar reports have been made recently at various medical meetings and even greater publicity has been given this drug in the lay press and in radio reports in this country. Unfortunately no published reports have yet appeared with any data from which the value of this drug can be assessed.

Those contemplating its use or the report of results of its use will do well to heed the warning which Dr. E. K. Marshall Jr. of Johns Hopkins has recently communicated in *THE JOURNAL* (January 28, p. 352) and his pointed reference to this drug. If evaluation in experimental animals under standard and controlled conditions is difficult, it is all the more reason for extreme caution in reporting results in human beings.

Those who have spent many years in the study of pneumonia will testify to the difficulties in assessing the value of any agent in this disease before a large number of cases have been accumulated, each properly studied with respect to etiology, bacteremia and the clinical factors affecting death rates. The untoward effects and possible dangers of the remedy must also be assessed. A number of such workers are now engaged in an earnest effort to evaluate this drug, with its benefits, limitations and dangers. They are attempting to learn the proper methods of using the drug in order to obtain the optimum of benefit with the minimum of harm.

While such investigations are in progress and until the results of these studies are carefully analyzed and assessed, it is well to retain and to use the proved remedies. It would be unfortunate if the appearance of a new therapy, no matter how promising, were to cause the abandonment of agents whose curative efficacy and life-saving qualities have become established. In the case of pneumonia, sulfapyridine must still be considered as an experimental drug and, as such, should be used only under controlled conditions. There are reasons to believe that this drug will have its best effect when used in conjunction with specific serums. It is only fair to the patient ill with pneumonia that he should not be deprived of the proved value of type specific serum, when this is indicated until those in a position to undertake carefully controlled observations have had an opportunity to ascertain the value of this drug and its limitations and are prepared to present properly documented results in significant numbers of cases.

JESSE G. M. BULLOWA, M.D., New York  
NORMAN PLUMMER, M.D., New York  
MAXWELL FINLAND, M.D., Boston

### THE PROBLEM OF THE REFUGEE PHYSICIAN

*To the Editor*—The editorial in *THE JOURNAL*, Sept. 17, 1938, concerning the problem of foreign refugee physicians in this country appears to have been sadly prophetic. Recent events in Central Europe have deprived hundreds of thousands of people of their means of livelihood and have enormously accelerated emigration. Among the expatriates coming to this country, according to the best information available there will be about two thousand doctors. The question of their fate is an important one. Will they be assets or will they be liabilities?

The fact that well qualified professional immigrants may become assets to the country is shown by previous and recent experiences. Some of our earliest universities were founded and staffed by political refugees. Within a hundred years the doctors and teachers who came here after the revolutions of 1848 have left a splendid heritage. Many of the refugee scholars and physicians who have left Central Europe within the past few years have already made important contributions to science and practice in this country. The best interests of the medical profession as a whole are served by a constant improvement in the knowledge and control of disease. Since the output of investigative work from European clinics and laboratories has been sharply curtailed, it is all the more important that the volume of scientific studies be increased here and that trained experts from abroad be given the opportunity to continue their work. In the field of general practice and in the specialties also numerous openings exist for which it is difficult to find qualified American physicians, for example, poorly paid full time positions and practices in rural communities. The farsightedness of the American medical profession and its general attitude of hospitality toward well trained foreign doctors accords well with a splendid national tradition.

There are unquestionably many difficult problems connected with finding work for refugees. One is that a certain number of them are poorly trained or of low ethical standing or still

have an arrogant attitude which makes satisfactory placement impossible. Few men so handicapped come to this country, however, as such shortcomings are an impediment to securing the sponsorship necessary for immigration. Another serious difficulty is the tendency to a concentration of large numbers of refugees in Eastern cities, already crowded with physicians, which is likely to rouse local resentment while the same number divided over a larger area would add to the efficiency of the medical community.

In the hope of safeguarding the public, avoiding injury to the medical profession and giving such help as may be possible to immigrant physicians in distress, committees have been formed in several cities. Their aims and policies are in general to raise funds for the alleviation of fundamental needs, to offer advice and opportunities for acclimatization and to arrange for a suitable distribution of refugees. Only in rarest instances will they encourage immigration. In seeking placement, their policy will be to look carefully into the credentials of foreign physicians and to recommend the qualified ones only for those positions for which no suitably trained American doctors are available, mainly in laboratories and in rural communities. A few are very distinguished for their contributions and would be an asset to any community. The placements so far effected have rarely failed to give satisfaction to all concerned. These committees hope to meet the distressing problem in accordance with American ideals and yet in as realistic a manner as possible. For this purpose, they bespeak the cooperation of the profession.

DAVID L. EDSALL, M.D., Boston

JOHN A. HARTWELL, M.D., New York

WARFIELD T. LONGCOPE, M.D., Baltimore

GEORGE R. MINOT, M.D., Boston

HOWARD C. NAFFZIGER, M.D., San Francisco

DALLAS B. PHEMISTER, M.D., Chicago

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### EMERY DUSTS AND THE LUNGS

*To the Editor*—I have under my care at the present time a patient whom I believe to have pneumoconiosis due to the protracted inhalation of emery dust. As I understand it, emery consists largely of the aluminum trioxide colored with oxides of iron and manganese and therefore the disease produced by the inhalation of this abrasive dust might be expected to differ in certain respects from the more common related condition, silicosis. I have not been able to find good references in the literature to this specific condition and I am therefore taking this opportunity to ask for information. I should like to know if possible the chemical composition of the common grades of abrasive wheels, whether or not emery deposited in the lungs would be opaque to the x-rays (since aluminum itself is so pervious), whether any method of chemical analysis or microscopic examination has been devised to determine the content of emery in the sputum as an aid to diagnosis and the important biochemical differences in the reaction of the lungs to this foreign substance as compared with silica, for example. I would also appreciate any references bearing on this problem.

RALPH H. EDSON, M.D., Shelton, Conn.

*ANSWER*—Extensive exposure to any dust over long periods represented by years may induce increased pulmonary fibrosis with much increased density in hilar shadows but will not lead to a condition analogous to silicosis as found on x-ray examination or necropsy. Natural emery is an impure natural oxide of aluminum found chiefly in India, Africa, Asia Minor and the Mediterranean islands. Natural emery and corundum are rarely used at present in the manufacture of abrasive wheels. Synthetic substitutes have almost entirely replaced them. Aluminum oxide ( $Al_2O_3$ ), commonly called emery, is chiefly made by fusing bauxite, a natural aluminum ore, which may contain impurities. Carborundum, another synthetic abrasive (silicon

carbide,  $SiC$ ) is manufactured by heating in electric furnaces a mixture of coke, silica sand, sawdust and sometimes sodium silicate. These two synthetic abrasives, under various names, represent the major components of abrasive wheels in use at this time.

In forming these granular abrasives into suitable abrasive wheels, high pressures may be utilized along with binders such as clay, glue, shellac, rubber, oil, sulfur and silicates. In times past silica has been used as a binder, but this use is believed to have disappeared because of the possible dangers of silicosis. Emery is substantially pervious to the x-rays, but even though such particles were opaque the size present in the lung would preclude the ready detection of individual particles in x-ray films. Impurities in emery might pave the way for x-ray opacity, particularly if heavy accumulations were present in lymph nodes about the roots of the lungs. Much work has been carried out on chemical and microscopic methods for the determination of dust particles in the sputum. All such procedures are essentially valueless, since they establish nothing more than exposure. Fairly extensive animal work has been carried out, making use of both inhalation and injection procedures and utilizing synthetic abrasive dusts as test material. The characteristic lesion produced is one of inertness associated with foreign body reactions in contrast to the proliferative reaction from silica dust. A few important publications related to this query are listed which contain many other references. In addition, helpful materials may be obtained from the Norton Company, Worcester, Mass.

Clark W. Irving, "The Dust Hazard in the Abrasive Industry," *J. Indust. Hyg.* 7: 345 (Aug.) 1925; first study with Edward B. Simmons, *MD* 11: 92 (March) 1929; second study 13: 343 (Dec.) 1931.

Miller J. R., Sayers R. R. and Yant W. P., "The Response of Peritoneal Tissue to Dusts Introduced as Foreign Bodies," *THE JOURNAL* Sept. 22, 1934, p. 907; *Am. J. Pub. Health* 25: 452 (April) 1935.

Sundias N. and Bygden A., "Isolation of the Mineral Dust in Lungs and Sputum," *J. Indust. Hyg. & Toxicol.* 20: 351 (May) 1938.

Bale W. F. and Fray W. W., "Method for Analysis of Dust Samples Employing X-Ray Diffraction," *J. Indust. Hyg.* 17: 30 (Jan.) 1935.

Gardner L. U. and Cummings D. E., "The Reaction to Fine and Medium Size Quartz and Aluminum Oxide Particles," *Silicotic Cirrhosis of the Liver*, *Am. J. Path.* (supp.) 9: 751 1933.

Gardner L. U., "Etiology of Pneumoconiosis," *THE JOURNAL* Nov. 19, 1925, p. 1925.

### NOSE BLOWING

*To the Editor*—What is the correct way to blow the nose? What difference does it make whether first one nostril and then the other is emptied or the two together so long as pressure is not exerted by forcible blowing?

EMILY A. PRATT, M.D., Albany, N. Y.

*ANSWER*—The correct way to blow the nose, physiologically, is to draw the secretion back to the nasopharynx and expel it. This procedure is certain to prevent any extension of infectious material to any of the uninfected cavities of the head and the ears. Nevertheless, this practice is unesthetic, and various methods have been designed from time to time to clear the nose in a more esthetic manner.

The principle, regardless of what method is used, consists of a deep inhalation through the mouth and a gentle expiratory blast through the nose. The expiratory effort through the nose can be accomplished with one or both nostrils open. It is of the utmost importance that the blowing of the nose should be extremely gentle.

For practical purposes it makes little difference what method is used as long as forcible nose blowing is at all times studiously avoided.

### CONSTIPATION AFTER STOPPING SMOKING

*To the Editor*—A woman aged 22 gave up smoking on my advice. Several days later she told me that she had become constipated since she had stopped smoking cigarettes. Where formerly she had two regular bowel movements daily it was now necessary for her to take a laxative in order to have a daily movement. She stated too that it was common knowledge among cigarette smokers that smoking did promote regular bowel movements. I am not a smoker myself so I could not confirm or deny the statement. Is there any physiologic basis for this patient's observation?

M.D., New Jersey

*ANSWER*—The observation described is not unique. But not all smokers have this experience when they cease smoking for a short time or permanently. Hence it depends essentially on some peculiarity or condition in the individual smoker. There is no evidence at present that the amount of nicotine and other substances that are absorbed into the blood from smoking has any direct or indirect action on the bowel. Nor has it been shown that the gastrocolic reflex initiated by eating and consequent digestive motility of the stomach and the small intestine is also inaugurated from the mouth and the upper respiratory passages by smoking. The most probable mechanism of the

occasional and temporary constipation on cessation of the smoking habit is temporary removal of neuromuscular tension by smoking in these people. That nervous tension may seriously interfere with the regular motility of the large bowel is well known. The large bowel is also influenced by the habits of the individual as a whole. A high strung individual accustomed to smoking after breakfast, after each meal, or when going to the toilet, may, for a while on abandoning this habit, experience temporary constipation because a conditioning factor in the favorable neuromuscular setting has suddenly dropped out. In this sense the bowel may in some persons be said to be conditioned to smoking as in others it may become conditioned to laxatives. In either case the bowel may in many cases at least be reconditioned to the absence of such factors.

#### SHORT WAVE DIATHERMY IN TONE DEAFNESS

*To the Editor*—A married man aged 29 well developed and well nourished complains of a fullness and dull throbbing sensation in both ears and mastoid regions. He gives a history of having had many middle ear infections as a boy. The drums are white and retracted and they show scars from old perforations. Roentgenograms of the mastoid regions show opacities of the peritrat cells and some of the mastoid labyrinth. Audiometer readings show a loss of 8 per cent hearing from each ear which is for conversational tones of 256, 512 and 1024 double vibration tones and a complete loss of hearing for sounds of the highest pitch. Will you kindly advise means of management? Would the use of a 6 meter Peerless short wave machine with air spaced electrodes be of value? What can you tell me of the merits of such a machine?

M D New Hampshire

*ANSWER*—Nasopharyngoscopy and eustachian catheterization to determine the patency of the eustachian tubes should be done in all such cases. Allergy should be eliminated or, if found to be present, should be controlled as adequately as possible. Increase or decrease of symptoms in the presence of head colds and sore throats should be ascertained and if either of these appears to be a contributing factor, they should receive attention. The same is true for any obstructions in the nasal cavity.

The 6 meter Peerless Short Wave Machine has been accepted by the Council on Physical Therapy but claims as to treatment of deafness have not been accepted. Short wave treatment will probably not increase the symptoms but it is doubtful that it will be beneficial.

#### ANACARDIC ACID DERMATITIS

*To the Editor*—I was questioned about the lesions that are supposed to be produced by anacardic acid. If any lesions are produced what is the description? Does it resemble rubio poisoning (I saw a case of it)? What is the preventive and curative treatment?

MICHAEL STOLFO M D Philadelphia

*ANSWER*—Anacardic acid is found in the oil from members of the cashew nut family. This oil has been found to be irritating when applied to the skin. In the West Indies it has been used for the treatment of warts and ringworm. No preventive treatment is known. Treatment is that of an acute dermatitis with mild astringent lotions, care to avoid mechanical irritation, and the like. The material should probably be avoided in the future.

#### TREATMENT OF HEMIPLEGIA

*To the Editor*—I should like information regarding reeducation of the use of hands, arms and legs following hemiplegia from cerebral embolism of cardiac origin. The embolism occurred six weeks ago and the patient has been in bed during this time. The leg has recovered enough to permit flexion at the hip and knee. There is moderate swelling of the arm and hand that of the leg having disappeared. The patient is at home and a practical nurse is in attendance. The patient is a woman 51 years of age and overweight.

M D Illinois

*ANSWER*—Recent hemiplegia will require gentle heat, gentle massage, gentle passive movements only. The heat relaxes spasm and the massage, in the form of gentle stroking with slow movements, is given to prevent adhesions. Severe spasm will require splints when treatment is not being given. Active movements are begun when the acute symptoms have subsided. The lower extremity tends to recover first, so the toes and ankle should be exercised first. Later the fingers and wrist should be exercised. The hand is the last to recover, so must be watched carefully. General exercises should be prescribed for all the muscle groups involved in the later stages of treatment. Lifting large objects, carrying different weights with both hands to straighten the elbows, shrugging the shoulders and maintaining proper posture are useful procedures. No exercise should ever be carried to the extent of tiring out the patient.

#### POISONING FROM INDELIBILE LAUNDRY INK

*To the Editor*—What is the chemical composition of indelible (laundry) ink and which constituents are most likely to act as poisons on being swallowed? A 2 year old child swallowed a small amount of laundry ink (Sanford's) and after about one hour became stuporose, cyanotic with grayish brown discoloration of the skin and almost ceased respiration. The pupils were dilated. No vomiting occurred. The urine was dark brown. It gave a negative benzidine reaction. There was no albumin and a trace of sugar was present. The blood showed no deviant from normal. Recovery followed artificial respiration and administration of oxygen.

M D New York

*ANSWER*—A typical formula for laundry ink is phenol 3 ounces, nitrobenzene 30 ounces, turpentine 12 ounces, Nigrosin 3 1/4 pounds and potassium aluminum sulfate 6 ounces. If in fact this type of ink represents the variety swallowed, the ensuing events are well accounted for. In all likelihood it is to the phenol that the chief manifestations are to be attributed. Not only by ingestion but through skin contact, some indelible marking inks may bring about injury. An instance was described in THE JOURNAL by McCord and Minster (Phenol Poisoning From Ink, Sept 13, 1924, p 843).

#### HANDWRITING AND PSYCHOLOGY

*To the Editor*—Is there any medically sound work on the correlation of handwriting and psychologic make-up?

M D New York

*ANSWER*—There is little that could be considered "medically sound" on this subject. A standard work is "Die Probleme der Graphologie," by Ludwig Klages, published by J. A. Barth, Leipzig. A journal, *Die Schrift*, is published by Rudolf M. Rohrer, Rafingasse 7, Brunn, Germany. An American publication is "Graphology and the Psychology of Handwriting," by June E. Downey, Baltimore, Warwick & York, 1919. Standard textbooks on psychiatry discuss changes in handwriting of disturbed persons.

#### UNDULANT FEVER AND MANTOUX TEST

*To the Editor*—A patient of 29 with marked loss of weight and blood positive to undulant fever shows a positive Mantoux test and a positive sputum on one test only. Does undulant fever affect the Mantoux reaction?

C C HALL, M D, Maynard Iowa

*ANSWER*—No

#### ATTACKS OF VERTIGO

*To the Editor*—In THE JOURNAL Dec 17 1936 there is a question concerning attacks of vertigo with nausea and vomiting of sudden onset and of from five to twelve days duration. From the data given by the inquirer it is impossible to make a diagnosis. I have met several of these cases in the past five years and have found most to be due to a vasomotor mechanism. In persons in whom the vertigo with nausea and vomiting due to a vasomotor cause there are found other vasomotor phenomena: coldness and at other times warmth and sweating of the fingers and some coldness of the toes also a sensation of numbness or tingling described as pins and needles by the patients and possibly a like sensation of the rim of the external ears. None have complained of headache associated with the vertigo. One of the patients had an associated diarrhea with the vertigo, nausea and vomiting. The blood pressure in all but one was found labile fluctuating from 170 to 120 within a few minutes. Some times this fluctuation is absent during the same examination but at a subsequent one will be found either much higher or lower. The diastolic pressure varies also. Just why a vasomotor instability in one person gives no such attacks of vertigo and in another does I do not know. Perhaps the labyrinth is the most vulnerable point. These have all responded with variable results to therapy of the same kind. However the same therapy in patients with vasomotor rhinitis failed completely. In my cases there was recurrence of the attacks some every few weeks, others at shorter and longer intervals before treatment was started, but during the treatment only slight vertigo, nausea and no vomiting occurred and when it did occur the intervals were as long as twenty months without an attack.

EMANUEL ROTH M D Flushing N Y

#### ATROPINE EYE DROPS

*To the Editor*—In THE JOURNAL Dec 17 1936 the question was asked about idiosyncrasy to atropine eye drops. Forty-eight years ago when I was assistant in the office of Drs. Green Post and Ewing they had for me that many patients (especially babies) were poisoned by aqueous solution of atropine which had a large area of absorption because the instillation had access to the nose and throat. Dr. Green then devised a method of dissolving the alkaloid of atropine in alcohol evaporated over a water bath and then triturating the resulting powder in pure castor oil frequently adding cocaine alkaloid which may be dissolved in the oil by trituration. The resultant solution does not go through the puncta to the canaliculi to the nose and throat but the eye absorbs the drug extremely well and naturally for a longer time. It was also found that a sensation to atropine usually exhibits only an edematous swelling of the lids with dryness and burning.

J W CHARLES M D St Louis

**Medical Examinations and Licensure****COMING EXAMINATIONS****STATE AND TERRITORIAL BOARDS**

Examinations of state and territorial boards were published in THE JOURNAL February 4 page 466

**NATIONAL BOARD OF MEDICAL EXAMINERS**

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II Medical centers having five or more candidates desiring to take the examination Feb 13 15 May 12 (Part II only—limited to a few centers) June 19 21 and Sept 11 13 Ex Sec Mr Everett S Elwood 225 S 15th Street Philadelphia

**SPECIAL BOARDS**

AMERICAN BOARD OF ANESTHESIOLOGY An Affiliate of the American Board of Surgery Written examination Part I will be held in various cities of the United States and Canada April 8 Oral examinations for all candidates St Louis May 13 14 Applications must be filed not later than sixty days prior to the date of the examinations Sec Dr Paul M Wood 745 Fifth Ave New York

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Philadelphia Oct 30 Nov 1 Sec Dr C Guy Lane 416 Marlboro St Boston

AMERICAN BOARD OF INTERNAL MEDICINE Written examinations will be held in various parts of the United States Feb 20 Sec Dr William S Middleton 1301 University Ave Madison Wis

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY General oral clinical and pathological examinations for all candidates Part II examinations (Groups A and B) will be held in St Louis May 15 16 Application for admission to Group A examinations must be on file in the Secretary's office by March 15 Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh (6)

AMERICAN BOARD OF OPHTHALMOLOGY Written Various cities throughout the country March 15 and Aug 5 Oral St Louis May 15 and Chicago Oct 7 Sec Dr John Green 6830 Waterman Ave St Louis

AMERICAN BOARD OF ORTHOPAEDIC SURGERY St Louis May Applications must be filed with the Secretary on or before April 1 Sec Dr Fremont A Chandler 6 N Michigan Ave Chicago

AMERICAN BOARD OF OTOLARYNGOLOGY St Louis May 12 13 and Chicago Oct 6 7 Sec Dr W P Wherry 1500 Medical Arts Bldg Omaha

AMERICAN BOARD OF PATHOLOGY Richmond Va April 3 4 Sec Dr F W Hartman Henry Ford Hospital Detroit

AMERICAN BOARD OF PEDIATRICS Cincinnati Nov 15 Appointments must be made before July 15 Sec Dr C A Aldrich 723 Elm St Winnetka Ill

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY Chicago May 13 Sec Dr Walter Freeman 1028 Connecticut Ave N W Washington D C

AMERICAN BOARD OF RADIOLOGY St Louis May 11 14 Sec Dr Byrl R Kirkin 102 110 Second Ave S W Rochester Minn

AMERICAN BOARD OF SURGERY Part I Simultaneously in various centers throughout the United States April 3 Part II New York May 8 and May 9 Sec Dr J Stewart Rodman 225 S 15th St Philadelphia

AMERICAN BOARD OF UROLOGY White Sulphur Springs W Va May 26 28 Sec Dr Gilbert J Thomas 1009 Nicollet Ave Minneapolis

**South Carolina Reciprocity and Endorsement Report**

Dr A Earle Boozer, secretary, State Board of Medical Examiners of South Carolina, reports eight physicians licensed by reciprocity and one physician licensed by endorsement at the meeting held in Columbia, Nov 7-8, 1938 The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Emory University School of Medicine	(1911)	(1918)	Georgia
University of Georgia Medical Department	(1911)	(1931)	Georgia
Detroit College of Medicine and Surgery	(1921)	(1921)	Michigan
University of Oklahoma School of Medicine	(1937)	(1937)	Oklahoma
Vanderbilt University School of Medicine	(1931)	(1933)	Tennessee
Medical College of Virginia	(1931)	(1933)	Virginia

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Rush Medical College	(1933)	(1933)	N B M Ex

**Texas November Report**

Dr T J Crowe, secretary, Texas State Board of Medical Examiners, reports the written examination held at Austin Nov 14-16 1938 The examination covered twelve subjects and included 120 questions An average of 75 per cent was required to pass Thirty-six candidates were examined, twenty-four of whom passed and twelve failed Sixty-six physicians were licensed by reciprocity and two physicians were licensed by endorsement The following schools were represented

School	PASSED	Year Grad	Per Cent
Chicago Medical School	(1938)	(1938)	75.8
Louisiana State University Medical Center	(1938)	(1938)	83.6
Tulane University of Louisiana School of Medicine	(1938)	(1938)	85.4
Harvard University Medical School	(1935)	(1935)	86
University of Michigan Medical School	(1933)	(1933)	81.5
St. Louis University School of Medicine	(1937)	(1937)	76.8
Washington University School of Medicine	(1934)	(1934)	75
Temple University School of Medicine	(1934)	(1934)	87.8
Baylor University College of Medicine	(1933)	(1938)	82

University of Texas School of Medicine	(1938)	76.8	77	80.5	85.5
University of Manitoba Faculty of Medicine	(1932)				79.5
Universität Heidelberg Medizinische Fakultät	(1924)				76
Universität Bern Medizinische Fakultät	(1935)	76.4	(1936)		76.4
Osteopaths †		75	75.6	78.8	81.5

School	FAILED	Year Grad	Per Cent
University of Arkansas School of Medicine		(1937)	72.6
Chicago Medical School	(1937)	67.6	73
Christian Albrechts Universität Kiel	Medizinische Fakultät	(1938)	70*
Friedrich Wilhelms Universität Berlin	Medizinische Fakultät	(1924)	67.2
Julius Maximilians Universität Würzburg	Medizinische Fakultät	(1926)	72
Escuela Medico Militar Mexico D F		(1904)	63.8
Universität Bern Medizinische Fakultät		(1922)	70.4
Osteopaths ‡		(1937)	72.6
		63.4	68
			71.2

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Univ of Arkansas School of Medicine	(1927) (1934)	(1938)	Arkansas
Howard University College of Medicine	(1930)	(1930)	Penna
Emory University School of Medicine	(1931)	(1931)	Georgia
Chicago College of Medicine and Surgery	(1917)	(1917)	Illinois
Northwestern University Medical School	(1937)	(1937)	Illinois
Univ of Illinois College of Medicine	(1914) (1935)	(1937)	Illinois
(1937) California Colorado			
Indiana University School of Medicine	(1930)	(1930)	Indiana
University of Kansas School of Medicine	(1937) 2	(1937) 2	Kansas
University of Louisville School of Medicine	(1937)	(1937)	Kentucky
Louisiana State University Medical Center	(1937)	(1937)	Louisiana
Tulane University of Louisiana School of Medicine	(1936) N	(1936) N	Carolina
(1937) Mississippi (1913) (1932) (1935) (1936)	(1938)	(1938)	Louisiana
University of Minnesota Medical School	(1925)	(1925)	Minnesota
St Louis Univ School of Medicine	(1935) California	(1937)	Louisiana
Washington University School of Medicine	(1932)	(1932)	Minnesota
University Medical College of Kansas City Missouri	(1910)	(1910)	Kansas
John A Creighton Medical College	(1913)	(1913)	Nebraska
Long Island College Hospital	(1927)	(1927)	New York
Long Island College of Medicine	(1936)	(1936)	New York
University of Buffalo School of Medicine	(1926)	(1926)	New York
University of Rochester School of Medicine	(1932)	(1932)	Maryland
Ohio State University College of Medicine	(1918)	(1918)	Ohio
University of Cincinnati College of Medicine	(1936)	(1936)	Ohio
University of Oklahoma School of Medicine	(1931) (1937) 2	(1937) 2	Oklahoma
University of Pennsylvania School of Medicine	(1934)	(1934)	Penna
Melbarr Medical College	(1937)	(1937)	Tennessee
University of Tennessee College of Medicine	(1932)	(1932)	Tennessee
Vanderbilt University School of Medicine	(1936)	(1936)	Mississippi
University of Wisconsin Medical School	(1935)	(1935)	Maryland
Universität Zürich Medizinische Fakultät	(1935)	(1935)	New York
Osteopaths † California Colorado 2 Kansas 4 Maine Nebraska 2 New Mexico 2 New York Ohio 2 Oklahoma 5			

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
University of Illinois College of Medicine	(1932)	(1932)	U S Navy
John A Creighton Medical College	(1917)	(1917)	U S Army
* This applicant has received the M B degree and will receive the M D degree on completion of internship			
† Licensed to practice medicine and surgery			
‡ Examined in medicine and surgery			

**West Virginia October-November Report**

Dr Arthur E McClue, secretary, West Virginia Public Health Council, reports the oral and written examination held in Bluefield, Oct 31-Nov 2, 1938 The examination covered eleven subjects and included 110 questions An average of 80 per cent was required to pass Seventeen candidates were examined all of whom passed Sixteen physicians were licensed by reciprocity The following schools were represented

School	PASSED	Year Grad	Per Cent
University of Georgia School of Medicine	(1937)	(1937)	86.9
Northwestern University Medical School	(1938)	(1938)	86.6
Rush Medical College	(1937)	(1937)	84.1
Johns Hopkins University School of Medicine	(1932)	(1932)	87.4
University of Cincinnati College of Medicine	(1938)	(1938)	82.5
Hahnemann Med College and Hospital of Philadelphia	(1937)	(1937)	83.8
University of Tennessee College of Medicine	(1935)	(1935)	85.1
Medical College of Virginia	(1935) 83.4	(1937)	86.5
University of Virginia Department of Medicine	(1935)	(1935)	82.5
88 (1936) 85.7			
University of Wisconsin Medical School	(1937)	(1937)	87.9
Medizinische Fakultät der Universität Wien	(1927)	(1927)	87.7
Julius Maximilians Universität Medizinische Fakultät Würzburg	(1907)	(1907)	83.3
Universität Heidelberg Medizinische Fakultät	(1921)	(1921)	82.9

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine	(1937)	(1937)	Arkansas
Howard University College of Medicine	(1931)	(1931)	Maryland
University of Louisville School of Medicine	(1935) (1937) 2	(1937) 2	Kentucky
Johns Hopkins University School of Medicine	(1933)	(1937)	Maryland
Ohio State University College of Medicine	(1937)	(1937)	Ohio
University of Cincinnati College of Medicine	(1910)	(1910)	Ohio
Hahnemann Med College and Hospital of Philadelphia	(1936)	(1936)	Penna
University of Pittsburgh School of Medicine	(1927)	(1927)	Penna
Melbarr Medical College	(1937)	(1937)	Tennessee
Medical College of Virginia	(1936)	(1937)	Virginia
Univ of Virginia Department of Medicine	(1929) (1935)	(1935)	Virginia

## Book Notices

**Sulfanilamide Therapy of Bacterial Infections with Special Reference to Diseases Caused by Hemolytic Streptococci Pneumococci Meningococci and Gonococci** By Ralph H. Mellon M.D. Dr. P. H. D. Sc. (Hon.) Director Institute of Pathology, The Western Pennsylvania Hospital Pittsburgh; Paul Gross M.D. Pathologist to the Institute and Frank B. Cooper M.S. Research Chemist to the Institute. Cloth Price \$4.15. 398 Springfield Illinois & Baltimore Charles C. Thomas Publisher 1938

This volume is an excellent reference work on sulfanilamide and its early clinical use. Under chemistry the authors list practically every therapeutic compound which is related to sulfanilamide and neoprontosil. The chapter on pharmacology contains frequent reference to the literature in support of the statements, increasing the value of the material presented. Experimental work, chemotherapeutic results, bacteriostatic effects and therapeutic use of the preparation are discussed. Other chapters deal with the various factors which enter into its use in therapeutics, including the cellular defenses, the fitness of the host, and natural resistance. Comparative bacteriostatic effects and the criteria of therapeutic efficiency are described. There is a bibliography of 305 references and an addendum covering the period between the time the manuscript went to press and the date of publication. This addendum includes references to photosensitization, sulfhemoglobinemia, the use of sulfanilamide in staphylococcal infections, and its relationship to the filtrable viruses, as well as consideration of the chlor of sulfanilamide incident. In view of the fact that this is one of the first books on sulfanilamide, credit is due to the authors for the careful manner in which it was prepared and the judgment used in evaluating the place of sulfanilamide in the modern therapeutic armamentarium.

**Care of Infants and Children** By Harry Lowenberg Sr. A.M. M.D. Attending Pediatrician to the Mt. Sinai Hospital Philadelphia. With an Introduction by Morris Fishbein M.D. Editor Journal of the American Medical Association. Whittlesey House Health Series. Morris Fishbein M.D. Editor. Cloth Price \$2.50. Pp. 300. New York & London Whittlesey House McGraw Hill Book Company Inc. 1938.

There is a plethora of guide books for the mother in the care of the infant. Many of these books attempt too much. They give in great detail methods for calculating feeding formulas. They enter into the discussion of diseases, giving symptoms which may only mislead the mother into attempting diagnosis and treatment. This book is limited to efforts to aid the mother and the nurse in carrying out the physician's orders, it gives such advice as will be of value to the mother in caring for the normal infant. The description of the care of the premature infant is too brief and might well be expanded. The book contains much valuable material for the mother, the nurse and the young physician. It is clearly written in concise English diction yet sufficiently detailed without being verbose. Complete directions are given when necessary to permit the mother to carry out the physician's suggestions. The first chapter is concerned with marriage and pregnancy, followed by material on feeding of infants and older children, development and hygiene, the care of the sick child, prevention of contagious diseases, and final chapters concerning sickroom preparations and the layette.

**Handbuch der Erbkrankheiten** Herausgegeben von Dr. med. Arthur Gütt. Leiter der Abteilung Volksgesundheit im Reichsministerium des Innern. Band V. Erbliden des Auges. Bearbeitet von Prof. Dr. Max Bücklers et al. Paper Price 24 marks. Pp. 310 with 221 illustrations. Leipzig Georg Thieme 1938.

This volume on hereditary diseases of the eye has been compiled by a group of physicians well qualified by experience and training to write on the subject. The facts are presented in a clear and concise form so that the practitioner as well as the specialist now has an excellent reference book on hereditary diseases of the eye—a subject of great importance in the prevention of blindness, as more than 50 per cent of the children in schools for the blind in the United States are blind because of hereditary and congenital defects. The principal purpose of the volume as claimed by the editor is to stimulate the interest of physicians in hereditary diseases of the eye. It is an authoritative compilation of our knowledge concerning these diseases, stressing particularly hereditary forms of cataract, opacities of the cornea, macular degeneration, color blindness, albinism, myopia and

other refractive errors, strabismus and nystagmus. The chapter on angiomas of the retina and coloboma of the retina are also but well illustrated. The chapter on retinitis pigmentosa is sufficiently complete to give the general physician a clear understanding of the hereditary implications. The chapter on cataract is especially complete and beautifully illustrated, furnishing the ophthalmologist and the general physician an exceptionally graphic concept of these defects.

**Internal Medicine Its Theory and Practice in Contributions by American Authors** Edited by John H. Musser B.S. M.D. F.A.C.P. Prof. of Medicine in the Tulane University of Louisiana School of Medicine New Orleans. Third edition. Cloth Price \$10. Pp. 1478 with illustrations. Philadelphia Lea & Febiger 1938.

This edition represents a complete revision from the edition of 1934. The revision includes the advances in medical science during the period and is responsible for adding 140 pages to the text. The editor calls especial attention to new sections: Haverhill fever as well as new material on influenza, undulant fever, tetanus, tularemia and a number of minor infections. There is much new material dealing with pneumonia and streptococcal infections, with the erythemas and with the advances in diagnosis and treatment of heart disease. Some new data have been added to gastroscopy and there has been complete revision of the section on the endocrine glands. An entirely new section has been written by Fuller Albright on gonadal physiology. Also there has been extensive material added on the blood diseases, on the locomotor system and on nutritional diseases. The section on diabetes has been extended to cover the use of protamine zinc insulin, and there is much new material on psychoses. Owing to the deaths of I. I. Leaman and Geo. Brown, the section on mycoses has now been entirely written by Frederic M. Hanes, and the section formerly written by Dr. Brown has been modified by E. V. Allen.

In this textbook of the practice of medicine there is special emphasis on physiology. Each of the authors in the work recognized as having been a major contributor to the topic that he discusses. The work is dependable, concrete and excellently outlined for prompt assimilation by the medical student. A brief bibliography accompanies each of the sections. If the bibliography is an indication of the extent of the revision, there are a few topics which have apparently benefited but little in a good many years. One would wish, for example, for reference to Rocky Mountain spotted fever later than 1933, since excellent contributions were published during the last two years dealing particularly with the diffusion of this disease throughout the country. It is rather sad to see the only reference to appendicitis a book written by Howard A. Kelly in 1909.

Especially useful is the section dealing with the endocrine glands. Here the references are modern, the material is highly concentrated and the data are exceedingly useful. Especially to be commended also is the section on diseases of the locomotor system, which classification includes arthritis and all the conditions affecting the bones—material frequently overlooked but poorly treated in many textbooks on the practice of medicine.

**Life and Letters of Fielding H. Garrison** By Solomon R. Kagan M.D. With an Introduction by Prof. James J. Walsh. Cloth Price \$4. Pp. 287 with portrait. Boston Massachusetts Medico-Historical Press 1938.

For every physician who knew Dr. Fielding H. Garrison and their number was legion, this will be a most welcome volume. It provides not only a brief survey of his career as a librarian, historian and teacher and bibliographer but a considerable insight into the character of the man himself as a lover of the arts, of music and of letters. Supplementary to these chapters is a collection of more than 200 pages of tributes and of correspondence which are fascinating because of the variety of the considerations, the innumerable interests and the great personalities who pass through these pages.

**Heilbrigðisskýrslur (Public Health in Iceland) 1935** Samdar af lækni eftir skýrslum beradisekna og odrum heilindum. With an English summary. Paper Pp. 218. Reykjavik Ríkisprentsmiðjan Gutenberg 1938.

At the end is a summary in English on six pages which gives a fairly good idea of the public health activities in Iceland in 1935. The population on December 31 of that year is given as 115,870. There were forty hospitals in the country with 1,091 beds, thirty-two being general hospitals with 592 beds.

**Functional Activities of the Pancreas and Liver** A Study of Objective Methods for the Estimation of Function Levels in Health and Disease By Charles W McClure MD Gastroenterologist to Fifth Medical Service Boston City Hospital Special chapters by Tage Christensen MD Resident Physician Medical Department County Hospital of Copenhagen Denmark and the late Allen W Rowe PhD With a foreword by Samuel Weiss MD FACP Cloth Price \$3.50 Pp 318 with 66 illustrations New York Medical Authors Publishing Company 1937

This interesting textbook deals with the normal physiology of the external pancreatic secretion the effects of various stimuli on the external secretory activity, the chemistry of the duodenal contents, and the clinical application of the various tests for pancreatic disease. A small chapter on achylia gastrica and its relation to pancreatic and liver diseases is included.

A second section of the book is devoted to diseases of the liver with a study of hepatic function based on duodenal contents in addition to the usual liver functional tests showing abnormal derangements of the liver. The treatment of the disturbed liver function is discussed in detail. The author chooses to use the so-called nonsurgical drainage and apparently in his hands it has given good results. However, no comparable data are offered when the magnesium sulfate is given by mouth instead of by duodenal tube, showing that the patients would probably have just as much clinical improvement. Of special interest is the section on the digestive secretion of the duodenal juice, included by one of the collaborators.

**The Social Life of Animals** By W C Allee Professor of Zoology The University of Chicago Chicago Cloth Price \$3 Pp 293 with 54 illustrations including 5 plates New York W W Norton & Company Inc 1938

Out of a wealth of personal experimentation and an exhaustive study of the work of other experimenters, an effort is made to show the relation between population and development of vital processes. The author holds that (p 51) the struggle for existence in certain brackets is mainly a matter of populations, measured only in the long run, and then by slight shifts in the ratio of births to deaths. Experiments with various forms of animal life, from protozoa to mammals indicate that a certain minimum population is essential to the most rapid development of some of the vital processes and that this development declines with a certain maximum population. He believes that this characteristic originates so low in the stage of evolution that its influence produces a law that extends up through the two main phyla of the animal world. In explanation it is suggested that association of a certain minimum number of individuals creates changes in the environment favorable to the life of group members. It is also maintained (pp 116 and 117) that "different species have different minimum populations below which the species cannot go with safety." The explanation offered for this is that when the number of individuals in any species is reduced below this minimum the number of genes necessary to adaptations to new environments and which made possible past adaptation has decreased to the point at which new adaptations cannot develop. In such a condition (p 125) there tends to be a fixation of the gene or genes that carry adaptive modifications, and evolution comes to a standstill and the species may disappear. The attempt to apply these conclusions to human society is not wholly satisfactory. Sociologists long ago learned to be fearful of biologic analogies when applied to societies consciously created. They know that the strata of the social sciences are filled with fossil philosophies built on such analogies. The author thinks that he has drawn some conclusions that are helpful in education and in the adjustment of international relations and he has undoubtedly thrown additional light on the discussions of underpopulation and overpopulation in human societies.

**Sammlung psychiatrischer und neurologischer Einzeldarstellungen** Herausgegeben von Prof Dr A Bostroem und Prof Dr J Lange Band XIII Das Realitätsbewusstsein in der Wahrnehmung und Trugwahrnehmung Von Dr med et phil Gerhard Kloss Landesmedizinalrat und erster Oberarzt der Landesheilkunst Haina/Kassel Paper Price 4.50 marks Pp 66 Leipzig Georg Thieme 1938

This is a philosophical consideration of perceptions illusions and hallucinations. It is essentially a review of the literature bringing no new concepts to light and its basis is far detached from analyses of actual clinical material. The author's manipulation of concepts is reminiscent of the methods of the old philosopher-psychologists and has little to bring to the psychology or psychopathology of living human beings.

**Public Health in Yugoslavia** By Dr A Štampar Paper Price 2s Pp 44 London University of London School of Slavonic and East European Studies 1938

At the close of the war, Yugoslavia practically started from scratch in the creation of a medical profession, medical facilities, public health and general medical service. In some districts there was only about an acre of arable land per person, one cow for three persons and one sheep for two. It was thought that the income of the population was too low to maintain any system of individual private practice. Assistance was received from the Rockefeller endowments and the Milbank Memorial Fund. A system of health centers and "health cooperatives," which would seem to be local organizations to maintain clinics and centers, was established. It is claimed that this method has brought at least some sort of medical service to large sections of the population which could not have been reached otherwise.

**Veterinary Helminthology and Entomology The Diseases of Domesticated Animals Caused by Helminth and Arthropod Parasites** By H O Monnig BA DrPhil BSc Professor of Parasitology Faculty of Veterinary Science University of Pretoria South Africa Second edition Cloth Price \$9 Pp 409 with 264 illustrations Baltimore William Wood & Company 1938

This veterinarians' textbook is written by the professor of parasitology in the University of Pretoria, South Africa and veterinary research officer at Onderstepoort. Since Africa is the continent of mammals it is also that for the mammalian parasites, and this book grew up in the paradise of parasites of the blood, the intestine and every organ of the vertebrate body. The book is not a mere rehash of older literature but a carefully wrought out account of the helminths and arthropods afflicting domesticated animals, with a clear presentation of diagnostic characters of ova larval stages and adults where known, with notes on the life cycle pathogenicity diagnosis, treatment and prophylaxis. The more important species are illustrated, often by original figures. There are introductory sections on parasitism, parasitic relations, pathogenic effects, host and organ specificity, resistance and immunity, effect of mode of life on the parasite, epizootology, geographic distribution a historical account and a host-parasite index. The historical account makes no mention of Theobald Smith's discovery in 1893 of the agency of the insect vector in the transmission of Babesia of Texas cattle fever. This edition has undergone considerable revision in the fields of therapy, pathogenicity, life cycles and nomenclature.

**Syllabus Classes for Prospective Fathers** Paper Price 15 cents Pp 14 with 3 illustrations New York Maternity Center Association [n d]

**A Talk for Prospective Fathers** By George W Kosmak MD Chairman of the Medical Board Maternity Center Association Paper Price 10 cents Pp 8 with 3 illustrations New York Maternity Center Association 1938

A syllabus with a sense of humor is this mimeographed outline for physicians' use in giving a five lesson course in prospective paternity to the heretofore unimportant parent the father. It is accompanied by a talk to prospective fathers, intended as an introduction to the course. Shrewdly reasoning that the interests of the pregnant woman will best be safeguarded if her husband understands the whole situation thoroughly, the association has prepared this course consisting of four lessons, together with demonstrations. The first lesson, to be given by a doctor from the outline furnished, deals with the process of fertilization signs and symptoms of pregnancy, the birth process the puerperium and other details, including maternity and its relationship to venereal diseases. Lesson II consists of tips to prospective fathers, with special relation to the importance of good medical care and how to recognize it. Lesson III is a demonstration session on care of the baby performed with untiring aid of 'Junior' the well known rubber doll. Lesson IV concludes with the vital technique of diapering and thus lays the groundwork for lesson V which deals with dressing the baby and making up his bed. In order that no important point may be overlooked a certificate of attendance is issued thus enabling father the forgotten man to come at last into his own. Presented half facetiously the excellent idea has been taken seriously. The outlines therefore should be revised in the interest of providing more information for those who will give the course and especially should a list be included of books and pamphlets for the expectant mother since the lecturer will surely be asked to supply such a list.



## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

#### Contraceptive Devices Statutory Prohibition of Sale, Sale Pursuant to Physician's Prescription Unlawful—

The defendants, a physician, a nurse and two social workers, were charged with violating a Massachusetts statute that prohibits the selling, lending, giving away, exhibiting or offering to sell, lend or give away any drug, medicine, instrument or article for the prevention of conception. It was admitted at the trial that two of the defendants sold and gave away articles and medicines for the prevention of conception to various patients, after the defendant physician, with the assistance of the defendant nurse, had examined those patients, and that they sold or gave away such articles and medicines only in accordance with instructions of the physician. The defendants contended that the statute under which they were convicted does not apply to drugs, medicines, instruments or articles for the prevention of conception when they are prescribed by a duly qualified physician for the preservation of life or health according to sound and generally accepted medical practices. The defendants were convicted and appealed to the Supreme Judicial Court of Massachusetts.

The terms of the Massachusetts statute, said the Supreme Judicial Court, are plain unequivocal and peremptory. They contain no exceptions. They are sweeping, absolute and devoid of ambiguity. They are directed with undeviating explicitness against the prevention of conception by any of the means specified. It would be difficult, the court thought, to select appropriate legislative words to express the thought with greater emphasis.

The statute was enacted in 1879 and was the earliest enactment in Massachusetts respecting the prevention of conception. The prevention of conception by medical advice and treatment was not unknown in 1879 and might have been the subject of an exception from the general legislative prohibition if the legislature had deemed such an exception consonant with public policy. The legislature, however, the court pointed out, had equal power to adopt the contrary view, that such an exception would endanger the effectiveness of the statute. If any exception had been intended to the broad prohibition enacted, the court thought, it would have been easy to give expression to it in the statute. To the court the inference seemed necessary that the moral and social wrongs arising from the prevention of conception appeared to the legislature so threatening in 1879, when the Massachusetts statute was enacted, that absolute and unconditional prohibition against the sale, gift or loan of contraceptive drugs, medicines or articles was necessary to meet the conditions.

The defendants relied on decisions by federal courts on somewhat similar points but no one of these decisions, the court pointed out, was persuasive to a conclusion in favor of the defendants in the present case. All of the federal cases depended in a large degree on a New York case, *People v. Sanger*, 222 N. Y. 192, 118 N. E. 637, where the governing statute contained in express terms an exception in favor of physicians, an exception lacking in the Massachusetts statute. And, in the opinion of the court, an exception could not be read into the Massachusetts statute by judicial interpretation. The statute must be interpreted and enforced as enacted and if relief is desired it must be from the law making department and not from the judicial department of the government.

The judgments of conviction were affirmed. An appeal to the Supreme Court of the United States for a review of this case was denied for want of a substantial federal question (59 Sup. Ct. 90).—*Commonwealth v. Gardner*, and three other cases (Mass.) 15 N. E. (2d) 222.

**Medical Practice Acts Injunction to Restrain Unlawful Practice**—Laman, whose only schooling in the healing art consisted of twenty two months' attendance at a chiropractic school and who had no license to practice in New York, openly and notoriously practiced medicine in that state. The attorney general and the state board of regents filed a bill in equity to

enjoin him from practicing. They alleged that his practice was a public nuisance, had caused and would cause irreparable injury to the health, safety and welfare of the people and could be abated only by the injunctive process. The trial court dismissed the bill without requiring the defendant to answer (*People ex rel. Bennett Att. Gen. v. Laman*, 295 N. Y. S. 728, abtr. J. A. M. A. 110 312 [Jan. 22] 1938), and the attorney general and those associated with him in the action appealed to the Court of Appeals of New York.

The state regulates the practice of medicine, said the Court of Appeals, not for the protection of physicians but for the protection and welfare of the people. Those seeking medical attention have no means of estimating the skill and ability of the physician and must depend on the state to permit to practice only those qualified to do so. The fact that a person who is practicing does not possess a license, however, does not mean necessarily that he is ignorant, incapable and a menace to the public health but in this case the bill alleges that the defendant is unskilled, incapable and lacking wholly in the qualifications required by statute and had endangered and would continue to endanger the public health. After discussing the medical practice act of New York, and in particular the section which imposes a criminal penalty on one practicing without a license the court stated that the question before it was whether a court of equity in New York had jurisdiction to enjoin the unlawful activities of the defendant or whether jurisdiction existed only in the criminal courts.

That a court of equity, the court continued, will not undertake the enforcement of the criminal law and will not enjoin the commission of a crime is settled beyond question. There can equally be no doubt, however, that the criminal nature of an act will not deprive equity of the jurisdiction if it would otherwise attach. Equity does not punish the perpetrator because of what he has done but it attempts to protect the rights of the party seeking relief and to prevent the performance of an act or acts that may injure many. The court pointed out that, although invasion of property rights or pecuniary interests was emphasized in some of the earlier cases as the basis for equitable interference there appeared later to be a recognition of the fact that the health, morals, safety and welfare of the community also required protection from irreparable injury. The provisions of the medical practice act were designed, the court pointed out, to protect the people from the danger of incompetent, incapable, ignorant persons. The imminence of such danger and the irreparable character of the injury are here fully apparent. The people, in the absence of special statutory authority, would not be entitled to an injunction on a showing only that the statute had been violated or that acts prohibited by the statute had been performed. The petition, however, alleges facts showing that the acts of the defendant imperiled the health of the people of the community and would continue to cause irreparable injury to the health of the people and perhaps loss of life. Enough has been shown here, if proved at the trial to warrant the issuance of an injunction.

The Court of Appeals accordingly reversed the action of the trial court dismissing the bill for an injunction and in effect ordered the case to proceed to trial.—*People ex rel. Bennett, Att. Gen. v. Laman* (N. Y.) 14 N. E. (2d) 439.

## Society Proceedings

### COMING MEETINGS

American Association of Anatomists Boston Apr. 6-8 Dr. E. R. Clark  
University of Pennsylvania School of Medicine, Philadelphia Secretary  
American Association of Pathologists and Bacteriologists Richmond, Va.  
Apr. 6-7 Dr. Howard T. Karsner 2085 Adelbert Rd. Cleveland  
Secretary  
American College of Physicians New Orleans March 27-31 Mr. E. R.  
Loveland 4200 Pine St. Philadelphia Executive Secretary  
American Orthopsychiatric Association New York Feb. 23-25 D.  
Norville C. La Mar 149 East 73d St. New York Secretary  
Annual Congress on Medical Education and Licensure Chicago Feb. 13-14  
Dr. W. D. Cutter 535 North Dearborn St. Chicago Secretary  
Mid South Post Graduate Assembly Memphis Feb. 14-17 Dr. A. F.  
Cooper Goodwyn Institute Bldg. Memphis Tenn. Secretary  
Pacific Coast Surgical Association San Francisco Oakland Hos. A.  
March 28-31 Dr. H. Glenn Bell University of California Secretary  
San Francisco Secretary

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### American Journal of Surgery, New York

43 1 198 (Jan.) 1939 Partial Index

- The Association of Polycystic Disease of the Kidneys with Congenital Aneurysms of the Cerebral Arteries C R O Crowley and H S Martland Newark N J—p 3
- Spontaneous Subarachnoid Hemorrhage and Congenital Berry Aneurysms of the Circle of Willis H S Martland Newark N J—p 10
- Role of Preliminary Medication in the Prevention of Anesthetic Deaths J T Gwatlimsey New York—p 20
- \*Apnea During Anesthesia: Relief of Anoxemia as a Possible Cause C L Burstein and E A Rovenstine New York—p 26
- The Prevention of Pain Following Hemorrhoidectomy T J Merar Chicago—p 45
- Traumatic Injuries to the Head: Study of 200 Consecutive Cases N P Battle Rocky Mount N C—p 66
- Selection of Cases for Transurethral Resection F C Hamm Brooklyn—p 73
- \*Personal Experiences with Gas Bacillus Infection: Report of Forty One Cases E P Coleman and D A Bennett Canton Ill—p 77
- \*Further Studies on Intraperitoneal Use of Bovine Amniotic Fluid in Abdominal Surgery J R Gepfert and M L Stone New York—p 81
- Important Reckonings in Biliary Surgery A F Sava Brooklyn—p 86
- Management of the Desperate Appendicitis Case A C Silverberg Seattle—p 92
- Management of Chronic Occlusive Peripheral Arterial Disease: Impressions Gained from Six Years of Clinical Study F L Pearl San Francisco—p 106
- \*Pancreatic Extract (Enzyme Free) in the Treatment of Diabetic and Arteriosclerotic Gangrene J B Wolfe Philadelphia—p 109
- Improved Cesarean Section Technique O DeMuth Vancouver B C—p 119
- Total Thyroidectomy in Treatment of Angina Pectoris: Late Results in Fourteen Cases J R Phillips and G Miliken Houston Texas—p 125
- Morphine as Factor in Postoperative Vomiting H H Davis and G Whiston Omaha—p 127

**Apnea During Anesthesia**—Burstein and Rovenstine believe that morphine medication is a frequent factor in causing central respiratory depression with ensuing hypoxemia resulting in respiratory activity maintained by an anoxic stimulus. Further addition of an anesthetic agent enhances the central depression so that the administration of high concentrations of oxygen may produce apnea by removal of the "anoxic stimulus." To avoid such apnea during anesthesia they recommend that preanesthetic morphine be reduced when a potent nonirritating anesthetic agent like cyclopropane and excess oxygen is to be used. When such apnea does occur they suggest that a high concentration of oxygen should be maintained and artificial respiration employed until spontaneous respiration is resumed. During such apnea the use of carbon dioxide is not advised. A central respiratory stimulant such as metrazol may be useful in conjunction with oxygen therapy. When respiratory activity is maintained largely by an anoxic stimulus by way of the carotid body, treatment with oxygen is indicated to prevent cerebral damage from oxygen want.

**Gas Bacillus Infection**—Coleman and Bennett discuss the various methods of treatment that they used in their forty one cases of gas bacillus infections and the mortality. Their first seven cases were those of gas gangrene of an extremity from twenty-four to ninety-six hours in duration. Immediate amputation was performed and no persons died. Six patients with existing gas infection received serotherapy in addition to amputation. Only one death occurred. In all six cases gas bacillus infections was proved clinically and bacteriologically. Serotherapy alone was unsuccessful in three cases of gas bacillus septicemia all of which proved fatal. Postmortem examination

showed that these patients died of septicemia resulting from gas bacillus infection. In five cases diagnosed as septicemia, serotherapy and extensive debridement of the extremity were employed, but only one patient recovered after late amputation (seventh day). Roentgen treatment, used in fourteen cases, resulted in four recoveries and ten deaths. Gas bacillus infection of the abdominal wall following operation developed in three of these patients and postmortem examination showed that they had died of gas bacillus septicemia. In the four patients who responded to roentgen therapy, wide opening and amputation resulted in recovery. Two of six patients who received varied combinations of treatment (operation, serotherapy, debridement and roentgen therapy) died respectively of septicemia and of gas bacillus sepsis. The authors believe that early recognition and immediate treatment of gas bacillus infections are absolutely essential and that roentgenograms may expedite the diagnosis. Serotherapy and roentgen therapy are not determining factors unless proper surgery has been done early in the progress of the disease.

### Bovine Amniotic Fluid and Abdominal Surgery

Gepfert and Stone used a concentrated sterile fraction of bovine amniotic fluid (amfetin) in treating fifty of 100 consecutive patients having a celiotomy. The fifty presenting the most marked pathologic changes in the pelvis at the time of operation were given the amniotic fluid and the other fifty patients were used as controls. Of the treated patients 74 per cent had dense adhesions at the time of operation, while 10 per cent of the control group had similar complications. The postoperative results were encouraging in that nausea, vomiting, distention and gas pains seemed to be definitely decreased by the use of the fluid (400 cc introduced postoperatively into the peritoneal cavity). There were several subjective factors which elude evaluation. For example, it was thought that a patient who had received the amniotic fluid had a softer abdomen, expressed a desire for food earlier and as a rule was brighter than a similar control patient. It was also thought that most of the treated patients more nearly approximated normal posture when allowed out of bed. In a second series of patients, 125 control and 102 treated, analysis shows that there was 21 per cent more abdominal distention, as measured in inches, in the untreated group. During the first twenty-four postoperative hours the treated group of patients showed a 17 per cent decrease in vomiting as compared to the control patients. During the subsequent ninety-six hours the treated patients vomited only half as many times as did the control patients. Contrary to the authors' observations in the first series the treated patients showed a slight decrease of gas pains but their pains were more severe. The moderately severe attacks in the treated group, while less numerous than in the controls, were more frequent than in the first series of cases. The treated patients show some advantage as far as nausea is concerned, but again there is a discrepancy between the two groups of patients. The similarity for the average temperature and pulse rates for the two groups precludes any conclusion on these factors. Also a striking similarity was found in the preoperative and postoperative blood pressures of both groups. The average number of catheterizations in the control group exceeded those of the treated group by 22 per cent. The treated patients began voiding about six hours earlier postoperatively than did the control patients. Peristaltic sounds were heard seven hours sooner in the average treated than in the average control patient.

**Pancreatic Extract in Treatment of Gangrene**—Wolfe used pancreatic extracts in the treatment of sixty cases of diabetic and forty of nondiabetic atherosclerotic gangrene. Some of the patients have been under observation for several years. Whenever they complained of pains, leg cramps and difficulty in walking treatment with pancreatic extract was repeated. Complete healing was obtained in 75 per cent. Most of the patients were treated conservatively. The extract was administered in doses of from 1 to 3 cc either daily or on alternate days, depending on indications, in addition to an adequate diabetic regimen. Nor were other measures neglected such as proper hygiene, asepsis, short wave diathermy, low fat diets and the like. Pancreatic extract (enzyme free) seems not only to produce an early arrest of pathologic processes but to stimulate repair more rapidly and more completely than any other conservative method.

## Annals of Internal Medicine, Lancaster, Pa

12 739 906 (Dec.) 1938

- Heart Failure or Acute Nephritis with Onset About Three Weeks After Delivery J H Musser W A Sodeman and R H Turner, New Orleans—p 739
- Positive Pressure Respiration and Its Application to the Treatment of Acute Pulmonary Edema A L Barach, J Martin and M J Chmura New York—p 754
- Survey of the So-Called Hemolytic Anemias O H P Pepper, Philadelphia—p 796
- Curves of Thyroxine Decay in Myxedema and of Iodine Response in Thyrotoxicosis Their Similarity and Its Possible Significance J H Means and J Lerman Boston—p 811
- \*How Accurate Is the Diagnosis of Functional Indigestion? Study of 354 Cases D L Wilbur and J H Mills Rochester Minn—p 821
- Clinical Experiences with Long Acting Insulin in Ambulatory Diabetic Patients H C Shephardson and R D Friedlander San Francisco—p 830
- Pressor Response of Normal and Hypertensive Human Subjects to Tyramine Introduced into the Ileum K A Elsom and P M Glenn Philadelphia—p 838
- \*Cerebrovascular Complications in Thrombo Angitis Obliterans I Hausner and F V Allen Rochester Minn—p 843
- Cardiovascular Changes Associated with Insulin Shock Treatment E Messenger Northport N Y—p 853
- Possibilities in Biologic Engineering K T Compton Cambridge Mass—p 867

**Diagnostic Accuracy of Functional Indigestion**—In an attempt to evaluate the diagnosis of nervous indigestion, Wilbur and Mills studied the records of 354 patients who after examination at the Mayo Clinic received a diagnosis of functional or nervous indigestion or its equivalent and who were reexamined at the clinic 7.33 years later. In 303 cases organic disease was not found at the time of subsequent examination. All these patients returned to the clinic at least five years after the original examination, at which time a diagnosis of functional or nervous indigestion had been made. The results suggest a diagnostic accuracy of at least 85.6 per cent for functional dyspepsia in this series. The original diagnosis usually rested on clinical data, which included evaluation of the gastrointestinal symptoms, the frequent nervous or apprehensive nature of the patient and the negative results of laboratory and x-ray studies. There were thirty-nine cases in which organic disease of the gastrointestinal tract was found at subsequent examination. In nineteen of the thirty-nine cases a final diagnosis of duodenal ulcer was made and this represented the most common diagnostic error in the series. Other subsequent diagnoses in this group included gastric ulcer (five), cholecystic disease (three) and carcinoma of the stomach (two). This evidence suggests that when a patient gives a characteristic history of duodenal ulcer, when free hydrochloric acid is present in the gastric content and when the x-ray appearance of the duodenum is normal, care must be exercised in making a diagnosis of functional dyspepsia. Organic disease was found outside the gastrointestinal tract at the time of subsequent examination in twelve cases. It was extremely difficult to determine accurately the relationship of the diseases (pernicious anemia, cardiac disease, syphilis and others) eventually discovered to the digestive symptoms originally complained of. Gastrointestinal symptoms may occur in all the diseases diagnosed in this group but a review of the histories of these patients show only two for whom a clearcut relationship could be established between the symptoms originally complained of and the disease eventually discovered. In one case a subtotal thyroidectomy for exophthalmic goiter three years after the original diagnosis of functional dyspepsia led to complete relief of all gastrointestinal symptoms. In another instance review of the history suggests that the original digestive symptoms could have resulted from a pituitary tumor which was found to be present after a period of six years. In one case the diagnosis of pernicious anemia was made one year after the original diagnosis of functional dyspepsia. It is quite likely that pernicious anemia was present at the time of the original examination.

**Cerebrovascular Complications in Thrombo-Angitis Obliterans**—Hausner and Allen conclude, from a study of the twenty-three cases of involvement of the cerebral arteries with thrombo angitis obliterans of the extremities reported in the literature, that lesions of the cerebral vessels, while not always characteristic of thrombo angitis obliterans, may affect individuals with this disease of the extremities who do not have syphilis, hypertension, diabetes or other detectable causes for cerebrovascular lesions. They have observed eleven cases of thrombo-

angitis obliterans involving the extremities in which there was evidence of vascular lesions involving the brain. The duration of the peripheral disease in their cases varied from five months to twenty years. The ages of the patients varied from 35 to 59 years. In most of the cases the cerebral complications occurred following the onset of the peripheral disease. The cerebral lesion preceded the peripheral symptoms in only three cases. In these three cases the hemiplegia was present two, one and four years respectively before the onset of the peripheral symptoms. Thrombo angitis obliterans must therefore be suspected in cases of cerebrovascular disease of obscure etiology. The main neurologic symptom was hemiplegia, which occurred transiently, once or several times or permanently. In some cases there was confusion, disorientation, aphasia and loss of memory, symptoms which frequently cleared up entirely. Hemianopia, present in two cases, disappeared in one case following sympathectomy. The symptoms of thrombo angitis in the brain depend chiefly on where the lesion is located in the brain. The eleven patients with cerebral involvement were from a group of 500 with thrombo-angitis obliterans of the extremities. It may be found that this complication occurs more frequently if attention is directed to it. The study emphasizes that cerebrovascular complications may occur in cases of thrombo-angitis obliterans and may precede evidence of the thrombo-angitis obliterans of the extremities. It is also apparent that peripheral thrombo angitis obliterans may be the least serious part of a disease which may be disabling or may terminate life as a result of cerebral or cardiac involvement.

## Archives of Surgery, Chicago

38 1 190 (Jan.) 1939

- Surgical Importance of Mammary and Subcutaneous Fat Necrosis J F Dunphy Boston—p 1
- Repair of Hernia with Plantaris Tendon Grafts R Pletcher London, England—p 16
- \*Subdural Hematoma: Diagnosis and Treatment P A Kunkel and W E Dandy Baltimore—p 24
- Surgical Treatment of Diabetes Mellitus: Bilateral Section of the Splanchnic Nerve and Denervation of the Liver P Ljvraga Turin Italy—p 55
- Benign Tumors of the Breast T de Cholnoky New York—p 99
- Anomalous Fixation of the Mesentery: Report of Two Cases E L Hayes, St Louis—p 99
- Primary Carcinoma of the Nail J Levine and J R Lisa New York—p 107
- Plastic Operation on the Breast H May Philadelphia—p 113
- Use of the Cutis Graft in Plastic Operations A Uehlein Jr Rochester Minn—p 118
- \*Mesenteric Lymphadenitis: Report of Twenty Four Cases with Tabulations Showing Relation to Appendicitis and Other Diseases: Need of Better Understanding of the Mesenteric Lymph Nodes A K Foster Jr, New York—p 131
- \*Spleneectomy in Treatment of Proved Subacute Bacterial Endocarditis: Report of Case and Review of Literature D Polow Paterson N Y—p 139
- Mechanical Effect of Artificial Pneumoperitoneum and Phrenic Nerve Block: Comparative Study A I Banaji Wauwatosa Wis—p 149
- Physical and Toxic Factors in Shock F M Allen New York—p 152
- Krukenberg Tumor C W Woodall Schenectady N Y—p 181

**Subdural Hematoma**—In the neurosurgical service of the Johns Hopkins Hospital between 1914 and 1935 Kunkel and Dandy encountered forty-eight cases of subdural hematoma in which the lesions at operation were found to have the characteristics of the traumatic hematomas. Of the forty eight patients forty were adults, six were minors and two were infants each 9 months of age. The largest number of hematomas (eleven) occurred in the sixth decade of life and the smallest number (three) occurred in the first decade. Five occurred in the second decade. The average age for the entire group was 41.2 years. There were forty-three male and five female patients, a disproportion encountered in all other case reports and doubtless correctly attributed to the accepted cause, trauma. Since an unlocalized tumor of the brain is suspected in a high percentage of cases of subdural hematoma, the localization of the lesion is ultimately dependent on ventriculographic examination or its equivalent, direct puncture of the hematoma. A subdural hematoma can not escape detection by ventriculographic study and not infrequently the exact character of the lesion can be determined from the ventriculograms alone. The only treatment is surgical. Although repeated aspirations of a subdural hematoma have been advocated, the authors experience with one hematoma so treated was the least satisfactory of the series, the patient recovered completely but required repeated tapings for three

months. Their plan of attack in recent years has been to turn down a very small bone flap, excise with the electrocautery the outer membrane flush with the dural incision and strip the thin, avascular and unattached inner membrane as far as possible from the surface of the brain. They irrigate the hematoma from the cranial chamber by flushing with Ringer's solution. Frequently one or more isolated pockets of blood exist in the subdural space. Careful inspection of this space will disclose them bulging into the large primary cavity. They are punctured, evacuated and irrigated, it has not been necessary to remove any of their covering membranes. Whether or not removal of the inner and outer membranes is necessary cannot be stated. The authors have gradually lessened the size of the cranial exposure and have seen no difference in the immediate or ultimate results. Among the forty-eight patients there were fifty hematomas. Forty-six patients recovered and two died. Subsequent reports from the patients who recovered have been gratifying. Twenty-eight were known to be in normal health in 1937 and among these are two who were operated on twenty years ago. No replies were received from twelve patients, and six are known to have died from causes unrelated to the hematoma a considerable time after their discharge from the hospital.

**Mesenteric Lymphadenitis**—According to Foster, mesenteric lymphadenitis is a little understood disease that cannot always be diagnosed alone but must not be considered unimportant because of this. Vague abdominal symptoms not apparently caused by any definite disease of any particular organ should draw the physician's attention to the mesenteric lymph nodes, if only because of the intimate association between the mesenteric nerve plexus, the mesenteric arteries and veins and the mesenteric lymph nodes themselves. The mesenteric lymphatics are not sufficiently emphasized as to their functional importance both in health and in disease. Appendectomy is the treatment for mesenteric lymphadenitis, it should be performed as soon as the diagnosis is made. Indications of other intra abdominal disease do not furnish any excuse for neglecting the appendix. Other pathologic conditions of the abdomen should likewise indicate the need of surgical intervention in addition to appendectomy, when necessary. Infection involving lymph nodes in any part of the body (especially the neck) should remind the examiner of the many mesenteric nodes which also may be infected. The vermiform appendix becomes more important than ever before because of the high percentage of diseased appendices observed in a total series of 147 cases of mesenteric lymphadenitis (in all but two of which the diagnosis was proved) from the records of the New York Post-Graduate Medical School and Hospital, Columbia University.

**Splenectomy and Bacterial Endocarditis**—A case of proved subacute bacterial endocarditis in which the condition was treated by splenectomy is reported by Polowe in detail. The patient is alive and well more than twenty months after splenectomy. An analysis of the fifteen cases thus far reported in which splenectomy was tried in an effort to alter the course of subacute bacterial endocarditis shows that in only three was the diagnosis proved prior to operation. These three patients died within fifteen weeks after splenectomy. It appears, then, to the author that his case is the first proved case of subacute bacterial endocarditis in which the patient recovered after splenectomy. He believes that when subacute bacterial endocarditis manifests progressive secondary anemia associated with splenomegaly and pain in the left side of the hypochondrium splenectomy is of definite palliative value. Splenectomy appears to act as a substitute for transfusions. It arrests the progress of the anemia and produces ultimate improvement in the hemoglobin and erythrocyte content of the blood. The white blood cell content is increased and in cases in which the condition is associated with thrombocytopenia the platelet count is lifted to normal levels. Abdominal and articular pains disappear after splenectomy and a quieting effect on the action of the heart is observed. The author believes that the spleen is a continuous source of reinfection and of absorption of bacterial toxins. In his two cases the patients' chief complaint abdominal pain was entirely relieved. The first patient died fifteen weeks later of cerebral embolus. The second patient, as stated, is alive and well more than twenty months later.

## Illinois Medical Journal, Chicago

75 192 (Jan.) 1939

- An Appraisal of Compulsory Health Insurance J R Neal Springfield—p 15  
The Serologic Control of Neisserian Infections by Means of the Bouillon Filtrate (Corbus Ferry) Further Report B C Corbus and B C Corbus Jr Chicago—p 19  
Experimental and Clinical Studies on the Relation of Streptococci to Various Diseases E C Rosenow Rochester Minn—p 28  
The Diagnostic Value of Sternal Marrow Aspirations L R Lumarzi Chicago—p 38  
Scarlet Fever Survey S Peacock J A Bigler Highland Park and Marie Werner Chicago—p 46  
Acute Laryngitis in Infants G J Greenwood Chicago—p 52  
\*Estrogenic Therapy of Menopausal Disorders P F Schneider Evanston—p 57  
Radiologic Aids in Diagnosis of Heart Disease in Children Review E G Lawler and G A Hellmuth Chicago—p 61  
\*Myxedematous Hypothyroidism Associated with Psychosis A Simon Elgin—p 66  
Cervical Fascias and Infections About the Neck R W Kerwin Chicago—p 69  
Spontaneous Subarachnoid Hemorrhage R F Herndon Springfield—p 73  
Tuberculosis of the Cervix Uteri H E Schmitz and C J Geiger Chicago—p 80  
Treatment of Malignancies of the Colon and Rectum L D Whittaker Peoria—p 83

**Estrogenic Therapy of Menopausal Disorders**—Schneider points out that careful analysis frequently reveals various combinations of menopausal symptoms with complete absence of hot flashes in many cases in which estrogenic therapy is indicated. The variations of therapeutic requirements explain the failure of routine methods in treating menopausal disorders. Three types of reaction following parenteral administration of estrogen have been found of value in establishing the diagnosis and in determining the dosage in each case. These reactions occur within one hour after intramuscular injection and are of considerable significance even though transitory. 1 Total absence of reaction usually indicates that estrogenic deficiency exists and that the initial dosage has been inadequate and should be increased. 2 Improvement or relief of symptoms and a feeling of well being is evidence that an actual estrogenic deficiency exists and that treatment should be continued. 3 If extreme exhaustion, pain in the ovarian regions or bearing down sensations are transitory and followed by relief of the original symptoms estrogenic deficiency exists but this shows that the initial dosage was excessive and should be decreased. If these symptoms are prolonged and not followed by relief of the original symptoms, estrogenic deficiency does not exist and treatment should be discontinued. If subjective symptoms are used as a criterion for treatment, estrogen will be administered only to women having an estrogenic deficiency, while massive doses administered to women having normal ovarian function might result in abnormal tissue growth and the production of carcinoma. The author believes that an analogous situation is that of the relationship of x-rays and radium to carcinoma.

**Hypothyroidism and Psychosis**—Although the diagnosis of psychosis with myxedema is rare, three cases have been observed at the Elgin State Hospital during the last few years. Simon reports these cases in order to emphasize some of the factors which may modify or determine the reaction pattern and course of the psychosis. The variations in their reaction patterns are attributed to differences in the hereditary, constitutional and environmental background as well as organic conditions. The author believes that young persons in whom myxedema develops and who possess a schizoid personality are prone to develop schizophrenic psychoses. In elderly patients with involutional and cerebral arteriosclerotic changes an organic psychosis characterized by a loosely constructed paranoid delusional system with confusion and vague hallucinatory experiences is apt to develop. Appropriate thyroid therapy may improve the physical and possibly ameliorate the mental condition.

## Iowa State Medical Society Journal, Des Moines

28 599 650 (Dec.) 1938

- The Present Status of Fever Therapy L T Hall Omaha—p 599  
Treatment of Infections of the Face and Neck T M Keefe Clinton—p 603  
Interpretation of Upper Abdominal Pain R A Netolicky Cedar Rapids—p 606  
Epidemic Encephalitis Cora W Negu Keswick—p 611  
Alcohol in Relation to the Human System The Resident Address Rosabell A Butterfield Indianola—p 617

**Public Health Reports, Washington, D C**

53 2193 2216 (Dec 16) 1938

- The Problem of Drug Addiction T Parran —p 2193  
 Spontaneous Lung Carcinoma in Mice J J Bittner —p 2197  
 A Supplementary Basic Technique for the Recovery of Protozoan Cysts and Helminth Eggs in Feces Preliminary Communication J S D Antoni and Vada Odom —p 2202  
 Psittacosis in Washington D C Three Human Cases in November and December 1938 Traced to Parakeets —p 2204

53 2217 2258 (Dec 23) 1938

- Longevity of the Tick *Ornithodoros turicata* and of *Spirochaeta recurrentis* Within This Tick E Francis —p 2220  
 Use of Yolk Sac of Developing Chick Embryo as Medium for Growing Rickettsiae of Rocky Mountain Spotted Fever and Typhus Groups H R Cox —p 2241

53 2259 2310 (Dec 30) 1938

- A Filter Passing Infectious Agent Isolated from Ticks I Isolation from Dermacentor Andersoni Reactions in Animals and Filtration Experiments G E Davis and H R Cox —p 2259  
 Id II Transmission by Dermacentor Andersoni R R Parker and G E Davis —p 2267  
 Id III Description of Organism and Cultivation Experiments H R Cox —p 2270  
 \*Id IV Human Infection R T Dyer —p 2277  
 Riboflavin Deficiency in Man Preliminary Note W H Sebrell and R E Butler —p 2282

**Virus from Ticks Causing Human Infection**—Dyer states that a newly recognized agent recovered from ticks (in Montana) has been found capable of causing infection in man. The relationship of this infection to Q fever of Australia is suggested by cross immunity tests in guinea pigs. That the two diseases may not be identical is indicated by failure to infect four monkeys, while the Australian workers report that monkeys are susceptible to Q fever. Epidemiologically the latter disease has been found in Australia, particularly among workers in abattoirs and among dairy farmers. Such an epidemiologic picture is not at variance with the picture of a "tick borne infection, since it suggests a reservoir in animals and the existence of the infection in their arthropod parasites.

**Southern Medical Journal, Birmingham, Ala**

32 1 124 (Jan) 1939 Partial Index

- Pathology of Human Brucellosis Report of Four Cases with One Autopsy P B Parsons and Mary A Poston Durham N C —p 7  
 Use of Stainless Steel Rods to Canalyze Flexor Tendon Sheaths H W Thatcher Portland Ore —p 13  
 Analgesia in Labor Modified Gwathmey Method C O McCormick Indianapolis —p 19  
 \*Blood Studies in Private Obstetric Patients Report of 1,000 Consecutive Cases J B Eskridge Jr and M J Serwer Oklahoma City —p 24  
 Primary Carcinoma of the Bronchus I H Lockwood Kansas City Mo —p 30  
 \*Therapeutic Use of Helium C W Metz A A Wearner and A E Evans Denver —p 34  
 Treatment of Pellagra with Special Reference to the Use of Nicotinic Acid J M Ruffin and D T Smith Durham N C —p 40  
 The Relative Incidence of Hyperplasia of the Prostate in the White and Colored Races in Louisiana Analysis of 325 Glands Removed at Operation R D Aunoy J R Schenken and E L Burns New Orleans —p 47  
 General Aspects of Automobile Injuries C S Venable San Antonio Texas —p 56  
 Neurologic Signs in Trauma of the Brain and Spinal Cord R G Spurling and F K Bradford Louisville Ky —p 59  
 The Role of Plastic Surgery in the Treatment of Malignancies About the Face J F Burton Oklahoma City —p 67  
 Etiology and Treatment of Strangulated Thrombosed Infected and Gangrenous Internal Hemorrhoids M C Pruitt Atlanta Ga —p 68  
 Is Revision of the Medical Curriculum Needed to Meet the Demands of Industry? G A Traylor Augusta Ga —p 80  
 The Relationship of Obstructive Lesions to Resistant Urinary Infections E G Ballenger O F Elder H P McDonald and R C Coleman Jr Atlanta Ga —p 85

**Blood Studies in Obstetric Patients**—Eskridge and Serwer found that during the first trimester of pregnancy 53.8 per cent of their 1,000 patients showed an erythrocyte count of 4 million cells or above, and 46.2 per cent had an erythrocyte count below 4 million. This increased during the second trimester to 55.9 and 44.1 per cent respectively. A decrease was observed during the third trimester, with 46.9 per cent having an erythrocyte count above 4 million and 53.1 per cent below 4 million. A hemoglobin of from 11.9 to 15.3 Gm (the so called average group) was present in 84.2 per cent of the patients in

the first trimester, which remained at 84.5 per cent during the second trimester and decreased to 52 per cent during the third trimester. The group of patients having 15.3 Gm of hemoglobin and above showed only 0.7 per cent change throughout the entire course of pregnancy, despite the fact that the greatest drain by the fetus on the mother is at its height during the third trimester. The authors did not observe any appreciable change in the leukocyte count throughout the course of pregnancy, with one exception, in which there was a slight gradual increase in the percentage of patients who had a leukocyte count above 10,000 during the third trimester. The marked rise which many authors speak of as labor approaches was absent in the series. The predominant granulocyte percentage was between 70 and 80 during the first trimester, and between 70 and 90 during the second and third trimesters. The reverse order was true of the nongranulocytes. During the third trimester, 80.9 per cent had a bleeding time of less than three minutes, the maximum being six minutes. 76 per cent had a coagulation time of less than three minutes during the third trimester, the maximum being 8.5 minutes. A total of 3,000 basal metabolic rate estimations were done, of which 1,952 were within the normal range (plus 10 to minus 10), 220 were above normal and 719 were below normal. There was no appreciable change in distribution as pregnancy progressed, there being only a slight increase in the number of normal range during the second trimester and a further slight increase during the third trimester. A small progressive decrease in the minus group was also observed during the later trimesters. There was an increase in the later trimesters on the plus side as pregnancy progressed.

**Therapeutic Use of Helium**—Metz and his associates have used helium in emphysema, bronchiectasis, pulmonary fibrosis and other conditions obstructive to breathing. Their results have been as satisfactory as those of other workers in the field. However, they emphasize that the administration of helium is dangerous when given by incompetent or untrained persons. The administrator must be well acquainted with the closed circuit system and the physiologic principles involved. Improper administration of helium may not only be valueless but may jeopardize the life of the patient by asphyxia. To be effective, nitrogen must be rigidly excluded because it defeats the purpose of the helium by increasing the weight of the mixture. Care must be taken to supply sufficient oxygen continually for metabolic needs. When a closed circuit is used positive pressure should be applied to the rebreathing bag during inspirations so that the patient is not compelled to breathe against the resistance in the circuit. Gentle positive pressure during inspiration not only renders breathing easier but aids the gas mixture in penetrating alveoli which have become more or less blocked by mucus and by bronchial spasm. The authors have also verified the results of Barach on the uselessness of helium in asthma, which is controllable by epinephrine. When administered during an attack in these cases, the cyanosis disappears and breathing becomes somewhat less difficult but the duration and frequency of the attacks are in no way altered. In borderline cases in which the patient is partially refractory to epinephrine, the administration of helium will again restore the effectiveness of the drug, after which the gas is of no further value. The authors believe that the present known uses of helium in the field of medicine are only suggestions of its possibilities and that further study and experimentation will bring to light many more conditions in which its use is beneficial.

**Southwestern Medicine, El Paso, Texas**

22 469 502 (Dec) 1938

- Pneumonia C D Awe El Paso Texas —p 469  
 Functional Hypoglycemia J T Bennett El Paso Texas —p 472  
 Bronchiectasis in General Practice and the Specialties J Chapman and H M Anderson Sanatorium Texas —p 474  
 Premature Separation of the Placenta with Uteroplacental Apoplexy G O Bassett Prescott Ariz —p 477  
 Leukopenic Index in Relation to Chronic Arthritis R A Hicks and B L Wyatt Tucson Ariz —p 480  
 Cancer Among the Indians of the United States with an Analysis of Cancer in Arizona E P Palmer Phoenix Ariz —p 483  
 Treatment of Atrophic Rhinitis E C Bakes Phoenix Ariz —p 487  
 General Rules for the Care of Eyes O W Thoeny Phoenix Ariz —p 488

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

**British Journal of Dermatology and Syphilis, London**

50 637 688 (Dec.) 1938

- \*Some Experiences of Sympathectomy in Diseases of the Skin E D Telford—p 637  
Case Apparently Illustrating the Primary Complex of Tuberculosis in the Skin R M B McKenna and C A Wells—p 645  
Cutis Hyperelastica (Ehlers Danlos Syndrome) A Burrows with pathologic report by H M Turnbull—p 648  
Kerion of the Beard Caused by Ectotrichophyton Mentagrophytes var Radiolatum M Moore—p 653

**Sympathectomy in Cutaneous Diseases**—Telford performed sympathectomy in the treatment of a number of these patients suffering from sclerodactyly, but the results were on the whole disappointing. No permanent benefit has been shown in the more severe cases with gross contracture and ulceration. Immediately after the operation pain has been abolished in dramatic fashion, but in all cases it has returned. One woman was enabled to return to her work as a weaver. While engaged in the study of sclerodactyly the author attempted the treatment of various other types of cutaneous and subcutaneous sclerosis. In the patchy and superficial form of scleroderma, sympathectomy has checked the progress of the disease and in some cases has brought about much improvement in the local condition. In the severe sclerosis occasionally seen in the limbs of infants, a condition apparently due to a fibrous dystrophy of subcutaneous fat the operation has been without success. In three cases of hyperhidrosis, sympathectomy has abolished the sweating. The results for twenty-seven patients with anterior poliomyelitis and forty with the erythrocytosis-Bazin syndrome who have been operated on by lumbar sympathectomy have been excellent especially for the younger patients. In a few of the older patients and in the more obese legs improvement has lapsed after two years. Although sympathectomy will lead to a dramatic healing of "trophic" ulcers their subsequent history may be disappointing owing to the ceaseless care necessary to prevent trauma to the insensative area. Sympathectomy is still on trial but because of the results that the author obtained in the varied instances he believes that it may prove of lasting benefit in certain selected cases of disease of the cutaneous and subcutaneous tissue.

**International Journal of Psycho-Analysis, London**

19 377 524 (Oct.) 1938

- Constructions in Analysis S Freud—p 377  
Affects, Passions and Temperament K Landauer—p 388  
Ego Disturbances and Their Treatment O Fenichel—p 416  
Some Remarks on Treatment of Sexes in Paleolithic Art P Heilbrunner—p 439  
A Psychoanalytic Note on Paleolithic Art E Jones—p 448  
Psychogenic Factors in Etiology of the Common Cold and Related Symptoms L J Saul—p 451  
The Position of the Psychopath in the Psychoanalytic System F Wittels—p 471

**Journal of Laryngology and Otology, London**

53 737 828 (Dec.) 1938

- Contribution to the Study of Middle Ear Suppuration with Special Reference to the Pathogen and Treatment of Cholesteatoma A Tumaikin—p 737  
Auditory Nerve Tumors P Scott—p 772

**Journal of Physiology, London**

94 281 460 (Dec. 14) 1938 Partial Index

- Blood Pressure Raising Secretion of the Ischemic Kidney J C Fasciolo B A Houssay and A C Truquini—p 281  
Reflexogenic and Central Structures in Oxygen Poisoning J W Bean and G Rottschäfer—p 294  
Early Lesions of Vitamin A Deficiency J T Irving and M B Richards—p 307  
Utilization of Various Metabolites (Blood Fat and Lactate Cardiac and Lung Glycogen) in Aglycemic Heart Lung Preparation I P Fletcher and E T Waters—p 337  
Concentration and Sedimentation Rates of Blood from the Splenic Artery and Vein J C Stephens—p 411  
The Circular Musculature of the Small Intestine K I Franklin and G P Mahe Loughnan—p 426

**Medical Journal of Australia, Sydney**

2 929 974 (Dec. 3) 1938

- Vertigo A S Walker—p 929  
Vertigo as a Symptom of Aural Disease E P Blashki—p 937  
Anesthetics in Australia in the Early Days W L Potter—p 940

2 975 1016 (Dec. 10) 1938

- Diabetes Mellitus E Downie—p 975  
Treatment of Ambulatory Diabetics with Zinc Protamine Insulin K Maddox and Madeleine Scott—p 983  
\*Immediate Feeding in Hematemesis and Melena Review After Twelve Months Trial J D Herlihy—p 996

**Immediate Feeding in Hematemesis and Melena**—For more than twelve months Herlihy has employed Witts's modified Meulengracht routine of immediate feeding in hemorrhages from peptic ulcer. He believes that this method combines the best features of the Meulengracht and the Sippy methods and fulfils all the other requirements of treatment. His results to date in the treatment of both private and hospital patients have been distinctly encouraging. So far there has been no occasion to invoke the aid of the surgeon. Should this need arise, the surgeon would be offered a reasonably good risk and not a forlorn hope as in the past. Since solitary hemorrhages are rarely fatal (in about 4 per cent) and with recurrence the mortality rate rises to 40 per cent (with further hemorrhages to 60 per cent), the key to the situation is to prevent such happenings. The treatment, in short, should be as follows: 1 Morphine should be used only when anxiety is a prominent feature. 2 Blood transfusion should not be regarded purely as a preparatory measure for surgical intervention. Medical treatment will improve by its adoption. It is not employed as a routine measure but should be if an analysis of the blood indicates it. It is essential to treat the general condition of the patient and not to concentrate on one symptom alone. After blood transfusion a rise in the hemoglobin percentage occurs. Thus is eliminated the state of anoxemia and a condition is created which directly aids healing and must therefore tend to prevent a recurrence of bleeding. Should further hemorrhages occur, the blood transfusion should be repeated as often as is necessary, preferably by the continuous drip method. 3 With a hemorrhage and its associated vomiting and the like, the patient probably loses between 2,000 and 3,000 cc of body fluid. As the normal water requirements of a patient are 3,500 cc a day, it is evident that he requires about 6,000 cc during the first twenty-four hours. This should be followed each subsequent day, with 3,500 cc. The rigid withholding of food by mouth is a further distinct fault, as a patient in danger of dying from exhaustion must be provided with a diet containing sufficient calories and vitamins, and to allow a stomach to remain empty and exposed to the unbuffered gastric juices is incorrect treatment of peptic ulceration. Excessive movements of the stomach are enhanced by hunger. The food must be kept moving through the stomach in order to rest it. The patients that the author treated so far have received from 2,500 to 3,500 calories daily and a total fluid intake of at least 2,500 cc. In addition, they were allowed water or dextrose solution between meals. The milk that they were given was not citrated but, if desired, was flavored with malt preparations. Alkaline powder and belladonna were seldom found necessary but were given in the usual manner when required. Vitamins were provided in the form of an autolyzed yeast preparation, orange and tomato juice, cod liver oil and malt. These were given at first in full doses to overcome any possible storage deficiency especially of vitamin C. According to the progress made and when it was certain that bleeding had ceased, the gradual transfer to a modified Sippy diet followed.

**South African Medical Journal, Cape Town**

12 867 902 (Dec. 10) 1938

- Transactions of the Surgical Unit of the University of the Witwatersrand I C de Diabetic Gangrene with a Resume of Some Aspects of the Problem of Gangrene in General A Y Mason—p 869  
Chronic Bacterial Leptomenigitis F H Koon—p 871  
Hydatid Disease of the Lung and Pleura T Schrire—p 873  
Pink Disease S N Javett—p 881  
Native Syphilis J H Rauch and L R Sanyaman—p 883



## Archives de Medecine des Enfants, Paris

11 785 860 (Dec.) 1938

\*Grave Forms of Urinary Colibacillosis of Nurslings—*Ribadeau-Dumas and J. Chabrun*—p. 785

\*Treatment of Lymphangiomas with Sclerosing Injections of Sodium Citrate—*Fonseca e Castro*—p. 798

Capillary Bronchitis of Diphtheric Origin and Secondary Otitis Due to *Loeffler's Bacillus*—*J. M. Paez de la Torre*—p. 803

**Urinary Colibacillosis in Nurslings**—*Ribadeau-Dumas and Chabrun* say that, however frequent may be the urinary infections provoked in nurslings by the colibacillus, they are usually benign. As a rule, the colibacillary pyelonephritides of young infants are cured easily by suitable alimentation and by urinary antiseptics. Nevertheless, grave forms of colibacillosis also are observed in infants. The existence of a congenital malformation in the urinary tract such as stenosis of the ureter or a vesical malformation may be an important factor in the grave forms. There are also serious forms of pyelonephritis, in which anatomic malformations are absent and in which the grave aspects may be due either to the special quality of certain strains of colon bacilli or to peculiar microbial associations. The authors report three cases. The first one concerns a nursing aged 5 months, in whom colibacillosis became manifest in severe nervous disturbances. At the onset the fever, the muscular rigidity and the convulsions simulated a meningitis. A little later a veritable catatonic syndrome appeared, which was characterized by muscular rigidity, coldness, a suspension of spontaneous motions and the prolonged persistence of passive attitudes (catalepsy). These symptoms were accompanied by dyspnea and vasomotor disturbances. Finally, in the course of a relapse there appeared a cerebellar syndrome, that is disturbances in the equilibrium, tremor and dysmetria. In attempting to explain the neurologic symptomatology of the colibacillary infection the authors direct attention to studies by Vincent, who demonstrated that the colon bacillus produces two types of toxins: an endotoxin which is enterotropic and hepatotropic and an exotoxin which is neurotropic. The production and toxicity of the latter toxin varies in different strains of the colon bacillus. By the injection of this toxin into rabbits, Vincent was able to elicit various nervous disturbances: coma, paralysis and retropulsion. The authors further mention Baruk and Claude, who demonstrated that the neurotropic toxin of the colon bacillus produces catatonics in cats, mice, guinea pigs and pigeons. In view of these observations, the colon bacilli obtained from the aforementioned nursing were tested in a rabbit and it was found that the rabbit developed paresis of the neck and of the posterior members and also diarrhea and dyspnea. The second case of grave colibacillosis described by the authors concerns an infant of 4½ months. In this case a typical urinary colibacillosis became complicated by an acute nephritis, which became evident in albuminuria, edemas, azotemia and acidosis. Then hypertrophy of the kidney developed and the necropsy disclosed a massive thrombosis of the renal vein. The third case concerned a child of 6 months. This child developed a bronchopneumonia, which was soon followed by a urinary bacillosis which was accompanied by severe nervous symptoms. The examination of the urine disclosed colon bacilli and staphylococci. The necropsy revealed in addition to the lesions of pyelonephritis a pulmonary abscess with staphylococci and a double otomastoiditis with pneumococci. The link which unites these disparate forms is the presence in the urine of pus and colon bacilli.

**Treatment of Lymphangiomas with Sclerosing Injections**—*Fonseca e Castro* says that the treatment of angiomas and lymphangiomas by means of injections is not new. The employment of coagulating substances was quickly abandoned, but the use of sclerosing substances is of greater interest. To be sure several have fallen quickly into disuse, such as tincture of iodine, oil of turpentine, mercuric iodide and salts of magnesium. Others, however, have been used widely: sodium salicylate, quinine-urethane or quinine-urea and finally sodium citrate. This last substance is the least irritating of all. Although possessed of the same sclerosing action as the others, it is practically harmless, because it does not have a necrosing action if it is injected in reasonable quantities. That is why Sicard prefers it for the treatment of varices and Trousier utilizes it in the therapy of certain forms of arteritis. The author found it to be a satisfactory means to obtain reduction by sclerosis of

tuberous angiomas. He developed the technique and the indications for this treatment in observations on dozens of patients. He employs a saturated solution of sodium citrate, which he injects deep into the tumor, if it is voluminous, he makes two or three punctures at different sites. Not more than 1 cc. is injected into each puncture and usually the quantity is less (0.5 cc.). Before the injection is renewed all reactions provoked by the previous one must have entirely disappeared. The technical regulations of the treatment of angiomas by injections of sodium citrate were applied also in several cases of lymphangioma and the author found that in these cases the results were even superior to those obtained in the majority of cases of angioma. He describes the clinical histories of three such cases. The first patient, a child aged 15 days, had a lymphangioma the size of a small orange, in the right supraclavicular region. Injections of sodium citrate were continued over a period of two months. At the end of that period the lymphangioma had completely disappeared and today, nine years later, there is no sign of a tumor. The second patient, a child aged 18 months, had a voluminous lymphangioma in the right axillary region and the third patient was a child of 20 days with a large lymphangioma in the left cervical region. In all these cases the injections of sodium citrate reduced the lymphangiomas to such an extent that they may be regarded as cured. The number of injections varies in the different cases.

## Presse Medicale, Paris

16 1873 1896 (Dec. 21) 1938 Partial Index

Ignored Cryptic Tonillitis—*W. Bensis*—p. 1874

Influence of Quinine in Large Doses on the Labyrinth—*J. Chrysos and G. Yanouli*—p. 1877

Streptotrichosis in Greece—*M. Petzetakis*—p. 1879

Treatment of Hydatid Cysts of Lung—*M. Makkas*—p. 1884

New Information on Nature of Ultravirus—*C. Levaditi*—p. 1889

Röntgenologic Diagnosis in Gynecology—*Study of Uterine Evacuation*—*R. Ledoux, J. Ehrard, J. Dalsace and J. Garcia Calderon*—p. 1894

**Influence of Quinine on Labyrinth**—*Chrysos and Yanouli* point out that in Greece quinine tablets are often used by persons who want to commit suicide. This is due to the fact that, because of the wide spread of malaria, quinine is easily obtainable. The authors studied the effect of large doses of quinine on the labyrinth in twenty eight cases, in twenty five the labyrinth was studied during life and in three anatomopathologic studies were made. Ten of the patients presented nothing of interest as far as the ear was concerned. Of a number of those who did present otic symptoms, the authors give clinical histories. These histories indicate that the patients had ingested from 5 to 10 Gm. of quinine. The extension of the lesions provoked by the absorption of quinine depends partly on the quantity of the alkaloid that has been taken and partly on the resistance of the organism. Evidently the time of day and the quantity of food taken before the absorption of the medicament as well as the presence or absence of vomiting and the length of time which elapsed before its onset, are of great importance. In some of their patients the authors observed congestion of the tympanum, a symptom which had been described previously by Rose. In one case they noted an exacerbation of a chronic otitis. Nearly all their patients complained of buzzing in the ears, which is a sign of labyrinthine congestion. After citing opinions expressed by Wittmaack, Beck, Schwabach and others on the action of quinine on the ear, the authors say that in two of their patients they observed vasomotor disturbances of the labyrinth, namely periodic attacks of vertigo and instability, which persisted for a long time. However, the authors do not consider quinine the principal cause of these disturbances because some other factors seemed involved in the two cases. They point out that although Haug regarded quinine intoxication as a principal cause of hyperacusis they never observed this condition. Other observers noted blindness and deafness as a complication, but the authors never detected deafness and in only one case did they note a considerable diminution in visual acuity. In several cases they observed reactions of the vestibular labyrinth, such as nystagmus of the first or second degree, deviation of the hand and sideward falling. In the excitation of the labyrinth with caloric and galvanic tests they noted a diminution in its excitability, whereas other investigators observed an augmentation in the excitability of the labyrinth, probably because small doses of quinine provoke a congestion of the auditory organ and consequently a hyper excitability.

## Archiv fur Verdauungs-Krankheiten, Basel

63 249 356 (Nov.) 1938

- Clinical Aspects of Pancreatic Disease W Löffler—p 249  
 Roentgenologic Diagnosis of Pancreatic Disorders M Ludin—p 273  
 \*Significance of Diastase Reaction for Diagnosis of Pancreatic Disorders  
 H Kapp and A Vischer—p 292  
 Diseases of Pancreas H Paschoud—p 298  
 Differential Diagnosis and Therapy of Steatorrhea H W Hotz—  
 p 319  
 Pancreatitis as Cause of Nonfunctioning Gastro-Enterostomy H Stalder  
 —p 331  
 Chemistry of Pancreatic Secretion F Leuthardt—p 335  
 Observations on Pancreatic Diseases in Practice A Haemmerli—  
 p 343

**Diastase Reaction for Diagnosis of Pancreatic Disorders**—Kapp and Vischer say that the diastase test for the diagnosis of pancreatic disorders, which was introduced by Wohlgemuth, has been evaluated differently. Whereas some recommend this method, others reject it. The authors investigated the method in the material of the medical and surgical clinic of the university of Basel. Tests in thirty-five cases in which either operation or necropsy had demonstrated a pancreatic disease revealed normal diastase values of the serum in 54 per cent of the cases. In only 46 per cent of the cases did the diastase test support the diagnosis. In the presence of tumors the increased values were detected more frequently than in cases of acute pancreatitis. In the latter disorder the failures of the diastase test were especially frequent. In twenty-six cases in which the clinical aspects as well as the outcome of several tests (condition of feces after Schmidt's test meal and positive ether reflex according to Katsch) indicated pancreatic disease, the diastase values in the serum showed a similar behavior to that in the cases that had been verified by operation or necropsy. To be sure the percentage of cases with normal values was somewhat lower, 42, compared to 54 in the verified group. The authors give their attention further to ninety-five cases in which, although increased diastase values existed in the serum, the clinical signs indicated extrapancreatic rather than pancreatic disorders. In the majority of these cases, that is in sixty-six, there existed gastric intestinal or biliary disorders, in thirteen cases diabetes and the remaining number of patients had various disorders such as cardiac insufficiency, intoxication, hemolytic icterus and septic diseases. Summarizing the results of their studies the authors say that only about 50 per cent of the cases, in which pancreatic disorders are certain, show increased diastase values in the serum. Thus the normal outcome of the diastase test cannot be regarded as a definite proof of the absence of pancreatic impairment. When other pancreatic tests indicate a lesion of the pancreas, the diastase test should be made as a corroborating test. Even if there are no clinical signs of pancreatic disease increased diastase values indicate at least an involvement of the pancreas. The observations discussed here concern the diastase content of the serum, because this has been regarded as more reliable than the test on the urine. In some cases in which pancreatic disorders seemed probable and in which serum and urine were tested, greatly increased diastase values were found in the urine whereas the serum values were normal but the reverse condition was also found in many cases. The lack of uniformity in the outcome of the diastase test induced the authors to investigate in healthy persons the relationship between the serum and urine values under the influence of various diets. They admit that the small number of tests does not permit the formulation of new theories, but the experiments do prove that the conditions under which the tests are made must be known. It was found that increased diastase values in the urine may be the result of the food intake. Moreover, it is suggested that the diastase test might gain in importance if it is further developed, that is, if attention is given to the time and quantity factors in connection with the tolerance tests.

## Gazzetta degli Ospedali e delle Cliniche, Milan

59 1105 1128 (Nov. 6) 1938

- \*Alcohol as Possible Vehicle of Gas Gangrene Infection G Benzoni—  
 p 1107

**Alcohol in Transmission of Gas Gangrene**—Benzoni says that in hospitals and similar centers it is customary to keep syringes and needles which are used for administration of hypodermic injections and hypodermoclysis in alcohol as a disinfectant.

As a rule alcohol in the jars in which the instruments are kept is changed once a day. The author searched for the presence of *Bacillus perfringens* on different specimens of alcohol taken by sterile means either from the jars in which the syringes and needles were kept or from the bottles from which the jars were supplied. He used a method of precipitation of a sediment in alcohol to which 1 or 2 cc of a sterile serum was added. Cultures from the centrifuged sediment were prepared by Zeiler's method. Thirteen of eighteen specimens taken from the jars were turbid and contained *Bacillus perfringens*, as verified by cultural and biologic studies. Five specimens from the jars and six from the bottles were clear and did not contain the bacilli. The author therefore concludes that ethylic and denatured alcohol is a vehicle for *Bacillus perfringens*. It has no bactericidal properties against gas gangrene even if in contact for a long time. There is the possibility of transmitting gas gangrene infection by means of the needles or syringes in the course of the administration of hypodermic injections or hypodermoclysis. It is advisable to take the instruments out of the jars by means of sterile forceps, never letting the fingers come in contact with the alcohol which is used as a disinfectant, to change the alcohol in the jars more frequently than is generally done and, if possible, to seek another disinfectant which may have more effective bactericidal action against gas gangrene than alcohol.

## Klinische Wochenschrift, Berlin

17 1745 1784 (Dec 10) 1938 Partial Index

- Investigations on Purine Metabolism with Especial Consideration of Uric Acid Glycolates F Chrometzka and H Lubjuhn—p 1748  
 Rare Secondary Changes in Blood Severe Myeloid Leukemoid Reaction in Gastric Carcinoma A H Müller—p 1755  
 Types of Pneumococci in Pneumococcus Meningitis in Children Joppich—p 1757  
 Statistical Evaluation of Result of Prophylactic Vaccinations H von Schelling—p 1758  
 Physiology and Pathology of Intermediate Fat Metabolism H G Krainick and F Müller—p 1760  
 \*Gold Therapy and Vitamin C Clinical and Experimental Study A Sande—p 1762  
 \*Sedimentation Speed of Erythrocytes as Objective Criterion of Therapeutic Results of Tonsillectomy F Kotzka—p 1764

**Gold Therapy and Vitamin C**—Sande observed three patients who did not tolerate gold therapy. One had bloody sputum, another one had petechiae and the third one developed hepatic symptoms with severe urobilinogenuria. These disorders did not yield to the customary treatments. Sande cites others who made similar observations in the course of gold therapy and then points out that Piesocki and Danow obtained favorable results with vitamin C in cases of intolerance to arsphenamine and to gold therapy. These results and those obtained by Hasselbach and others in the treatment of tuberculous hemoptysis induced Sande to try vitamin C for the patients who did not tolerate gold therapy. He administered from 100 to 200 mg of vitamin C by intravenous injection and found that the petechiae, the blood in the sputum and the urobilinogenuria disappeared. He further describes experiments on guinea pigs. The animals were treated with different types of gold preparations and then the vitamin C content of the various organs was determined. It was found to be greatly reduced in all organs except the liver in which it remained fairly constant. The reduction was greatest when the gold preparations were administered intravenously. The author concludes that the favorable results obtained in the patients and the observations in the course of the animal experiments justify the prophylactic and therapeutic application of vitamin C in the course of gold therapy.

**Erythrocyte Sedimentation Speed in Tonsillectomy**

Kotzka studied the sedimentation speed of the erythrocytes in 200 patients who underwent tonsillectomy. He employed Westergren's method for all tests and found that 80 per cent of the patients had a normal sedimentation speed before the tonsillectomy. Tests made immediately after the intervention revealed that a noticeable change in the sedimentation speed becomes evident only after at least twelve hours has elapsed. In the days following it increases. On the third day, when the inflammatory manifestations in the tonsillar bed are most pronounced the acceleration in the sedimentation is usually greatest. After that the values gradually subside. This course is usually observed in patients who merely had a chronic tonsillitis without local or

general complications. In cases of rheumatism and nephritis, however, the postoperative fluctuations in the sedimentation speed are greater, particularly when the sedimentation speed was already increased before the intervention. The return of the sedimentation rate to low values often required three months and longer, especially when the tonsillectomy was followed by an exacerbation in the articular and renal inflammations. A final evaluation of the therapeutic effect of tonsillectomy is possible only after prolonged observation. In 123 cases, control tests could be made after the intervention of from one to five months. These tests revealed that tonsillectomy was followed by an absolute reduction in the sedimentation speed in seventy-eight of the 123 cases (63.41 per cent), by an absolute increase in twenty-six cases (21.14 per cent) and by unchanged values in nineteen cases (15.45 per cent). The author reaches the conclusion that in connection with tonsillectomy the systematic control of the sedimentation speed of the erythrocytes is of great diagnostic and prognostic value. He recommends that the sedimentation speed be determined before and at monthly intervals after the operation. If after one or two months the tests show an absolute reduction, he regards this as an indication that the tonsillectomy has removed the focus of the disease and that the patient's general condition is improved. If this status has not been attained after two or three months, it must be assumed that either the complications (endocarditis or articular rheumatism) cannot be influenced by the tonsillectomy or the result has been obtained but is masked by other diseases such as tuberculosis and empyema of the sinuses.

### Munchener medizinische Wochenschrift, Munich

85 1937-1976 (Dec. 16) 1938 Partial Index

Treatment of Prostatitis J. Mayr—p. 1937

Epidemic Occurrence of Keratitis Nummularis Dummer in Bavaria W. Meisner—p. 1939

\*Liver as Defense Organ in Bacterial Infections E. Reiss—p. 1940

Gas Gangrene After Appendicitis H. J. A. Tober—p. 1942

Manifestations During Withdrawal of Tumoral G. Schmidt—p. 1944

Treatment of Rickets—A Necessary Measure in Treatment of Whooping

Cough of Young Children F. Hansen—p. 1949

Problem of Serotherapy of Diphtheria H. Weinbauer—p. 1951

**Liver as Defense Organ in Bacterial Infections**—Reiss injected into the blood stream of eight rabbits such quantities of bacilli that the bacteria could be demonstrated in the microscopic examination of sections of the organs. One each of the first four rabbits had been immunized respectively against *Bacillus pyocyaneus*, *Bacillus albidigenes*, the pseudodiphtheria bacillus and a gram-positive bacillus that had been cultured from earth. Into the other four nonimmunized rabbits the same number of the respective bacteria were injected. Five minutes after the injection had been completed the animals were killed and the organs were examined under the microscope either at once or after twenty-four hours of incubation. It was immediately evident that the examined organs—liver, spleen, adrenals and brain—did not contain the same number of bacteria per unit of volume. The liver was overloaded with them, whereas in the other organs they were detected comparatively rarely. A mechanical filtration in the capillaries cannot have been responsible for this, because the bacteria, which were injected into the jugular vein, were carried to the right auricle, the right ventricle and from there to the lungs after passing the pulmonary capillaries they were carried back to the left side of the heart and from there into the general circulation. No phagocytosis could be observed in the phagocytic cells of the kidneys, adrenals, brain and spleen. To be sure, this does not exclude the possibility of a slight phagocytosis here. However, Kupffer's cells in the liver were practically filled with bacteria. Kupffer's star-shaped cells contained even more bacteria in the immunized animals than they did in the nonimmunized animals. After citing other differences between the immunized and the nonimmunized animals, the author stresses that these observations permit the conclusion that the reticulo endothelial system in its entirety does not participate uniformly in the destruction of the agents of bacterial infection but that the liver plays by far the most important part in defense against the pathogenic micro-organisms.

### Nederlandsch Tijdschrift v Geneeskunde, Amsterdam

82 5717-5840 (Dec. 3) 1938 Partial Index

Struma and Malignancy C. Bonne—p. 5719

Connection Between Primary Chronic Polyarthrits with Achlorhydria and Anemia R. K. W. Kuipers—p. 5725

\*Treatment of Warts P. J. van Putte—p. 5737

Aimed Roentgenography of Lungs A. Draen—p. 5743

Treatment of Psoriasis T. M. van Leeuwen—p. 5750

**Polyarthrits, Achlorhydria and Anemia**—The fact that a number of authors reported the existence of an achlorhydria in primary chronic polyarthrits induced Kuipers to investigate the concurrence of these disorders in sixty-five cases. After withdrawing a specimen of gastric contents from the fasting stomach, he gave the patients 250 cc of unsweetened tea. After that specimens were withdrawn at fifteen minute intervals. If at the end of forty-five minutes the specimens contained no free hydrochloric acid a subcutaneous injection of 0.5 cc of histamine was given. After that a specimen of gastric juice was withdrawn at hourly intervals. In thirty-four (52 per cent) of the cases achlorhydria was observed after the tea test, and in fifteen (23 per cent) the achlorhydria persisted after the histamine injection. Comparing this incidence with that in healthy subjects, the author finds that in patients with primary chronic polyarthrits the percentage of achlorhydria is greater. He observed also that this achlorhydria is related neither to the age of the patient nor to the duration of the illness. Further he takes up the question whether the achlorhydria is related to the hypochromic anemia which he so frequently encountered in his patients with primary chronic polyarthrits. He found that achlorhydria is just as frequent in patients with severe anemia as in those with a normal hemoglobin content and that, on the other hand, anemia is found in patients with normal gastric secretion as well as in patients with achlorhydria. From this he concludes that the hypochromic anemia is not caused by the achlorhydria and thus has no connection with the disordered gastric function. To be sure it is possible that the impaired iron resorption in achlorhydria increases the severity of the existing anemia, but the table recording the author's observations does not indicate this definitely. Another factor, which indicates that the achlorhydria is not connected with the hypochromic anemia, is that anemia responds to gold therapy and the achlorhydria does not.

**Treatment of Warts**—Under the term warts, van Putte combines the verrucae vulgares, the verrucae planae juveniles and the condylomata acuminata and states that it is generally assumed that these three forms of warts are caused by the same ultravirus. After citing some of the experiments on which the theory of the ultravirus etiology of warts has been based, the author says that there is as much disagreement about the therapy of warts as there is agreement about their etiology. He cites a number of treatments he found recommended in the literature on warts and then describes the method which he regards as most satisfactory. In the case of verrucae vulgares he disinfects the wart and the surrounding skin with tincture of iodine, injects a 2 per cent solution of procaine hydrochloride under the wart and then performs curettage in the direction of the skin clefts. The sharp curet lifts the whole wart from the underlying tissue without causing noticeable damage of the cutis. Since bleeding is undesirable, the author presses the artery that supplies the blood and then applies solution of potassium permanganate by means of a swab. The potassium permanganate solution not only is an effective hemostatic in cutaneous lesions but also has an antiseptic effect. During the first four days the dressing of the wound is changed three times and after that twice daily until complete healing has been obtained. At the change of dressing in the morning the entire area is wiped off with a swab that has been dipped into an oil benzene mixture (1:3). At the midday and evening change new gauze with ointment is applied, after the cavity has been cleansed with cotton that has been dipped into boric acid solution or into a 1:1,000 mercuric oxy cyanide solution. The second type of warts, the verrucae planae juveniles, which have a tendency to spontaneous cure, the author counteracts by applying once daily or every other day undiluted tincture of iodine (6.5 per cent). The third type of warts, the condylomata acuminata, he treats again like the verrucae vulgares, by means of curettage, potassium permanganate solution and so on.

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## THE PREVENTION OF DEAFNESS

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AND  
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BALTIMORE

A laboratory was established at the Johns Hopkins University in 1924 for study of the causes and prevention of deafness. The plan of investigation was patterned after that used so successfully in general pathology, i. e. the correlation of impaired function as determined by clinical tests with the location and nature of the causal lesion. Systematic adherence to this plan for fourteen years has resulted in the accumulation of approximately 15,000 records of hearing tests, illustrating every type and degree of deafness, and has led us to conclusions that could not have been forecast. This communication deals with one phase of our investigation, which we believe is of the first importance in the recognition and prevention of the commonest type of deafness. A preliminary report on this subject was published in 1937.<sup>1</sup>

It was essential that the hearing test should be as accurate as possible and that each patient be followed and retested from time to time. Through the courtesy of the Bell Telephone Laboratories, we have used for these tests an audiometer with a range of tones from 32 to 16,384 double vibrations, which is not available in the commercial audiometers. As the number of records made with this audiometer increased, it became apparent that impaired hearing for high tones is extremely common in children as well as in adults. The classic teaching in otology has always been that "impaired hearing for high tones with good hearing for low tones" indicates an inner ear or nerve lesion, but the frequency with which we found this disorder in children led us to doubt the conclusion. Our doubts were increased after a clinical-pathologic study published in 1934<sup>2</sup> and by the observation that some children regain their hearing of high tones after removal of enlarged tonsils and adenoids. The fact that the hearing did not always improve after operation led us to examine the upper air passages, nasopharynx and eustachian tubes of these children in search of a cause. It is necessary to use a nasopharyngoscope to obtain a clear view of this region. With some children a satisfactory examination may require a general anesthetic, such as avertin with amylene hydrate, but the results justify the means.

During childhood the lymphoid tissue in the throat reacts to infection by increasing in size and spreading to areas of mucous membrane normally free from it, for brevity we designate this condition an overgrowth of lymphoid tissue. It often happens that, after removal of the tonsils and adenoids in children and in some adults, numerous nodules of lymphoid tissue appear on the lateral and posterior walls of the pharynx. This condition is called granular pharyngitis. Our nasopharyngoscopic examinations of children with high tone impairment that failed to clear up after operation showed a condition in the nasopharynx identical with granular pharyngitis and, in addition, overgrowth of lymphoid tissue in and around the pharyngeal orifice of the eustachian tubes.

This abnormal growth of lymphoid tissue partially obstructs the tubes, causes a hypersecretion of mucus, which further impairs function, and produces a chronic irritation in the tubes and middle ears. The earliest symptom of such a partial obstruction is impaired hearing for the tones between 10,000 and 16,000 double vibrations. Good hearing in the middle of the scale, from 250 to 3,000 double vibrations, is essential for understanding speech, and until hearing for the middle tones becomes impaired children with partial tubal obstruction may have no evident difficulty in hearing at school or at home or if they do it is ascribed to inattention. If untreated the deafness progresses by involving one octave after another toward the low end of the scale and becomes evident only when the tones in the speech range are affected. Thus the primary cause may be insidiously damaging the hearing apparatus for several years before it is recognized. The location makes it impossible to remove this hyperplastic lymphoid tissue surgically without further damaging the tubes. The work of Heineke<sup>3</sup> at the University of Leipzig, which in 1905 showed that lymphoid tissue is more susceptible to irradiation than the adjacent epithelium, muscle and bone, suggested to us the use of radium and roentgen rays in the treatment of this condition. Safe doses of roentgen rays or radium do not destroy or totally remove lymphoid tissue but do reduce its size and temporarily inhibit its growth. With the aid and advice of Dr Curtis F Burnam, we began about ten years ago to treat hypertrophied lymphoid tissue around the eustachian tubes with roentgen rays through portals near the angle of the jaw and with radium in an applicator small enough to pass along the floor of the nose. With a nasopharyngoscope in one side of the nose and the applicator in the other it is possible to place the applicator under visual control.

It was this combination of factors which led us to the conclusion that the most common type of middle ear

From the Otological Research Laboratory, the Johns Hopkins University School of Medicine.

<sup>1</sup> Crowe S J and Guild S R. Impaired Hearing for High Tones. *Acta oto-laryng* 26: 138, 1938.

<sup>2</sup> Crowe S J, Guild S R and Polvogt I M. Observations on the Pathology of High Tone Deafness. *Bull Johns Hopkins Hosp* 54: 315 (May) 1934.

<sup>3</sup> Heineke H. Experimentelle Untersuchungen über die Einwirkung der Röntgenstrahlen auf innere Organe. *Mitt a d Grenzgeb d Med u Chir* 14: 21, 1905.

deafness in adults begins in childhood between the ages of 5 and 10 years. The primary cause is hyperplastic lymphoid tissue around and in the pharyngeal end of the eustachian tubes. When the tubal orifices are partially blocked from this cause, operative removal of the tonsils and adenoids must be supplemented by one or more radiation treatments. Complete obstruction of the eustachian tube causes acute middle ear symptoms

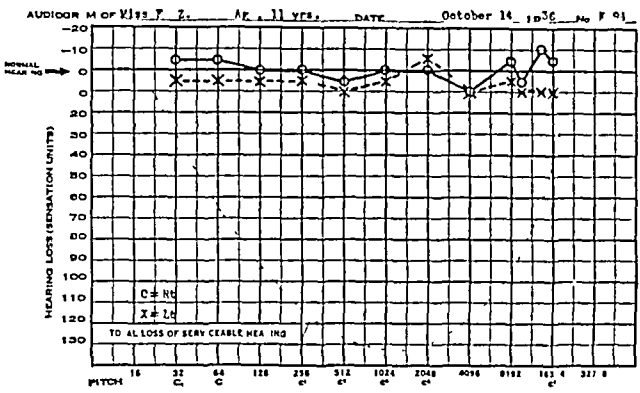


Chart 1—The acuity of hearing for the frequencies 10 121 13 004 and 16 384 double vibrations in an 11 year old child with normal hearing

and often abscess. The most common result of a long-continued partial obstruction during childhood is an insidious, slowly progressing deafness that begins with the highest tones. Pain, tinnitus, dizziness or other symptoms of ear trouble were absent in the majority of our patients. Recurring attacks of otitis media in children who have a tendency to lymphoid hyperplasia is the second most frequent symptom of a chronic, partial obstruction of the eustachian tube. A third symptom is long-continued discharge from the ear after paracentesis or after a simple or radical mastoid operation. There are other causes of chronic discharge but before one resorts to surgical operation the nasopharynx should be examined with a nasopharyngoscope and, if indicated, the function of the eustachian tube should be restored by suitable irradiation. We have found this supplementary treatment of great value. Occasionally it is necessary to pass a cotton-tipped Yankauer applicator through the eustachian tube, followed by gentle inflation, to remove plugs of thick mucus. The tube usually clears itself, however, after adequate irradiation, and unnecessary treatment causes irritation and a continued hypersecretion of mucus. Hyperplasia of lymphoid tissue in the upper air passages in response to every slight infection is most marked in children. After the age of puberty this type of reaction gradually disappears. If damage to the hearing apparatus and deafness later in life are to be prevented, one must do everything possible to improve the general condition and prevent recurring infections during childhood. This necessitates constant surveillance, particularly, frequent tests of hearing and repeated examinations of the tympanic membranes and nasopharynx.

When a condition around the orifice of the eustachian tubes is found that mechanically predisposes the child to ear infections or to deafness later in life, the first step is to take a careful history. Everything possible must be done to improve resistance and lessen the frequency of colds. For this reason the diet, clothing, digestion and number of hours of sleep should be inquired into. It is a mistake to put the child on an open porch or in a cold room at night, he should have an adequate amount of fresh air without undue expo-

sure. A general physical examination including a tuberculin test is made. The adenoids, tonsils and hypertrophied lymphoid tissue on the lateral walls of the pharynx and at the base of the tongue are thoroughly removed by surgical operation. Later another examination is made with the nasopharyngoscope, and if lymphoid nodules around the tubes are still present the area is treated with radium. The applicator is made of flexible steel wire threaded for the attachment of a piece of brass tubing 1.5 cm. in length, which is closed at one end. The radium is placed in the brass tube, the wall of which is 1 mm. thick and allows the passage of gamma rays but filters out most of the beta rays. We have used from 2 to 2.5 gram minutes on each side of the nasopharynx. It is better to give repeated small doses at intervals of a month or six weeks than to risk the irritation and edema that follow an overdose. The radium containing end of the applicator is held a few millimeters away from the surface of the lymphoid tissue being treated; the irritation or overtreatment of a localized area thus being avoided. It is never necessary or advisable to put the applicator directly into the lumen of the tube. If the hyperplastic lymphoid tissue in the pharynx is so diffuse that it cannot all be removed at operation or if it regenerates after every cold, we supplement the radium treatment with high voltage roentgen therapy. The total dose is 500 roentgens as calculated for the rays reaching the tissue being treated. This is given not at one exposure but in six treatments at intervals of four days. This may cause slight redness of the pharynx and discomfort on swallowing but causes no irritation of the skin.

We cannot emphasize too strongly that lymphoid nodules around the tubes may recur even after the most thorough operation and irradiation. The object of the operation is, by removing infected lymphoid tissue, to make the local condition in the nose and throat as favorable as possible for the normal function of the eustachian tubes, while the object of the irradiation is not to destroy or remove lymphoid tissue but to keep it in

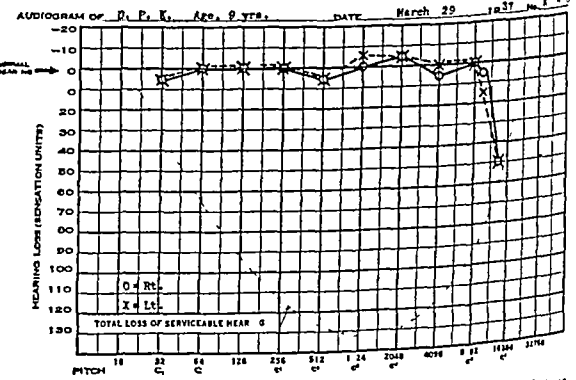


Chart 2—The earliest stage of impaired hearing due to partial obstruction of the eustachian tubes with hyperplastic lymphoid tissue. Only the highest tones were affected. The frequency 16 384 double vibrations was not heard at the maximum intensity of the audiometer. More advanced stages of deafness from the same cause are shown in charts 3 and 4.

abeyance during the age period in which it grows most actively. By this method the hearing of children may be safeguarded and those already deaf from tubal obstruction may even be cured, as illustrated by the following case reports.

CASE 1—E. F., a boy, brought to the Johns Hopkins Hospital in 1932, when 10 years of age with marked impairment of hearing, during the first four years of life had had frequent colds that began with a sore throat and nasal congestion and usually terminated in a prolonged attack of bronchitis. In

several of these attacks his ears became infected and his tympanic membranes either ruptured spontaneously or were opened by paracentesis. For the relief of these symptoms his tonsils and adenoids were removed when he was 4 years old. After this operation the acute attacks were less frequent and he had no further earache or discharge, but he continued to have frequent colds and his hearing became progressively worse.

Physical examination showed nothing abnormal except in the ears and upper air passages. The tympanic membranes were intact but extremely retracted, scarred and opaque. The accessory nasal sinuses were not infected, but the adenoids had reappeared and were so large that they completely covered the orifices of both eustachian tubes. The lymphoid tissue on the lateral and posterior walls of the pharynx and at the base of the tongue was enlarged and infected. This hyperplastic lymphoid tissue was removed as thoroughly as possible with the idea of decreasing the area to be irradiated and thereby decreasing the dose of roentgen rays or radium necessary to restore the normal function of the eustachian tubes. For eight months after this operation the child had no colds, his hearing improved and the hyperplastic lymphoid tissue around his tubes regressed somewhat. The hyperplasia recurred, however, after the first cold, and his hearing gradually became worse. His hearing test at this time (March 1933) is shown in chart 3.

The nodules of lymphoid tissue, after two operations for their removal were so diffusely scattered over the pharynx and nasopharynx that the patient was referred to Dr Charles A. Waters in March 1933 for a series of roentgen treatments. It would probably have been wiser to do this in the first place. Over a period of a month he received 1,132 roentgens over the external auditory canal on each side, 468 roentgens over the tonsillar region on each side and 1,404 roentgens anteriorly over the base of the tongue and pharynx. For several weeks after these treatments his hearing was worse, owing no doubt to edema of the mucous membranes in the middle ear and eustachian tubes. After this it slowly improved. In November 1933 he had a second series of roentgen treatments and received 1,344 roentgens directed toward the nasopharynx on each side. His hearing rapidly improved and it remained good until March 1934, when hearing for the higher tones again became impaired in the left ear (chart 3). This was due to pneumonia with a mild secondary infection of the mucous membrane around the left eustachian tube. With no local treatment of any kind this condition cleared up and the hearing again improved, as shown in chart 3 (April 1934).

During the next twenty-one months the patient had no severe colds and no trouble in hearing. In February 1936 after a 'slight head cold' with no sore throat, cough or fever, he again became quite deaf (chart 3). The lymphoid tissue in the nasopharynx was again hypertrophied and completely covered the orifice of the tubes. Radium was used and only the pharyngeal orifice of the tubes was treated. A 276 millicurie applicator, shielded with brass, was passed along the floor of the nose and under direct vision with a nasopharyngoscope in the opposite side, each eustachian orifice was irradiated for eight minutes a dose equivalent to 22 gram minutes of radium.

After this treatment, in February 1936 the hearing improved reaching normal by August 1936. The patient was next seen in October 1938, when in response to our request he returned for another examination. He was then 17 years of age, weighed 160 pounds (73 Kg.), rarely had a cold and had no noticeable impairment of hearing (chart 3). His tympanic membranes were scarred, opaque and retracted, especially Shrapnell's membrane but his hearing was good and he had apparently passed the period of active lymphoid hyperplasia. It is worthy of note that at no time did he have a eustachian tube dilation or inflation. His only treatment was irradiation for the purpose of keeping the tubes open and clear of mucus.

CASE 2—The first ear trouble of R. B. a boy occurred in 1930 at the age of 3 following removal of his tonsils and adenoids. Both tympanic membranes ruptured and the discharge continued for several weeks. Three years later his tonsils and adenoids were again removed because of deafness, recurring colds, enlarged cervical glands, a continuous fever and extreme nervousness suggesting chorea. His hearing improved and for a year he was well but after measles in

December 1933 his hearing again became impaired, although there was no pain or discharge. He was brought to the Johns Hopkins Hospital in September 1934 because his hearing was growing progressively worse. He had a hearing loss of approximately 25 per cent which was due to diffuse nodular hyperplasia of lymphoid tissue in the nasopharynx, on the lateral and posterior pharyngeal walls and at the base of the tongue. The tissue was removed with the patient under general anesthesia. This was the third time lymphoid tissue had been removed during four years. We now know that the results would have been better if, instead of this operation, the patient had been given a series of high voltage roentgen treatments. The orifices of both eustachian tubes were overgrown with

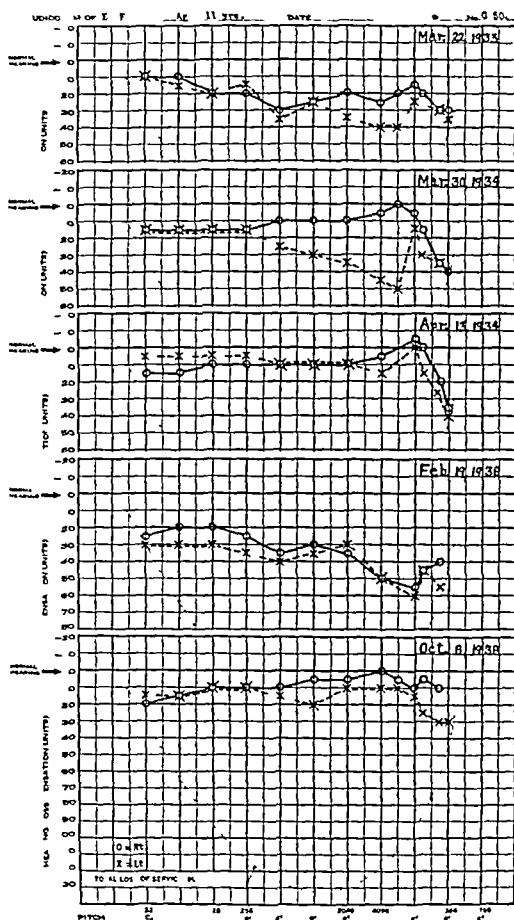


Chart 3 (case 1)—This series of audiograms shows clearly the effect on hearing of irradiation of hyperplastic lymphoid tissue in and around the orifices of the eustachian tubes. It also shows the necessity for frequent hearing and nasopharyngeal examinations as well as repeated radiation treatments. Note the similarity between the April 1934 audiogram and chart 2.

lymphoid tissue but at this time we were uncertain about the effect of nasopharyngeal irradiation on the pituitary gland and nothing more was done for a year and a half.

At a second examination, in April 1936 the general physical condition was found to be much improved and the lymphoid hyperplasia in the pharynx and at the base of the tongue had not recurred, but the local condition in the nasopharynx was unchanged. The tympanic membranes were retracted, tuning fork tests indicated a middle ear lesion with good bone conduction and the audiometer test showed impaired hearing in both ears (chart 4 April 1936). The patient was given his first radium treatment, a 2 gram minute application over each eustachian orifice. Six months later the pharyngeal orifices of the tubes appeared more normal than at any previous examination and his hearing was so much improved that for the first time in two years he heard tuning forks better by air than by bone conduction. The improvement was only temporary. After a cold the tubes again became partially blocked with lymphoid



tissue, and the test in July 1937 showed that his hearing was more impaired on the right side (chart 4). Three weeks after the second radium treatment, 2 gram minute application over each eustachian tube, acute otitis media developed in the right ear and his hearing in both ears became worse than before the irradiation. This was probably due to the irritating beta

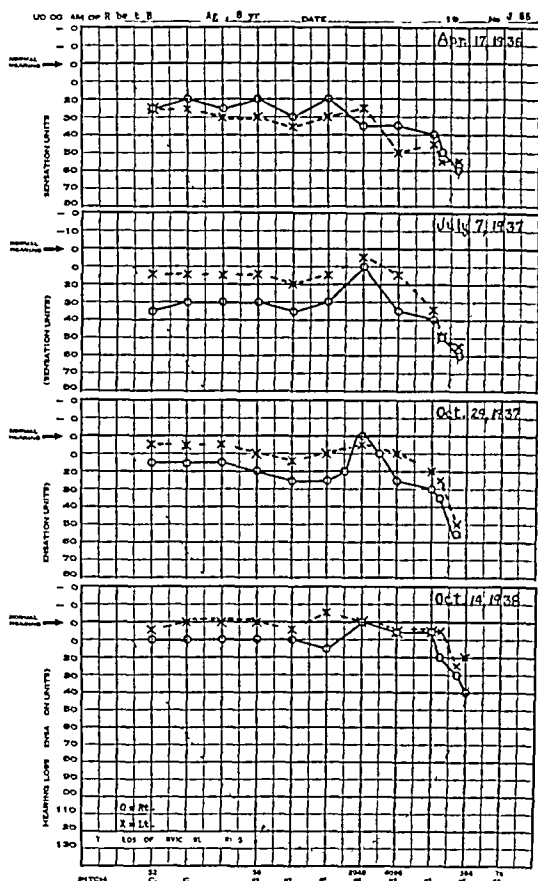


Chart 4 (case 2)—It was unusually difficult in this case to keep the eustachian tubes clear of lymphoid tissue. Frequent radium treatments over a period of two years were necessary to restore the hearing. We shall continue to examine the child every six months and give further radium treatments if necessary.

rays. The applicator either was held too close to the orifice of the tubes or was improperly screened. Since then the patient's hearing has gradually improved (chart 4, October 1937-1938), although he has had no further treatment of any kind.

The patient is now 11 years of age, is in excellent physical condition and rarely has a cold, and his upper air passages, including the pharyngeal orifices of the eustachian tubes, are normal in every way. His hearing is so nearly normal on both sides that he has no difficulty in school work.

CASE 3—E O., a girl, probably began to have impairment of hearing in infancy, although it was not noticed until she was 8 years of age. She had otitis media at the age of 2, and at this time her tonsils and adenoids were thoroughly removed. The ears stopped discharging after this operation, but she continued to have difficulty in breathing through her nose. When first seen in the outpatient department of the Johns Hopkins Hospital, in April 1935, she was 7 years old but the true nature and implications of her trouble were not recognized. Her nasal mucous membranes were congested, her nose was filled with discharge, and nodules of hypertrophied and infected lymphoid tissue were seen on the lateral and posterior walls of her pharynx, but on palpation no enlarged adenoids were found. Both tympanic membranes were retracted but otherwise looked normal. It was thought that her trouble was due to a sinus infection. She was difficult to examine and treat and did not return until a year later. She came then because her teacher had noticed that she was partially deaf.

At the second examination her hearing was found to be markedly impaired (chart 5, April 1936). The low tones were

heard better than the high tones. None of the tones above 2,896 double vibrations on the right or 5,793 double vibrations on the left were heard at the maximum intensity of the audiometer. The 512 double vibration fork was not heard by bone conduction. She was then examined under general anesthesia with a nasopharyngoscope. The adenoids in the midline of the nasopharynx were not enlarged, but the orifices of the eustachian tubes were completely covered with nodules of lymphoid tissue, similar to those in the pharynx.

The lymphoid nodules on the lateral and posterior walls of the pharynx were removed and at a later date the region around the pharyngeal orifice of the tubes was treated with radium. The hearing improved, the nasal congestion and discharge disappeared and the audiometer test made about fourteen months later showed approximately normal hearing for both ears (chart 5, June 1937).

This case alone refutes the universally accepted idea that such an extreme degree of deafness, with the high tones more affected than the low tones and a total loss of hearing by bone conduction for the 512 double vibration fork, is always due to an inner ear or nerve lesion. The child had no treatment of any kind aside from the operation and the irradiation of the pharyngeal end of the tubes, but hearing for 4,096 double vibrations and

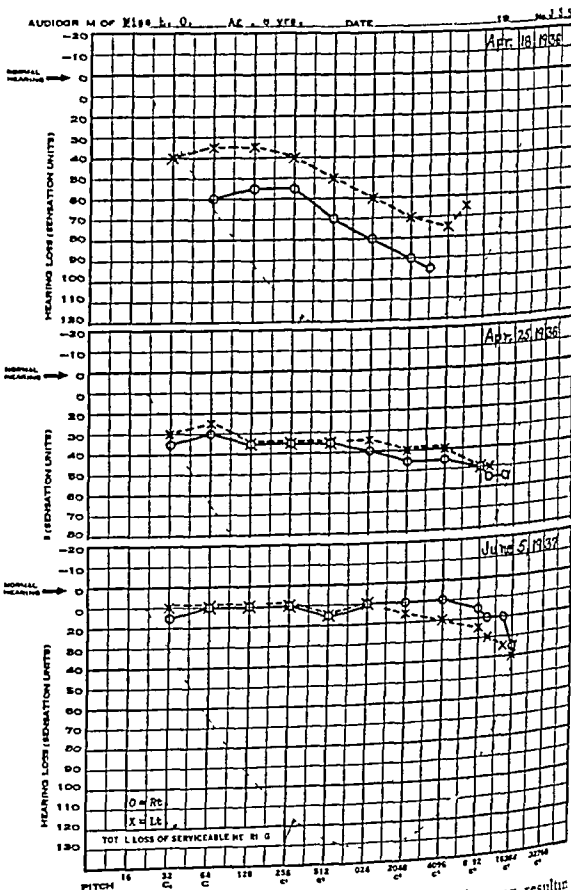


Chart 5 (case 3)—The most striking improvement in hearing resulted from irradiation of eustachian tubes obstructed by lymphoid tissue. The hearing test of April 18 1936 was typical of an inner ear or nerve deafness. The higher tones were not heard by air and the 512 double vibration fork was not heard by bone conduction. In June 1937 the hearing was good for all high tones by air and normal by bone conduction.

all higher tones returned almost to the normal level. When the entire series of cases is considered, showing the hearing in all stages of impairment for high tones and for bone conduction and its return to the normal level, it is certain that the interpretation of hearing tests must be radically revised. An apparently hopeless deafness can be cured if it is recognized and treated early but

is incurable if allowed to progress until secondary changes in the middle ear embed the ossicles in scar tissue and adhesions

CASE 4—R S, a boy aged 11 years, was brought to the outpatient department in October 1935 because of progressive impairment of hearing for three years. He had never had

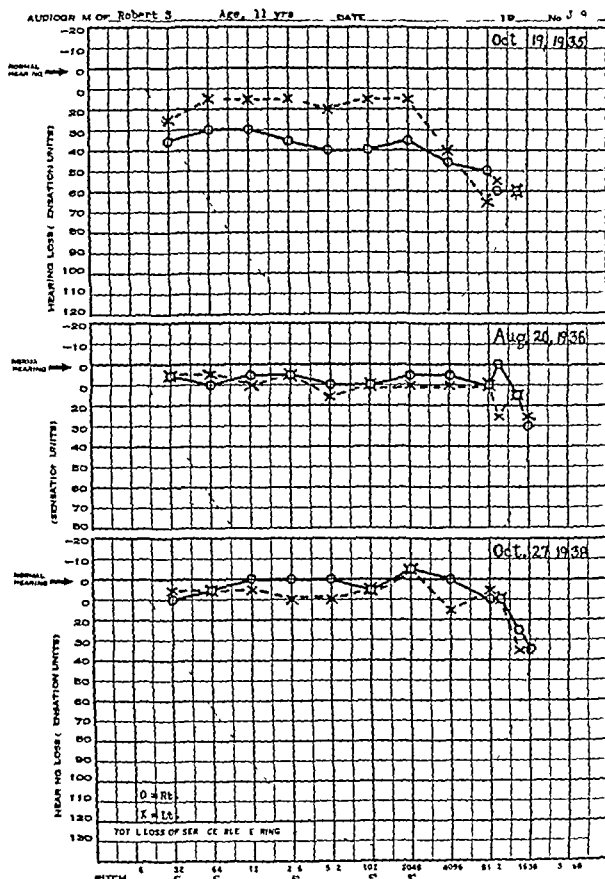


Chart 6 (case 4)—The impaired hearing in October 1935 was due to partial obstruction of the eustachian tubes with lymphoid tissue. The audiograms for the right and left ears differ markedly. The tubal obstruction and middle ear changes are more advanced on the right. The audiogram for the left ear when compared with chart 2 and with the audiograms of March 30 1934 in chart 3 and April 19 1936 in chart 5 shows that deafness begins with the high tones and progresses by involving one octave after another toward the low end of the scale

an ear infection but was a mouth breather and had had occasional attacks of tonsillitis. There was no history of deafness in the family. The general physical examination showed nothing abnormal except in the ears and upper air passages. The tonsils were enlarged and the orifices of both eustachian tubes completely covered by an overgrowth of lymphoid tissue. The tympanic membranes were much retracted but otherwise normal. No evidence of sinus infection was seen.

The first audiometer test in October 1935 showed an impairment greater on the right for low tones but very severe on both sides for all high tones above 2,048 double vibrations (chart 6). It is noteworthy that the hearing was better by air than by bone and bone conduction for the 512 double vibration fork was greatly shortened. Ten days later the tonsils and adenoids were removed. The patient was not seen again until April 1936 when his mother brought him back because his hearing had failed to improve. No audiometer test was made at this time but on examination with the nasopharyngoscope it was seen that the eustachian orifices were still occluded with lymphoid tissue. He has had only one radium treatment (April 1936) with a nasal applicator screened with brass for 15 gram minutes on each side. The second audiometer test in August 1936 showed normal hearing in both ears (chart 6). The nasopharynx and tubal orifices were normal. When the patient was seen in October 1938 his hearing was good both subjectively and objectively (chart 6). It is noteworthy that

as hearing improves the hearing for the highest tones is the last to reach the normal line. We have repeatedly observed that with children the highest tones are the first to be affected during the earliest stage of partial obstruction of the eustachian tubes by an overgrowth of lymphoid tissue.

The first diagnosis was a combined middle and inner ear deafness, but the absence of improvement in the six months following the removal of the tonsils and adenoids and the very striking improvement following irradiation shows that this diagnosis was incorrect. One radium treatment cleared away the lymphoid tissue around the tubal orifices. With the restoration of function of the tubes the hearing for conversation returned to normal, and it has remained so for more than two years. Hearing for some of the high tones has improved as much as 60 decibels. If a partial obstruction of the tubes is not corrected during childhood it is certain that later in life permanent deafness will result from irreparable changes in the middle ears.

This boy is now 14 years old and has good hearing in both ears, and now that he has passed the age of excessive lymphoid hyperplasia there is every reason to think that his hearing will remain good.

CASE 5—J H, a boy, had increasing deafness, which made it impossible for him to keep up with his class at school and frequent colds and mouth breathing, and the school physician advised his parents to have his tonsils and adenoids removed. This was done, but very inadequately, in the spring of 1937. During the next year the symptoms all became worse. His hearing was so poor that the school authorities transferred him to a special class for handicapped children where he was taught lip reading. We first saw him in June 1938 and found that his tonsils had been partially removed, that the pharyngeal orifices of both eustachian tubes were completely obscured with

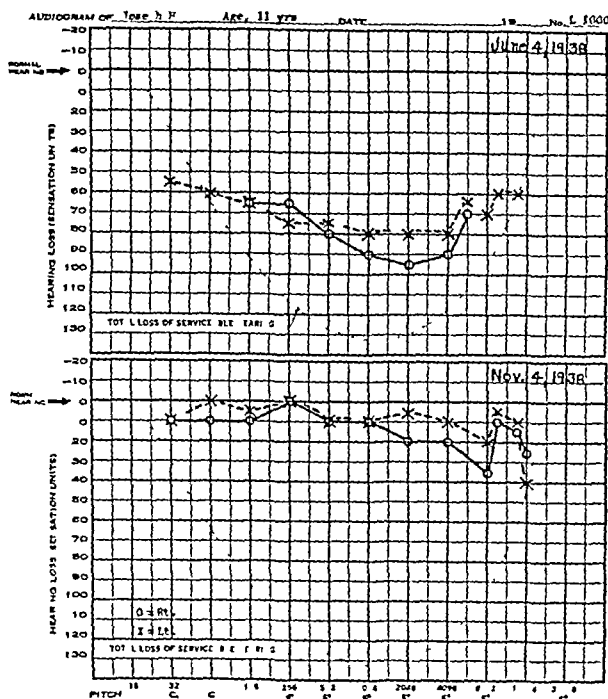


Chart 7 (case 5)—The spectacular improvement resulted from adenoidectomy, followed by radium treatment of the remaining hyperplastic lymphoid tissue around the orifices of the eustachian tubes. A year before our first examination the patient had been transferred to a special school for deaf children and taught lip reading. Now he is back with normal children and doing well in his studies.

nodules of lymphoid tissue and that the tympanic membranes were intact but markedly retracted. He was almost totally deaf (chart 7 June 1938). He failed to hear the high tones by air conduction at the maximum intensity of the audiometer or a 512 double vibration steel fork at maximum intensity by bone conduction. The observations were typical of severe inner ear deafness.

The remaining tonsil and adenoid tissue was removed, together with the hypertrophied lymphoid nodules on the posterior and lateral walls of the pharynx. Later the lymphoid tissue in and around the eustachian tubes was treated with radium. An applicator containing 147 millicuries was passed along the floor of the nose and held over the eustachian orifices for fifteen minutes on each side, a dose equivalent to 22 gram minutes of radium. The ears were not inflated at any time. Within a week the hearing began to improve and when the second audiometer examination was made eighteen days after the first test his hearing was found to be practically normal on both sides for air and bone conduction. At our request the patient's mother brought him back for an examination in November 1938, just five months after the operation and irradiation. During this short period he had been transformed from a dull, listless, almost totally deaf child who had been in a lip-reading class for nearly a year to a bright, alert, healthy looking boy with good hearing in both ears (chart 7 November 1938). At the beginning of the school year in September, he was put back into a class of children with normal hearing and is doing good work. At the first examination he did not hear the higher tones even at the maximum intensity of the audiometer or the monochord and heard nothing by bone conduction. The improvement shown by the second examination has been maintained and extended particularly for bone-conducted sounds. We can offer no explanation of the latter phenomenon. The only objective finding to explain it is the disappearance of the lymphoid tissue in and around the pharyngeal orifice of the eustachian tubes. The only adults in whom we have seen a comparable improvement in hearing for air and bone conduction had Meniere's disease.<sup>4</sup> In these patients the eustachian tubes and middle ears were normal and the improvement was spontaneous and not the result of any form of treatment.

This case emphasizes the necessity for a revision of diagnostic methods for differentiating middle and inner ear lesions and proves that in children an apparently hopeless deafness may be cured.

#### SUMMARY

A long-continued partial obstruction of the eustachian tubes in children causes retraction of the tympanic membranes, impaired hearing for high tones with relatively good hearing for low tones, and sometimes a total loss of hearing by bone conduction. This revolutionary statement is based on detailed observation of sixty children, in some cases for ten years. In all of them the pharyngeal orifices of the eustachian tubes were partially occluded with nodules of lymphoid tissue. This condition in the nasopharynx is identical with granular pharyngitis but is more difficult to see. The location of the hyperplastic lymphoid tissue interferes with the normal function of the tubes. The most satisfactory method of treatment is irradiation with radium or roentgen rays. After the hyperplastic lymphoid tissue has been reduced and the tubal orifices look normal when viewed with the nasopharyngoscope, the hearing for high tones and for bone-conducted sounds often returns to the normal level, and it remains there so long as the eustachian tubes are clear. After a cold the original condition may recur, with consequent loss of hearing. This proves that impairment or even total loss of hearing for high tones and for bone conducted sounds does not necessarily imply an inner ear or nerve lesion.

Complete obstruction of the eustachian tube causes acute middle ear symptoms and often abscess. Partial obstruction in children causes a progressive loss of hearing, beginning with the high tones and gradually involving the low tones. If the causal condition is recognized and properly treated before the age of 15, hearing usually returns to somewhere near the normal level.

After this age the results are far less satisfactory, because hyperplastic lymphoid tissue and partial tubal obstruction usually date from early childhood. After the age of 15 the secondary changes in the middle ear may be so advanced that they can be repaired by no treatment whatever.

Irradiation does not permanently remove hyperplastic lymphoid tissue, but relatively small doses, which in no way injure the pituitary gland, nasopharyngeal mucosa or inner ear, keep it in abeyance during the age period in which it grows most actively.

We conclude from our studies that the most common type of middle ear deafness in adults begins during childhood. It often progresses so gradually and insidiously that it may not become evident, i. e., the frequency range of speech is not involved, until it is too late to correct the primary trouble and restore the hearing. We feel that if school children in the primary grades were examined with a nasopharyngoscope at least once a year and those with hyperplastic lymphoid tissue in and around the orifice of the eustachian tubes were treated with radiation as often as necessary to insure normal functioning of tubes, the number of deaf adults in the next generation could be reduced by 50 per cent.

## HORSE SERUM NEURITIS

WITH REPORT OF FIVE CASES

A. E. BENNETT, M.D.

OMAHA

While the potential dangers of immediate and delayed reactions following parenteral administration of horse serum are well recognized by the medical profession, the possibility that serum sickness may result in serious complications is not as well known. One of the most serious sequels following prophylactic and therapeutic injection is horse serum neuritis.

Serum sickness, a delayed type of reaction, occurs from six to fourteen days after the injection of horse serum. It is in no way dependent on atopic, hereditary sensitiveness or anaphylaxis (artificial sensitization by previous injections that at times causes immediate, life endangering reactions). Serum sickness probably would occur in all cases if enough serum were given. Local itching, swelling, generalized urticaria, fever, enlargement of lymph glands, polyarthritides, general malaise, leukopenia, albuminuria, fall of blood pressure and decreased coagulability of the blood make up the complete clinical picture.

The severity of the reaction varies greatly. The cause is in no way understood. Size of the dose, age and degree of purification and concentration, type of bacteria, peculiarities of serum from certain horses and route of administration are factors, but the exact cause of the sickness is not known.

In a small minority of cases, neurologic complications occur at the onset or height of serum disease. While cerebral, meningeal and spinal lesions occur, the commonest involvement is in peripheral nerves. Also in a large percentage of cases the nerves from the cephalic part of the brachial plexus (fifth and sixth cervical roots) are involved.

From the Department of Neurology, University of Nebraska College of Medicine.  
Read before the Section on Nervous and Mental Diseases at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 17, 1938.

## SYMPTOMS OF SERUM NEURITIS

Within a few hours after the onset of serum sickness and generalized urticaria, severe neuritic pains develop. The pains usually involve the neck, shoulders, arms and legs and are so severe that analgesic and opiate medication gives little relief. Flaccid paralysis occurs within a few hours to a day or two and it is followed by gradual atrophy of muscles. Muscle tenderness, hyperesthesia and dull pains persist for several weeks. The neurologic signs, depending on the neural segments involved, consist of motor paralysis, atrophy, at times fibrillations, sensory loss and reduced or absent reflexes.

## PATHOGENESIS OF SERUM NEURITIS

Just as the exact cause of serum disease is not known, the exact cause of the occurrence and localization of serum neuritis is not known. Early authors, for example Richardson,<sup>1</sup> offered the explanation of a direct toxic action of serum on nerves. Others for example Bourguignon<sup>2</sup> and Pessin,<sup>3</sup> have favored the theory that protein toxins affect muscles innervated by nerves of low or medium chronaxia. Most writers—Kennedy,<sup>4</sup> Young,<sup>5</sup> Allen,<sup>6</sup> Kraus and Chaney,<sup>7</sup> Wilson and Hadden<sup>8</sup>—offer the more plausible theory of perineural urticaria and edema producing a compressive or ischemic paralysis of nerve trunks or peripheral nerves.

The common site of involvement of the upper brachial nerves (fifth and sixth cervical nerves) producing the characteristic Erb-Duchenne scapulohumeral palsy is not explained. The largest percentage of reported cases are of involvement of the suprascapular nerve combined at times with involvement of the axillary nerve or long thoracic nerve, all from the fifth, sixth and seventh cervical nerves. To explain this localization there must be some localized anatomic condition similar to the compressive neuritis of Bell's facial palsy or the compression of the scalenus anticus muscle associated with cervical rib neuritis. Associated with serum sickness are intense vasodilatation and edema of skin, muscles, bursae and joint tissues. Perineural urticarial compression of these nerve trunks for a few hours could produce the palsy.

It seems possible that this edematous process may occur in the intervertebral foramina, bony grooves or perineural sheaths of the roots or nerves, interfering with the blood supply and causing impairment of nutrition or anoxemia with temporary nerve cell and fiber death. The experiments of Garcin and Bertrand<sup>9</sup> and Dechaume and Croizat<sup>10</sup> with animals showed, after repeated anaphylactic shock phenomena of vasodilatation, perivascular infiltration and at times minute

hemorrhages with cellular destruction and marked meningeal reactions. Increased lymphocytosis has been observed frequently in the spinal fluid during the serum sickness stage. Possibly then a combination of a vascular disorder and edematous compression accounts for the neuropathologic picture of complete peripheral nerve palsy and muscular atrophy. The anterior horn motor neurons must be unaffected, because complete regeneration usually occurs.

Another etiologic factor is age. Almost all reported cases have been in adults, the average age being 26. Men are more frequently affected than women. In over half the reported cases the complication has followed the prophylactic use of tetanus antitoxin, but practically all types of horse serum antitoxin have produced it.

## REVIEW OF LITERATURE

Most of the reported cases are from France, about seventy to 1938. Twenty-nine authentic cases have been found in the English literature, ten have been reported from Germany and a few isolated ones from Denmark,<sup>11</sup> Italy, Poland, Rumania, Japan and Switzerland. Approximately 115 cases have been reported. It is difficult to be exact, because many complications from vaccine therapy and other allergic manifestations with neurologic complications are included in some reports. These are not true post-serum sickness neuritis.

The first accurate case reports were made by Grudiere and Gangolphe<sup>12</sup> in 1908, Thaon<sup>13</sup> in 1912 and Vincent and Richet<sup>14</sup> in 1911 in France. The first American case was reported by Richardson<sup>1</sup> in 1917, Dyke<sup>15</sup> of England in 1918 described a typical case, in which the neuritis followed the prophylactic injection of tetanus antitoxin for war injuries. Lhermitte<sup>16</sup> reporting in 1919, stimulated renewed interest in France. The many succeeding authentic case reports have been summarized best by Kennedy<sup>4</sup> in the United States, Allen<sup>6</sup> in England in 1931, Young<sup>5</sup> in the United States in 1932, Doyle<sup>17</sup> in the United States in 1933, Vogel<sup>18</sup> in Germany in 1935, Roger and Poursines<sup>19</sup> in 1932, Mignot<sup>20</sup> in 1936, Kraus and Chaney<sup>7</sup> in 1937, Schipkowensky<sup>21</sup> in 1937 and Chavany and Askenazy<sup>22</sup> in 1936.

## TREATMENT

*Prophylaxis of Serum Disease*—There is no known method of desensitization to prevent serum sickness nor any way of detecting susceptible persons, as with atopic or anaphylactic types. The only sure prophylaxis would be the substitution of other animal serums.

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- 13 Thaon P Neuritis Following Prophylactic Injection of Tetanus Antitoxin *Re de med* 32 749 (Sept) 1912 cited by Wilson and Hadden<sup>8</sup>
- 14 Vincent C and Richet C Forme atypique de la maladie de serum accidents tardies et graves *Bull et mem Soc med d hop de Paris* 32 670 1911 cited by Doyle<sup>17</sup>
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- 16 Lhermitte J Paralyse After Serum Treatment *Paris med* 1 221 (March 8) 1924 cited by Young<sup>5</sup>
- 17 Doyle J B Neurologic Complications of Serum Sickness *Am J M Sc* 185 484 492 (April) 1933
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- 19 Roger Henri and Pourcin Yvires Les formes polyneuritiques des paralysies sero-therapeutiques *Arch de med gen et coloniale* 1 65 78 1932 cited by Kraus and Chaney<sup>7</sup>
- 20 Mignot Rene Paralysie due a plexus brachial apres serotherapie antidiphtherique *Presse med* 44 883 884 (May 30) 1936
- 21 Schipkowensky Nikola Schindigungen des Nervensystems bei Serumkrankheit *Arch f Psychiat* 106 779 792 1937
- 22 Chavany J A and Askenazy H Reflexions a propos d'un cas de paralysie post sero-therapeutique *Gaz med de France* 13 361 370 (April 15) 1936

for horse serum.<sup>23</sup> The development of tetanus immunization by alum-precipitated toxoid would eliminate the larger percentage of complications.<sup>24</sup>

*Prophylaxis of Post-Serum Sickness Neuritis*—It appears to me to be much more feasible to prevent the serious complication of neuritis or at least the extreme atrophic types by early recognition. The development of neuritis can be detected early by the characteristic neuritic pains following generalized urticaria. Shoulder, joint or muscle pains sufficiently severe to require opiates are suggestive of radical involvement. Measures directed toward reducing vasodilatation and urticarial swelling should reduce the perineural edema and lessen residual neural damage. Intravenous injections of hypertonic sucrose or dextrose solution and artificial hyperpyrexia (103 to 104 F for two hours) or blanket sweat packs with pilocarpine would dehydrate muscle, joint and neural structures, relieve pain and tend to restore normal nerve function.<sup>25</sup> Repeated injections of epinephrine, which are so effectual in relieving urticarial swelling, probably lessen nerve damage.

*Treatment of Neuritis*—After the serum sickness stage the treatment is largely symptomatic. An abduction splint and complete rest of the arm are indicated during the acute stage. General nutritive and vitamin therapy may be of value. Local and general heat therapy relieves neuritic pain, muscular tenderness and hyperesthesia, which may persist for some weeks. After the hyperesthetic stage, physical therapy such as massage and electrical stimulation similar to the treatment for poliomyelitis, are indicated.

#### PROGNOSIS

Patients having profound atrophy within six weeks after serum disease are slowest to recover. However, even those with advanced atrophy and absence of electrical reactions tend to recover. About 20 per cent are left with residual weakness and atrophy, especially of the deltoid muscles. The large majority recover in about six months. Recovery occurs as late as eighteen months after injury.

#### MEDICOLEGAL ASPECTS

The medicolegal aspects are of extreme economic importance, as in a large percentage of cases the neuritis develops after industrial wounds and prophylactic administration of tetanus antitoxin. It is directly the result of the treatment administered for the accidental wound and is compensable. Insurance companies have to accept this fact and recognize the risk, since physicians must give prophylactic injections of tetanus antitoxin. However, greater care can be exercised by the physician in giving prophylactic serum only for dirty or penetrating wounds. Patients who have previously had neuritis are particularly susceptible to reactivation with serum sickness.<sup>18</sup> An explanation of the symptoms of serum sickness should be given to the patient with instructions to call the physician if severe neuritic pains develop in order that he may administer early curative treatment.

23 Fantus Bernard and Feinberg S M. The Therapy of Horse Serum Reactions. J A M A 107 1717 1719 (Nov 21) 1936. Paschla Gunther. Was kann von Privatzirlicher und staatlicher Seite zur Verhütung unerwünschter Serumreaktionen getan werden. Deutsche med Wchnschr 63 1016 1018 (June 25) 1050 1051 (July 2) 1937.  
24 Gold Herman. Active Immunization of Normal Persons with Tetanus Toxoid Alum Precipitated Refined. J A M A 109 481 484 (Aug 14) 1937.  
25 Bennett A E and Cash Paul T. Relief of Neuritic Pain by Artificial Fever Therapy. Arch Phys Therap 19 69 74 (Feb) 1938.

In an attempt to obtain facts concerning the compensation experience of leading insurance companies, a questionnaire was sent to eighteen companies or commissions. Replies were received from eleven companies. Six said that they had had no experience relative to complications following serum sickness. Two replied that they had had claims for this type of disability, but no facts were given. One stated they had had one serious claim, but the facts were unobtainable. The Travelers Insurance Company, through Dr James C Graves, supplied data concerning two typical cases of palsy of the upper brachial nerves following tetanus prophylaxis. One patient recovered in five months, with compensation of over \$500. The other had not recovered since July 1937, he was still being carried on the basis of a 50 per cent disability of the arm, and the total amount of the claim was not stated. Another company reported a case in which brachial neuritis on the right side, with aphasia, occurred at the height of serum sickness following prophylactic injection of tetanus antitoxin, the disability lasted six months, with an approximate compensation cost of \$2,000.

Finally, physicians should avoid indiscriminate injections of horse serum antitoxins which are nonspecific in their action or of which the therapeutic value is questionable, for example antistreptococcus, antistaphylococcus or antigonococcus serums. Other therapy less dangerous had better be substituted.

Only by a more general knowledge of the facts regarding neurologic complications of horse serum inoculation can the physician remove these unfortunate sequelae.

#### REPORT OF CASES

CASE 1—J M, a youth aged 16, July 4, 1933, received a burn of the left hand from a firecracker. The family physician treated it and injected 1,500 units of tetanus antitoxin into the left deltoid region. Seven days later generalized urticaria, malaise, fever and joint pains developed. Very severe pains, persisting for about six weeks, occurred in the right elbow, shoulder and arm. Two days after the onset the patient was unable to lift the right arm. He was referred for neurologic examination about August 4. At that time he complained of loss of weight and numbness of the right shoulder region. He had received an injection of diphtheria toxin antitoxin at the age of 13. There was no history of an allergic tendency.

Examination disclosed marked atrophy with complete loss of motor power of the deltoid, supraspinatus and infraspinatus muscles of the right shoulder. There was also moderate weakness of the right biceps. Loss of pain and touch sensation was present over the deltoid area. The biceps reflex was diminished. Extreme muscular tenderness was present over the atrophic muscles and brachial plexus. No response was elicited by faradic stimulation of the atrophied muscles.

Local diathermy treatments to the right arm and shoulder were given, together with analgesic medication. The patient's arm was kept at complete rest. After about three months the motor power gradually returned and the muscle atrophy disappeared, and by the end of about six months the muscles appeared normal. A complete neurologic examination four years later, Dec 29, 1937, revealed no evidence of residual weakness, atrophy or reflex disturbance. Recovery from a severe grade of serum neuritis of the upper part of the brachial plexus was complete.

CASE 2—W J, a man aged 56, Sept 27, 1935, received a severe laceration and compound fracture of the right ankle and leg from a mowing machine. Fifteen hundred units of tetanus antitoxin was injected into the arm muscles. Because of the severity of the injuries, the patient was referred to a surgeon in a city hospital. Cultures of material from the wounds revealed *Bacillus welchii*, and 60 cc of gas bacillus antitoxin was given. The patient was critically ill for two

weeks, with a temperature as high as 106 F. About October 15 a serum reaction, generalized joint pains and urticaria, with a temperature of 100.5 F, developed. At the same time severe pains through the right shoulder, arm and hand, with numbness along the ulnar distribution, and tremor of the hand occurred. Muscular wasting of the shoulder muscles and small muscles of the right hand gradually developed.

Physical examination, with otherwise essentially negative results, revealed focal infection of the teeth and tonsils gen-

eralized undernutrition and an open, draining wound in the right leg. Neurologic examination showed nothing abnormal except in the right upper extremity.

Motor power was markedly reduced in all the shoulder muscles, especially the supraspinatus, infraspinatus and deltoid. Motor weakness was also present in the biceps and the muscles of the forearm, with one-half inch to an inch of atrophy. The hand grip was reduced and abduction and adduction of the fingers were lost. Marked atrophy of the shoulder girdle and intrinsic hand muscles was present. Hyperesthesia in the shoulder and arm muscles was present, otherwise the

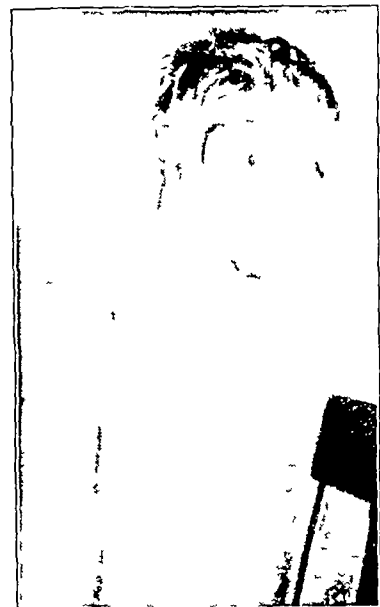


Fig 1—Marked atrophy of the right supraspinatus, infraspinatus and deltoid muscles.

sensory examination gave negative results. The biceps and triceps reflexes on the right were still present but were markedly diminished.

The patient recovered from the fracture and wound of the ankle. Gradually the neuritic pains subsided after about three months, motor power gradually returned and the muscular atrophy disappeared. Reexamination six months later revealed almost complete functional recovery from the fairly complete serum neuritis of the brachial plexus.

CASE 3—R. G., a man aged 26. March 2, 1937, punctured the left hand with pruning shears. Fifteen hundred units of tetanus antitoxin was injected into the left upper arm muscles. The wound healed without infection. Eight days later severe pains developed in the right shoulder region. The patient was confined in bed for two days and complained of generalized aching throughout the body, especially the joints, and had a slight cutaneous eruption. The severe shoulder pains continued, the patient gradually losing the ability to raise the right arm from the side. In about six weeks he noted wasting of the shoulder muscles. As the pains lessened he attempted to work but was unable to use the right arm. He had also noted an area of numbness over the right upper arm. About 15 pounds (7 Kg) loss of weight occurred and at times the left shoulder muscles were painful. The patient received no special treatment for five months and a diagnosis was not made.

The past history was unimportant. No atopic tendency was present and the patient had never received an injection of serum.

Physical examination August 13 gave essentially negative results. Neurologic examination, except for the upper extremities, revealed nothing abnormal. On inspection gross atrophy of the right side of the shoulder girdle was apparent (fig 1). The deltoid, supraspinatus, infraspinatus and teres muscles were almost completely absent. The patient was totally unable to elevate the right arm, backward extension was very weak. The remainder of the arm muscles were in normal tone. The sensory examination revealed nothing abnormal except extreme

tenderness of muscles and nerve trunks. A few fibrillary twitchings and myxedema were seen. The reflexes were all present. The left shoulder muscles were painful to pressure and muscular irritability was present on percussion, otherwise the left upper extremity was normal. Faradic stimulation elicited no muscular contraction from the atrophic muscles.

The patient was hospitalized August 16 and six artificial fever treatments three hours at a temperature of 103 to 104 F were given at three day intervals. Prompt and complete relief of pain occurred. A high vitamin diet, with additions of vitamin B<sub>1</sub> and injections of liver extract, was given. After the soreness of the muscles disappeared light massage was given to the atrophic muscles, but otherwise immobilization of the shoulder was carried out. Examinations were carried out every thirty days. The right triceps reflex was gradually reduced until it was absent. The atrophy of the deltoid muscles progressed. The patient gained 10 pounds (4.5 Kg) in weight. Faradic responses were not elicited in the atrophic muscles. Jan 1, 1938, compensation on the basis of 50 per cent permanent loss of function in the right arm was paid the patient. Observation one year after the serum sickness revealed no improvement in the condition.

This patient's neuritic involvement was more severe than that of the other four patients, and he was the only one who failed to obtain a functional recovery. One can only speculate as to whether earlier treatment might have lessened the total disability. The fact that he received compensation for one year and a settlement on the basis of 50 per cent permanent disability of the arm illustrates the economic problem of insurance compensation in industrial cases.

CASE 4—G. C., a man aged 29, Aug 4, 1937, received a nail puncture wound of the foot. Fifteen hundred units of tetanus antitoxin was injected into the left upper arm muscles. One week later mild generalized urticaria occurred with generalized aching. A few hours later very severe pains began in both

shoulders. A physician was called in the night, but in spite of several hypodermic injections of narcotics and strong sedatives he was unable to obtain relief of pain. Within twelve hours after the onset of pain the patient was unable to lift the left arm. The pains gradually lessened in severity but were replaced by a burning sensation throughout the left shoulder muscles. An area of numbness appeared over the left deltoid muscle. Gradually the patient noticed wasting of the left shoulder muscles. A 5 pound (2 Kg) loss of weight occurred. Otherwise the general health remained good. The patient had always had

excellent health, the only previous administration of serum had been for immunization against diphtheria.

Physical examination August 26 gave essentially negative results throughout. Neurologic examination revealed nothing abnormal except in the left upper extremity. On inspection the left shoulder was seen to be grossly atrophic, the left supraspinatus, infraspinatus and deltoid muscles were three-fourths inch smaller than and the left biceps one-half inch smaller than the right (fig 2). The patient was totally unable

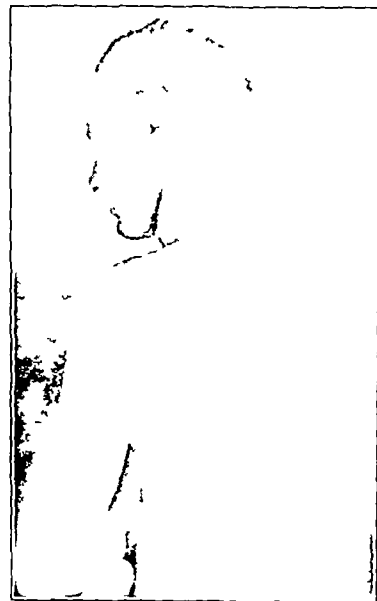


Fig 2—Moderate atrophy of the left supraspinatus, infraspinatus and deltoid muscles.



to elevate the arm or raise the hand to the head. Marked weakness of external rotation and of forward flexion likewise were present. Both biceps and triceps reflexes were present. Marked muscular irritability was present, and the patient was very tender over the shoulder muscles and in the region of the brachial plexus. An area of total anesthesia and analgesia was present corresponding to the left circumflex nerve distribution over the deltoid. The atrophic muscles did not contract on faradic stimulation.

The patient was hospitalized for active treatment. Six artificial fever treatments of three hours, at a temperature of 103 to 104 F., were given at intervals of three days together with vitamin therapy. The neuritic pains, tenderness and anesthesia were entirely gone in three weeks. The patient gained 10 pounds (4.5 Kg.) in weight. The muscular atrophy progressed slightly. Active daily massage was carried on. Four months after the serum sickness the patient showed the first signs of regaining motor power. A definite response to electrical stimulation occurred and he was able to contract the deltoid muscle sufficiently to hold the arm horizontally for a moment. One month later he was able to carry out all movements of the shoulder but the muscles fatigued readily. The atrophy was disappearing. Two months later, about seven months after the injury, slight residual atrophy remained with weakness of abduction, extension and flexion of the upper arm. The patient resumed light manual labor.

The early treatment instituted relieved the acute neuritic manifestations, especially the pain, and probably prevented progression to the extreme atrophic stage of case 3. This may have been an important factor in the recovery. The patient received compensation for seven months, which illustrates the importance of the problem these complications present for insurance companies.<sup>26</sup>

CASE 5—A. L. A., a man aged 26, had always had robust health. At the age of 15 he received antitoxin for diphtheria immunization. Aside from occasional attacks of hives from bee stings and ingestion of fruit, he had no history of allergy.

At the age of 19, Aug. 5, 1931, he received a puncture wound of the foot. Fifteen hundred units of tetanus antitoxin was injected in the left upper arm. Seven days later severe urticaria developed, requiring three hypodermics of epinephrine in five hours for relief. Twelve hours after the onset of urticaria severe pains developed in all four extremities, especially severe in both shoulders and the left arm. After twenty-four hours as the severe pains were subsiding, the patient noted complete inability to extend the fingers and thumb of the left hand. He was also unable to extend the left elbow because of pain and swelling of the joint. The condition lasted one week. The loss of extension of the fingers continued, but extension, pronation and supination of the wrist remained. Numbness over the dorsum of the hand was also present. The only way the fingers could be extended was by complete flexing of the wrist. No muscular atrophy appeared.

The patient received electrical massage for several months. Seven months after the onset of paralysis the extensor power of the fingers returned.

This patient suffered partial radial neuritis after serum sickness and made a complete recovery in seven months.

#### SUMMARY

Horse serum neuritis, a severe sequel of serum sickness, develops at the height of the serum disease, usually one week after the injection of serum. Any type of horse serum can produce it, but in the majority of cases it follows injection of tetanus antitoxin. The neuritic type of pain is classic, and an early diagnosis of the complication can be made.

The cause of serum sickness and its neuritic complications is unknown. Perineural edema producing compressive neuritis seems the logical cause. In a large

majority of cases a peculiar anatomic localization occurs, involving the cephalic part of the brachial plexus (fifth and sixth cervical nerves). About 115 authentic cases have been recorded in the world literature during the past thirty years.

The ideal treatment would be prophylaxis of serum sickness by substitution of other serums for horse serum.<sup>23</sup> Early diagnosis of the neuritic complication with adequate treatment should prevent the severely atrophic types of paralysis. Vigorous dehydrating measures are recommended during the acute stages.

The prognosis for recovery within six months is usually good, but about 20 per cent of patients are left with residual weakness and atrophy. Medico-legal responsibility in industrial or compensation cases must be recognized.<sup>27</sup> Greater care in the administration of serum when tetanus is suspected and avoidance of the use of antitoxins not of proved specific value will cut down the incidence of these unfortunate complications of biologic therapeutics.

#### CONCLUSION

Complete recovery occurred in three cases and incomplete recovery in two cases of neuritis following horse serum sickness. This distinct clinical entity should be more widely recognized by the medical profession. The present knowledge of the pathogenesis and treatment offers possibilities of prevention.

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#### ABSTRACT OF DISCUSSION

DR. WALTER FREEMAN, Washington, D. C. Dr. Bennett has had an exceptional experience in finding five cases in the past six years. The condition occurs relatively often in industrial communities and will continue until the underlying physiology of the serum illness is determined. The theory that the nerves suffer from compression by the swollen tissues is probably the most acceptable one. Here is a difference from certain other kinds of neuritis, for instance the diphtherial neuritis which is often a local condition but which is much more closely related to the site of the injection or the site of the local infection than is the horse serum neuritis. I think Dr. Bennett might emphasize that although these involvements were always in the arm they were by no means always in the arm that was inoculated, whereas in cases of localized wound diphtheria it is the local nerve that seems always to be affected. It is the same way with tetanus itself. Just what the cause of the reaction to this serum is has not been elucidated. While there is a strong element of allergy, the question of blood volume must be considered. If the blood volume is increased beyond the height tolerated by the patient the result is likely to be urticaria. It has been shown by the injection of large quantities of serum and of large quantities even of such an inert substance as acacia. These large quantities can be injected if the person is dehydrated or depleted or otherwise has less than normal blood volume. If he has a normal or a high blood volume, he breaks out into urticaria. The signs of serum sickness resemble those which occur with increased blood volume and they are successfully handled by methods that reduce blood volume. Of those I would emphasize the injections of epinephrine and sweating. These two work rapidly in the reduction of blood volume. Whether Dr. Bennett would like to try hypertonic solution of dextrose on patients with early disease or sweat them right away is a question to be decided later, but certainly the injection of epinephrine in cases in which serum sickness is developing has already been found of great value and I think should be pushed to the limit with patients showing signs of neuritic involvement.

DR. JOHN B. DOYLE, Los Angeles. In the decade between 1920 and 1930 the neurologic literature not infrequently

<sup>26</sup> Examination fifteen months after injury showed residual weakness of the deltoid. The compensation claim was still unsettled.

<sup>27</sup> Wulff<sup>24</sup> Vogel<sup>25</sup> Chavany and Askenazy<sup>22</sup>

described cases of this sort April 17, 1930, I had the opportunity of seeing a man aged 37 who had had a prophylactic injection of serum for scarlatina. Seven days later serum sickness developed. At the height of his pain marked weakness of the right deltoid and scapular muscles developed. Since that time I have had the opportunity of observing two additional cases. Apparently the meninges, the brain, the spinal cord, the nerve roots, the cords of the brachial plexus or the peripheral nerves may be affected. In the majority of cases, however, the brachial plexus has been involved. In a few instances there has been a clinical picture of mononeuritis. Sicard and Cantaloube have offered the explanation that this type of clinical picture is due to edema within the aponeurotic sheath of the affected nerve. To describe the mechanism they coined the term "neurodocitique." In all the cases of involvement of nervous structures associated with the upper limb the disturbance has been of a motor character. In about one fourth there have been additional sensory changes. In the plurality of cases, that is, in thirty of forty-two cases in the series I reported, the involvement was unilateral and purely motor and involved only the fifth and sixth cervical roots or their derivatives. An important clinical point made by Sainton in 1924 is that the process may not involve equally all the fibers of a given muscle but may spare bundles of varying size. This was true in three of the cases which I have encountered. The prognosis is far better than Dr. Bennett might lead us to believe. In his case 3 at the end of a year there was little if any improvement. There are, however, several factors to be considered. First, the patient was not treated at all for five months. During that interval there must have been profound stretching of the muscle. Second, a certain proportion of patient suffering from severe damage may not manifest return of normal sensation until as much as eighteen months has elapsed from the time of onset of symptoms.

DR HYMAN I VENER, Los Angeles. The problem of tetanus is my only reason for any comment regarding this excellent presentation. My experience with several hundred cases has convinced me of the grave seriousness of this disease. The California State Department of Health for the years 1920-1935 reported a fatality rate of approximately 75 per cent for a group of 1,000 cases. It is time the profession took cognizance of the situation. The occurrence of neuritis may be used as an excuse for withholding prophylactic antitoxin. Unfortunately, tetanus cannot be forecast. The apparent innocence of a wound is no criterion of the future result. The disease must be prevented by proper debridement and administration of prophylactic antitoxin. Over many years of active management of clinical tetanus, with an average dose per case of approximately 225,000 units of serum, I have not seen a patient, during hospitalization, in whom this complication developed. Some questions may arise. Was the refining process of the serum faulty? Was the serum used in all cases manufactured by the same biological firm? Could such mishaps have been avoided if the serum had been given intradermally and in divided doses? Is the problem one of individual susceptibility? Progress is being made in the manufacturing process to avoid just such untoward serum reactions. Tetanus toxoid is an excellent product, especially for allergic persons. However, there are too many variable factors to warrant dogmatic statements. Most studies conducted have dealt with adults, whereas the greatest incidence is among children. In man the amount of toxin that will cause clinical symptoms is not known, nor is the duration of immunity conferred known so each case must be judged on its merits. When one is in doubt prophylactic antitoxin should be administered. I hope that the problem will be solved in the near future and the occurrence of such cases as cited further diminished. The comparatively few complications following the administration of prophylactic antitoxin should not deter us from using it. When we consider the thousands of doses used daily for the prevention of the disease which, once it occurs, has an extremely high fatality rate, we must rely on our clinical judgment and exert every possible precaution.

DR HENRY R VIETS, Boston. My experience is based on observation of seven cases, most of them in the last three years. As I remember my war experience, a great deal of horse

serum was given and serum neuritis was rare. My observations on this subject are practically the same as Dr. Bennett's, with one or two exceptions. In the first place, it does not seem to make any difference where the horse serum is injected. In all my cases the principal nerves involved were the fifth and sixth cervical roots and strangely enough, all on the right side. Dr. Bennett, I think, had three on the right and two on the left. Another striking thing is that in not all of my cases was the serum sickness severe. In two cases that I can recall it was slight. That differs a little from Dr. Freeman's report. There is marked atrophy of the deltoid and supraspinatus muscles, in spite of the fact that, in my experience, all patients have recovered almost entirely without any treatment. I have not used the treatment that Dr. Bennett suggests. I feel, therefore, that this syndrome of neuritis limited to the fifth and sixth cervical roots after administration of horse serum is perhaps increasing and it is wise to have a paper of this type before this section so that all physicians will keep this disease in mind.

DR TOM B THROCKMORTON, Des Moines, Iowa. If I recall correctly, the injections in Dr. Bennett's cases followed only small or trivial traumatic conditions, whereas the case which came to my attention some years ago was that of a farmer who, while climbing a ladder into the hay loft, fell, striking on his head and shoulders. He had a slight concussion of the brain and his right hand was injured. He was afterward given the antitetanus and anti-gas gangrene serums, and after this weakness of the shoulder girdle on both sides developed. The question which came up in a study of his compensation was whether the weakness was traumatic as the result of the fall injuring either the spinal cord or, more particularly, the spinal root or whether it was a serum neuritis from which he probably would eventually recover. I saw him within the last year. He has made some improvement, but he still has distinct muscular atrophy of the shoulder girdle on both sides and more particularly on the side on which the infection was more pronounced.

DR LEOPOLD BRAHDY, New York. I have had one case of special interest in connection with this paper. The patient was given prophylactic tetanus antitoxin, paralysis developed on the left side, with left wrist drop, and he made a complete recovery after a few months. Three years later he received a second injection, the paralysis recurred, but this time there was no recovery—the lesion is permanent. I have followed him now for more than three years and there is no improvement. There was a marked alcoholic background in this case and I wish to ask Dr. Bennett to comment on whether an alcoholic basis was in evidence in his cases.

DR L. H. ZIEGLER, Wauwatosa, Wis. This is a timely and interesting study. I have observed two cases similar to those presented by Dr. Bennett in the last two or three years. I should like to present exceptions to the suggestion that the manifestation may be entirely explained by allergy. One often gets off the track when one sticks to a single etiologic concept too tenaciously. The persons who have been given this serum have usually been treated for a wound or some other illness which may have had some relation to the complication. The paralysis sometimes develops in the arm not inoculated. This should make one suspicious that something else may be going on. It is interesting to note that in four of the five cases that Dr. Bennett has presented the onset was in the summer during the poliomyelitis season. I do not mean to imply that this disorder is poliomyelitis. Studies of spinal fluid have not been made and little is known as yet about the pathology of the nervous system. However, there may be some relation to other disorders such as an association of lesions of the nervous system with intraspinal anesthesia and damage to the nervous system from infections such as cowpox. I have a feeling that the explanation for these complications of serum prophylaxis may be due to some unusual local toxin or virus which has some relation to the lymphatic vessels of the peripheral nerves and perhaps the central nervous system.

DR A. E. BENNETT, Omaha. I am glad Dr. Freeman brought out that the reaction is systemic and not local and is not dependent on the site of injection in any way. Dr.

Doyle's remarks about the prognosis, I think, are well taken. I could not determine accurately from the literature the percentage of persons who did not recover. There seemed to be a definite residual group, although many have not been followed long enough to justify certainty of this, and I have not been able to follow enough cases personally to be certain of it. Dr. Vener's remarks concerning the infrequency of complications in treating tetanus were extremely interesting. Under my observation at present is a young woman who, being treated for tetanus, received 300,000 units at the height of her serum sickness, complete transverse myelitis developed almost overnight and she is not going to recover. The condition is permanent with her. It seems to me that there must have been intensive vascular involvement of the spinal cord in this case. I noticed recently in *THE JOURNAL* a report of a case of tetanus treated with 2,000,000 units of tetanus antitoxin. I feel that is an unnecessary amount of serum to be given to a patient. Dr. Viets's experience with cases of mild serum sickness is interesting. I noticed in the literature a few such cases reported. I am glad to hear that all these patients have recovered completely. Dr. Brahdy's observation of a reactivation by a second injection is important. This has been reported a number of times and is in my paper, but I could not bring it out. With regard to Dr. Ziegler's remarks, examinations of spinal fluid have been made in a number of these cases in the early stages. They show increased cell counts and protein contents.

## PRIMARY CARCINOMA OF THE URETER

WITH REPORT OF SEVEN CASES

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AND

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The rarity of primary carcinomas of the ureter, together with the fact that they are often not even suspected, warrants the presentation of six proved cases and a probable seventh case. Caulk,<sup>1</sup> in his compiled series, together with Hunt<sup>2</sup> and others, found less than 7 per cent of renal tumors primary in the pelvis, while Thomas and Regnier<sup>3</sup> in 253 collected cases of carcinoma of the renal pelvis and ureter found 15 per cent primary in the ureter. These figures suggest that about 1 per cent of carcinoma of the upper part of the urinary tract originate in the ureter.

### HISTORY

Wising and Bliv<sup>4</sup> in 1878 reported the first authentic case with a microscopic diagnosis, an instance of medullary carcinoma with metastasis to retroperitoneal nodes, rectum and perineum. Up to 1900, eight cases had been reported, in all of which the diagnosis had been made at autopsy. Shortly after this, Albarran,<sup>5</sup> Gerstein<sup>6</sup>

and Heresco<sup>7</sup> each made preoperative diagnoses of ureteral tumor by observing a papillary growth projecting from a ureteral meatus. A decade later, in 1912 a diagnostic sign was described by Chevassu and Mock,<sup>8</sup> who called attention to the free bleeding often provoked by the light touch of a ureteral catheter. The first case from the Mayo Clinic was reported in 1921 by Judd and Struthers.<sup>9</sup> In 1924 Kretschmer<sup>10</sup> reviewed the subject and reported a case. In 1930 Rousselot and Lamont<sup>11</sup> were able to collect fifty cases of primary malignant process in the ureter, adding a case. In 1931 Renner<sup>12</sup> reported finding three primary ureteral carcinomas in 13,854 autopsies in five years at the Vienna Pathologic Institute. In the same year Chauvin and Cerati<sup>13</sup> presented a comprehensive study and reported a case. In 1933 Colston<sup>14</sup> reported two cases from 22,000 urologic cases at the Brady Institute at Johns Hopkins Hospital. The first case from the files of the Massachusetts General Hospital was reported by Snyder and Wood<sup>15</sup> in 1933. In 1934 Scott<sup>16</sup> and Lazarus<sup>17</sup> each presented a study and compilation of cases, bringing the total to sixty-eight. Bergendahl<sup>18</sup> of Sweden in the same year presented his summary, with a total of seventy-six cases. In 1936 Schilling and Sondervorst<sup>19</sup> made a thorough study of the literature, presenting two cases and tabulating 113 of cancer of the ureter. In 1938 Rusche and Bacon,<sup>20</sup> reporting two cases, compiled forty of benign and ninety-six of malignant neoplasms. When ten cases not tabulated in any of these summaries (table 1) and our six cases are added, the number of cases of primary cancer of the ureter is 139. Thus in the past eight years eighty-nine cases have been reported, as against fifty in all previous records.

### CLINICAL AND PATHOLOGIC FEATURES

**Age**—The youngest patient was 22 and the oldest 89. There were three in the twenties, seven in the thirties, twenty-six in the forties, thirty-eight in the fifties, forty-four in the sixties, eighteen in the seventies and three in the eighties.

**Symptoms**—The basic triad is hematuria, pain and mass. Hematuria was noted in ninety-seven or 70 per cent, of the 139 cases, in eleven there was no bleeding, and in thirty-one bleeding was not mentioned. The duration of bleeding was under three months in thirteen cases, from three to twelve months in thirteen, from one to two years in four and over two years in nine.

Pain is next in point of frequency (table 2). It occurred in eighty-four, or 60 per cent, of the cases and was noted to be absent in only eleven cases. Its

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From the laboratories of the Collis P. and Howard Huntington Memorial Hospital and the departments of urology and pathology, University of Southern California School of Medicine.

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duration varied from less than three months to many years. It is most commonly a dull ache in the region of the kidney but occasionally a colicky ureteral pain. When the tumor invades the neighboring organs and muscles, pain is constant and sometimes referred to the solar or hypogastric plexus. Extension to pelvic organs causes a perineal ache referred down the legs. Sciatic pain may be severe. Involvement of the bladder may cause intense dysuria. Bone metastasis has its type of pain. In Hunt's case the process metastasized to the brain and was explored as a brain tumor.

The tumor palpated is nearly always the hydronephrotic kidney. It is possible, however, for the kidney to be completely obstructed and not enlarged, as in our first case. It is rarely possible to palpate a tumor of the upper part of the ureter. In our case 4 a tumor of the midureter was palpated, and in cases 2 and 3 a fixed stony mass was felt by rectum above the prostate.

**Urine**—Cases have been reported in which the urine was normal, but red blood cells are probably always present at some time. Pus is generally present, since infection commonly occurs sooner or later. When the growth is papillary, tumor cells or even fragments of growth may be found occasionally.

**X-Ray Examination**—On the flat plate an enlarged renal mass is often distinguishable. Coincident stones may rarely appear, but they seem to have little etiologic significance. Metastases in the lungs and bones should be looked for.

**Cystoscopic Examination**—It is important that this be done while the bleeding is in progress, as a leading point is won by visualizing the bleeding meatus. This was observed in twenty-six of eighty-one cases in which cystoscopic examination was performed (table 3). One should note the character of the jet. Blood from the kidney or upper part of the ureter is likely to be ejected in normal spurts, while a bleeding tumor in the lower part of the ureter will give a feeble spurt, often only a drip. The meatuses may appear entirely normal or there may be congestion or pouting on the affected side. Tumor tissue was observed to project in thirty of seventy-eight cases. The projecting tumor may so obscure the meatus that it is impossible to determine whether it originates in the ureter or at the edge of the meatus. A tumor may peep through the meatus only during ureteral peristalsis, or a telltale bulge may occur at that time. Observation of the ejection of indigo carmine may make more plain the alteration of the peristaltic jet or its absence.

With a great proportion of ureteral tumors there is a complete block, and no catheter or bougie will pass beyond the tumor. This was observed in fifty cases. Chevassu and Mock in 1912 called attention to bleeding through or around the catheter, induced by slight catheter trauma. This was noted in seventeen cases. Of course this is not pathognomonic, since congestion around a stone or a benign lesion may bleed. It is entirely possible for a carcinoma to be present without any bleeding either spontaneous or induced. Marion noted that, while blood might be coming through the ureter, a catheter passing beyond the tumor might drain off clear urine. Blood, however, may retrograde from the tumor to the renal pelvis.

**Urograms**—Excretory urograms usually show no dye in the affected side. They may faintly outline a hydronephrosis or, rarely, show a normal kidney on the affected side. The excretory urogram is inadequate to outline satisfactorily a ureteral filling defect. A catheter

may not enter. It may not be possible, even with a Garceau catheter, to distend the lower part of the ureter. However, with a tight catheter in the lower part of the ureter and the patient in the Trendelenburg position, a gravity flow with the least induction of spasm may give a satisfactory urogram. Serial pyelograms after Moore's<sup>21</sup> method are desirable to show constant filling defects. Clots may cause a false filling defect. Rusche and Bacon obtained a clear picture of a filling defect due to a ureteral tumor by passing a ureteral catheter to the pelvis, drawing it down and injecting at different levels, with a picture of each. Air pyelo-urograms were advocated by Neuwirth<sup>22</sup> in 1924. If the medium passes the obstruction a hydronephrosis is seen with a ureter dilated down to the tumor. If the obstruction is not passed, the medium may distend an atonic ureter. If the catheter does not fit snugly, only a cystogram may result.

TABLE 1—Cases Reported in Addition to Those Listed in the Tables Compiled by Schillings and Sondervorst and Rusche and Bacon

Reference	Age Sex	Diagnosis	Pathology
Cross John B. J. M. A. Georgia 20 123 (April) 1931	48 ♂	No urologic examination	Solid carcinoma lemon size involving iliac vessels
Ito Seitaro Ztschr. d. Japan Chirurg. Gesellsch. 36 64 1933	63 ♀	Hydro nephrosis	Papillary carcinoma middle and lower third
Taylor W. N. and Kuehn C. A. Tr. North Central Br. Am. Urol. A. September 1936 p. 40	54 ♂	Tumor of ureter	Papillary carcinoma grade 2 lower half
Ibid	71 ♀	Tumor of ureter	Papillary carcinoma grade 3 in middle third
Gilbert J. B. Am. J. Surg. 36 710 (April) 1937	61 ♀	No urologic examination	Squamous cell carcinoma lower third
Lyall Alexander Brit. M. J. 2 961 (Nov. 13) 1937	57 ♀	No urologic examination	Papillary carcinoma entire ureter no hydronephrosis
Marion and Kogan Mll. J. d. urol. 41 364 (April) 1937	60 ♂	Tumor of ureter? Stone	Papillary carcinoma middle third
Maycock P. P. and Baurys William Pennsylvania M. J. 40 933 (Aug.) 1937	52 ♂	Cancer of ureter	Papillary carcinoma lower 2 cm
O'Brien H. A. J. Urol. 77 49 (Jan.) 1937	61 ♀	Papillary carcinoma of ureter	Papillary carcinoma grade 1 lower two thirds
Parker Geoffrey J. d. urol. 75 38 (Jan.) 1938	61 ♂	Tumor of ureter	Pedunculated papillary carcinoma middle third low grade

The form of filling defect may be (1) a ringlike obstruction, narrow or wide, (2) a single pedunculated or sessile mass or (3) a ragged, moth-eaten condition from papillary involvement, which may extend the whole length of the ureter. The only pathognomonic sign of primary ureteral tumor is a characteristic and constant filling defect, together with a pyelogram excluding renal neoplasm. Periureteral growths, traction and inflammation have not been a source of error. Coincident stone has caused error.

It must be borne in mind that a bleeding papilloma may be so small, no bigger than a grain of wheat, that it produces no obstruction to a ureteral catheter, no filling defect, not even a palpable mass when the ureter is exposed surgically. If a nephrectomy has been done for bleeding and the kidney does not explain the source prompt ureterectomy is indicated unless benign ureteral disease is demonstrated. Many operations have been done with the expectation of finding a renal neoplasm. At a second operation the ureteral cancer was removed. Peacock<sup>23</sup> recently reported a case in which another

<sup>21</sup> Moore T. D. Consideration of Ureter in Serial Pyelogram South M. J. 27 823 (Oct.) 1934

<sup>22</sup> Neuwirth K. Vienna Urologic Society Ztschr. f. urol. Chir. 25 477 1928

<sup>23</sup> Peacock Alexander. Personal communication to the author

surgeon had removed the kidney, leaving a ureteral tumor, which by delay had become inoperable Table 4 summarizes the diagnoses made in the reported 139 cases

*Pathology*—In the cases so far reported, the lower end of the ureter has been by far the commonest place for the tumor to appear, eighty-five of the tumors having been located in the lower third, twenty-three in the middle third, twenty in the upper third, six in the

TABLE 2—Pain with Ureteral Carcinoma

Incidence		Duration of Pain	
No pain	16	Less than 2 months	14
Renal	60	3 to 12 months	22
Pelvic	17	1 to 2 years	2
Renal and pelvic	3	Over 2 years	12
Ureteral colic	3	Duration not stated	13
Epigastric	1		
Unstated	29		

entire ureter, two in the middle and lower thirds and one in the upper and middle thirds No location was given in two cases All degrees of involvement of the ureter from small localized lesions to massive involvement of long segments have been reported, in many cases one third or more of the ureter was involved Because of marked differences in the terminology used, it is difficult to classify some of the tumors accurately However, the tumors closely resembled those in the bladder, and, of the 139 reported, seventy-five were papillary, sixty were some type of solid, nonpapillary tumor, three were reported as adenocarcinoma and one was unclassified There is insufficient evidence for us to agree with the authors who reported the adenocarcinoma Small papillary growths mentioned here and there in the literature are often classified as benign tumors, but none of these are included in our summary of the literature However, from experience with tumors of the bladder, we feel that these should be considered as low grade malignant processes, since recurrence is such a common clinical experience

A satisfactory grouping is as follows

1 Papillary carcinoma

(a) The so-called single pedunculated papilloma, sometimes called benign

(b) The single pedunculated solid appearing carcinoma which distends and blocks the lumen Such carcinoma show microscopically some papillary structure

(c) The single papillary carcinoma with a sessile invaded base

TABLE 3—Cystoscopic Data

Number of cases studied	81
Ureteral tumor visible	30
Ureteral tumor visible only during peristalsis	2
Bleeding from meatus	26
Congested meatus	7
Impassable obstruction to catheter	50
Catheter trauma (Chevassu and Mock)	17
Blood from meatus clear urine from catheter above tumor	3
Associated tumor of bladder	6

(d) The diffuse papillary carcinoma showing multiple growths, often extending nearly the entire length of the mucosa of the ureter Such carcinomas may or may not thicken the underlying wall very much

2 The solid, nonpapillary carcinoma which begins as a localized lesion This may continue as a localized diffuse thickening of the wall, but it commonly grows so as to thicken markedly the wall and involve its entire circumference It is notoriously invasive and spreads commonly for considerable distances in the wall of the ureter and often into neighboring tissues

It is possible that, as in the bladder, the tumor may start as a papillary growth which invades the underlying wall, the superficial papillary portion may slough away because of interference with the blood supply, and the remaining tumor may be considered a solid, nonpapillary invasive tumor when seen with the naked eye

Many histologic classifications are given in the literature, but a simple classification similar to that used for cancers of the bladder appears most satisfactory The tumors can therefore be classified as papillary and nonpapillary growths and the latter graded numerically as squamous cell neoplasms according to Broders' classification On the whole, the cancers reported have shown approximately the same histologic patterns and the same degrees of malignancy as would be expected in a series of cancers of the bladder

TREATMENT

All authorities agree that the treatment of choice is early surgical extirpation, which means nephrectomy and ureterectomy

For forty-four nephro-ureterectomies in one stage the mortality was 40 per cent, while for twenty-two nephro-ureterectomies in two stages the mortality was 5 per cent

TABLE 4—Diagnosis in 139 Cases

Tumor of ureter	34	Ureterocele	1
No diagnosis	34	Prostatic hypertrophy	1
Hydronephrosis	7	Prostatic abscess	1
Tumor of kidney or ureter	6	Rectal cancer	1
Tumor of kidney	6	Dermoid cyst	1
Stone in ureter	3	Osteosarcoma of the ileum	1
Tumor of bladder	4	Tumor of the ovary	1
Tumor or stone in ureter	3	Salpingitis	1
Tumor of gastrointestinal tract	2	Cancer of undetermined origin	1
Retrosclerous tumor origin?	2	Stricture of ureter	1
Tumor in pelvic organs	2	Tuberculosis of ureter	1
Ectopic kidney	1	Intestinal or ureteral tumor	1
Pyelonephrosis	1		

If a certain diagnosis has been reached, preoperative roentgen treatment is justified Postoperative roentgen treatment is of some value, particularly to relieve the pain of extension and metastasis

PROGNOSIS

For a total compiled series of 100 operations, the three month mortality was 34 per cent Scott in 1931, in an effort to follow collected cases in which operation was performed, could find only two patients alive after five years One patient reported on by Kraft Vorpahl's 33 patient lived eight years after a nephrectomy and partial ureterectomy and died with general metastasis The growth was squamous Crance and Knickerbocker 34 reported that a patient was well eight years after a nephro-ureterectomy for a nonpapillary cancer

In general the early and the late prognosis are very unfavorable

REPORT OF CASES

Pathologic studies, including surgical and postmortem examination, were done by one of us (A G F) in all the cases except case 6, which was

24 Broders A C Squamous Cell Epithelioma of the Lip A Study of 537 Cases J A M A 74 656 (March 6) 1920  
32 Kraft S Falle von primaren und sekundaren Ureterpapillomen Ztschr f Urol 16 385 1922  
33 Vorpahl K Ueber ein primares Carcinom des Ureters Am J Urol 2 509 1905  
34 Crance A M and Knickerbocker H J Primary Carcinoma of the Ureter J Urol 17 157 (Feb) 1927

provided by Dr Newton Evans and Dr C B Coggin Urologic studies, by one of us (P A F), were performed only in cases 1 and 2

CASE 1—Mrs I M J, white, aged 69 who entered the Huntington Memorial Hospital Feb 27, 1934 had first noted painless hematuria one year before, with complete remission for five months. It recurred and continued in severe form. The hemoglobin content dropped to 66 per cent (Newcomer)

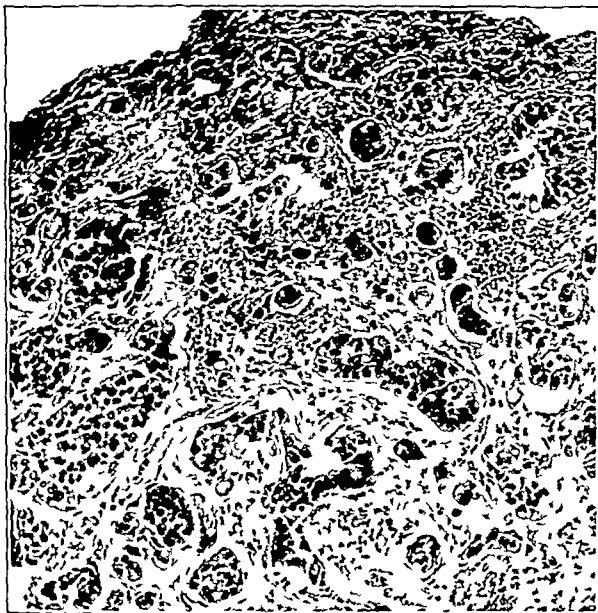


Fig 1 (case 1)—Ureteral wall showing nests of poorly differentiated squamous cells invading widely

She lost 20 pounds (9 Kg) and looked ill. The heart and lungs were normal. The blood pressure was 130/70. The urine showed gross blood, a few pus cells and casts. In the phenolsulfonphthalein test 15 per cent was excreted the first hour and 15 per cent the second hour. Roentgenograms of the kidneys, ureters, bladder and lungs were normal. An intravenous urogram showed a normal left renal outline and no shadow on the right. Cystoscopic examination showed blood trickling from a relaxed right meatus, without spurts. Otherwise the results were negative. No tumor protruded. Indigo carmine was excreted heavily on the left and not at all on the right. Catheters on the right side met with an impassable obstruction below the brim of the pelvis and caused increased bleeding. A ureterogram showed a relaxed right ureter completely obstructed just below the pelvic brim. There was no irregularity of the wall.

The diagnosis was tumor of the right ureter possibly secondary to renal tumor. Through curved loin and right rectus abdominal incisions a right nephro-ureterectomy was done. The tumor was limited to the middle third of the ureter and was adherent to the fascia surrounding the common iliac vessels. The iliac and para aortic vessels were not indurated. As the growth was obviously squamous and not papillary, the mural ureter was not removed. No radiation was given.

The patient lived comfortably for over a year then began to have sciatic pain on the right side and pain in the chest and she died with metastases in the liver and lungs as shown by a nodular liver and a roentgenogram of the chest. No autopsy was performed.

The pathologic specimen consisted of a right kidney and 22 cm of ureter. A segment of ureter 2 cm long beginning at a point 14 cm from the pelvis was thickened to 1.2 cm in external diameter and on section gray homogeneous fairly firm tumor tissue was seen to fill the lumen and to invade the wall. Dilatation of the ureter to 1.5 cm in circumference with moderate thickening was noted above the tumor. Numerous small dilated veins were seen in the mucosa just below

the tumor. Marked simple hydronephrosis with fibrosis and atrophy of the parenchyma, so that it was only 12 or 13 mm thick was present in the kidney, which measured only 9 by 5 by 3 cm.

Microscopic examination showed the tumor to be a solid, nonpapillary, poorly differentiated (grade 3) squamous cell growth (fig 1) arising from and replacing the mucosa and infiltrating the entire wall in various-sized nests, about which moderate fibrosis was present. The tumor cells were medium sized, noncornified squamous cells varying much in size and shape and showed many mitotic figures. Portions of the ureteral epithelium not involved by the tumor showed slight squamous cell metaplasia. The kidney showed simple hydronephrotic atrophic and fibrotic changes.

The diagnosis was solid, nonpapillary, poorly differentiated squamous cell carcinoma (grade 3) of the lower end of the ureter, 8 cm from the bladder, with complete obstruction, moderate hydro-ureter and marked hydronephrotic atrophy and fibrosis of the kidney.

CASE 2—J L, a white man aged 82, who entered the Huntington Memorial Hospital March 4, 1938, claimed that he had had good health up to one month previously, when he began to have vague abdominolumbar pain on the left side with gross hematuria and loss of weight and strength. Ten years previously a benign prostatic growth had been removed suprapubically. There was fullness without tenderness in the left renal fossa. The prostatic bed was firm and above it on the left was a hard, fixed mass. The blood pressure was 160/80. Roentgenograms of the kidneys and bladder showed nothing abnormal except ill defined density in the left renal area. An intravenous urogram showed a normal right side but no dye on the left. Cystoscopic examination with spinal anesthesia showed the bladder neck high and fixed. Many clots were evacuated. The right meatus appeared normal but the left could not be visualized on account of a tumor mass which seemed to elevate the floor of the bladder on the left and to invade it as a mass 2 cm in diameter where the meatus should have been. Biopsy showed an invasive squamous tumor consistent with vesical or ureteral origin. A diagnosis of cancer of the ureter was made.

Bleeding was controlled by coagulation, but the next day the bladder was again filled with clots. After transfusion the left kidney and 16 cm of the ureter were removed. The kidney was greatly distended with clear urine. The tumor of the



Fig 2 (case 2)—Wall of ureter showing papillary portions and areas of squamous cell differentiation

ureter extended from the pelvic brim underneath the bladder so extensively as not to be operable even to stop hemorrhage. Despite coagulation hemorrhage continued and the patient died six days later.

The surgical specimen showed by gross and microscopic examination a simple profound hydro-ureter and hydronephrosis with atrophy and fibrosis of the renal parenchyma. The ureter averaged from 23 to 28 mm in circumference. The kidney measured 11 by 5.5 by 3 cm.



be more slowly secured. The transduodenal method is carried out with too little inconvenience to the patient or consumption of time for the physician to persuade one to trade a reasonably certain method for a doubtful one.

In no case has freedom from worms been recorded on the evidence of normal stools alone, it is insisted that examination of the duodenal fluid must repeatedly show negative results. It is believed that at least some of the cases reported in the literature as instances of rid-dance of worms would not have been so classed had duodenal drainage been done.

#### MOP-UP CAMPAIGN

My experience convinces me that riddance of infestation is not assured unless a thorough systematic cleaning-up program is instituted. The carpets and rugs must be either dry cleaned or exposed to the sun's rays for several days. Wearing apparel not damaged by heat should be boiled, other garments should be dry cleaned. Floors should be scrubbed with soap and hot water. The floors of cellars and outbuildings, if earthen, should be covered with lime, if wood they should be scrubbed with soap and water. Household pets, dogs and cats, should be either killed or treated. Examination of the

#### Results of Gastric Analysis in a Case of Strongyloidiasis

	60 minutes	75 minutes	90 minutes
Time of removal	60 minutes	75 minutes	90 minutes
Amount aspirated	10 cc	15 cc	60 cc
Free hydrochloric acid	0	16	10
Combined hydrochloric acid	8	26	16
Organic acids	12	14	28
Total acids	20	56	54
Blood	0	0	0
Mucus	1 plus	1 plus	2 plus
Bile	0	0	0

water supply has shown no ova in my experience. Examination of every member of the family should be searchingly done. It does not seem reasonable to conclude that the family will escape after one member becomes infested.

#### REPORT OF CASE

*History*.—A single woman aged 33, born and reared on a farm, had the usual diseases of childhood without complications, and at 19 appendicitis with rupture before operation and a slow convalescence covering some twelve months. The menses began at 13 and continued normally. Her maximum weight was 128 pounds (58 Kg) at 25, her current weight ranged from 98 to 100 pounds (44.5 to 45.4 Kg).

She was seen in consultation with Dr J. C. Hartman, the family physician, and Dr Lamar Neblett, surgeon, having been admitted to St Anthony's Hospital with a tentative diagnosis of "surgical abdomen." She had been ill for one year, with a poor appetite, nausea, occasional vomiting, unlocalized pain in the abdomen, abdominal distention and tenderness of a low grade, loss of weight and strength, a tendency toward constipation and an almost daily headache.

*Examination*.—She appeared undernourished with dry, atonic skin and flaccid muscles. There was low grade cervical adenopathy. An adenoma was present at the junction of the isthmus and the left lobe of the thyroid. The lungs showed no active abnormality. There were no neurologic signs of diagnostic significance. There was a marginal infection of the gums, and the tonsillar crypts contained cheesy exudate. Generalized abdominal tenderness was present, most marked in the lower part of the epigastrium and below the umbilicus, the liver was not palpable, but there was low grade tenderness on heavy percussion. The cecal head was palpable and tender,

the sigmoid flexure, spastic and tender. Peristalsis was audible and accentuated by palpation. By percussion the spleen measured 8 by 9 cm.

Urinalysis showed no abnormality except an occasional hyaline cast. A blood count showed 4,200,000 erythrocytes, 14,800 leukocytes and 85 per cent hemoglobin, the color index was 1, and there were 62 per cent polymorphonuclears, 24 per cent lymphocytes and 14 per cent eosinophils. The results of fractional gastric analysis after a test meal are shown in the accompanying table.

The duodenal contents showed *Strongyloides* larvae (motile) and adult worms, the feces (obtained by saline purgation), *Strongyloides* (actively motile) and occult blood.

*Clinical Course*.—Thymol, carbon tetrachloride, santal, oil of chenopodium, dihydranol and gentian violet were used in turn. With some the duodenal contents showed a disappearance of larvae for a few days only, with as many appearing at subsequent study as before treatment. Observations were made in the laboratory to determine the killing strength of some, in fact most, of these chemotherapeutic substances. Solutions of salicylic acid (1:100) lessened motility definitely, but complete cessation was not obtained if the specimen was kept on a warm stage. Iodine was then tried, and an almost spectacular change was noted in less than one minute. The worm would rapidly lose motility and straighten out and could not be restored. There was little difference in effectiveness between tincture of iodine and compound solution of iodine. The latter was selected for use. It was given through a transduodenal tube. Larvae recovered from the duodenum and in the feces were motionless and eventually determined to be lifeless. This proved only a temporary disappearance, however, as larvae were recovered when the patient returned in two weeks. The term temporary disturbance is emphasized for in this patient and four other members of her family adult worms and larvae were again found in two weeks. Only after a thorough clean up campaign, followed by a course of compound solution of iodine given by tube were permanent negative results charted.

The patient gained weight, from 105 pounds (47.6 Kg) on discharge from the hospital to 129 pounds (58.5 Kg) in April 1936.

#### SUMMARY

Strongyloidiasis is a more frequent infestation than the profession appears to believe.

Its diagnosis rests ultimately on the finding of parasites or larvae in the duodenal contents and feces.

Iodine has been found the most satisfactory agent for removal of the worms.

A series of nine cases were studied as a basis for the conclusions reached on the efficacy of treatment.

The criteria on which the conclusion of permanent riddance of infestation was based were repeatedly negative results of study of the duodenal fluid and feces.

#### ABSTRACT OF DISCUSSION

DR THOMAS T. MACKIE, New York. Dr Simpson did not have time to discuss certain important aspects of the life cycle of this parasite. The adult female penetrates the mucosa of the intestine, often creating extensive tunnels in the host tissue. These are superficial to the muscularis mucosae. Viable larvae are produced which usually are passed in the stools as the rhabditiform or noninfective form. The infective filariform larvae may likewise be produced in the host's intestinal tract. These invade the tissue, are transported to the lungs by the blood stream and ultimately reach the intestine by way of the esophagus and stomach when they grow to maturity. There is therefore the possibility of continuous hyperinfection. A parasite capable of producing such anatomic changes in the intestinal mucosa from duodenum to rectum may be responsible for disease. Unfortunately, most if not all of the studies of the clinical significance of this parasite have been insufficiently controlled. Persons harboring the *strongyloides* have necessarily been exposed to infection by numerous other intestinal parasites, helminthic and protozoal, to say nothing of bacterial. I have seen many

infected persons in Central America. Without exception they presented mixed infections, harboring in addition ascarids, hookworms and various types of protozoa. I have not seen intestinal disease which could with certainty be ascribed to strongyloides infestation. It is highly important to continue the clinical studies of this infection. They must be controlled by complete studies of the helminthic and protozoal load and by cultures for pathogenic bacteria. Although I do not feel competent to discuss therapy of this infection, it is relevant to point out that certain combinations of iodine are relatively efficient amebicides.

## MANAGEMENT OF PROSTATIC DISEASE IN PERSONS PAST 75

A REPORT OF SEVENTY-FIVE CASES WITH  
END RESULTS

ALF H. GUNDERSEN, M.D.

LA CROSSE, WIS.

In a recent paper read before the Wisconsin Urological Society on transurethral prostatic resection for bladder neck obstruction, I discussed the general problem of prostatic disease. I also carefully analyzed 100 consecutive cases of resection and compared them with 100 cases of total enucleation. The mortality rate was a flat 2 per cent for the resection group, and, remarkably enough, the two deaths occurred in relatively young men, aged 61 and 65, respectively. There were no deaths among the fifty-two patients over 70. This was encouraging and argued strongly for resection for the aged person with prostatic disease, particularly in view of the repeatedly proved fact that the mortality in any enucleation group rises sharply after the age of 70 (in my series of 100, up to 18 per cent).

The very aged, who formerly preferred either to carry on with their suffering or, in many cases, to continue with catheterization, are now seen in the urologic wards of hospitals as willing patients, electing resection rather than continuance of the uncomfortable and oftentimes painful existence which inevitably led to death. The surgeon who formerly refused to operate on the aged because of the grave risk involved with prostatectomy is now confident of his ability to benefit that group through transurethral resection. As time has gone on, with subsequent improvements of technique and armamentarium and shortening of operating time, the courage and confidence of the resectionist have increased.

During 1937 I had a relatively large group of the very aged, the total being thirty-two patients over 75 years of age. The results were so uniformly satisfactory that I was prompted to analyze them in detail, particularly in view of the fact that there was only one death in the group. The analysis brings home more forcibly than ever the fact that the experience of the operator is by far the most important factor in obtaining good results with transurethral resection. Not only was there but one death in this group in 1937, but the end results were uniformly more successful and the complications more rare. For the entire series of seventy-five patients the average age was 79½ years, 35 per cent were past 80, and two were past 90.

During the early period of transurethral resection there was apparently a great deal to be learned. It became evident that the total operating time had to be cut down. To subject a man of 80 to one hour of

urethral trauma is entirely too much. One should strive to operate rapidly and to finish the entire resection in from forty to fifty minutes. Loss of blood weakens the aged rapidly. A supportive transfusion shortly after the operation is helpful in combating shock. This is resorted to more frequently now than in the past. In the 1937 group 70 per cent had one or more transfusions. Adequate continued control of bleeding throughout the operation is of great importance.

Flocks's<sup>1</sup> and Alcock's contributions to our knowledge of the blood supply of the hypertrophied prostate have been used to advantage in operative technique. By cutting downward deeply at 7 o'clock and at 5 o'clock to the floor of the bladder, one is in a position to fulgurate the large feeding arteries to the subcervical portion and the middle lobe of the hypertrophied gland. The remaining intravesicular projections, except the anterior lobe, then become relatively avascular. In my experience the most difficult hemorrhage to control is that which occurs at the apex of the prostate, near the verumontanum. Cutting here is deferred until the very last of the operation, after all other bleeding is stopped. Occasionally in my efforts to make lateral excavations I have cut into the surgical capsule of the prostate. In so doing one may encounter large venous sinuses which are extremely difficult to control, in fact, on two occasions recently I could not stop the bleeding by coagulation. With this type of hemorrhage a traction bag is invaluable. The slightest traction on the bag will promptly stop the bleeding. This adjunct to the urologist's armamentarium has doubtless saved many lives. The new 5 cc retention type of catheter has done away with adhesive tape fastenings. It permits free drainage of urethral pus incident to the presence of the catheter. Its use has become a routine.

As I pointed out in a previous paper the irrigating fluid at the end of the operation must come back clear or a very very pale pink. Bleeding will only obstruct the catheter and disturb the entire convalescence. Irrigations of the catheter have rarely been necessary in my experience but must always be resorted to immediately by a trained attendant if a clot obstructs the eye of the catheter. Constant uninterrupted drainage of the catheter is by far the most important single item in convalescence.

Adequate removal of all obstructing tissue is a cardinal factor of success in the management of prostatic obstruction. It is even more important with the very aged than with the younger person. Inability of the urine, usually infected, to pass freely over the cut surface of the posterior portion of the urethra leads not only to severe toxemia but frequently to sepsis and disaster. Inadequate removal necessitates a second resection in an already weakened person, which is frequently the straw which breaks the camel's back. Every effort should be made to complete the operation in one sitting. The second resection is often poorly tolerated and when necessary must be undertaken only when the patient is afebrile and definitely on the mend, not when he is going downhill. If the patient is unable to void freely, it may mean that the operator has overlooked hypertrophy of the anterior lobe. This is best diagnosed with the retrospective lens, the use of which is important to successful resection. However, obstructing tissue projecting into the very outlet of the created

<sup>1</sup> Flocks, R. H. The Arterial Distribution Within the Prostate Gland. Its Role in Transurethral Prostatic Resection. *J. Urol.* 37: 524 (April) 1937.

funnel near the verumontanum may also be overlooked. These obstructions result from undermining of the lateral lobes with the loop and failure to remove the prostatic tissue high in the lateral lobes low down in the posterior portion of the urethra. When the catheter is removed, they fall downward into the apex of the cone. In my early experience, for fear of injuring the external sphincter I made this error frequently. Hyperplastic prostatic tissue in cases of large adenoma may bulge into the posterior part of the urethra from the lateral lobes, even after what appears to be a large and adequate resection (from 30 to 50 Gm). As Flocks<sup>2</sup> has shown, such hyperplastic masses have been deprived of their main source of blood, the intra-urethral arteries. They not only cause partial or complete obstruction but are a common cause of continued sloughing, infection, urinary frequency and sometimes encrustations. Healing and epithelization of such bulging tissue masses is necessarily slow and accounts for many of the poor results and delayed healing. If one is to be successful, one must be radical, bearing in mind that in results the perfect resection approaches complete transurethral prostatectomy.

As I pointed out before, I make every effort to carry out an aseptic technic in the preoperative, operative and postoperative care of the patient with prostatic disease.

I am convinced that the careless introduction into the obstructed bladder of an aged man of foreign organisms to which he has no immunity is dangerous. Particularly is this true when the bladder and the posterior part of the urethra are severely traumatized as they are by transurethral operations, when relatively ineffective drainage by catheter is used. I have no proof that an aseptic technic speaks for less severe reactions and the avoidance of pyelonephritis, because so many other factors are involved in the evaluation of results, but the rationale is sound.

It had long been my routine to place all prospective subjects for resection on methenamine and ammonium chloride on entry to the hospital. In June 1937 I changed to sulfanilamide as a routine drug. Each patient is given 40 grains (2.6 Gm) each day with sodium bicarbonate and the drug is given throughout the preoperative and immediate postoperative period. If symptoms of toxemia, such as languor, lassitude, cyanosis, weakness, tinnitus, chills and fever, set in, the drug is withdrawn. It is sometimes difficult to differentiate between fever caused by trauma and infection in the urinary tract and fever caused by the administration of sulfanilamide. If the fever is caused by the drug alone, the temperature usually subsides within twenty-four hours after the withdrawal of the drug. I have not yet any definite proof with regard to the value of sulfanilamide as a prophylactic drug against infection following transurethral operations, but I am of the distinct impression that the patients do better, the margin of safety seems greater, the reactions less severe and the incidence of pyelonephritis less. The drug has been found of distinct value late in convalescence in clearing up infection after sloughing has stopped. Other observers, however, reporting large series of cases, have found sulfanilamide of no value as a prophylactic drug against infection and sepsis.

There is still some controversy with regard to preoperative drainage. In the presence of impaired renal function caused by back pressure, improvement after drainage is spectacular and must be carried out before resection is attempted. Furthermore, in the presence of infection with fever, drainage must be instituted. Indiscriminate catheterization or allowing a catheter to remain in the urethra can only do harm to the patient with good kidney function. It has been shown by Cabot and Meland<sup>3</sup> that after a catheter has remained in the urethra there comes a time, usually on the fifth or seventh day, when it often serves to irritate and aggravate the usually low grade infections commonly present in the hypertrophied glands of old men. The patient begins to have fever and becomes mildly toxic. It soon became evident that the patients with good kidney function who had never been catheterized did much better than similar patients in whom drainage with a urethral catheter had been done. Resection carries with it little shock to the cardiorenal mechanism and therefore can be performed without drainage in the majority of cases (in this series of seventy-five, or 66 per cent).

A patient who has had a large distended bladder for a long period, with elevated values for the blood chemistry, must have slow decompression, but, as Thompson has pointed out, resection can be performed successfully on patients with highly elevated values for the blood chemistry provided the daily output is abundant and the nitrogen retention products are reasonably stabilized.

One must always remember that aged persons never do well if convalescence in bed is prolonged. My patients remain in the Fowler position four hours after the operation and are out of bed the following day. On the day of removal of the catheter (second or third) they are encouraged to walk about. They must be made to eat, brandy and nourishing fluids are of value. Often if the patient starts going downhill, the battle is lost, again transfusions must be resorted to.

#### ANALYSIS OF SEVENTY-FIVE CASES

An analysis of the cases shows that in 92 per cent the involvement was primary while in 8 per cent it was recurrent. Three recurrences followed a Caulk cauterization procedure elsewhere, two followed resection elsewhere, and one followed perineal prostatectomy in 1919, suprapubic enucleation in 1924 and finally, after complete obstruction, transurethral resection in 1935.

Preoperative complications were not unusual. Thirty-nine per cent of the patients showed symptoms of uremia with elevated nonprotein nitrogen levels, 67 per cent had grossly infected glands without fever, 22 per cent had infected glands with fever and 11 per cent had clean glands. 32 per cent of the patients came to the hospital with complete obstruction, and 66 per cent were operated on without preliminary catheter or suprapubic drainage.

Microscopic section showed 27 per cent of the lesions to be carcinoma. The average stay in the hospital for all cases was sixteen days. The average amount of tissue removed was 15.08 Gm. Seventy-two per cent of the patients had one resection and 23 per cent two resections.

<sup>2</sup> Flocks, R. H. Local Repair Following Transurethral Prostatic Resection. Its Role in the Clinical Events Associated with This Operation. *J. Urol.* 40: 208 (July) 1938.

<sup>3</sup> Cabot, Hugh and Meland, E. L. The Problem of Drainage in Preparation for Operations for Prostatic Obstruction. *Proc. Internat. Assemb. Inter State Post Grad. M. A. North America* 1932.

Operative and postoperative complications were common during the first three years of my experience. In four cases of hemorrhage reoperation was required for control of bleeding.

The immediate hospital mortality rate was 53 per cent (four patients). One death was due to perforation of the bladder (seen post mortem), one to bronchopneumonia on the tenth postoperative day (seen post mortem), one to pyelonephritis six weeks after operation (seen post mortem).

Eight patients died within one year after leaving the hospital, three of them had carcinoma and died of cachexia. Heart disease claimed two patients, and carcinoma of the stomach and bowel caused the death of the remaining three of this group.

Nine patients have since died of varying causes. Satisfactory function of the bladder was obtained in all cases of this group.

#### Summary of Fifty-Four Questionnaires

1. Are you satisfied with the present condition of your bladder?

51 answered yes

3 answered no { 1 incontinent  
1 partially incontinent  
1 with frequency

2. Does the urine flow freely?

51 answered yes

3 answered no { R Operation 1936  
S Operation 1937  
G Operation 1935

3. How many times do you get up at night?

4 omitted to answer

6 answered not at all

44 answered average 2.4 times

4. Is urination painful to you?

46 answered no

5 answered yes

3 answered slightly { 1 benign disease  
2 carcinoma

5. Is your general health improved since operation?

40 answered yes

2 answered no (carcinoma)

12 omitted to answer

6. Have you gained or lost weight since operation?

2 answered lost

17 answered same weight

28 answered gained (average 15 pounds [6.8 Kg])

7 omitted to answer

Fifty-four of the seventy-five men are still living. Each was sent a questionnaire, and, remarkably enough, answers were obtained from each patient. These are shown in the accompanying table.

#### CONCLUSIONS

A satisfactory result with the aged patient with prostatic disease depends largely on the skill and experience of the operator. Urethral trauma must be minimized by shortening the operating time, hemorrhage must be under control at all times. Supportive blood transfusions should be given more frequently than to younger patients (70 per cent of my group in 1937 received one or more transfusions). Whenever possible, the entire obstruction should be removed in one sitting, a second resection is often poorly tolerated. Asepsis, adequate removal of all obstruction and meticulous care of the draining catheter are even more important in older than in younger patients. I believe that sulfanilamide as a preoperative prophylactic drug against infection is of value. Despite the fact that men over 75 with prostatic obstruction are a precarious lot, resection does hold for them relief from suffering and a comfortable life so far as the bladder is concerned. There will always be a mortality rate, but with care and proper management it can be kept surprisingly low.

## Clinical Notes, Suggestions and New Instruments

### RECURRENCES OF UNDULANT FEVER (BRUCELOSIS) FOLLOWING THE ADMINISTRATION OF SULFANILAMIDE

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Within the past year ten articles in the American and British literature have come to my attention, all reporting uniformly good results in the treatment of undulant fever with sulfanilamide, no case of failure having been recorded. Because of this, and because of the unusually small number of cases reported in any series, along with the danger of the indiscriminate use of this remedy and the belief that a word of warning should be voiced to prevent the overenthusiastic employment of this procedure, I report six cases which have been unsuccessfully treated with large doses of this drug as described in the aforementioned articles.

#### REPORT OF CASES

CASE 1—A white man aged 28 entered the clinic May 3, 1938 complaining of chills, fever, fatigue and aching in the lower part of the back and the calves of both legs.

The patient was a dairy worker and stated that it was his custom to "clean up" the cows, without the use of rubber gloves, after they had aborted, he had carried out this procedure several times during the past year, the last time being about April 1. He also stated that he had drunk a good deal of milk given by infected cattle.

For the two weeks preceding entrance he had had chills and fever at irregular intervals of from twenty-four to forty hours. For the past week he had been unable to perform his duties because of marked weakness, aching and fever.

The patient was fairly well developed, he was lying quietly on the examination table, mentally alert and cooperative. The temperature was 98.2 F, the pulse 84, the blood pressure 114 systolic 80 diastolic. He weighed 155 pounds (70 Kg). The skin was moist and warm. The eyes and ears were normal. The mouth showed evidence of oral neglect with pyorrhea of several teeth. The tonsils were submerged and cryptic, the pillars were not injected. The thyroid was not palpable. The heart and lungs were normal on auscultation and percussion. The abdomen was normal. The reflexes were physiologic. The extremities were normal.

At 4 p. m. on the day he was hospitalized the patient experienced a chill and his fever mounted to 103.8 F and returned to 99 F at 10 o'clock.

Laboratory examination revealed the following: The red blood count was 4,320,000, hemoglobin content 14 Gm, white blood count 5,100. The Kahn reaction was negative. The sedimentation rate was 7 mm in one hour. Undulant fever agglutination was 4 plus in all dilutions to 1:480. The tuberculin reaction was negative with purified protein derivative. The cutaneous test was markedly positive to 60,000 Brucella abortus and Brucella melitensis organisms.

Following a second chill and fever to 103 F the patient was placed on sulfanilamide and given 450 grains (30 Gm) in eleven days, as follows: first day 60 grains (4 Gm), second, third and fourth days 80 grains (5 Gm), fifth day 60 grains, sixth day 40 grains (2.6 Gm) and then 10 grains (0.65 Gm) for five days. The temperature became normal and the patient felt markedly improved on the fourth day. He continued to improve and had no further fever for five weeks, at which time he had a chill and was reported to have a fever as high as 105 F. Following this he had a return of chills, fever, malaise and aching recurring at irregular intervals as before. He was again placed on sulfanilamide as previously, which was likewise accompanied by a remission of symptoms on the fourth day. Immediately after his course of sulfanilamide he was given atabrine 5 grains (0.3 Gm) three times a day for five days on the advice of another physician. Following this the patient was not heard from for three months, but inquiry at this time disclosed that he had recently had a return of his symptoms and was at that time "taking treatment" from an Indian faith healer who "had his temperature down one degree."

CASE 2—A white man aged 26 was brought to the hospital June 4, 1938, in a delirious state and with a temperature of 105 F. The history given by relatives at this time disclosed the following significant facts. The patient had recently been on a fishing trip in an endemic malarial country and had been drinking much milk from a cow known to be "Bang positive."

On physical examination the patient was asthenic, irrational and thrashing about in bed. The blood pressure was 142 systolic, 70 diastolic, the pulse was 126, the temperature 105 F, the respiratory rate 18. The examination was otherwise essentially negative. Laboratory examination revealed red blood cells 4,850,000, hemoglobin 14.5 Gm, white blood cells 8,250. The sedimentation rate was 6 mm. The Widal reaction was negative. Thick smears taken at the height of fever were negative for malarial parasites. The Kahn reaction was negative. Undulant fever agglutination in dilutions of 1:60 was 4 plus, of 1:120 4 plus, of 1:240 3 plus and of 1:480 2 plus. The cutaneous test was markedly positive for undulant fever. Roentgenograms of the chest were negative.

After three days, with two subsequent chills and intermittent fever to 103.2 F, a diagnosis of undulant fever was made and the patient was given sulfanilamide 450 grains in six days, then 20 grains (13 Gm) a day for five days and 10 grains a day for one week.

The patient had chills and fever for three days following institution of treatment and continued to have an intermittent but gradually diminishing daily elevation of temperature of about 2.5 degrees F for seven days. At this time it was found that the patient's hemoglobin content was reduced to 11.5 Gm and a transfusion of 550 cc of whole citrated blood was given and medication was continued.

The patient apparently made an uneventful recovery gained weight and felt well for three weeks after discontinuance of treatment, then there was a return of symptoms of intermittent fever, anorexia and weakness. The patient was advised to take vaccine treatment which he did for two weeks but discontinued this because of his belief that vaccine was aggravating the condition.

CASE 3—A nurse aged 23 consulted me July 2, 1938 because of 'waves' of mental depression, malaise and fever to 100.5 F, which had occurred at irregular intervals of from two to four days for six weeks. The patient was known as a 'great milk drinker' and had drunk milk from a number of different sources, some raw, but none known to be from infected cattle.

The patient was well nourished, plump and alert. The temperature was 100 F, the pulse rate 96 and the blood pressure 106 systolic, 70 diastolic. The mouth was well kept with tonsil tags at both bases. The heart, lungs and abdomen were normal. Pelvic examination was essentially negative. The red blood cells numbered 4,200,000, the hemoglobin content was 14 Gm and the white blood count was 4,680. Undulant fever agglutination was 4 plus in all dilutions. There was a markedly positive cutaneous reaction with 5,000,000 *Brucella abortus* and *Brucella melitensis* organisms. The percutaneous tuberculin reaction was mildly positive. X-ray examination of the chest was negative. The patient was given 450 grains of sulfanilamide in ten days, 350 grains in the first five days. She continued her duties but malaise and aching persisted, although she had a remission of fever after the seventh day. The fever returned eighteen days after discontinuance of treatment and continued for ten days, when the patient was placed on vaccine treatment in very small daily doses, which frequently gave marked local and mild general reactions, but she was markedly improved after two months of continuous treatment by vaccines and has remained free from fever to date, Nov 7, 1938.

CASE 4—A white woman aged 38, a nurse, consulted me July 18, 1938, complaining of alternating periods of exhilaration and depression 'waves' of fatigue and anorexia, associated with pain and swelling in the middle and ring fingers of the right hand and some rather vague generalized aches and pains throughout the body of four or five months duration. The patient lived in a district where Bang's disease was prevalent, had drunk milk from many sources but had had no direct contact with infected cattle.

On physical examination the temperature was 99.6 F, the pulse rate 60, the blood pressure 100 systolic, 70 diastolic, but

examination was otherwise essentially negative. Laboratory examination August 17 revealed the sedimentation rate to be 12 mm, hemoglobin 16 Gm, red blood count 5,600,000. Gastric analysis revealed free hydrochloric acid 12, total acid 28. Undulant fever agglutination was negative. The basal metabolic rate was plus 5 per cent. X-ray examination of the chest, stomach and colon was negative and of the right hand revealed evidence of periostitis of the affected fingers. The intracutaneous tuberculin test gave negative results. The intracutaneous test for undulant fever with 60,000 *Brucella abortus* and *Brucella melitensis* organisms gave the largest reaction that I ever observed with a like amount of vaccine, the redness and induration extending from the cubital fossa to within 2 inches of the flexor surface of the wrist and persisting in this condition for ten days following which a suppurating abscess formed which drained for eight weeks.

The patient was seen in consultation by three other physicians and a diagnosis of undulant fever was agreed on and sulfanilamide therapy instituted August 17, 380 grains (25 Gm) being administered in five days and 10 grains a day for ten days. The patient was last seen October 15, at which time she stated that she had noted no improvement in her general condition had continued to have subjective symptoms but was more interested at the time in a lump in the breast for which surgery was advised, but the patient has not been heard from since.

CASE 5—Dr H. M., a man aged 34, an associate of mine, had been complaining of recurrent transient attacks of fatigue, anorexia, depression, somnolence and generalized aching lasting from a few hours to two days and recurring at irregular intervals for several months and associated with a sensation of fever.

The patient was robust with no physical abnormalities, having a temperature of 99.8 F, a pulse rate of 76 and a blood pressure of 120 systolic, 80 diastolic. Laboratory examination August 18 was as follows: Undulant fever agglutination was 4 plus in all dilutions to 1:400. The intracutaneous tuberculin test gave negative results. The Kahn reaction was negative. A definitely positive cutaneous reaction with *Brucella abortus* and *Brucella melitensis* persisted for two weeks.

The patient took sulfanilamide 20 grains the first day, 80 grains a day for three days and then from 20 to 40 grains a day for two weeks beginning August 20. At the end of this time he discontinued treatment and stated that he could not distinguish any change in his subjective symptoms. September 16 he was again found to have a 4 plus undulant fever agglutination and was advised to try the vaccine treatment, which was instituted at this time and has been continued to date, with marked improvement of all symptoms.

CASE 6—A man aged 21 who consulted Dr T. L. Wainwright of Oklahoma City July 24, 1938, complained of marked weakness, malaise, generalized aching and dyspepsia. The patient gave a history of having taken over 1,000 grains (65 Gm) of sulfanilamide in daily doses of 60 grains from June 24 to July 10, 1938, for the treatment of gonorrhea.

The patient was given a thorough examination by Dr Minard F. Jacobs, also of Oklahoma City, and Dr Wainwright. He was well developed. The temperature was 100.2 F, the blood pressure 106 systolic, 72 diastolic, and the pulse rate was 120. There were no other physical abnormalities save for tenderness throughout the abdomen, especially in the midepigastrium. He was found to have a markedly increased phagocytosis for *Brucella melitensis* as shown by the opsonic index, a 4 plus undulant fever agglutination and a negative Kahn reaction.

The patient was placed on daily injections of undulant fever vaccines and has made marked and consistent improvement in all symptoms.

#### SUMMARY

Two cases of acute, one of subacute and three of chronic undulant fever—five from my personal practice and one from that of Dr T. L. Wainwright—have been treated by maximum therapeutic doses of sulfanilamide as recommended in the American and British literature of the past year. I have been unable to duplicate the satisfactory results heretofore reported in this condition by the use of this therapeutic agent.

1. Wainwright, T. L. Personal communication to the author.

## DERMATITIS DUE TO BUTYN

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According to Lundy<sup>1</sup> 'Good surface anesthetics are not common. One that is used with considerable satisfaction is butyn. It is used as a surface anesthetic in 2 per cent solution. It is used for anesthetizing the throat and nose by spraying a small amount of 5 or 10 per cent solution being used. In a 5 or 10 per cent solution as a spray, butyn takes the place of a 10 to 20 per cent cocaine spray for anesthetizing the throat and larynx prior to the introduction of the intratracheal tube under general anesthesia. Butyn is also used with considerable satisfaction by ophthalmologists in an ophthalmic ointment of 2 per cent concentration.

In the use of butyn one should be on guard for idiosyncrasy, since occasions have developed when it seemed that the patient was hypersensitive to butyn. The butyn solution is somewhat irritating when instilled into the eye, and for that reason it has not become as popular as it would have otherwise. It may be used in gels and ointments, in 0.5 or 1 per cent concentration. Butyn is not habit forming.

Since Lundy mentioned the possibility of idiosyncrasy, we had expected that numerous cases of dermatitis due to butyn would have been reported. However, in a careful search through the literature, only three such cases could be found.

In 1924 Greenwood and Quest<sup>2</sup> of Boston reported a case of dermatitis due to butyn, beginning on the hands and arms and becoming generalized. The patient was a urologist who used a 2 per cent solution of butyn with epinephrine as a local anesthetic for passing sounds, for cystoscopic study and for minor operations. Cutaneous tests with this solution were strongly positive (and tests with a 1 per cent solution of procaine hydrochloride were also [less markedly] positive).

In 1927 Lemone<sup>3</sup> of Kansas City, Mo., and Newton<sup>4</sup> of Dallas, Texas each reported a case of conjunctivitis and dermatitis due to butyn. Both patients were women (aged 50 and 66). Lemone's patient, aged 50, had used a solution containing 1 per cent butyn and 0.25 per cent zinc sulfate in her eyes with no apparent ill effects. Seven months later she used the same solution again, and severe conjunctivitis and dermatitis of the lids immediately followed. An intradermal test with 1 per cent solution of butyn was strongly positive, and the conjunctivitis and dermatitis recurred later when this solution was instilled in the eyes. For the local treatment of bilateral glaucoma simplex, Newton prescribed a solution of pilocarpine containing 1 gram (0.06 Gm.) each of butyn and ethylmorphine hydrochloride to the ounce, for home use. A marked dermatitis of the eyelids ensued faded when the butyn was discontinued and recurred within thirty minutes after 4 per cent butyn was used as an anesthetic for taking the tonometric reading.

## REPORT OF CASE

Sept. 7, 1938 one of us (J. A. L.) saw Mrs. O. C. T., aged 49, with a sty of the right upper eyelid and an infected chalazion of the right lower lid. A 2 per cent solution of butyn was instilled in the eye for local anesthesia, and after three instillations the usual chalazion clamp was applied to the lower lid and the infected chalazion was incised. Pus was expressed and granulation tissue curetted away, and the cavity was then wiped out with a cotton tipped applicator saturated with a 1:1,000 solution of merthiolate. The clamp was then removed and the eye bathed with hot compresses to control bleeding and swelling. The patient was instructed to continue the hot compresses at home and to use drops of 0.2 per cent solution of zinc sulfate in 2 per cent boric acid three times a day. September 8 both right eyelids were markedly swollen and itched severely. The drops and compresses were continued and paste of zinc oxide (without salicylic acid) was prescribed for local application.

September 9 there was a more severe dermatitis of the lids, with vesiculation and edema; the eye was swollen shut. An

erythematous vesicular streak, about 5 mm wide, extended down the cheek to the chin, apparently following the path along which a solution had run down. The patient was advised to wash the area night and morning with mild soap and water and to apply moist compresses of a saturated boric acid solution constantly during the day and at night a little plain zinc oxide ointment, rubbed in gently and wiped off with cotton, followed by the application of a little plain talcum. The dermatitis subsided almost completely in a week. In the meantime patch tests with the solution of butyn and with the zinc sulfate solution were applied to the patient's left arm September 10 and removed twenty-four hours later. The reaction to the butyn was positive and increased in intensity, so that three days later the patch was red, vesicular and edematous and the arm swollen and painful. Calamine lotion was ordered, and at the end of a week this reaction had subsided.

This patient showed an intense hypersensitivity to butyn as used in ophthalmologic practice. Perhaps such instances occur more frequently than the paucity of reports would seem to indicate.

316 Michigan Street

## Special Article

## CONFERENCES ON THERAPY

## TREATMENT OF EDEMA

NOTE—These are actual reports, slightly edited, of conferences by the members of the Departments of Pharmacology and of Medicine of Cornell University Medical College and the New York Hospital. The questions and discussions involve participation by members of the college staff, students and visitors.

DR. EUGENE F. DU BOIS: It was only ten or fifteen years ago that there were large numbers of patients in medical wards with extreme grades of edema. They presented a distressing picture. Treatment was most unsatisfactory. Nowadays such patients are relatively few, thanks to the various studies in physiology, biology, chemistry, pharmacology and clinical medicine. Dr. Milhorat will begin the discussion.

## Normal Values

Water content of human body	from 58 to 66 per cent of the body weight
Blood volume of human body	from 79 to 99 cc. per kilogram of body weight
Volume of lymph	from 1,500 to 2,400 cc.
Osmotic pressure of blood serum	30 mm. of mercury
Total serum protein	from 6.5 to 8.2 per cent
Total serum albumin	from 4.6 to 6.7 per cent
Total serum globulin	from 1.2 to 2.3 per cent
Osmotic pressure of serum albumin	is four times that of serum globulin
Hydrostatic pressure	
Arteries	120 mm. of mercury
Capillaries	from 20 to 26 mm. of mercury
Veins	6-7 mm. of mercury
Sacrating in normal adult male	
At rest	from 23 to 30 C. skin and lungs
From 29 to 33 Gm	per kilogram
At rest	from 30 to 35 C. skin and lungs
From 100 to 120 Gm	per hour
Vigorous muscular exercise	up to 230 Gm. in 12 minutes
800 Gm	in 35 minutes

DR. A. T. MILHORAT: Edema is a symptom and sign, not a disease. Various and diverse are the factors which can bring it about. Some of these factors are still obscure but many of them are now fairly well known, such as the role of blood proteins, of the  $pH$  of the tissues and of potassium and sodium ions, and the effect of salt on the osmotic pressure of proteins. Through analysis of these and others we are able to comprehend better the treatment of edema and the successful results as well as the failures.

1 Lundy, John S. The Use of Local Anesthetics. J. A. M. A. 107: 1468 (Oct. 31) 1936.

2 Greenwood, Arthur M. and Quest, James F. A Case of Butyn Dermatitis. J. A. M. A. 83: 1077 (Oct. 4) 1924.

3 Lemone, Albert A. Conjunctivitis and Dermatitis Due to Butyn. Am. J. Ophth. 10: 125 (Feb.) 1927.

4 Newton, F. H. Conjunctivitis and Dermatitis Due to Butyn. Am. J. Ophth. 10: 412 (June) 1927.



Some of the mechanisms that cause edema are

- 1 Increased permeability of the capillary wall (snake venom, asphyxia)
- 2 Decrease in the osmotic pressure of the blood, as after plasmapheresis and repeated hemorrhage and in cases of massive albuminuria. The thinner fluid, one might say, is drawn into the tissues
- 3 Increased hydrostatic pressure in the vessels of the region involved (cardiac failure, varicose veins). In this case it might be said that the fluid is forced into the tissues
- 4 Retention of certain substances the accumulation of which disturbs the normal osmotic relationships between the blood plasma and the tissues. Edema arising as the result of the use of sodium chloride in patients with impaired capacity for its excretion is an illustration of this fact

There are several clinical varieties of edema—cardiac, renal, nutritional, toxic, obstructive. Each presents its own peculiar problems in treatment. The factors which require consideration in every case of edema are (1) diet (protein content, acid or alkaline ash), (2) fluid intake, (3) salt intake, (4) diuretic agent and (5) special measures directed to the underlying disease itself.

In most cases of heart failure digitalis suffices to abolish edema indirectly by improvement of the circulation through the kidney. There are many cases, however, in which that is not enough and in these some of the diuretics alone or in combination often produce dramatic results. The more important diuretics are (1) the purine bases, or xanthines, (2) the organic mercurials, (3) the acid-forming diuretics and (4) nonthreshold diuretics.

The purine bases or the members of the caffeine group have long been used as diuretic agents but are perhaps not so popular today as some of the others. The use of caffeine itself is limited by the fact that it tends to cause restlessness and insomnia. In theobromine and theophylline the diuretic action is stronger and they exert relatively less stimulant effect on the higher centers. These compounds are insoluble in water but go into solution readily when mixed with such salts as sodium acetate, sodium salicylate or calcium salicylate. The insoluble theophylline (theocine) may be used as such in oral doses varying from 1½ to 9 grains (0.1 to 0.6 Gm.) three times daily. It tends to irritate the gastrointestinal tract and vomiting is caused in some individuals by even small doses. The soluble double salts (theobromine with sodium salicylate, theophylline with sodium acetate or theobromine with calcium salicylate) are said to be less irritant but the evidence is not conclusive. Only about 50 per cent of their weight is the purine base. The double salt of theophylline is given in doses of about 3 to 15 grains (0.2 to 1 Gm.) three times daily, those of theobromine in doses of from 15 to 30 grains (1 to 2 Gm.) in a similar way. Theophylline with ethylene diamine (aminophylline) is also effective in comparable amounts; it contains somewhat more of the base, namely about 75 per cent of its weight. How the purines act to produce diuresis is not fully established. Various views have been advanced—increased renal blood flow, some extra-renal action, or direct action on the renal epithelium. Increase in glomerular filtration appears to be the outstanding phenomenon.

The most effective diuretics in use at the present time are the organic mercurials. There are several such preparations. The older merbaphen (novasurol) has now been virtually replaced in practice by mersalyl (salyrgan). Other similar preparations are neptal and

mercaptopurin. All of these exert essentially similar actions. They are supplied on the market in ampules in which 1 cc. of the solution represents approximately 40 mg. of mercury in nonionizable form. There is available a rectal suppository known as mercurin and another of salyrgan. These contain much larger amounts of mercury and sometimes cause rectal irritation. They are useful, however, in cases in which the frequent injection of a drug is not feasible. The dose of the solutions of these mercurials in the treatment of cardiac edema is from 1 to 2 cc. by intravenous injection. They are sometimes given intramuscularly but are liable to cause pain at the site of injection. Great care must be taken to avoid leakage into the subcutaneous tissues, for this will cause local necrosis and slough. The use of a very small needle for the intravenous injection helps to prevent this. The interval between doses varies greatly, depending on the severity of the edema. Usually an injection every second or third day suffices, sometimes a daily injection is necessary, often an injection once a week will prove sufficiently effective. As a rule, the necessary dosage for maintaining a patient free from edema causes no appreciable injury to the kidney, although occasionally patients unduly sensitive to the action of mercury are encountered, and these may show signs of mercury poisoning—renal damage, stomatitis, vomiting and bloody diarrhea. It is wise, therefore, to make frequent urine examinations for the presence of blood cells and for increase in albumin or casts during a course of treatment. The mechanism of the diuretic action of the organic mercurials is not established. In contradistinction to the xanthines these are generally believed to act primarily by decreasing tubular reabsorption.

An acid-forming diuretic, such as ammonium chloride, is often administered together with the organic mercurial. As I shall mention presently, increased acidity of the tissues favors diuresis, also a normal blood chloride is necessary for effective diuresis. The majority of cases, however, do quite well with the mercurial alone.

There are several compounds belonging to the group of so-called acid-forming diuretics, such as calcium chloride, ammonium chloride and ammonium nitrate. These substances, when given in large amounts, shift the acid-base equilibrium of the body toward the acid side. In the case of ammonium chloride the chemical reaction involves the conversion of ammonia to urea with the liberation of the acid ion. In the case of calcium chloride the reaction with carbonic acid produces calcium carbonate and hydrochloric acid. The diuretic action is due not solely to the acidity, however, but also to the character of the acid radical, for in some cases ammonium chloride, in other cases ammonium nitrate proves more effective.

Ammonium chloride and ammonium nitrate are among the most useful members of this group. They are used in total amounts of about 6 Gm. daily given in single doses of 2 Gm. three times a day. A convenient form is a tablet coated with phenyl salicylate of 0.5 Gm. each.

Urea is a nonthreshold substance which the kidney excretes as soon as it enters the blood stream and it takes with it quantities of water. It has been used in various types of edema with favorable results for about half a century. It is sometimes useful in patients with nephritic edema in whom the blood urea is not elevated but the most striking effects are seen in patients with

**cardiac edema** Large doses are necessary, namely from 30 to 60 Gm daily given in single doses of from 10 to 20 Gm three times a day. It has a disagreeable metallic taste and sometimes causes vomiting. It is best given after meals, well diluted with water or orange juice. Excessive doses cause weakness and lassitude, associated with very high blood urea values (from 80 to 90 mg per hundred cubic centimeters).

The diuretic effect of the purine bases, the organic mercurials and urea begins within a few hours after the dose, and the effect of any given dose is usually over within approximately twenty-four hours.

The accumulation of sodium in the tissues tends to promote the accumulation of water. The administration of potassium salts, however, tends to increase the excretion of sodium. Potassium salts therefore, are occasionally very effective as diuretics. Potassium nitrate is the compound generally employed, in doses of about 5 Gm daily. It sometimes produces a marked diuresis in patients in whom other agents have proved unsuccessful. The potassium ion is more toxic than sodium and in the presence of severe renal injury potassium salts must be given with caution, since the kidney may fail to eliminate them adequately, in which case the potassium concentration of the blood may rise to toxic levels.

The restriction of salt intake in patients with edema is usually desirable. When the ability to excrete salt is impaired the use of salt sometimes causes a rapid increase in the edema and, conversely, the restriction of salt may be followed by a decrease in the edema.

The restriction of water involves several considerations. It is usually advisable to restrict the fluid intake to about a liter a day. However, excessive restriction of water may prove injurious. Newburgh showed that patients with impaired ability to concentrate the urine will often show a decrease in edema when the fluid intake is increased. He believes that enough water should be given so that the specific gravity of the urine is kept below the maximal specific gravity of which the kidneys are capable. Normally the kidneys require around 600 to 700 cc of water daily to excrete the waste products. Patients with an impaired ability to concentrate the urine require larger amounts of water. For such patients restriction of fluids will increase the edema, where the administration of adequate amounts of water will decrease it.

#### TREATMENT OF NEPHROSIS AND NEPHRITIS

DR LEE C. FARR (of the Rockefeller Institute) In the treatment of edema a disease which is called pure lipid nephrosis has occupied an important experimental role because in this disease we have a process in which edema is formed in the individual without renal failure and without cardiac failure, in other words, probably here the physical-chemical mechanism for the exchange of fluid between the vascular system and the tissues is the one primarily at fault in the edema formation.

In the normal blood serum or plasma the proteins exert an osmotic pressure of approximately 30 mm of mercury. The osmotic pressure might be simply defined as the attraction of the solute for the solvent, in other words a plasma protein concentration of from 6.5 to 8.2 per cent, with an albumin above 4, will attract water to such an extent that 30 mm of mercury pressure is exerted in an osmometer.

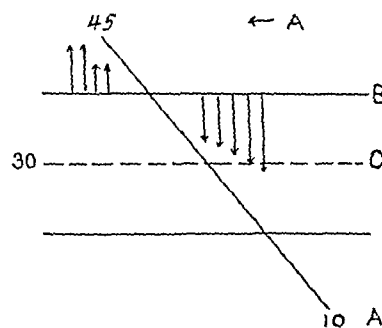
As the blood enters the capillaries the hydrostatic pressure due to the blood pressure is greater than the osmotic pressure. This difference in pressure varies with the point at which the measurements are made because there is a fall in the hydrostatic pressure as the blood progresses through the capillary system, but at approximately the arterial end of the capillaries the total hydrostatic pressure would be about 45 mm of mercury.

Since the osmotic pressure of serum is approximately 30 mm of mercury, that would give a pressure gradient of about 15 mm of mercury. In other words, water tends to diffuse out of the vascular bed and into the extracellular spaces. On the other hand, farther along the capillary the hydrostatic pressure falls, so that at some point there is equilibrium, and at this point there will be equal diffusion from within the capillary out and from the extracellular spaces into the capillary. At the venous end of the capillary, with a further drop in the hydrostatic pressure, we find a negative gradient of about 20 mm, which tends to enhance the transfer of water from the extracellular spaces in the capillary bed. Under normal conditions these processes of diffusion out and in are balanced so that the full quantities of water which are extruded from the vascular bed are resorbed in the capillaries and the lymphatics. In nephrosis, which exemplifies the effects of a reduction of the serum protein, instead of there being an osmotic pressure exerted of 30 mm there is a pressure of something less than 30 mm, depending on the reduction in protein.

With a reduction in serum osmotic pressure, a glance

at the illustration will make apparent that throughout most of the course of the capillary the hydrostatic pressure is exceeding the osmotic pressure, so that diffusion of fluid from the vascular system to the extracellular spaces is enhanced, while in only a relatively short distance and at a diminished pressure gradient is fluid transferred from the extracellular spaces back into the capillary. A rise of venous pressure would exert essentially the same effect. It is purely the relationship between the hydrostatic pressure which is existing in the system at any point, tending to push the fluid out, and the osmotic pressure, which tends to withdraw fluid from the extracellular spaces.

It would seem, of course, that the ideal way to treat this condition is to increase the osmotic pressure of the blood serum or plasma. This can be done in a variety of ways. Of course it can be done by increasing the plasma protein. Such an increase occurring spontaneously may be seen in patients with nutritional edema. With adequate nutrition being provided, the plasma proteins rise to their normal level and edema disappears. The osmotic pressure may be increased by the intravenous administration of acacia, which, being a nondiffusible substance, raises the colloid osmotic



Schematic representation of fall in hydrostatic pressure in a capillary and its relation to the colloid osmotic pressure of plasma shown here as 30 mm of mercury. The arrows represent the resultant diffusion effected as a difference in the two pressures. A hydrostatic pressure B capillary wall C osmotic pressure

pressure of the blood in proportion to its plasma concentration. It has been attempted by the administration of concentrated human serum and also by the administration of blood by transfusion.

In the treatment of nephrosis, however, none of these methods are particularly satisfactory. Acacia is a foreign substance, which tends to accumulate in the liver, and the ultimate effects of acacia are not entirely understood, in addition to which following the administration of acacia severe reactions may be encountered in patients, which may be of such a degree as to induce an acute uremia.

The administration of plasma protein by transfusion or concentrated serum is not satisfactory because in nephrotic individuals the extra plasma protein which is administered intravenously is lost usually within twenty-four to forty-eight hours in the urine. As a result, benefits obtained by such treatment are usually transitory, although occasionally a patient does seem to be permanently benefited.

In adults, when the plasma albumin is reduced below approximately 2.5 Gm per hundred cubic centimeters of plasma, salt restriction and administration of diuretics such as urea are usually ineffective in controlling the edema. Thus, then, we take as the critical level for edema formation in adults. In children, however, the critical level is approximately 1.2 Gm per hundred cubic centimeters of plasma. These figures are for the plasma albumin. The osmotic pressure of globulin is relatively insignificant in comparison with the albumin. Why this difference should exist between adults and children is not clear, because osmotic pressure measurements on these serums are in essential agreement with the albumin content. These are merely empirical figures which have been observed in the clinic. When a child's plasma albumin—a child around 4 or 5 years—is below 1.2, diuretic measures are not of much avail, and, when the adult's plasma albumin is below 2.5, again diuretic measures are not of much avail. However in a nephrotic child with the plasma albumin above 1.2 Gm per hundred cubic centimeters very often striking and remarkable results are obtained by the administration of almost any diuretic or usually simply by salt restriction.

In the attempt to build up plasma protein in these patients it has been customary to feed a high protein diet. A high protein diet has several effects. In the first place, it increases the quantity of urea which is available for excretion and thereby acts much the same as the simple administration of urea. This effect is primarily diuretic. A second effect of high protein feedings, which in children with pure lipoid nephrosis and in dogs is relatively easy to demonstrate, is what we may interpret as an increased renal blood flow reflected by an increase in the urea clearance.

With an increased renal blood flow one might expect an increase in the glomerular filtrate with a corresponding increase of water elimination. The exact mechanism is not yet worked out, but with an increase of renal blood flow and urea excretion usually more salt and water are eliminated and the effect is very roughly proportional to the quantity of protein that is fed in the diet.

The third effect, which is really what we are seeking, is to provide nitrogen for restoration of tissue proteins and plasma proteins. To promote optimal nitrogen assimilation there are certain restrictions that must be

introduced in the use of a high protein diet. Nephrotic children fed 0.5 Gm of protein per kilogram of ideal body weight can be shown to be on a negative nitrogen balance. Obviously we cannot hope for restoration of plasma protein with the patient on a negative nitrogen balance, as a matter of fact, a decrease in plasma proteins might be expected if the diet is fed for a long enough period of time. With an increase of protein in the diet, from 0.5 to 1, 2 and 3 Gm per kilogram of ideal body weight, the children show an increasingly positive nitrogen balance and accordingly are, I believe, under conditions which tend to promote the restoration of tissue and plasma protein.

However, when the protein in the diet is increased above 3 Gm per kilogram of ideal body weight, not only is there no further increase in positive nitrogen balance but actually there is a decrease in the nitrogen assimilated, so that a child may be on a negative nitrogen balance with a protein intake of 5 Gm per kilogram of ideal body weight, whereas he is on a positive nitrogen balance at 3. The point at which this break in nitrogen assimilation occurs is quite sharp and is apparently at about 3 Gm per kilogram of ideal body weight. Apparently, in children with increasing protein intakes there is a speeding up of the catabolic processes, and on a very high protein diet the nephrotic child may actually be on a negative nitrogen balance. This fact may be deceptive clinically, because with this very high protein diet the initial increase in excreted urea due to dietary protein and destroyed tissue may cause a temporary diuresis with apparent clinical improvement. Such a paradox will occur only when the plasma albumin is above the critical edema level.

In the adult we give about 1.5 Gm of protein per kilogram of ideal body weight. It is obvious that the patient cannot be fed on his actual body weight, because he may weigh as much as 50 per cent over his expected weight. A diet calculated on his ideal body weight provides an adequate amount of nitrogen for the restoration of protein tissue with a sufficient excess provided for wear and tear quota. The actual protein fed per kilogram of protein tissue in these patients is quite high because of the severe malnutrition due to nephrosis.

The general caloric intake, of course, must be kept adequate throughout any protein-feeding period. In general, if one is desirous of controlling the edema in nephrotic patients it is best to place them on as ideal a protein intake as possible in order to promote the regeneration of tissue and plasma proteins and then if necessary to supplement this by the judicious use of diuretics. The diuretic would not be indicated until the plasma albumin exceeds the critical edema level. The permanence of any improvement will depend ultimately on the restoration of tissue and plasma proteins to a normal level and it is well to be cautious in the use of diuretics on these patients so that the physician does not delude himself into believing that the unphysiologic state attained as a result of the use of diuretics represents material improvement of the patient.

#### DISCUSSION

STUDENT Does this 3 Gm of protein per kilogram of body weight apply to both the child and the adult or only to the child?

DR FARR That is only in the child. In the adult we give about 1.5 Gm per kilogram of ideal body weight because no provision is necessary for growth require-

ments in the adult. The tendency of children to go into a negative balance on a high protein intake is what we call paradoxical dumping. It occurs in normal children as well as in nephrotic children. The mechanism is not well understood. Apparently in the normal child the level at which the paradoxical dumping occurs is somewhat higher than in the nephrotic children. Probably in the normal child it is around 4 Gm per kilogram of ideal body weight.

**STUDENT** For the patient who has a retention of urea wouldn't ammonium chloride be contraindicated on the basis of its forming further urea to be excreted?

**DR MILHORAT** I think not. The ammonium chloride is given in small amounts, whereas the amount of urea normally excreted is from 20 to 30 Gm daily. If you estimate the amount of urea formed from the ammonium chloride which is administered, it will be found to be small. I should like to know whether Dr Farr has noticed any difference in the effectiveness of the different proteins. One would expect a difference between a protein like fibrin, which is complete, and one like gelatin, which is very unsatisfactory as a nutritive substance.

**DR FARR** It is almost impossible to give pure proteins in the diet. You cannot feed patients just gelatin or casein and get them to take it. Experimentally, apparently lactalbumin, casein and beef protein have about the same quality with regard to regeneration of plasma protein. Ox serum protein seems to surpass each of the others. That seems to be about the best protein that could be used if one is restricted to feeding a single protein, but the difference between ox serum protein and a well rounded diet with about 70 per cent of the protein in the diet as animal protein is not sufficient to warrant an attempt to feed a patient on pure ox serum protein. Experimentally in dogs there is an advantage, a theoretical advantage, but practically in the treatment of patients it is not sufficient to warrant the use of a purified protein product. Further, in these individuals we have done amino acid studies and, as far as we can tell from a study of the blood and the amino acid curve after the ingestion of protein, proteins are broken down and absorbed in a normal fashion in these patients. There apparently is no inability, as far as the patient is concerned, to digest and absorb the amino acids of which the proteins are constituted. Knowing that, one would hardly expect much difference between the different proteins as they occur in nature. In the treatment of this particular complex, no one has demonstrated a specific amino acid deficiency, although there has been some evidence that probably cystine might be a little bit lacking in these patients.

**DR EPHRAIM SHORR** Dr Farr, in the frequently occurring spontaneous improvements in children—that is, when they are not placed on any specific type of diet—do you notice corresponding changes in the plasma protein?

**DR FARR** You mean a child is going along without any change in his regimen and suddenly develops a diuresis and apparently is cured?

**DR SHORR** Yes.

**DR FARR** Not necessarily. I have seen diureses occur in these children with a shift in the plasma albumin from 11 to 13, which is certainly in ordinary parlance not significant, but it is amazing how sharply

this critical level is observed by the children, and a very slight deviation on either side will lead to the production of edema or the loss of edema.

**DR SHORR** I wondered whether we might not at the same time think of other factors. One thing that we note clinically is that edema is uncommonly associated with uremia. Wouldn't that possibly point to some influence of the diminished plasma protein on renal excretion itself? That is, may we not consider the renal filtration as taking place under the same circumstances as occurs in filtration of water in the peripheral tissues? So that if you diminish your plasma proteins as you find them diminished, I will say, in nephrosis, you then have a blood with a lowered plasma protein passing through the glomerulus. The decreased osmotic pressure of the proteins is going to offer less resistance to filtration. From the standpoint of the kidney this would seem a very desirable circumstance. This should increase the glomerular filtration and in that way increase the actual renal secretion of urea and all the other metabolites that go with it. It may be that it is that factor rather than a slight shift in the level of the proteins which may bring about the sudden diuresis, when children with nephrosis spontaneously lose their edema.

**DR FARR** That is an interesting possibility. In these children the urea clearance will run anywhere from 140 to 300 per cent normal, which indicates an increased renal blood flow. Presumably as the blood goes through the capillary there is an increased capillary filtration due to the reduction in osmotic pressure, but surprisingly enough there also seems to be an increased tubular resorption of water, which more than offsets the increased glomerular filtration, so that the concentration index or the U over B ratio, instead of running around 50 as seen in normal individuals, may go up as high as 100 in these children, which would indicate an excessive concentration of urea in the kidney tubules.

**DR SHORR** So that waste products will be eliminated favorably under these conditions with not necessarily a concomitant elimination of water?

**DR FARR** Water and salt are reabsorbed to an exceedingly great extent.

**DR SHORR** If this increased glomerular filtration as a result of low plasma protein is a factor in human disease, it might be a possible explanation for the observation that patients with edema do not go into the state of nitrogen retention quite as readily as the other type of nephritic?

**DR FARR** What we find is that we can divide these edematous patients into two groups: those with no impairment of nitrogen excreting abilities, and usually their urine nonprotein specific gravity is also normal; and those with an impairment of nitrogen excreting abilities and a reduction in the urea clearance with or without evidence of any nitrogen retention. The reduction of plasma protein does not seem to be the determining factor in inhibiting or enhancing nitrogen retention. In following those patients along a rapid rise in the serum proteins from a pathologic level with the albumin at about 1 per cent to a normal level with the albumin at about 4 per cent occurring in a period of three weeks is not accompanied by any demonstrable change in renal function. In acute uremia particularly that which is terminal there is such a reduction in the number of functioning glomeruli that it is mechanically impossible

for the body to lose protein as rapidly as it is formed apparently, and the reabsorptive mechanism of the kidney is so seriously impaired that it cannot concentrate the glomerular filtrate to the same extent as it does before that particular phase has been reached. So that in uremia paradoxically enough you often see an improvement in edema accompanied by a loss of electrolytes, and in uremia it is necessary often to give these patients sodium chloride in order to preserve their electrolyte balance. I have seen one girl whose plasma chloride went down to 40 milliequivalents in a terminal uremia, which is less than half the expected normal.

DR DU BOIS: Dr Farr, I think a good many of us have noticed that fairly frequently patients given diuretics get a good diuresis and that their general condition becomes much worse following the use of the diuretics. Would you explain that on the same basis?

DR FARR: Well, it is possible to explain it on the same basis. On the other hand, these patients can show what amounts to a vascular dehydration in the face of edema. That is, apparently they will, even with edema present, show the same response to the lack of fluid as a normal individual. Now apparently in some instances when given diuretics this condition prevails and they have an apparent vascular dehydration with also a loss of extracellular water, which induces an apparent—well I should almost have to call it shock, it is not shock, but that comes the closest to describing it—and by the restoration of fluid volume these patients will often make a spectacular improvement with only a slight increase in their weight and without recovering all the edema that was lost during the diuresis.

DR DU BOIS: I think the group would appreciate it if you would review some of the contraindications for the use of diuretics. That is a tremendously important clinical question.

DR FARR: In the treatment of nephritis, one must always be on the lookout for the development of acidosis, and with the development of acidosis of course the acidifying diuretics are definitely contraindicated. In the use of an acidifying diuretic, ammonium chloride, in a nephritic patient, it is desirable, in fact it is almost necessary, to follow the carbon dioxide or chloride to prevent the development of an excessive acidosis with a concomitant uremia. These patients sometimes, even on a small dose of ammonium chloride, will go into uremia in a couple of days, and it is impossible to make a prognostication before the dose has actually been tried as to whether any patient will develop an acidotic uremia under these circumstances or not. If these patients do develop a severe acidosis, discontinue the drug and treat them with alkalis. Mercurial diuretics, I feel, are contraindicated in renal lesions because almost invariably we have found in the administration of the mercurial diuretic, if the urine is carefully examined, that one can find a shower of red blood cells and casts with or without diuresis.

In individuals who have a normal functioning kidney, as in cardiac cases, we have followed the urea clearance after the administration of mercurial diuretics, and curiously enough despite the induction of a most satisfactory diuresis we have often observed an actual fall in the apparent renal function, very consistent in one individual, not great, but always about 10 per cent from the preexisting level, returning to normal within twenty-four to thirty-six hours after the administration

of salyrgan or mercurpurin. We feel that since the primary action of these mercurial diuretics is probably on the tubules, and since in the nephrotic syndrome it is the tubule that is most seriously involved, any diuretic which would act on the tubule would be contraindicated.

Our choice of a diuretic in cases of nephritis and nephrosis is urea, and the dose will vary somewhat with the individual. In general we give as much as 40 or 45 Gm a day even to a 5 year old child, where the urea-excreting mechanism is normal. Where you have impairment of renal function, the dosage of urea should be determined by the elevation of the blood urea nitrogen and an increase of more than 10 to 15 mg per hundred cubic centimeters should mean a reduction in the dose. The mere elevation of the blood urea nitrogen does not seem to be harmful. I have seen it rise from a value of 16 mg per hundred cubic centimeters to 82 mg in a patient by feeding urea without any apparent deleterious effects—no change in the renal function—but we are always a bit hesitant to continue the drug under these circumstances, and certainly the piling up of urea in the blood is to be avoided. When urea increases in the blood to 10 or 15 mg higher than it was at the beginning of treatment, the maximal diuretic effect that can be obtained with urea is usually present.

DR HENRY B. RICHARDSON: There was mention of potassium salt. There was some old work tending to show that potassium had an adverse effect on the kidney, wasn't there? It was an old article of Smillie's on that point.

DR FARR: Potassium and magnesium still are not clear as to their effect on the kidney, whether they are actually deleterious or not, but certainly in these patients where you have—and you always have—an impairment of excretion of these materials, one must be quite circumspect about using potassium or magnesium salts as a diuretic.

DR HARRY GOLD: Did you ever use thyroid?

DR FARR: Yes, without any consistent effect.

DR MILHORAT: May I ask Dr Farr whether he feels that it is a rational process ever to give amino acids intravenously in any of these cases?

DR FARR: Amino acids have not been tried in this condition because they have not been available. A preparation that was suitable for intravenous use has certain theoretical advantages and a good many practical disadvantages, but theoretically it would seem to be ideal to feed these patients that way when they are unable to take anything by mouth, thus supplementing their diet. We plan to try this.

DR MILHORAT: May I say a word about the administration of the amino acids? If the technique should be perfected, I think it will be found that the proportions or the relative amounts of the amino acids will be as important as the kinds of amino acid used. In my own work I found that the concomitant administration of a complete protein had no effect on the ability of the animal to utilize gelatin. Blood fibrin is a complete protein, and all the nitrogen is retained by the fasting dog. On the other hand, most of the nitrogen of gelatin, which is an incomplete protein, is excreted. The amino acids in blood fibrin are in such amounts that there are not enough of the nondispensable ones left to make gelatin a complete protein.

## Council on Pharmacy and Chemistry

### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH Secretary

### ANTIPNEUMOCOCCIC SERUM, TYPES I AND II COMBINED (See New and Nonofficial Remedies, 1938, p 399)

The Gilliland Laboratories Inc., Marietta, Pa

*Antipneumococcic Serum Refined and Concentrated Types I and II*—Prepared by immunizing horses with intravenous injections of the virulent and avirulent cultures of type I and type II pneumococci. Trial bleedings are made at frequent intervals and when the serum has reached a sufficient degree of potency for type I and type II pneumococci the horses are bled aseptically and the serum is refined and concentrated by the method of Lloyd D Felton (*J Infect Dis* December 1928 p 543). The concentrated product contains type I and type II pneumococcus antibodies. After concentration sterility tests are carried out in the manner prescribed by the National Institute of Health and safety tests are carried out by injection into white mice and guinea pigs. The potency of the product is expressed in terms of the unit described by Felton (*Boston M & S J* May 15 1924 p 819 *J Infect Dis* September 1925 p 199 October 1925 p 309) the unit being  $\frac{1}{100}$  cc for type I and  $\frac{1}{10}$  cc for type II of the control serum (P 11) distributed by the National Institute of Health. Marketed in packages of one syringe containing 10 000 units each of type I and type II and in packages of one syringe containing 20 000 units each of type I and type II pneumococci each accompanied by a vial of dilute serum (1:10) for the sensitivity test.

### AMYTAL (See New and Nonofficial Remedies, 1938, p 111)

The following dosage forms have been accepted

*Elixir Amytal 2 grains per fluidounce* Amytal approximately 0.44 Gm per hundred cubic centimeters in a vehicle containing alcohol 30 per cent glycerin water and aromatics methenamine 2 grains per fluidounce is present for the purpose of increasing the solubility of the amytal.

*Elixir Amytal 4 grains per fluidounce* Amytal approximately 0.88 Gm per hundred cubic centimeters in a vehicle containing alcohol 34 per cent glycerin water and aromatics methenamine 4 grains per fluidounce is present for the purpose of increasing the solubility of the amytal.

## Council on Foods

### ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED

FRANKLIN C BING Secretary

### LIBBY'S HOMOGENIZED BABY FOODS FORMULATED COMBINATIONS

NOS 1, 2, 3, 4, 5 AND 6

*Manufacturer*—Libby, McNeill & Libby, Chicago

*Description*—Canned preparations of homogenized vegetable fruit cereal and soup mixtures, intended for infant feeding or as foods in special diets, available in the following combinations

1 Peas, beets and asparagus in equal quantities, with small amounts of added water and salt

2 Pumpkin, stringless beans and tomatoes (skin and seeds removed) in equal quantities, with small amounts of added water and salt

3 Carrots, spinach and peas in equal quantities with small amounts of added water and salt

4 Whole milk whole wheat flour and soya flour, with a small amount of salt

5 Strained stewed prunes, with small amounts of lemon juice and pineapple juice

6 Tomato juice, celery carrots chicken livers barley flour and water, slightly seasoned with onion and salt

*Manufacture*—The specified ingredients for each combination are mixed in formula proportions heated and a small amount of water added if necessary to furnish the desired consistency. The mixture is then strained in an atmosphere of steam through

a stainless steel screen, and the strained mixture is further subdivided or homogenized by being forced through stainless steel valves under 3 500 to 4 500 pounds pressure, after which they are packed in enamel-lined containers and heat processed.

*Analyses* (submitted by manufacturer) —

	Combination Numbers					
	1	2	3	4	5	6
	%	%	%	%	%	%
Moisture	90.1	92.6	90.6	77.8	67.8	90.2
Total solids	9.9	7.4	9.4	22.2	32.2	9.8
Ash	1.1	0.9	1.0	1.2	0.7	1.1
Fat (ether extract)	0.2	0.2	0.2	1.8	0.6	0.3
Protein (N x 6.25)	2.0	1.1	2.0	5.3	1.1	2.2
Reducing sugars as dextrose after inversion	2.8	2.3	2.1	3.3	17.8	1.9
Crude fiber	0.0	0.9	0.7	0.6	0.6	0.4
Carbohydrates other than crude fiber (by difference)	6.0	4.5	5.5	13.3	29.2	5.8
Calcium (Ca)	0.018	0.024	0.031	0.110	0.027	0.023
Phosphorus (P)	0.056	0.031	0.054	0.151	0.063	0.059
Iron (Fe)	0.0010	0.0014	0.0016	0.0011	0.0015	0.0010
Copper (Cu)	0.0002	0.0002	0.0002	0.0003	0.0005	0.0002
Calories per gram	0.54	0.14	0.33	0.93	1.99	0.33
Calories per ounce	9.7	4.0	9.4	26.4	36.6	9.4

*Vitamins*—The firm has provided protocols of biologic assays which show the various combinations to have the following vitamin content

*Vitamin A* U S P units Per gram—(combination 1) 3.3, (2) 20 (3) 30 (4) 18, (5) 7.1, (6) 57 per ounce—(combination 1) 94 (2) 554 (3) 850 (4) 52, (5) 200 (6) 1 630

*Vitamin B<sub>1</sub>* international units Per gram—(combination 1) 0.19 (2) 0.14 (3) 0.19 (4) not reported (5) 0.16 (6) 0.26, per ounce—(combination 1) 5.5, (2) 4.2, (3) 5.5 (4) not reported, (5) 4.8 (6) 7.5

*Vitamin C (ascorbic acid)* milligrams Per gram—(combination 1) 0.084 (2) 0.056 (3) 0.081 (4) 0.014 (5) 0.106 (6) 0.038, per ounce—(combination 1) 2.40, (2) 1.60, (3) 2.31 (4) 0.40, (5) 3.02 (6) 1.1 International units Per gram—(combination 1) 1.68 (2) 1.12 (3) 1.63 (4) 0.28 (5) 2.12 (6) 0.76, per ounce—(combination 1) 47.71, (2) 31.81, (3) 46.29, (4) 8, (5) 60.21, (6) 22

*Vitamin G (riboflavin)* Bourquin-Sherman units Per gram—(combination 1) 0.281 (2) 0.147, (3) 0.264 (4) not reported, (5) 0.352 (6) 0.528 per ounce—(combination 1) 8.0 (2) 4.2, (3) 7.5 (4) not reported, (5) 10.0 (6) 15.0

*Claims Recognized by the Council* There is evidence that fruits and vegetables in finely divided form such as these homogenized foods are well tolerated by infants as young as 1 or 2 months of age. Because the amounts of iron and vitamin B<sub>1</sub> of the diet of the infant may require more attention than has been given them in the past some pediatricians may consider that even small amounts of foods containing these nutritional essentials may be a desirable addition to the diet of the young infant. Libby's Homogenized Baby Foods are accepted as foods suitable for use particularly during the early months of infancy.

### CLAPPS CHOPPED PRUNES

*Manufacturer*—Harold H Clapp Incorporated, Rochester, N Y

*Description*—Canned chopped prunes, flavored with lemon juice

*Manufacture*—Prunes are pitted washed and chopped. Lemon juice is added. The mixture is heated in an atmosphere of steam, adjusted to standard consistency, filled into cans, sealed, processed under pressure in steam retorts and cooled.

*Analysis* (submitted by manufacturer) — Moisture 70.0%, total solids 30.0%, ash 0.7%, fat (ether extract) 1.5%, protein (N x 6.25) 1.1%, crude fiber 2.4%, carbohydrates other than crude fiber (by difference) 24.3%

*Calories*—12 per gram 34 per ounce



# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 4, 1939

## IODINE BALANCE IN EXOPHTHALMIC GOITER

The discovery by Baumann in 1895 that the thyroid gland of mammals contains iodine in organic combination stimulated other investigators in their attempts to throw light on the true nature of diseases of the thyroid. Two decades after Baumann's observation, Kendall succeeded in isolating the iodine-containing amino acid thyroxine, the active principle of the gland. Elaborate statistical studies point to the interrelationship of the prevalence of goiter in certain localities and the amount of iodine available to inhabitants of these districts. Measures based on this relationship have had widespread influence on public health.

Iodine is an essential component of the thyroid hormone and thus thyroid function and iodine metabolism are intimately related. A recent study of the iodine balance in exophthalmic goiter by Puppel and Curtis<sup>1</sup> is an important contribution to our knowledge of the nature of hyperthyroidism. These investigators realized that the effect of hyperthyroidism on the metabolism of iodine is significant in considerations of disturbed thyroid function. Although hyperiodemia and hyperioduria had been shown in patients with exophthalmic goiter, it remained necessary to study the intake and the excretion of iodine by both normal persons and patients suffering from exophthalmic goiter in order to have a comparative study of iodine metabolism. By carefully controlling the diet, Puppel and Curtis were able to maintain normal subjects on a low intake of iodine. Under these conditions it is found that more iodine is excreted than is taken in, normal persons on a low iodine intake are unable to maintain a positive iodine balance. Persons receiving an average of 29 micrograms of iodine daily lost this element to the extent of 42 micrograms a day. A similar study made on normal subjects during starvation shows that the excretion of iodine in the sweat, feces and urine continues so that an even greater negative balance results. Examination of the iodine excretion

of a pregnant woman on a low intake of iodine revealed the fact that the net loss of iodine continued through the eighth month of gestation. A possible explanation of this negative balance in normal persons on a low intake of iodine is that some of the iodine resulting from the breakdown of thyroid hormone is not then available to the thyroid or other tissues and is consequently excreted. Indeed, other investigations indicate that from 163 to 325 micrograms of iodine is utilized daily in the form of thyroxine.

Patients with exophthalmic goiter, maintained on a low intake of iodine, show a negative iodine balance which is from two to three times that observed for normal persons under similar conditions. Although under these conditions the greatest excretion occurs through the urine, the feces are responsible for 40 per cent of the total elimination whereas normal persons maintained on a low iodine intake excrete only 15 per cent in the feces. On an intake of iodine sufficient to keep a normal subject in positive iodine balance, patients with exophthalmic goiter excrete more iodine than they receive and are thus in a negative iodine balance. Feeding of increased amounts of iodine to a normal person previously on a low intake of iodine produces an immediate positive balance. Similar treatment of a patient with hyperthyroidism results in an immediate pronounced retention of iodine and a consequent positive balance which is twice the normal. Patients with exophthalmic goiter show iodine values in the blood which average 9 micrograms per hundred cubic centimeters, in contrast to the value of 4.3 in normal subjects. These data indicate that the increased amount of blood iodine in hyperthyroidism may result from augmentation of total iodine metabolism. There is an increase in its mobilization and an increase in its excretion through one or all of the excretory channels.

These profound changes in iodine metabolism are abolished by thyroidectomy. One patient showed complete recovery from symptoms characteristic of exophthalmic goiter two years and seven months after adequate subtotal thyroidectomy. At this time the iodine balance was normal, although previous to the operation a negative iodine balance had existed despite an adequate intake of iodine. A patient with toxic nodular goiter and hyperthyroidism showed a dramatic fall in excreted iodine to within normal limits as early as the sixth day after thyroidectomy with concomitant clinical improvement. In another case, in which medical management alone brought about clinical improvement, the excretion of iodine decreased and the balance returned to within normal limits.

Although the research by Puppel and Curtis bears directly on the problem of iodine balance in exophthalmic goiter, it also extends our conception of the function of the thyroid gland and has helped further the integration of the various aspects of the problem of thyroid function.

<sup>1</sup> Puppel I. D. and Curtis G. M. Iodine Balance in Exophthalmic Goiter. Arch. Intern. Med. 26: 1093 (Dec.) 1938.

## EXPERIMENTAL ECLAMPSIA

The recent demonstration by Dill and Erickson<sup>1</sup> of Duke University that a typical eclampsia-like syndrome can be produced in pregnant dogs and rabbits by a simple operation on the kidney suggests a new theory as to the etiology of toxemia of pregnancy and makes possible an intensive laboratory study of the nature and treatment of this disorder. Sheep and guinea pigs occasionally develop eclampsia-like symptoms during gestation. A highly fatal toxemia of pregnancy also occasionally develops in rabbits. Eclampsia in rabbits has been extensively studied by Greene<sup>2</sup> of the Rockefeller Institute, who found that fatalities are not limited to pregnant rabbits but may occur in pseudopregnancy. From this he concluded that the hypothetic toxic factors in this disease cannot arise from the fetus or placenta. Demonstration by Anselmino and Hoffmann<sup>3</sup> that an excess of vasopressin is present in human eclamptic blood led to the hypothesis that the toxic factor in eclampsia is of pituitary origin. This hypothesis is supported by the fact that repeated injections of commercial vasopressin will produce eclampsia-like symptoms and lesions in laboratory animals.<sup>4</sup>

In order to settle these and other controversial questions, Dill and Erickson tested the effects of experimental renal ischemia in pregnant dogs. Nonpregnant females were used as controls. Renal ischemia was produced by the application of Goldblatt adjustable clamps to the renal arteries. Within forty-eight to 120 hours after relatively slight constriction of the renal arteries by this technic the pregnant dogs developed weakness, lassitude and convulsions and exhibited hypertension, hematuria, albuminuria and nitrogen retention. The symptoms deepened to coma, death occurring in from five to fifteen days. Control nonpregnant dogs often failed to show symptoms following mild renal ischemia, hypertension being observed only after the renal clamps had been further tightened.

Following the development of typical eclampsia, two of the Duke University dogs aborted. Rapid improvement and full recovery followed, except for a slight residual arterial hypertension. The significant appearance at autopsy in their eclamptic dogs is practically identical with that described in fatal human eclampsia.

Even more fulminating toxic symptoms were obtained by applying the same renal ischemic technic to pregnant rabbits. Death usually occurred within two to five days, with typical eclamptic lesions of parenchymatous tissues.

The Duke investigators believe that the physiologic and pathologic processes underlying their experimental eclampsia in dogs and rabbits are identical with those of human eclampsia. A study of the presumptive toxic

factor is now in progress in their laboratory, in the hope of developing a logical and effective therapy. The only fact definitely established by the Duke investigation, however, is their demonstration that a relatively slight interference with normal renal function is sufficient to cause a fatal toxemia of pregnancy in laboratory animals.

## SIGNIFICANCE OF URINARY AMMONIA

Although the acid-base equilibrium is first maintained by the buffers of the blood and other body fluids, the final removal of acid from the body is effected by the lungs, skin and kidneys. The expired air and the sweat are of peculiar significance as pathways for loss of metabolic acid, as all of the expired carbon dioxide and about half of the lactic acid of the sweat are removed without accompanying loss of base. In the kidney likewise there is a highly important mechanism for the excretion of acid without concomitant loss of fixed base, here it is the formation of ammonia from urea. The formation of this endogenous base in response to the administration of mineral acids was first noted by Walter in 1877. Magnus-Levy, in his classic monograph on diabetic acidosis, called attention to the augmented excretion of ammonia in the urine of such patients and suggested that the level of urinary ammonia might be used as an index of acid excretion. The fact that administration of sodium bicarbonate results in a marked diminution in the production of ammonia by the kidney has served to support further the view that there exists a close relation between acid excretion and formation of ammonia.

A recent statistical study<sup>1</sup> of the correlation between the volume, specific gravity, titratable acidity,  $p_H$  and urea nitrogen on a large number of samples of human urine shows a higher coefficient of correlation between ammonia production and titratable acidity than between ammonia and any of the other constituents determined. The lack of definite parallelism between ammonia and  $p_H$  was reaffirmed. The exact mechanism or stimulus which brings about the increase of ammonia is not so clear. It has been shown<sup>2</sup> that in the course of fasting the ammonia production is not strictly parallel to the increase in acid excretion but rather inversely proportional to the concentration of fixed base. Again, from a study of the so-called acidosis of pregnancy it was concluded<sup>3</sup> that the elevated urinary ammonia was a sign of decreased level of available fixed base rather than of increased acid excretion. In other words the formation of ammonia in the kidney is conditioned by the necessity on the part of the body to conserve fixed base. A sign of dissent with this point of view is contained in a recent report by Briggs,<sup>4</sup> who on the basis

<sup>1</sup> Dill L. V. and Erickson C. C. *Proc. Soc. Exper. Biol. & Med.* **39**, 362 (Nov.) 1938.

<sup>2</sup> Greene H. S. *N. J. Exper. Med.* **65**, 809 (June) 1937.

<sup>3</sup> Anselmino K. J. and Hoffmann. *Friedrich. Klin. Wchnschr.* **10**, 1438 (Aug. 1) 1931.

<sup>4</sup> Fauvet Egon. *Klin. Wchnschr.* **10**, 2125 (Nov. 14) 1931. Byrom F. B. *J. Path. & Bact.* **45**, 1 (July) 1937.

<sup>1</sup> Cavett J. W. and Foster W. C. *Am. J. Physiol.* **124**, 66 (Oct.) 1938.

<sup>2</sup> Gamble J. L., Ross G. S. and Tridall F. F. *J. Biol. Chem.* **77**, 633 (Oct.) 1923.

<sup>3</sup> Oard H. C. and Peters J. P. *J. Biol. Chem.* **81**, 9 (Jan.) 1929.

<sup>4</sup> Briggs A. P. *Proc. Soc. Exper. Biol. & Med.* **38**, 893 (June) 1938.

of failure of prompt adjustment of ammonia to changes in urinary fixed base after forced breathing believes that the function of urinary ammonia is to protect the urinary passages from the acidity of the urine. According to this view it is the acid-base balance of the urine, not of the tissues, which governs the production of ammonia.

The recent studies in which newer experimental procedures have been employed and novel points of view developed have raised questions as to the exciting mechanism of the production of ammonia. The current basic conception has been changed little, if any, the variation in urinary ammonia follows the body's need for the excretion of acid with, at the same time, the maximum conservation of fixed base.

### Current Comment

#### BACTERIOLOGIC INVESTIGATIONS OF PUBLIC HEALTH SERVICE

The bacteriologic investigations of the United States Public Health Service are often overlooked because of the better known activities of this agency in more publicized fields. Most of the original research of the service along these lines was done at the Hygienic Laboratory, the name of which was changed in 1930 to the National Institute of Health. The work of this branch of the service has been recently summarized in a condensed but impressive fashion.<sup>1</sup> Especially noteworthy activities include the control of standards of biologic products for immunization and treatment, important work on disinfectants, especially with regard to fumigation and embalming procedures, and original investigations on encephalitis, leprosy, pellagra, plague, poliomyelitis and rabies, to mention only a few. A continuation of distinguished investigation in these and other fields may be confidently expected.

#### CLINICAL STUDY OF DRUG ADDICTS

As one part of the extensive studies on drug addiction at the United States Public Health Service Hospital at Lexington, Ky., recently discussed in *THE JOURNAL*,<sup>1</sup> Pescor<sup>2</sup> presents a statistical analysis of the information contained in the clinical records of more than a thousand admissions. Although addiction may occur at any age, the heaviest concentration of cases occurred in the decade between 20 and 30 and few became addicted after the age of 50. Thus there is greater potential danger of acquiring the habit in youth than in the later years of life. To the question as to why drugs were begun, the most common reply given was "curiosity and association with undesirable companions." Following this in order of frequency was the use of drugs "for the relief of pain or physical distress," "to sober up after alcohol sprees or to relieve hang-

over" and "relief of fatigue," also as an antidote for environmental distress. Morphine was the first drug used by the majority of patients, opium smoking and the use of heroin followed closely. Although the average period of addiction at the time of admittance was about twelve and a half years, five of the patients admitted addiction of forty years or more and one had used drugs continuously for fifty-nine years. About three fourths of the patients had previously attempted a cure, more than half of these having been enforced, or "jail house," cures. Such "cures" in general did not appear to be as effective as voluntary cures. The educational attainments of the patients were more or less comparable to those of the population at large. The occupational distribution revealed the highest concentration in the personal service classifications and the professional class. The majority of the addicts came from deteriorated and densely populated localities. The tendency to marital failure and inadequacy of social adjustment was strongly manifest. Dental difficulty of a type peculiar to addicts was found in practically every case. The majority of the patients made satisfactory social adjustments before but not after addiction. Finally it was noted that the "voluntary" patients were the least cooperative chiefly because of their insistent demands for release against medical advice.

#### SENATOR WAGNER INTRODUCES HEALTH PROGRAM LEGISLATION

On February 28 Senator Wagner of New York introduced in the Senate a bill for the carrying out of some of the phases of the National Health Program. In the proposed bill Senator Wagner offers a series of amendments to the Social Security Act calling for an expenditure of federal funds amounting to \$80,000,000 the first year with gradual increases over a ten year period for the purpose of establishing, expanding and improving state programs for "(1) child and maternal care, (2) general public health services and investigations, (3) construction of needed hospitals and health centers, (4) general programs of medical care, and (5) insurance against the loss of wages during periods of temporary disability." Senator Wagner said in an interview that it "should be clearly understood that the bill does not establish a system of health insurance or require the states to do so." Funds would be made available under this bill to "those localities and states which are in the greatest need of the services," the size of the grants being determined "on a variable matching basis, depending on the relative financial resources of the several states as determined by the per capita income of their inhabitants." It is not possible at this time to offer a complete analysis of the details of the proposed legislation. Obviously, it will be necessary for suitable committees of the Congress to give careful consideration to the proposals. While the sum announced—namely, \$80,000,000 annually—is not large as compared with an annual expenditure of \$850,000,000 ultimately proposed by the National Health Program, it represents nevertheless a considerable sum. Senators interested in an economy rather than a spending program have already announced opposition.

<sup>1</sup> A Brief History of Bacteriological Investigations of the U. S. Public Health Service. Pub. Health Rep. Supplement 141, 1938.

<sup>2</sup> Nine Years of Research on Drug Addiction. editorial J. A. M. A. 111: 1846 (Nov. 12) 1938.

<sup>3</sup> Pescor, Michael J. A Statistical Analysis of the Clinical Records of Hospitalized Drug Addicts. Pub. Health Rep. Supplement 143, 1938.

# ORGANIZATION SECTION

## AMERICAN MEDICAL ASSOCIATION STUDY OF MEDICAL CARE

### REPORT OF MIDDLESEX SOUTH DISTRICT (MASS) MEDICAL SOCIETY, BOSTON

The following report is based on the data recorded on the summary sheet of the Middlesex South District Medical Society. As indicated in the title, the Middlesex South District is not a county but a district society and, as stated in the summary sheet, no estimates of the population in this district can be made. The largest political unit included in this district is the city of Cambridge—a part of the metropolitan district of Boston. Some idea as to the population and economic status of the people in this district may be obtained from the following facts. Harvard University is located in Cambridge, and much of the surrounding area is urban residential districts, there are 169 industrial concerns in Cambridge, of which 143 are manufacturing plants which employ 20,753 workers.

In order to show the number of persons and organizations which contributed the information included in this summary, a list of the number of forms sent out and the number and the percentage of returns is given in table 1.

This table brings out the fact that a larger percentage of the health departments, the welfare and relief agencies, the hospitals, the nurses' organizations and the schools and colleges have contributed data, on which this report is based, than of physicians and pharmacists. Consequently, the statistics in this report are made up primarily of the figures recorded by those organizations. Therefore a summary of the data must present an accurate picture of the supply and need for medical care in this district, since it is not based on the experience of any one group of persons or organizations but on the experience of representatives of all persons who provide medical care and of practically every organization that arranges or furnishes medical care. The public health nurses, the welfare and relief agencies and the health departments are engaged in work that offers them every opportunity to discover persons unable to obtain medical care, so it is very improbable that any lack of medical care could have passed unnoticed by them.

A concise report on the amount of medical and surgical care furnished in 1937 is given in table 2. A study of this table will show that medical care is available to all economic classes, especially the indigent and low-income groups.

Table 2 shows that during 1937 a great deal of medical services, hospitalization, nursing services and medicines were furnished free or at reduced rates to a large number of persons in this area. For the indigent and the low-income group twenty-three clinics and outpatient departments furnished care at no cost or at reduced rates to persons eligible to receive such care. The colleges provided medical treatment for their students, so they did not need to obtain services from the clinics or outpatient departments. Since we have no figures on the number of persons in this district, it is difficult to determine the adequacy of medical care from the amount of medical care furnished.

From the data given on the lack or need of medical care it is possible to determine more specifically whether some persons were unable to obtain necessary medical care. Three physicians stated that they knew of some persons unable to obtain medical or dental services. The reason for one case was the inability to obtain free dental services. The other cases were due to overcrowding at clinics and inadequate hospital facilities for the poor. Comments from forty-four of the physicians accompanied the report. An analysis of these comments indicated that twenty-two of the physicians felt that there was an opportunity for every one to obtain services at the clinics if they were unable to afford a private physician. Too many of the patients accepted by the clinics could pay for their medical services. Since the physicians devote a portion of their time in furnishing free services at the clinics, either some arrangement should be made to eliminate the patients capable of paying regular fees or physicians should be partially remunerated for their services at the clinics. Three physicians believed that it was the high cost of surgical treatment that caused so many persons with low incomes to feel that they could not afford medical care. Four physicians thought that the most important factor in the lack of medical care among the low-income group was lack of information on the availability of medical care. Two physicians were in favor of compulsory prepayment plans for medical care, or sickness insurance for the low-income group, since this group seemed to be incapable of making provisions to pay for medical care. A few physicians thought that it was the high cost of laboratory tests and x-ray treatments that caused so many people to think that medical care was beyond their ability to pay. To alleviate this condition they recommended free diagnostic centers, maintained by the government.

One hospital reported that 285 patients were refused admittance as bed patients because they were not able to pay for hospitalization. The other sixteen hospitals reported that they had not turned away any patients. The comments from eight hospitals on the methods to improve the supply of medical care may be summarized as follows. There is a great need for a "filter system" that will prevent people who are able to pay for medical care from taking advantage of the free services provided in the outpatient departments and clinics. The local governmental agencies should pay for hospitalization and medical services required by people who are financially unable to pay for such services themselves, after their indigence has been established by a thorough investigation.

The hospital outpatient departments turned away fifty-eight persons because they were not eligible to receive care there. Some were referred to physicians, some to the Veterans' Bureau and the remainder to the eye clinics.

The health departments stated that 15,583 persons in need of medical care were reported to them. These people needed treatment for tonsils, adenoids, teeth, ears and eyes, and orthopedic therapy. It was stated that they were unable to obtain the necessary treat-

ments because there were inadequate free services available. If these people did not receive medical care the responsibility must rest with the local governments, since the health departments had been informed of their need and of their inability to pay for the necessary services. The health departments also reported that 13,585 people had requested medical services from

TABLE 1—Distribution of Forms

	Number Sent	Forms Returned and Used in Study	
		Number	Per Cent
Physicians in active practice*	800	140	17
Hospitals	20	17	85
Nurses organizations	16	16	100
Health departments	14	12	86
Welfare and relief agencies	13	12	92
Schools	70	64	91
Colleges	6	6	100
Other organizations		22	
Pharmacists	196	46	23

\* The information supplied by the dentists in this district is included in the Suffolk district report.

them and that the necessary services could not be obtained for 4,801. The reasons for this inability were not given. Five health departments made statements as to what they considered was needed to meet the need for medical care. Three of the health departments stated that all persons who applied for medical care were getting the necessary care through the cooperation of the public health nurses, the private physicians and the public welfare boards. One health department thought that more clinics for tonsil and eye cases were needed. Another stated that outside of the communicable diseases, for which adequate care was provided, they had no information on need for medical care.

The welfare and relief agencies reported that they knew of no persons who needed medical care that could not obtain the necessary care. If the 20,384 persons reported by the health departments as unable to obtain medical, dental, hospital or nursing services were referred to the welfare and relief agencies or the public health nurses, then they evidently received the necessary services since the welfare and relief agencies and the nurses stated that they were able to arrange or provide medical services in every instance in which they found a need for such services. There appears to be a lack of cooperation and agreement between the health departments and the welfare and relief agencies and public health nurses in this area. The comments from the welfare and relief agencies indicated, however, that the people they dealt with might not be furnished with all the medical care they needed. They stated that they lacked funds to provide dental care, eye examinations and glasses to some of their clients. They also believed that many people with low incomes waited too long before obtaining necessary medical or dental care but, in their experiences, they knew of no cases in which medical or dental care could not be obtained if requested.

The public health nurses reported that they had not found any person in need of medical care who could not be furnished with the necessary care. The general experience of the nurses, as stated in their comments, was that they occasionally found a person in need of medical treatment who had made no attempt to obtain such treatment because he felt that he could not afford the cost. In such cases the nurses experienced

no difficulty in furnishing medical care. The nurses have always found the private physicians and the welfare and relief agencies willing to cooperate with them in their work. To the nurses the big problem is economic—not medical—since so many people have such low wages that they are unable to maintain a standard of living that is conducive to good health. These same people are not eligible for governmental aid in obtaining necessary goods and services, which they need as much as the totally indigent persons who are cared for through the use of government funds.

In the elementary or secondary schools the examinations provided by the school boards revealed that 19,237 pupils were in need of medical or dental care in 1937. Of this number 2,000 were unable to obtain the recommended care because their parents were unable to pay for it or because there were not enough free clinics where the treatment could be obtained. The comments from the schools were, in general, that the parents cooperated very well with the recommendations of the school physicians, although there was some difficulty in obtaining glasses and dental care for many of the children whose parents lacked the funds to pay for such services and items themselves.

The colleges and universities provided their students with the necessary medical care through their infirmaries and staff of physicians.

TABLE 2—The Amount of Medical Care Furnished in 1937 According to the Persons and Organizations That Provided It

	No.	No. of Beds	Pay and Part Pay Patients	Public Charges	Free Patients
Hospitals	17	2,979	3,355	3,771	3,929
Patient days			417,094	58,936	53,463
Outpatient clinics	9	24,454		61,374	
departments and					
Public health nurses	51	84,471		Percentage of Visits Made Without Charge 30.5	
Pharmacists	46	2,810		No. of Prescriptions Provided at Cost or Reduced Rates 65.0	
Physicians	140	16,090		Total Number of Persons Who Received Free Care in Home or Office 115	
Per physician				Total Number of Hours Devoted to Care of Free Cases in Clinics 27,581	
					Number
Clinics maintained by the health department					11
Clinics maintained by welfare and relief agencies					3
Schools which have health supervision					61
Colleges which have health examination and supervision					0

The number of free prescriptions furnished by the pharmacists has been given in table 2. The pharmacists' ideas on the methods of supplying medical care is presented in the following summary of their comments. The public is well supplied with medical care and the physicians and the pharmacists have contributed more than their share of free services and medicine in making this care available to the poor. The local governments should apportion funds to be used to pay for medicine prescribed by the physicians to patients who are in the low-income class, as well as for the indi-

gent The indigent should have the privilege of calling their own physician and of obtaining prescribed medicine at their local pharmacy

The study on the supply of medical services in industrial plants was made with the aid of Mr Winthrop Taft of the Harvard Business School, who was employed to collect the data and information from the 169 industrial concerns in this district This group is made up of 143 manufacturing plants, and the remaining twenty-six are warehouses, banks and small stores

The 143 manufacturing plants employ 20,753 persons Of this number 51 per cent of the workers receive some medical attention through their employment, but only seventeen of the 143 plants have the services of a physician available or on call Nursing services are available in twenty-one plants, which includes 64 per cent of the 20,753 workers Seven of the plants require annual physical examinations, and eighteen plants give physical examinations when the workers are hired Forty-four plants, employing 82 per cent of the total workers, maintain first aid rooms, but there is one plant employing 200 people that does not provide even a first aid kit, although the law requires that all plants employing 100 persons or more must provide first aid rooms The amount of medical care provided by the twenty-six warehouses, banks and stores is negligible, as no establishment employs as many as 100 persons

The following recommendations concluded the report on medical care in industrial concerns

It is recommended that

- 1 Medical supervision of plant employees be increased
- 2 Annual physical examinations be increased
- 3 Health records be increased
- 4 Cambridge physicians be used more extensively (in order that a doctor would have personal interest in a plant rather than being representative from an insurance company or hospital)
- 5 More dental clinics be fostered in the community where dental care can be given within the patient's means
- 6 Health education be increased

The members of the Middlesex South District Medical Society's Committee on the American Medical Association's Study of the Need and Supply of Medical Care made an appraisal of the comments submitted by the physicians and pharmacists concerning the need of medical care and the methods that they believed should be considered in meeting this need Because this committee is more qualified to interpret and explain the comments of the local physicians and pharmacists, its report is printed below

There is little doubt in regard to the unanimous attitude of the doctors that they are making every reasonable attempt to provide medical care for all who need it This desire, however, is tempered as well as at times tried because of certain disturbing conditions The first of these is the obvious attempt on the part of some to secure medical attention gratis when a reasonable fee could be paid The matter, however, is not simply that of trying to distinguish patients on the basis of minimum financial ability Other things enter the picture For example, a number of doctors have commented on the expense of laboratory, x-ray and other special services needed for diagnosis The expense of these seems at times to be out of proportion to the small income of the patient, since such services increase substantially the total cost to the patient Even more serious is the public relations aspect as indicated by the comment "I observe that clinic patients can obtain

laboratory and x-rays for a lower price than private patients that I send to hospitals for this work This discourages the pay patients to come to me and many go directly to clinics the next time they require such work I believe that a set price should be established for such work" Other comments seem also to point toward a potential case of carelessness with which the social services may be charged when deciding, without careful inquiry, to send patients where they may obtain free advice

Another comment made by many physicians is that the very poor have far better medical assistance than those wage earners whose incomes are in the lower brackets Often these patients have to bear the full cost of medical care simply because they are receiving a nominal income This serious problem appears to revolve about the question of how in an economically and socially wise manner medical care may be provided for these people Some of the replies reflect a hasty opinion that the government might as well provide the cost of this service, implying that the government has already wasted more than enough to cover all such needed help to the citizens This position, however, appears to beg the question, since there are many individuals who are either too proud to come or who because of a technical fact of small income cannot come under this government control The doctors making the comment of "let the government do it" appear to forget that such a move on the part of the government represents a first step toward full government control of medical services to the whole population

A number of the comments reflect the well known fact that in many instances the less well-to-do and the poor are as inefficient in caring for their health as they are in their economic position Lifting an individual out of trouble with regard to his or her ailment consequently does not lead necessarily to a permanent cure

On the other side of the picture there is the question of how much time, energy and also out-of-pocket expense the doctors should be expected to provide Many of the comments reflect the ever present struggle to earn a living The thought that this might be avoided through some kind of sovietized medicine recalls once more the dread of politics and lowered standards

Turning now from the point of view of the doctors to that of the pharmacists, we find some interesting suggestions These concern the patients from the lower economic classes The pharmacists comment that the socially poor tend to ask for medical care in the case of trivial ailments This observation is coordinate with that of the doctors, indicating that the fundamental trouble with many of these people is a poverty in understanding and wisdom as well as that of pocketbook and social position Also, in the minds of the pharmacists, many clinics are too hurried for full diagnosis

There is no doubt that the pharmacists are anxious to cooperate with the doctors The service, however, which they render to indigent and low income groups of customers is given more from a feeling of business charity than is true of the gratis service of doctors which originates in knowledge that they are following a profession

There is apparently the serious difficulty of fee and public payment plan between politicians, doctors and pharmacists in the case of some charity patients This would lead one to inquire whether for the poorer patients the whole relationship between doctors, patients and pharmacists, with the politician on the side, ought



not to be reviewed very carefully by physicians in order that they might fully understand one phase of public relations in public health work.

With reference to the special instances, one pharmacist indicated that the physicians whose prescriptions he fills are not always too thoughtful regarding the expense of the drugs prescribed. This pharmacist comments "After forty years in the business I am convinced that the patient is asked to pay too much for specialty prescriptions. The physician writes for some specialty either not knowing the cost or at least not telling the patient, and the result is that the patient thinks he is being robbed."

In summary it may be said that both doctors and pharmacists are vitally interested in the health of the community from the point of view of a wholly sound and highly professional attitude. This is well known

There appears to be in the situation, however, some difficult problems. These center about the means of providing medical care for the lower income groups and surgical care for the very poor according to some plan which will provide the attending physician with a financial return sufficient to enable him to maintain self respect among his fellows. There is, in addition, the serious problem of coordination between doctors and pharmacists. Possibly doctors have been too inclined to take the pharmacists for granted and too ignorant of the business side of the drug store. Finally, the comments in many instances hint at unsolved problems of human relations. These problems should be discovered, their causes disclosed and their cure begun. Only in this way can the medical profession through its own activity avoid what is believed to be the very bad alternative of governmental control.

## THE COMMONWEALTH FUND AND EXTENSION TEACHING

*Abridgment of Report on Postgraduate Study and Extension Teaching from the 1938 Annual Report of the Commonwealth Fund, New York City*

The Commonwealth Fund encourages postgraduate study in several ways by giving fellowships for study at selected medical schools to physicians in certain parts of the country through the Divisions of Rural Hospitals and Public Health, by subsidizing the development of university facilities for postgraduate teaching and by joining with state medical societies and health authorities in setting up extension courses which take instruction to the doctor in his own bailiwick.

Whatever the content, the division believes that postgraduate study is rewarding if it brings the student into close personal touch with an outstanding and modern-minded teacher—discipleship plays a large part in medical education—if it helps him to make the best use of books and journals, and if it gives him a sound approach to diagnosis.

In the public health program, emphasis falls on general brush-up courses for physicians practicing in the states in which the fund is subsidizing public health work, and in some instances in neighboring states. To meet the preferences of such men, the four month courses hitherto offered at Vanderbilt have been broken up into four units of a month each, to be taken separately at the physician's convenience. It is understood, however, that the month in physical diagnosis and internal medicine is to come first and is to serve as a foundation for the courses in surgical diagnosis, obstetrics and pediatrics. A similar arrangement is in force at Harvard for postgraduate students from the four northern New England states.

Postgraduate teaching under university auspices may be done either on the campus or in the field. On the initiative of its late president, L. D. Coffman, the University of Minnesota recently found a fresh way to lure busy men and women back to the campus. A building was put up for their special use, and a schedule of week-long courses in many fields keeps this dormitory-teaching center in constant use. All the circumstances favor serious and concentrated work. Courses in medicine form an essential part of the plan, physicians enrolled readily for the first of these courses and in some instances came back again and again for more

The fund has made it possible for the university to employ a full-time director to develop these medical courses to their fullest possibilities.

At Tulane University, where resident postgraduate medical instruction is of long standing, the fund has helped to set up a division of extension education which, in collaboration with various professional agencies, offers instruction in the field. This division has arranged courses in pediatrics and syphilology which have already reached several hundred physicians in Mississippi. Here the unit of instruction is a series of lectures every day for a week, but some of the best teaching is done by the instructor in consultation with individual physicians outside the regular sessions. The state medical association and the state department of health in Alabama have now joined in asking that similar courses in internal medicine be offered in that state.

Meanwhile, field instruction in obstetrics, following the pattern used with such success in Virginia and Mississippi, has been continued for a second year in Tennessee with a full-time instructor employed jointly by the state medical association, the state health department, the two medical schools and the Commonwealth Fund, and a similar arrangement was launched during the year in Oklahoma. Both projects have been highly successful. Something over 1,100 physicians have been enrolled in Tennessee, and the initial response in Oklahoma surpassed all expectations. In one circuit in rough, hilly country in Oklahoma, a doctor distinguished himself by driving eighty miles from his home to the nearest center of instruction to make up for a session which he had been forced to miss because of an emergency call.

The scholarship plan by which the fund seeks to steer promising medical students into rural practice has now carried thirty-three young men through medical school and into small-town offices, with seventy-eight more on the way.

Medical education underlies the fund's field programs in public health, rural hospitals and mental hygiene. When the sums earmarked for this purpose are brought together from the budgets of these programs and added to those appropriated directly in the form of special grants, they total, for the year just ended, approximately \$375,000.

## GRADUATE MEDICAL EDUCATION

A PROGRESS REPORT OF THE FIELD STUDY ON GRADUATE MEDICAL EDUCATION IN THE UNITED STATES  
BEING CONDUCTED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

## OKLAHOMA

In 1925 the director of the Extension Division of the University of Oklahoma adapted North Carolina's plan for continuing the training of practicing physicians to the needs of Oklahoma. The dean of the University of Oklahoma School of Medicine became interested and was appointed the first chairman of a committee of three, with the superintendent of the university hospital and the professor of internal medicine of the school of medicine as members. The director of the extension division served as an ex officio member. A budget of \$1,500 was appropriated by the president of the university, although it was proposed that the extension programs be self supporting. A field director was appointed and an out of state pediatrician who was experienced in conducting graduate courses on a circuit basis was engaged. County medical societies throughout the state were presented with the plan and voted on its acceptance. Six circuits of seven centers each were set up the first year, and within fourteen months the state was covered, and slightly more than 1,100 physicians had subscribed for the series of twelve lectures. A registration fee of \$30 was charged.

The extension division of the university continued to administer the graduate program, publicize the courses and organize the instructors' itineraries. Physicians who gave the instruction were engaged by the university. The extension division later provided for the financing, prepared the announcements and arranged for enrolment of practicing physicians.

In 1926 other courses were given in internal medicine, a series of nine lectures with clinics and consultations in seven teaching centers.

The course in internal medicine was repeated in 1927 with another guest lecturer, who gave three hours of lectures and clinics weekly for nine or ten times. An organizer from the university's extension division assisted each county society which elected the program. The fee for this series was \$35. A short course in the examination, diagnosis and treatment of tuberculosis was arranged in each of the three state tuberculosis sanatoriums. Illustrated lectures, laboratory demonstrations and clinics were given by the hospital personnel for one week. Each class was limited to twenty physicians, the fee was \$7.50. Demonstrations and lectures in physical therapy were conducted for one week at the medical school by an out of state physician, with the use of the facilities of the university hospital.

In 1928 one week intramural courses in surgical diagnosis and in medical diagnosis were held in Oklahoma City, while the instruction in tuberculosis was repeated in one of the state sanatoriums and courses in physical therapy and surgical diagnosis were given in Tulsa.

Intramural courses designed for practicing physicians were given in obstetrics, gynecology, pediatrics, urology and eye, ear, nose and throat during 1929. Five or six out of state specialists constituted the faculty for the week of instruction in each subject. The enrolment for each course was limited to forty physicians. Fees were \$35. In addition the extramural course in internal medicine was repeated in six teaching centers of the state.

The graduate activities of the first five years resulted in a deficit greater than the university could assume. The Oklahoma State Medical Association therefore donated approximately \$700 in order that the field director might continue his work. Full time instructors were discontinued and teams of three prominent guest speakers were invited to visit the state for a week's period. Each of these instructors gave six lectures to any county medical society that would pay the traveling expenses. Attendance varied at these meetings from twenty-five to 250 physicians, depending on the number of physicians practicing in the sections visited.

In 1929 officers of the state medical association proposed to the extension division of the university that medical and surgical motion picture films be distributed among the county medical societies of the state. Approved films were purchased by the state association, the extension division serviced them, arranged for booking and distributed them to various county societies. The only charge to the local societies was for transportation of films to and from the university. When local operators were not

available, they were provided for a small fee. The films were widely used throughout the state and at the University of Oklahoma School of Medicine. In 1933 films were shown in seventy-seven towns and in all but two cases were without expense to the state medical association.

During the period 1929-1930 the University of Oklahoma provided the otolaryngologists and ophthalmologists in two centers of the state with one week of instruction, including pathologic anatomy with material for dissection. Again prominent teachers visited the state and supervised dissections. Two graduate physicians were assigned to each cadaver. University hospitals provided facilities. A fee of \$50 was charged, thus providing competent instruction. Groups of from twenty to sixty physicians enrolled and the venture proved successful financially.

From 1930 to 1933 the practicing physicians of the state were again provided with prominent out of state instructors, who gave intensive intramural courses at Oklahoma City and one circuit course throughout the state. In 1931 there were an intramural course and a series of circuit courses which were held in six centers of the state. In 1932 two courses were given in each of the eleven centers as well as one intramural program on degenerative disease.

The state medical association appropriated sufficient funds in 1933 for four courses of instruction, one each in obstetrics and gynecology, in surgical diagnosis, in traumatic surgery and in degenerative disease. Thirty-six out of state speakers participated in these courses, which were given in twenty-six centers of the state. Twenty-eight in state physicians also participated. Cancer teaching clinics were organized in several parts of the state and were attended by 1,137 physicians.

There were approximately 1,900 physicians who received instruction in one or more of the subjects given during 1933. The state medical association spent \$700, the state of Oklahoma appropriated \$1,431 and the physicians paid fees totaling \$5,065. The deficit was made up by the extension division of the university.

The courses were discontinued at this point because the governor of Oklahoma withdrew financial support from the extension division of the university. In addition, cultists attempted to gain entry to the state courses in October 1933, and three years passed before it was possible to resume the graduate program which had had such an auspicious beginning.

At this time a joint committee composed of representatives from the state medical association and the faculty of the school of medicine developed a speakers' bureau. The university extension division issued a bulletin containing the names of 100 Oklahoma physicians and the subjects on which they would speak. The secretary of every county medical society was provided with a copy so that some graduate training might be continued to this extent.

In 1936 the state association's special committee on postgraduate medical teaching again planned an extensive program of graduate instruction. The committee was composed of three members with Dr. Henry H. Turner as chairman. Three out of state speakers were engaged to give courses in cities in the western half of the state. Subjects of general interest to practicing physicians were included at this time.

In 1937 the request of the postgraduate committee of the state medical association for an appropriation of \$2,000 was granted in order that a state wide postgraduate program in obstetrics might be financed. The Commonwealth Fund of New York made a very substantial contribution and the Oklahoma Health Department also assisted financially. Under the plan ten lectures, clinics and demonstrations in obstetrics would be given at weekly intervals in county seat towns or centers where physicians customarily met for county medical society meetings. A full time instructor was engaged and a field director familiar with the state employed to make the preliminary arrangements. The plan is similar to the one which operated so successfully in Tennessee.<sup>1</sup>

<sup>1</sup> Graduate Medical Education Tennessee J A M A 111 725 (Aug. 20) 1938

The state was divided into nine teaching circuits. Five cities in each circuit were selected as teaching centers. The first course began on April 4, 1938, in the northeastern part of the state. By November 15 three circuits had been completed and 244 physicians in thirty-one counties had received instruction. Enrolment for the fourth circuit totaled 115. It is expected that the nine circuits in the state will be covered by January 1940.

In each teaching center a clinic chairman arranges for clinics and for consultations whenever the latter are requested by local physicians. A record of attendance is kept. The registration fee is \$5 for the series of clinics, which include manikin demonstrations. The fact that the success of the clinic depends largely on the cooperation of physicians in the community makes the program a responsibility of the local profession thus assuring keen local interest. A minimum of fifteen physicians must register in a center before a course may be given.

In addition to practicing physicians attending obstetric lectures and clinics, nurses who assist local physicians are invited to listen to the instruction. Superintendent nurses of obstetric hospital wards are invited also, as well as nurses employed full time by county health units. No fee is charged nurses for this training, since the course is arranged primarily for physicians.

The committee on postgraduate medical teaching has an advisory committee of six members with the commissioner of health of the Oklahoma Health Department and the dean of the medical school as members. The health department has cooperated by rendering financial assistance. Mimeographed notes of the lecturers are prepared by the committee's secretary. These are bound and distributed to physicians on completion of the course. The medical school has contributed equipment which is used in illustrating the lectures. It is estimated that the total expenditure for this type of instruction will approximate \$19,500 to provide for the salary and traveling expenses of the clinical instructor and field director and the salary of a full time office secretary in addition to miscellaneous expenses for supplies and equipment. The treasurer of the state medical association disburses the funds on the approval of vouchers by the committee chairman.

The Oklahoma Health Department began a series of post graduate courses in venereal disease in October 1938. These courses are given one day each week for five times without cost to physicians. They are conducted by a member of the health department and will be given until the entire state is covered. The president and secretary of each county medical society are notified when lectures are to be held and are responsible for making the local arrangements. Instruction is limited to practicing physicians only. Thus far, four counties have been visited and 157 physicians in these areas have attended the lectures.

The Oklahoma City Clinic sponsored by the Oklahoma City Clinical Society has been given each year since 1930 by a group of physicians in the Oklahoma County Medical Society. The clinical society consists of 150 members of the 290 in the county medical society, each member contributing \$10 a year. This organization brings to Oklahoma City sixteen prominent guest speakers, who are given traveling expenses only. The meetings, are of four days' duration and consist of a series of lectures and round table discussions, which are held in a local hotel. The director of clinics, at present Dr. Wendell Long, has charge of local arrangements. Commercial exhibits, thirty in number, aid in financing the clinical conference. The number of physicians who have registered has increased from 385 in 1933 to 522 in 1937. Approximately 80 per cent of those who attend are from Oklahoma and the remainder are distributed throughout the ten states in this section of the country. Registration fees are \$10. The conferences are announced in state medical journals and by letter to approximately 13,000 physicians.

The Commonwealth Fund of New York offers eight scholarships each year to practicing physicians of Oklahoma who desire to spend three or four months of graduate study in a medical center. Each applicant is interviewed by a member of the staff of the Commonwealth Fund. Physicians who are selected are given a small stipend and are provided with traveling expenses and tuition. This plan, which has operated so successfully in other states, was begun in Oklahoma in 1938.

There are 2,364 physicians in Oklahoma, 1,457 of whom are members of the Oklahoma State Medical Association.

## OFFICIAL NOTES

### ADDRESSES BY OFFICIAL STAFF

DR PAUL C BARTON

March 8—Interprofessional Relationship Committee of the Hennepin County Medical Society, Minneapolis

DR W W BAUER

March 6—Woman's Club, People's Church, Chicago

March 13—Marquette University, Milwaukee

March 20—Men's Civic Club, Antioch, Ill

March 21—Young Women's Club, Bryn Mawr Church, Chicago

DR MORRIS FISHBEIN

March 6—Southeastern Surgical Congress, Atlanta, Ga

March 7—Executives' Club, Charlotte, N C

March 13—Lay audience, auspices Payne County Medical Society, Stillwater, Okla

March 13—Banquet, Payne County Medical Society, Stillwater, Okla

March 14—Three civic clubs, Shawnee, Okla

March 14—Pottawatomie County Medical Society, Shawnee, Okla

March 15—Jackson County Health Forum, Kansas City, Mo

March 17—Northwest Branch Chicago Medical Society, Chicago

March 22—Phi Beta Lecture, Mercy Hospital, Chicago

March 23—Chamber of Commerce, Lions and Rotary Club, Hannibal, Mo

March 23—Marion-Ralls County Medical Society, Hannibal, Mo

March 29—St Joseph Clinical Society, St Joseph, Mo

March 29—Public meeting, auspices St Joseph Clinical Society, St Joseph, Mo

DR PAUL A TESCHNER

March 9—Public school, Cicero, Ill

March 10—Woman's Auxiliary, Milwaukee County Medical Society, Milwaukee

### RADIO BROADCASTS

The fourth series of programs broadcast in dramatic form portraying fictitious but typical incidents of significance in relation to health by the American Medical Association and the National Broadcasting Company, entitled "Your Health," began Wednesday October 19 and will run consecutively for thirty-four weeks. The program is broadcast each Wednesday over the blue network of the National Broadcasting Company at 2 p m eastern standard time (1 p m central standard time, 12 noon mountain time, 11 a m Pacific time).<sup>1</sup>

These programs are broadcast on what is known in radio as a sustaining basis, that is, the time is furnished gratis by the radio network and local stations and no revenue is derived from the programs. Therefore, local stations may or may not take the program, at their discretion, except those stations which are owned and operated by the National Broadcasting Company.

The next three programs to be broadcast, together with their dates and their topics are as follows:

March 8 Water Waste and Sanitation

March 15 Guarding Fresh Foods

March 22 Auditing the Health Record.

<sup>1</sup> Owing to program conflicts there will be no Chicago broadcast of the network program. Instead a recording of the program will be broadcast over station WENR at 8 p m each Wednesday. This recording will be an identical rebroadcast of the network program broadcast earlier the same day.

## MEDICAL LEGISLATION

## MEDICAL BILLS IN CONGRESS

*Bills Introduced*—S 1383, introduced by Senator Brown, Michigan, and H R 4496, introduced by Representative Lesinski, Michigan, propose that no citizen of any foreign country the boundaries of which touch the boundaries of the United States shall be permitted habitually to cross the international boundary line for the purpose of seeking employment or engaging in any employment, vocation or trade in the United States S 1557, introduced by Senator Shipstead, Minnesota, proposes to enact a National Epilepsy Research Act This bill proposes to create in the United States Public Health Service a National Epilepsy Institute to conduct researches, investigations, experiments and studies relating to the cause, diagnosis and treatment of epilepsy to assist and foster similar research activities by other agencies, public and private, and to promote the coordination of all such researches and activities and the useful application of their results, with a view to the development and prompt widespread use of the most effective methods of prevention, diagnosis and treatment of epilepsy This bill is modeled closely after the National Cancer Institute Act S 1563, introduced (by request) by Senator Andrews, Florida, proposes to provide payment of pensions and increase in pensions to all veterans in all wars, their widows and dependents and certain peacetime soldiers The word "veteran" is defined in the bill in such a way as to exclude contract surgeons of the Spanish-American War H R 4421 and H R 4422, introduced by Representative Bloom, New York, propose, respectively, to establish a chiroprap corps in the Medical Departments of the Navy and Army H R 4425, introduced by Representative Cochran, Missouri, proposes to provide for reorganizing agencies of the government The bill does not provide for the creation of a federal department of health nor will the establishment of such a department be possible under the provisions of the bill if it is enacted H R 4427 introduced by Representative Green, Florida, proposes to authorize an appropriation of \$1,550,000 to construct a marine hospital in Florida on a site to be selected by the Federal Board of Hospitalization

## STATE MEDICAL LEGISLATION

## Alabama

*Bills Introduced*—S 115 proposes to require a physician diagnosing or treating a case of syphilis gonorrhea, chancroid, lymphogranuloma inguinale or granuloma venereum to report the facts immediately in writing to the county health officer S 116 proposes to authorize a county health officer (1) to require all persons infected with a venereal disease to undergo treatment therefor and (2) to isolate or quarantine persons infected with venereal disease and to commit to jail for treatment persons refusing to take or continue treatments

## Arizona

*Bills Introduced*—H 209 proposes to require every physician or other person engaged in the prenatal care of a pregnant woman or attending her at delivery, to obtain a specimen of her blood not less than ten days after the first professional visit and to submit that sample to an approved laboratory for a standard laboratory test for syphilis S 165 to amend the naturopathic practice act proposes to authorize the issuance without examination of a license to practice naturopathy to any person who has practiced naturopathy in the state for at least three years prior to January 1, 1939 provided application is made within sixty days after the date this bill becomes a law and is accompanied by a fee of seventy-five dollars H 249 proposes (1) apparently to repeal all existing law with respect to the practice of the healing arts (2) to create a board of examiners in the healing arts and (3) to prohibit the practice of any branch of the healing arts unless licensed by this board The board in the healing arts is to consist of one doctor of medicine, one osteopath, one chiropractor and one naturopath The bill proposes that any person practicing more than one branch of healing is to be required to obtain a certificate of

license for each branch so practiced The bill then attempts to define the practice of medicine, the practice of osteopathy, the practice of naturopathy and the practice of chiropractic The practice of medicine is defined "as a system of treating the abnormalities of the human mind and body by all forms of materia-medica and surgery" Naturopathy is defined as "a system of treating the abnormalities of the human mind and body by all forms of physiotherapy including the use of physical, electrical, hygienic and sanitary measures incident thereto, and does not include materia-medica or surgery" It would seem, therefore, that a doctor of medicine would be limited by a license to practice medicine to the use of "all forms of materia-medica and surgery," and that if he desired to use any form of physiotherapy it would be necessary for him to be licensed also to practice naturopathy The bill proposes to permit all licentiates to use the title of doctor or physician, to give all licentiates equal rights and privileges in all city, county and state institutions, agencies, institutions or hospitals deriving any support from the public funds and to give them equal rights and privileges under the workmen's compensation act and all health laws

## Arkansas

*Bills Introduced*—S 242 proposes to exempt from the payment of any privilege or occupation tax levied by any city or town which does not maintain a free medical clinic any physician whose services are largely given to the care of the indigent sick S 308 proposes that when any state agency empowered to issue or revoke any license refuses to issue or revokes a license the agency must make a report, setting forth the grounds for its action and, on request of the aggrieved person, must transmit the record to the appropriate chancery court H 366 proposes to create a state hospital board to be composed of the secretaries of the Medical Examining Board of the Arkansas Medical Society, the Eclectic Medical Examining Board, the Homeopathic Medical Examining Board, the Osteopathic Examining Board and the Chiropractic Examining Board This board is to require the registration of every hospital in the state and is to charge each hospital an annual registration fee of not more than \$5

*Bill Passed*—S 304 passed the senate February 21, proposing to classify as an investment company a person or organization issuing any form of contract or certificate to furnish hospitalization and/or medical care at a future date and to require such persons and organizations to obtain a permit from the Securities Division of the Bank Commission to file reports, to submit to examination and to pay similar fees therefor as is now required by law of all other investment companies

## California

*Bills Introduced*—A 2112 proposes to create a State Board of Eugenics, which is to be authorized on the application of the superintendent or warden of any state institution, to order the sexual sterilization of particular inmates of state institutions Apparently sterilization may be ordered when any inmate, if released without sterilization, would be likely to procreate a child or children who would have a tendency to serious physical, mental or nervous disease or deficiency A 2338 proposes to create seven crippled children hospital districts in the state, each district to provide special care and treatment, transportation and physical rehabilitation for physically defective and handicapped persons under the age of 18 A 2494 and A 2501 proposes to authorize the organization of corporations to write insurance against the need for medical and hospital services The bill apparently contemplates that a company so organized may provide medical services through licensed physicians in its employ A 2585, to supplement the Business and Professions Code, proposes to enact a massage, electro physiotherapy practice act and to create a state board to examine and license persons applying for such licenses Apparently licentiates of the board are to receive one of two types of licenses (1) a license to practice suggestive therapy, physiotherapy or magnetic healing and (2) a license to practice massage Swedish movements, medical gymnastics, and electro, hydro vibro helio, thermo, zone or mechano therapy The bill

defines physio therapy as the "treatment by mental impression or suggestion" A 2764, to amend the provisions of the Business and Professions Code relating to ophthalmia neonatorum, proposes that it is to be the duty of the attending physician where a child develops ophthalmia neonatorum within two weeks after birth to administer silver nitrate and to report the case within twenty-four hours after knowledge to the appropriate local health officer A 2745, to supplement the Business and Professions Code, proposes to permit any person whose license has been revoked to file an action in the superior court in the county in which he resides to determine all questions of law and fact pertaining to the revocation and to give that court full jurisdiction in the matter, provided that action is instituted in that court within sixty days after revocation of the license A 2436, to amend the law approved May 3, 1933, requiring the use of materials and supplies substantially produced in the United States in public works and for public purposes, proposes that the act shall not apply to medical and surgical instruments scientific equipment, microscopes, lenses, or instruments used for scientific or medical research

#### Colorado

*Bill Introduced*—S 332 proposes to restrict licensure in medicine, chiropractic, chiropody, mid-wifery or any of the healing arts to citizens of the United States

#### Connecticut

*Bills Introduced*—S 290 proposes to prohibit any hospital receiving a state appropriation from requiring or permitting any female nurse to work more than eight hours in any one day, nor more than forty-four hours in any one week H 464 proposes to amend section 3 of the charter of the Connecticut State Medical Society so as to provide that the house of delegates shall be composed of (1) the president, president elect, treasurer and secretary, (2) delegates to be elected annually by the several county medical associations, and (3) eight councilors to be elected from time to time as provided in the charter H 845 proposes to create stated persons a body politic and incorporate by the name of The College of Natureopathic Physicians The corporation's object is to be instruction in the principles, practice and theory of naturopathy and the corporation is to have the right to establish and maintain hospitals, sanatoriums, infirmaries and clinics and to award the degree of Doctor of Natureopathy to such persons as it deems entitled thereto H 1009, to amend the medical practice act, proposes apparently to provide for an eclectic medical examining board H 1025 proposes to make it an offense punishable by a fine of not less than \$500 for any institution receiving state aid to interfere or attempt to interfere with a patient in determining what physician shall attend him within the institution

#### Delaware

*Bill Passed*—S 27 passed the Senate February 23, proposing to require every physician attending a pregnant woman to take or cause to be taken a sample of her blood at the time of the first examination and to submit that sample to an approved laboratory for a standard serologic test for syphilis

*Bill Introduced*—S 57 proposes to repeal the laws relating to the Delaware Commission for the Feeble Minded and to create a Delaware Commission for the Mentally Deficient, which is to have jurisdiction and control over the Home for the Mentally Deficient

#### Georgia

*Bills Introduced*—S 139, to amend the osteopathic practice act, proposes to require an applicant to be a graduate of an accredited high school, to have completed not less than two years of college work "according to the Carnegie units, in an approved college of arts and sciences," and to have obtained a diploma from some legally incorporated and reputable school of osteopathy requiring a course of study of not less than four terms of nine months each Apparently the present osteopathic practice act imposes no educational qualification other than graduation from an osteopathic school requiring a course of study of at least three terms of nine months each H 399, to supplement the workmen's compensation act, proposes to make compensable disability arising from some twenty-five stated occupational diseases

#### Idaho

*Bills Introduced*—S 144, to amend the osteopathic practice act, proposes to make it "unlawful for any osteopathic physician to use the word 'doctor' or any abbreviation thereof in any advertisement or sign after or before his name, or in connection with his practice without adding the words 'osteopathy,' 'osteopath' or 'osteopathic physician' thereto" H 253 proposes, as a condition precedent to the issuance of a license to marry, that each party to a prospective marriage present a physician's certificate or a certificate from the Commissioner of Public Welfare that he or she is free from feeble mindedness, insanity or venereal disease in a contagious stage The bill proposes to limit a physician to \$2 for executing such a certificate and making the necessary tests

#### Illinois

*Bills Introduced*—H 224 proposes to appropriate \$1,000,000 for the erection and operation of a state hospital for the care and treatment of poor persons affected with tuberculosis H 230 proposes to prohibit the employment or continuance in employment of a food handler unless he possesses a certificate from a licensed physician dated within the preceding ninety days certifying that he is free from communicable disease H 282 proposes to enact a separate chiropractic practice act and to create an examining committee to examine and license persons to practice chiropractic The bill defines chiropractic as "the science of palpating and adjusting the articulations of the human spinal column by hand only" H 293 proposes to enact a separate osteopathic practice act and to create an examining committee to examine and license persons to practice osteopathy The bill defines osteopathy as "a system of practice of the healing arts in all its branches with therapeutic majoring in manipulation" Just what a license to practice osteopathy will permit the licensee to practice is not clear but, as all applicants will be examined in surgery, obstetrics and gynecology, the license conceivably may permit the practice of obstetrics and the performance of all forms of surgery

#### Indiana

*Bill Passed*—H 134 passed the house February 14, proposing, as a condition precedent to the issuance of a license to marry, that each party to a prospective marriage present a physician's certificate that he or she has been given such examination, including a standard serologic test, as may be necessary for the discovery of syphilis and that in the opinion of the physician the party is not infected with syphilis or, if so affected, is not in a communicable stage of that disease

*Bills Introduced*—H 418 proposes that all actions against physicians, dentists or hospitals for malpractice, error, mistake or failure to cure, whether based on contract or tort, must be commenced within two years after the cause of action accrues The bill proposes that a cause of action will be deemed to have accrued on the date of the act or neglect complained of H 477 proposes, among other things, to prohibit the retail sale or distribution of barbituric acid, aminopyrine, cinchophen, dinitrophenol or sulfanilamide except on the written prescription of a licensed physician, dentist or veterinarian H 494 proposes to require every physician, dentist and nurse on or before July 1, 1939, and at least once every twenty-four months thereafter, to submit a sample of his blood to an approved laboratory for a standard serologic test for syphilis If the test indicates infection, the license of such person is to be suspended automatically and remain suspended so long as the disease is in a communicable stage

#### Kansas

*Bills Introduced*—H 330 proposes to repeal existing laws regulating the possession and distribution of narcotic drugs and to enact what appears to be the uniform narcotic drug act H 375 proposes to impose a tax on the gross receipts derived from professional services, amounting to fifteen mills on the dollar

#### Maine

*Bills Introduced*—H 1416 proposes to give to any hospital, not organized for profit and furnishing hospital service or materials to any patient injured by any accident not covered by the workmen's compensation act, a first lien on such proceeds or any accident and liability insurance policy issued by

any insurance company as may be due the patient, either directly or indirectly H 1432 and H 1433 authorize the formation of nonprofit hospital service corporations to enter into contracts with subscribers for the rendering of hospital service to them through hospitals contracting to do so with the corporations in question H 1645 proposes to create a department of professional licensing to exercise all the powers and functions heretofore vested in the secretaries of the various licensing boards of the state, including the medical board, the osteopathic board, the chiropractic board and the dental board H 1706 proposes to require hospitals which are tax exempt or which receive any public funds to permit such osteopaths as are in good standing and are licensed to practice obstetrics and surgery to practice in their confines and to furnish laboratory service to outpatients of osteopaths The present law requires such hospitals to admit osteopaths, subject to the approval of the hospital board to treat their own paying patients and says nothing with respect to the laboratory service which must be furnished to outpatients of osteopaths

#### Maryland

*Bills Introduced*—H 250 proposes to enact a law regulating the manufacture, distribution or advertising of foods, drugs, cosmetics and devices H 325 proposes to authorize the state board of health to establish such minimum standards and qualifications as it may deem necessary for laboratories in the state, except in Baltimore City, which make examinations in connection with the diagnosis and control of human diseases

#### Minnesota

*Bill Introduced*—S 547 proposes to establish a state-wide system for the after-care of patients discharged from county and state tuberculosis sanatoriums

#### Missouri

*Bills Introduced*—S 68 proposes in effect, to permit hospitals to practice medicine through the agency of physicians in their employ H 264 proposes that a licensed physician or the owner or operator of a private sanatorium or hospital shall not be liable in damages for the restraint of any insane person or person of feeble or disordered mind by reason of having in good faith furnished care, treatment or attention to such person

#### Montana

*Bills Introduced*—H 249 proposes to establish a state hospital to be known as the Montana State Infantile Paralysis Sanitarium H 265 proposes to authorize the state superintendent of public instruction to employ a specialist in the field of health and physical education to direct and supervise the organization of a state-wide program of health and physical education for public schools

#### Nebraska

*Bills Introduced*—Bill 392 proposes to condition the annual renewal of a license to practice osteopathy on the presentation of proof that the holder in the preceding year has attended at least two days of the annual 'educational' program as conducted by the Nebraska State Osteopathic Association, or its equivalent Bill 476 proposes a procedure whereby hospitals may be reimbursed by the state for treating indigent persons injured in motor vehicle accidents

#### New Hampshire

*Bill Introduced*—H 327 proposes to create a commission on disability benefits to compile a report on the possibility of protecting individuals unemployed because of sickness or ill health

#### New Jersey

*Bill Enacted*—S 61 has been enacted as Laws 1939 chapter 13 appropriating \$25 000 to the State Department of Health for the purchase and free distribution of antipneumococcus serum for the treatment of persons affected with pneumonia and financially unable to purchase the serum

*Bills Introduced*—A 199 proposes to enact a separate chiropractic practice act and to establish an independent board of chiropractic examiners to examine and license persons to practice chiropractic The bill defines chiropractic as that branch of medi-

cine and surgery which treats with ailments of the foot and leg and includes the diagnosis of the medical, surgical, mechanical manipulative, and electrical treatments of all the ailments of the human foot and leg, excepting amputation of the leg foot or toes, or the use of any anaesthetic other than local, or the treatment of congenital deformities by the use of the knife or radical operations for talipes valgus, or the treatment of varicose veins by injection or surgery " A 200 proposes to authorize a judge of the court of common pleas, after notice and hearing to commit a narcotic addict to any state, county or city institution for the care and treatment of his addiction

#### New Mexico

*Bills Passed*—S 111 passed the senate February 20, proposing to permit the organization of corporations to operate hospital service plans and to provide that such a corporation may be organized by filing a certificate setting forth its name, its object, location and term of existence with the Superintendent of Insurance of the State, who is to endorse thereto his consent and file it in the Office of the State Corporation Commission H 259 passed the House February 22, proposing to make it a misdemeanor, punishable by a fine of from \$100 to \$500, for any person practicing the healing art to fail to specify on any sign or other advertising to the public the particular branch of the healing art which he practices H 51 passed the House January 27, proposing to require the governing authority of every public high school in the State to arrange for instruction in the public high schools concerning the prevention of venereal diseases

#### New York

*Bills Introduced*—S 877 proposes to enact a self-styled New York uniform food drug and cosmetic act to regulate the manufacture, sale or advertising of foods, drugs cosmetics and devices A 1064 proposes to prohibit the practice of radiology except by licensed physicians, dentists, osteopaths and chiropractors subject, however, to the conditions and limitations of their licenses The bill proposes to define radiology as 'diagnosis and/or treatment of diseases by means of exposure to roentgen rays and/or radium' A 1090, to amend the law permitting a court whenever it is relevant to the prosecution or defense of an action to direct any party to the action and the child of any such party and the person involved in the controversy to submit to one or more blood grouping tests, proposes also to permit a court to order such a test wherever it shall be relevant in any proceeding pending in a court of record A 1137 proposes to make it a misdemeanor for any hospital wholly or partly supported by public funds or exempt from taxation to refuse to permit any licensed physician the right to attend treat and prescribe for any patient therein desiring his services

#### North Carolina

*Bill Passed*—S 119, which passed the senate February 23, proposes to require the parent or parents or guardian of any child to have administered to the child between the ages of 6 months and 12 months an immunizing dose of a prophylactic diphtheria agent meeting the standard approved by the United States Public Health Service for such biologic products This duty is also to be imposed on the parent or parents or guardian of any child between the ages of 12 months and 5 years who has not been previously immunized against diphtheria If the parent or parents or guardian of such child are unable to pay for the services of a private physician for the immunization referred to the appropriate county health officer is to administer the treatment

#### North Dakota

*Bills Introduced*—H 267 proposes as a condition precedent to the issue of a license to marry that each party to the proposed marriage present a physician's certificate that he or she has been given such examination, including a standard serologic test as may be necessary for the discovery of syphilis and that in the opinion of the physician the party either is not infected with syphilis or, if infected is not in a stage of the disease which is or may become communicable to the marital partner S 194 proposes that an action may be commenced by the state by any person who has a special interest in the action against any person practicing without a license, any profession requiring a license or certificate or other legal



**authorization** One of the results of the enactment of this bill may well be to permit the issuance of injunctions to restrain the unlicensed practice of medicine. H 281 proposes to authorize counties, either separately or in conjunction with one or more contiguous counties, to establish and maintain full time local health departments. H 388 proposes to impose a tax of 2 per cent of the gross income received from any business, trade, profession or occupation.

### Ohio

**Bills Introduced**—S 181 proposes to organize the organization of corporations not for profit to establish and operate non-profit hospital service plans whereby hospital service may be provided by hospitals with which such corporations have contracted to such of the public as become subscribers to said hospital service plans. H 268, to revise and codify the laws relating to marriage, proposes, among other things, as a condition precedent to the issuance of a license to marry, that each party to a proposed marriage present a physician's certificate that he or she is free from venereal disease, epilepsy, feeble-mindedness and insanity, as nearly as can be determined by thorough examination and by the application of the recognized clinical and laboratory tests of scientific research approved by the State Director of Health.

### Oklahoma

**Bill Passed**—S 92 has passed the senate, proposing to require every physician attending a pregnant woman to take or cause to be taken a sample of her blood at the time of the first examination and to submit that sample to an approved laboratory for a standard serologic test for syphilis.

**Bill Introduced**—H 329 proposes to enact an independent naturopathic practice act and to create a board of naturopathic examiners to examine and license persons to practice naturopathy. The bill defines naturopathy as 'The physiological and mechanical sciences, such as mechanotherapy, articular manipulation, corrective orthopedic gymnastics, neurotherapy, psychotherapy, hydrotherapy and mineral baths, electrotherapy, thermotherapy, phototherapy, chromotherapy, vibrotherapy, thalamotherapy and dietetics, which shall include the use of foods of such biochemical tissue-building products and cell salts as are found in the normal body, and the use of vegetable oils and dehydrated and pulverized fruits, flowers, seeds, barks, roots and vegetables uncombined and in their natural state, and, added to the above definition, will include all methods now in use, as physiotherapy, Indian herb and simple remedy doctoring, physical culture, gynecology [sic], autobiochemistry, colonic-therapy and scientific massage and such methods as are taught in standard schools of Naturopathy.'

### Oregon

**Bills Introduced**—S 353 proposes that "Whenever any person shall receive hospitalization or medical or surgical care on account of any injury and such injured person shall claim damages from the party causing the injury, such hospital or person rendering medical or surgical care shall have a lien upon any sum awarded the injured person in judgment or obtained by a settlement or compromise on the amount due for the reasonable value of such hospitalization or medical or surgical care rendered the injured person." This bill proposes to repeal the existing law which grants a similar lien to hospitals under the circumstances stated. H 403, to amend the workmen's compensation act, proposes to make compensable an occupational disease arising out of and in the course of employment.

**Bill Passed**—H 415 passed the house February 20, proposing a procedure for the reimbursement of hospitals treating indigents injured in motor vehicle accidents.

### South Dakota

**Bills Introduced**—H 247 proposes to require every physician attending a pregnant woman to take or cause to be taken a sample of her blood at the time of the first examination and to submit such sample for standard serologic tests for syphilis to the State Hygienic Laboratory of the State Board of Health or such other laboratories as are approved by the State Board of Health. H 248 proposes to require as a condition precedent to the issuance of a license to marry that both parties to a

proposed marriage present a certificate from a licensed physician that they are either free from syphilis or are not in a stage of the disease whereby it may become communicable, as nearly as can be determined by a thorough physical examination and such standard microscopic and serologic tests as are necessary for the discovery of syphilis.

**Bill Enacted**—H 10, the basic science bill, was approved by the governor February 23. The new law will require all applicants for licenses to practice any form of the healing art, as a condition precedent to examination and licensure by their respective professional boards, to pass examinations in anatomy, chemistry, physiology, pathology and bacteriology to be given by a board of basic science examiners.

### Tennessee

**Bills Introduced**—S 547 and H 739 propose to prohibit the retail sale and distribution of barbitol except on the written prescription of a licensed physician, dentist or veterinarian. H 758 proposes to grant to hospitals, treating persons injured through the negligence of others, liens on all claims, rights of action, judgments, compromises or settlements accruing to the injured persons because of their injuries.

**Bills Passed**—H 835, to supplement the medical practice act, has passed the house and senate, proposing to prescribe a procedure which must be followed in the revocation or suspension of licenses and to confer on the board of medical examiners stated powers with respect to such proceedings. The bill proposes that in such proceedings the accused physician must be given fifteen days' notice of the time set for the hearing and must be given an opportunity to prepare his defense, and is to be heard in person or by counsel, or both. The board is given the power in such proceedings to administer oaths, issue subpoenas and to enforce the attendance and testimony of witnesses. A companion bill, S 619, was introduced in the senate February 4. H 609 passed the house February 22, proposing to require, as a condition precedent to the issuance of a license to marry, that each party to the proposed marriage present a physician's certificate that he or she has submitted to a physical examination, including a Wassermann and/or Kahn blood test, or other similar laboratory blood test, including a darkfield test where indicated, and that in the opinion of the physician the party is free from venereal disease.

### Texas

**Bill Introduced**—S 81 proposes to appropriate \$50,000 to the State Department of Health to assist in the eradication and control of pneumonia in the state.

### Utah

**Bills Introduced**—H 225 proposes to authorize the organization of what the bill denominates health cooperatives to provide medical, dental, hospital and related services to their members. A cooperative may contract with or employ persons qualified to render any of the health services noted to its members. It may also contract for, own or operate such hospital, clinical, medical or dental facilities as it deems necessary. It is to be authorized to secure membership by advertisement, solicitation or any other means. H 198 proposes to raise to \$10 the annual license renewal fee required of physicians and surgeons, osteopaths, chiropractors and dentists.

### Washington

**Bills Passed**—S 159 passed the senate February 21, proposing to make it unlawful for any hospital organized as a charitable institution to refuse to any licensed physician and surgeon the use of facilities therein or the right to attend patients therein, or refuse admittance to any patient for the direct or indirect reason that a particular physician and surgeon contracts to give medical service in consideration of payment of periodic premiums or dues or because of any physician's membership or nonmembership in any society or other lawful organization. H 325 has passed the house and senate, proposing to amend the law approved by the governor February 3 prohibiting the retail sale or distribution of amital, luminal, veronal, barbitol, acid diethylbarbituric or any of their salts, derivatives or compounds except on the prescription of a licensed physician, dentist or veterinarian. H 325

proposes specifically that "It shall be unlawful for any person, firm or corporation to sell, give away, barter, exchange or distribute amytal, luminal, veronal, barbital, acid diethylbarbituric, or any of their salts, derivatives, or compounds of the foregoing substances or any preparation or compound containing any of the foregoing substances, or their salts, derivatives or compounds, or any registered, trade-marked or copyrighted preparation or compound registered in the United States patent office

*containing more than one grain to the avoirdupois or fluid ounce of the above substances'* except under the written prescription of a licensed physician, dentist or veterinarian. Provisions of the law approved February 3 restricting the sale of para-amino benzene sulfonamide, sulfanilamid sulfamidyl, prontosil, prontosil, neo prontosil, edimalin, sulfonamid or any of their salts, derivatives or compounds are not changed by the provisions of H 325

**Bills Introduced**—S 263 proposes to enact a separate sanipractic practice act and to establish a sanipractic physicians examining board to examine and license persons to practice sanipractic. The bill proposes the following definition "Sanipractic is the science and art of applied prophylactic and therapeutic sanitation which enables the physician to direct, advise, prescribe or apply food water, roots herbs, light, heat, exercises active and passive, manipulation, adjusting tissue vital organs and anatomical structure by manual, mechanical or electrical instruments or appliances or other natural agency, to assist nature restore a psychological and physiological interfunction for the purpose of maintaining a normal state of health in mind and body. Above definition copyrighted 1919 for the purpose of protecting a separate and coordinate principle of healing". This bill was reported unfavorably to the senate February 22. S 311 proposes to create a commission to investigate the organization operation and control of hospital associations medical service bureaus and other organizations supplying medical, hospital or surgical care. On the basis of its investigation and study the commission is to make recommendations to the 1941 session of the legislature respecting the regulation and control of persons or organizations engaging in the activities under study. S 315 proposes to enact what it denominates the Washington uniform food drug

and cosmetic act to regulate the manufacture, distribution and advertising of foods, drugs, cosmetics and devices. H 387 proposes to impose the following additional annual license fees on practitioners of the professions and occupations noted: drugless healing \$3, medicine \$5, midwifery \$3 and veterinary medicine \$3.

#### West Virginia

**Bills Introduced**—S 152 proposes that the provisions of the medical practice act "shall not be construed to apply to the practice of Christian Science, provided that the laws, rules, and regulations relating to communicable diseases and sanitary matters are not violated". H 268, to amend the laws authorizing the sexual sterilization of certain socially inadequate inmates of state institutions proposes to authorize the sexual sterilization of any inmate of a state institution afflicted with or suffering from any of the following conditions: (1) mental disease which may have been inherited and is likely to be transmitted to descendants; (2) feeble-mindedness or mental deficiency, in any of its various grades, or (3) perversion or marked departure from normal mentality. The bill also proposes that any person found guilty of a carnal abuse of a female under 16 may, in addition to such other punishment or confinement as may be imposed by court, be subject to sexual sterilization. H 352 proposes to make it unlawful for any person to use the prefix "Doctor" or "Dr" in connection with his name in any letter, business card, advertisement, sign or public display of any nature whatsoever, without affixing thereto suitable words or letters designating the degree which he holds.

#### Wisconsin

**Bills Introduced**—S 142 proposes to direct the board of control to establish a chiropractic ward at the Winnebago state hospital for the insane. A 311, to amend the law requiring applicants for licenses to marry to present physicians' certificates as to freedom from syphilis, proposes (1) that such a certificate must be signed by a physician licensed to practice either in Wisconsin or in the state in which the applicant resides and (2) apparently, to limit to \$3 the fee which a physician can charge for executing the certificate and making the necessary examination.

## WOMAN'S AUXILIARY

### Oregon

The auxiliary to the Oregon State Medical Society held a meeting of the board in Portland Nov 2 1938. Dr Charles E Sears gave an address on 'State Medicine'.

The auxiliary to the Josephine County Medical Society was organized Oct 30 1938 with eight charter members. Mrs Byron G Bailey, Grants Pass, was elected president.

The auxiliary to the Jackson County Medical Society met Oct 19 1938, having as guest the state president, Mrs Otto C Hagmeier, Seaside. The auxiliary will try to help furnish oxygen for patients who cannot afford it.

The November meeting of the auxiliary of the Klamath-Lake County Medical Society was spent making bibs and booties for the Doernbecher Memorial Hospital for Children, Portland.

The auxiliary of the Polk-Yamhill-Marion County Medical Society met November 8. Mr R Ivan Loveall, professor of history at Willamette University, Salem, spoke on 'Conditions in Europe Today'.

### Texas

The auxiliary to the Travis County Medical Society met at the home of the president, Mrs C M Darnall, Austin, October 18. Dr B J Lloyd, director of the Austin and Travis County health unit, was speaker.

The auxiliary to the Wichita Medical Society held a breakfast meeting at the Woman's Forum Club House, Wichita Falls, October 11. Dr C W Monroe of Electra spoke on socialized medicine.

Dr S E Thompson of Kerrville spoke on socialized medicine at a meeting of the auxiliary to the Fifteenth District Medical Society and the society in Texarkana, October 13.

### Utah

The auxiliary to the Salt Lake County Medical Society met at the Lion House Social Center, Salt Lake City, October 17. Mrs Henry Raile, president, presided. Members discussed 'The Doctor of Yesterday,' 'The Intern of Today,' 'The Dilemma,' 'We Might' and 'Doctors' Day'.

The auxiliary to the Carbon County Medical Society sponsored a public meeting held at the Elks Club, Price, recently. Dr Edward L Van Alstyn and Miss Jane West of the public health service discussed community health problems. The officers of the state medical association and of the auxiliary held a joint meeting October 9 at Price with the Carbon County Medical Society and its auxiliary as hosts. Dr L A Stevenson, Salt Lake City, discussed the program for medical legislation and Mr W H Tibballs talked on socialized medicine.

The executive board of the auxiliary to the Utah Medical Association met at Salt Lake City, October 13, with Mrs Walter M Stookey, president, presiding. The members voted to undertake the preparation of a history of the pioneer physicians of Utah.

### Washington

The auxiliary to the Washington State Medical Association cooperated with the association in sponsoring 'Your Health Exposition' held in Seattle in September. Exhibits from the American Medical Association and from local health organizations were shown. The exposition was attended by thousands of persons.

The auxiliary to the Cowlitz County Medical Society met at Longview in September. Dr J W Henderson spoke on legislation and public health at a meeting November 16. The

program included a debate on "Resolved that socialized medicine would provide more adequate care for the public than our present system"

At a recent meeting of the auxiliary to the Pierce County Medical Society, Dr Charles Engeles and Dr W G Cameron spoke on legislative questions affecting the practice of medicine

A meeting of the King County auxiliary was held November 21 in Seattle "The Life of Chevalier Jackson" and "The Horse and Buggy Doctor" were reviewed More than 100 members were present

The auxiliary to the Walla Walla County Medical Society met October 14 at Walla Walla Candidates for the state

legislature presented their views on medical subjects Mrs R E Ahlquist, president of the auxiliary to the Washington State Medical Association, discussed plans for the year's work

At a recent meeting of the auxiliary to the Yakima County Medical Society, Dr Paul Lewis spoke on "The Six Most Common Diseases and Causes of Death" Mrs J C Applewhite of Clarkston, parliamentarian for the State Federation of Women's Clubs, spoke on parliamentary procedure

At a meeting of the auxiliary to the Spokane County Medical Society October 14, Dr McIntyre, president of the society, talked on medical legislation On November 11 'Socialized Medicine' was discussed

## MEDICAL ECONOMIC ABSTRACTS

### CUT RATE EXAMINATIONS

A physician in Dayton, Ohio, has received the following letter from a "transport service bureau" in Detroit

A trucking company has requested us to aid them in obtaining the services of a legally qualified physician in Dayton for the purpose of making medical examination of their drivers They have about five employees to be examined These examinations are made to ascertain the physical fitness of the drivers who operate a motor vehicle on the public highway They have eleven other terminals where examinations have been made or are in the process of being made by physicians such as Toledo and Columbus and the doctors in those cities do the work for \$1 per examination on the form attached hereto which includes urinalysis but does not include blood test Will you kindly advise if you will accept an appointment and if so we will then send you full instructions and supplies also direct the employees to call at your office for these examinations In event you accept the appointment any other trucking company having employees to be examined in Dayton will be referred to you Will you kindly give us an immediate reply as they are desirous of having these examinations made at once

The copy of the Medical Examiner's Report which is attached to the letter calls for an examination of visual acuity, with and without glasses, for each eye, and an isolation and combination test for color blindness The physician is also asked to state the degree of impairment of hearing on a percentage basis for each ear In addition, he is asked to answer the question "Do you find evidence of *past* or *present* disease or impairment of the following" (*italics in original*)

- (a) Eyes 1 Right eye?  
2 Left eye?
  - (b) Hearing 1 Right ear?  
2 Left ear?
  - (c) Nose or throat?
  - (d) Teeth and gums?
  - (e) Skin thyroids glands?
  - (f) Brain or nervous system?
  - (g) Lungs or pleurae?
  - (h) Pulse rate 1 Before exercise?  
2 After exercise?
  - (i) Heart (Examine before and after 30 hops on one foot)  
1 Is there a murmur?  
2 Is there dyspnea or other evidence of heart failure?
  - (j) Blood pressure 1 Systolic?  
2 Diastolic?
  - (k) Stomach or abdominal organs?
  - (l) Rupture?
  - (m) Piles?
  - (n) Maimed or deformed?
  - (o) Any restriction in motion of any joint
  - (p) Syphilis?
  - (q) Venereal disease?
  - (r) Varicose veins or ulcers?
  - (s) Rheumatism?
  - (t) Any chronic or recurrent disease or deformity not included above?
- Urinalysis Reaction? Specific gravity? Albumin? Sugar?

The physicians are then instructed, with regard to any of these questions, "When answered 'Yes' give details"

It may be assumed that the "transport service bureau" expects accurate and complete information on all the items listed If such an examination is actually made conscientiously by a physician who is willing to defend his results, it would require from one to more than two hours of time and possibly a consultation with or referral to some specialists for confirmation The amount of laboratory work would, of course, vary with different persons, but a minimum must be performed including a serum test for syphilis

For all this the physician is to receive *one dollar* By what intellectual legerdemain can it be concluded that the physician who undertakes such examinations will receive a fair fee for his services? And again, is it possible for any one to deliver a dependable service of the type requested for the price that is authorized?

### MORBIDITY RISES UNDER BRITISH INSURANCE

"The National Health Insurance Act was designed principally as an instrument to improve the standard of curative medicine in general practice by replacing the old club system of contract practice," said Dr A B Walker, regional medical officer, Department of Health for Scotland, in an address at the 1938 health congress at Portsmouth, published in the *Journal of the Royal Sanitary Institute* (59 511 [Jan] 1939)

It was reasonable to hope that this act together with the improved environmental services by providing early and effective treatment would have some effect, not only in diminishing the amount and duration of disabling illness, but also an important preventive element Yet, whilst sickness insurance on a national scale is a social service of proved value, it has not had these effects Morbidity data available during the past few years show that incapacitating illness has tended to rise and with yearly fluctuations remains today at a new high level This persistence of incapacitating illness amongst the insured population at a high general level, in spite of advances in preventive and curative medicine is indicated in the successive Annual Reports on Incapacitating Sickness in the Insured Population, published by the Department of Health for Scotland It is a fact which deserves the serious consideration of all interested in the public welfare"

### UTAH STATE MEDICAL ASSOCIATION PREPAYMENT PLAN

The House of Delegates of the Utah State Medical Association has endorsed a plan of combined hospital insurance and cash indemnity for a limited amount of medical care The hospital plan follows the general lines of existing plans except that anesthesia and laboratory and x-ray services are provided for on a cash indemnity basis instead of being included in hospital care The annual premium for the hospital plan is \$10 for an individual, \$18 when one dependent is included and \$24 for an entire family regardless of size

Only those who are covered by the hospital insurance plan are included in the cash indemnity plan for general medical care The additional premiums are exactly the same as for hospital care making \$21.60 annually for an individual \$36 for an additional dependent and \$48 for a family for both hospital and medical care The amounts to be reimbursed to the insured for various medical services are set forth in a schedule, and surgical services are limited to one major and one minor operation per member in a single year

Enrolment is confined to employed persons and to groups which may be either employees of a common employer or members of church and fraternal groups and their dependents agreeing to collect the necessary membership fees by assessment or subscription, remitting through a designated agent

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### ALABAMA

**Society News**—A joint meeting of the southwestern and northwestern divisions of the state medical association was recently addressed in Tuscaloosa, among others, by Drs Gerald H Teasley, Athens, on 'Nitrous Oxide-Oxygen in Rural Obstetrics', Kellie N Joseph, Birmingham, 'Diagnosis and Treatment of Pleural Effusions', William M Bland, Tuscaloosa 'Preoperative Diagnosis of Gallbladder Disease Made Possible Through Laboratory Analysis in Conjunction with Fluoroscopic Examination of the Gallbladder and Duodenum', Benjamin T Beasley, Atlanta Ga, "Surgical Management of Damaged Genital Supports in the Female," and William G Harrison Jr, Birmingham, "Therapy of Heart Disease" The luncheon meeting was addressed by Richard C Foster, DCL, president of the University of Alabama, and Drs Stuart Graves, University, William D Partlow, Tuscaloosa, and Seale Harris, Birmingham

### ARKANSAS

**District Meeting**—The Fifth Councilor District Medical Society met at El Dorado January 11 The speakers included Drs Richard B DeLee and Harold G F Edwards, both of Shreveport, La, on "Bronchial Asthma" and 'Carcinoma' respectively

**Project Approved for Training Center**—The field experience center operated by the state board of health at Morrilton has been approved as a health training center by Vanderbilt University, Peabody College and the Medical College of Virginia, newspapers recently reported The center is intended to give actual training to persons engaged in public health work in the state

### CALIFORNIA

**Changes in Health Officers**—Dr Dwight M Bissell, Pittsburg, has been appointed health officer in Monterey County, succeeding Dr Roy M Fortier, Salinas, who has taken a leave of absence for one year on account of illness Dr Bryson E Cox has been named city health officer of Coalinga

**Diphtheria Increases in Adults**—In 1938 forty-three cases of diphtheria were reported in San Francisco with nine deaths, fourteen cases and four deaths were in adults A statement from the city health department offers for comparison the 360 cases of diphtheria reported in 1929, including forty-three cases in adults, of the seventeen deaths, only two occurred in the adult group The program for immunization for diphtheria control among the age group from 6 months to 15 years has been nearly accomplished in the last fifteen years, but the state department says that this has meant a higher incidence of diphtheria in nonimmunized adults than among children in the population of San Francisco today

**Tuberculosis Hospitals for Indians**—A new fifty bed annex for the treatment of tuberculous Indians was dedicated August 6 at the Weimar Joint Sanatorium Weimar, and one of thirty-six beds at the Wish-i-ah Sanatorium near Auberry Fresno County Aug 13, 1938 Constructed on land deeded to the federal government each unit cost \$70,000, it was reported Both are PWA projects sponsored by the Office of Indian Affairs, U S Department of Interior The Weimar annex will be operated by the hospital central committee of the Weimar Joint Sanatorium under the professional and administrative direction of Dr Mildred E Thorin superintendent and medical director, while the unit at Wish-i-ah will be operated by the county of Fresno under the supervision of Dr Everett Morris, superintendent and medical director At Weimar Indians residing in the fourteen counties comprising the sanatorium group will be given preference in admission while Indians of Fresno County will be given preference at Wish-i-ah Indians who are recognized wards of the government may be admitted if space is available In both cases the federal government will reimburse the counties at the per diem cost determined as a routine by the institutions Applications for admission will be passed on by the superintendent of the Sacramento Indian Agency Sacramento, technical assistance

will be given by the district medical director of the U S Indian Service in San Francisco Prior to the completion of these units a hospital at Fort Bidwell Modoc County, was the only institution of the U S Indian Service in the state available for the care of tuberculous Indians It has a total of thirty-eight beds, thirty of which are available for the treatment of tuberculosis There is now a maximum of 120 beds available for these Indians in federal institutions in the state, serving an estimated Indian population of 28,000 During the calendar year 1937 there were sixty-seven deaths from tuberculosis among the Indian population of the state, based on this number of deaths there are now about two beds for each annual death from the disease

### COLORADO

**Sewall Foundation Lectures**—Dr Russell M Wilder, Rochester, Minn, lectured at the University of Colorado School of Medicine, Denver, under the auspices of the Henry Sewall Foundation, February 7-8 His subjects were 'Arteriosclerosis and Diabetes' and "Diabetes and Endocrine Glands Other Than the Pancreas"

### CONNECTICUT

**Society News**—Dr Herbert C Miller Jr, New Haven, among others, presented "A Study of Infant Mortality in Cesarean Section" before the Yale Medical Society, New Haven, February 8 Dr Norman E Freeman, Philadelphia, discussed "Circulation in Surgical Shock" before the society January 8

**Report of Summer Round-Up**—According to the state department of health, 3,476 children were examined in 226 round-ups held during the summer of 1938 The group was 71 per cent of all children entering the 314 schools in the towns participating in the round-ups Among the total examined 2,594 children were found to have 5,214 physical defects, of which 1,517 were serious enough to be referred to family physicians Seventy-eight per cent, or 2,737 of the children examined, suffered from dental defects During the fall, reports of corrections of defects have been returned and tabulated These reports, although incomplete, show that to date 850, or 16 per cent, of the physical defects found have been corrected or improved, while 354, or 13 per cent, of the children received dental care

### DELAWARE

**Society News**—Dr Robert P Bay, Baltimore, addressed the New Castle County Medical Society in Wilmington recently, the title of his paper was "The Surgical Abdomen" Dr Joseph C Birdsall, Philadelphia, recently discussed "Renal Pathology in Urinary Tract Obstruction" before the society Dr Amos R Koontz, Baltimore, addressed the society January 17 on 'The Use of Fascia in Surgery'

### GEORGIA

**Society News**—Dr Avary M Dimmock gave a clinical talk on Sulfonamide and Specific Serum in Pneumonia" before the Fulton County Medical Society in Atlanta January 19 and Dr Grady E Clay read a paper entitled "Lycground Changes in Hypertension and Encephalitis," both of Atlanta Dr Albert A Rayle read a paper entitled "Radiology and the Right Lower Quadrant" before the society, Atlanta, February 2

**Dr L C Fischer's Gift to Atlanta**—Property valued at nearly a million dollars was recently given to the city of Atlanta by Dr Luther C Fischer including the Crawford W Long Memorial Hospital, established in 1908 by Dr Fischer and the late Dr Edward C Davis Dr Fischer gave also his 138 acre estate in Chamblee to the same board of trustees who will handle the hospital for the public Ten acres of the estate is planted in roses, the gardens are endowed with \$200,000 for maintenance Dr Fischer stipulated that the hospital must be operated for the benefit of families of modest means, persons who are unable to pay the standard costs of hospitalization and unwilling to accept charity but who will pay only what they are able

### ILLINOIS

**Society News**—Dr Raymond A Tearnan Decatur, discussed Ovarian Dysfunction and Treatment before the Franklin County Medical Society in Benton January 26—At a meeting of the Douglas County Medical Society in Villa Grove January 27, Dr Thomas B Williamson, Mount Vernon, spoke on 'The Significance of Prenatal Care'—A symposium on fractures of the neck of the femur was presented before the

Sangamon County Medical Society January 5 by Drs Frank A Norris, Ivan E Brouse and Carl Black, all of Jacksonville —Dr James Duffy Hancock, Louisville, Ky, discussed "Abdominal Tumors in Children, Surgical Treatment" before the St Clair County Medical Society in East St Louis January 5 —A symposium on physiologic action of insulin and metrazol as used in shock therapy was presented before the Illinois Psychiatric Society, Chicago, January 5 by Drs Samuel Soskin, Ernst Gellhorn and Ralph W Gerard Dr H Douglas Singer delivered his presidential address on "Relationship Between Personality and Psychosis" —At a meeting of the Madison County Medical Society in Edwardsville February 3, Dr Charles J Drueck, Chicago, among others, spoke on "Fruritus Ani"

#### Chicago

**Studies in Malaria** —The Rockefeller Foundation has made a grant of \$2,000 to continue for the year 1939 the studies in malaria conducted by William H Tahaferro, Ph D, chairman of the department of bacteriology and parasitology, and dean of the Division of Biological Sciences, University of Chicago The foundation has supported the work of Dr Tahaferro and his associates for a number of years The studies are concerned with analysis of the mechanisms by which the body resists malarial infection and with the physiologic and genetic studies of the mosquitoes which transmit malaria and of malarial parasites

**Society News** —Dr Irvin Abell, Louisville Ky, President, American Medical Association, lectured at the Chicago Woman's Club February 22 under the auspices of the public health committee of the Chicago Woman's Club the Chicago Medical Society and the Chicago chapter of the American College of Surgeons, his subject was 'The Position of Medicine in Our Present Day Culture' —Dr William D Stroud, Philadelphia, discussed "Coronary Disease Including Angina Pectoris" at the annual meeting of the Chicago Heart Association January 31 —Dr Lewis Gregory Cole, New York, discussed "Dyspnea of Silicosis What Causes It" before the Chicago Roentgen Society February 16 —Among others, Ludwig R Kuhn, Ph D, presented "Some Observations on Experimental Cryptococcus Infection" before the Chicago Pathological Society February 13 —The speakers before the Chicago Neurological Society February 16 included Dr Mark A Foster, Madison, Wis, on "Acute Encephalomyelitis, Equine or Avian?" and Drs Harry A Paskind and Meyer Brown, "Constitutional Differences Between Deteriorated and Nondeteriorated Patients with Epilepsy IV Dactylographic Studies" —The Chicago Ophthalmological Society was addressed February 20 by Drs Sanford R Gifford and Gilbert H Marquardt, among others, on "Central Angiospastic Retinopathy" —Dr Louis E Prickman, Rochester, Minn, discussed 'Asthma and the Stenosed Bronchus Syndrome' before the Chicago Society of Allergy February 20 —Dr Ralph Hess Kunststadter presented the inaugural thesis before the Chicago Pediatric Society February 21 on 'The Waterhouse-Friderichsen Syndrome'

#### INDIANA

**Members of State Board Reelected** —The following officers of the Indiana State Board of Medical Registration and Examination were reelected at the annual meeting January 10 in Indianapolis Drs Jacob T Oliphant, Farmersburg, president, Norris E Harold, Indianapolis, vice president, Jesse W Bowers, Fort Wayne, secretary, and William C Moore, Muncie, treasurer

**Personal** —Dr Ernst L Schaible, Gary, has been elected mayor of Gary —Dr Otho R Lynch Peru, has been appointed medical director of the Wabash Valley Sanatorium, he was formerly superintendent of the Longcliff State Insane Hospital near Logansport —James F Glore, medical artist at the Indiana University Medical Center, was recently presented with the Indianapolis Junior Chamber of Commerce distinguished service award for "outstanding community service during 1938"

**Society News** —At a meeting of the Tippecanoe County Medical Society in Lafayette January 10 Dr Henry O Mertz, Indianapolis, spoke on 'Traumatic Injuries to the Urinary Tract' —The Gibson County Medical Society was addressed in Princeton January 9 by Dr Robert R Acre, Evansville, on 'The Prostate After Age 40' —Dr Charles J Cooney, Fort Wayne, discussed hematuria before the Fort Wayne Medical Society January 3 —The Indianapolis Medical Society was addressed by Drs Murray N Hadley and Rollin H Moser, both of Indianapolis February 28 on 'The Surgical Treatment of Intractable Peptic Ulcer' and "Medical Aspects of Peptic and Duodenal Ulcer"

#### IOWA

**Annual Tuberculosis Meeting** —The Iowa Tuberculosis Association will hold its annual meeting at the Fort Des Moines Hotel, Des Moines, March 10, with the following speakers included on the tentative program

Dr Nevim Boyd Anderson, Des Moines Surgical Treatment of Tuberculosis  
Dr John Russell Des Moines Pneumoperitoneum  
Dr Charles K McCarthy Des Moines The Cooperative Case-Finding Program  
Dr James A Downing, Des Moines Use of the Bronchoscope in Diseases of the Chest  
Dr Ira D Nelson Toledo Films of Indian Children  
Dr John C Parsons Des Moines Blood Findings in Tuberculosis  
Dr Irving H Borts, Iowa City Sputum Determinations in Tuberculosis  
Dr Lee F Hill Des Moines Significance of the Primary Infection  
Dr Horton R Casparis, Nashville, Tenn, will address the noon luncheon

#### LOUISIANA

**Personal** —Dr Emmanuel F Salerno was recently elected chief medical officer of the Orleans Parish school board, filling the vacancy caused by the death of Dr John Signorelli —Dr Charles A Bahn, New Orleans was awarded the annual cup by the Rotary Club for "outstanding civic services," which were his part in reorganizing the Louisiana Society for the Prevention of Blindness

**Changes in Health Officers** —Dr Murphy M Sims has been appointed director of the Vermilion Parish health unit, Abbeville, succeeding Dr Benjamin O Morrison who was assigned as director of the Acadia Parish unit, Crowley —Dr Herbert E Cannon, Covington, has been chosen to head a new health unit to be started in St Tammany Parish, news papers recently reported, he will take a special course of training before taking over his new position

#### MAINE

**Society News** —Piscataquis County Medical Society was the first society, for the second successive year, to send to the Maine Medical Association 100 per cent payment of dues —Dr Samuel A Levine, Boston, will discuss 'The Auscultation of the Heart' before the Kennebec County Medical Association in Gardiner April 20

#### MICHIGAN

**New Hospital Service Plan** —The Michigan Society for Group Hospitalization was incorporated Dec 8, 1938, and was expected to begin functioning February 15, according to *Detroit Medical News* The new society was organized by the Michigan State Hospital Association with the approval of the Michigan State Medical Society Provisions have been made for a board of trustees not to exceed twenty-five members, officers to be Mr William J Griffin, a trustee of the Highland Park General Hospital, president, Mr John R Mannix, formerly assistant director of the University Hospitals of Cleveland, director, Dr Joseph Thomas Stewart Hamilton, Detroit, vice president, and Dr Warren L Babcock, Detroit, treasurer According to the *Detroit Medical News*, the society will provide hospital service for twenty-one days in any one year in a ward room at the following rates

Individual 60 cents a month husband and wife \$1 20 a month entire family (with all children from age 1 year to 19 years) \$1 50 a month  
Service in semiprivate room will be available at the following rates  
Individual 75 cents a month husband and wife \$1 50 a month family \$1 90 a month

Hospital service will include room and board, general nursing, operating room service, including anesthesia when administered by a salaried employee of the hospital, routine clinical laboratory service and ordinary drugs and dressings It will not include the services of the subscriber's attending physician or surgeon nor special nurses or their board The plan provides for free choice of physician, and all admissions to the hospitals will have as a prerequisite the certification by a physician that the hospital service is needed

#### MINNESOTA

**Hospital News** —Dr Ian Snapper, professor of medicine, University of Amsterdam, gave a Mayo Foundation lecture in Rochester January 16 on "Chemical Investigations on the Influence of Organic Iodine Compounds on the Activity of the Thyroid Gland Dr Maurice B Visscher, Minneapolis, delivered a foundation lecture January 19 on "Recent Studies on Energetics of the Failing Heart"

**Society News**—Dr Charles B Wright addressed the Hennepin County Medical Society in Minneapolis February 8 on "The American Medical Association Its History and Background" Dr Wyman C C Cole, Detroit, spoke February 6 on "Etiologic Factors in Neonatal Asphyxia" Dr John Albert Key, St Louis addressed the annual foundation dinner and meeting of the Minneapolis Surgical Society February 2 on "Treatment of Compound Fractures"

**Osteopath Fined for Practicing Medicine**—John L. Moore, a licensed osteopath with offices at Windom, pleaded guilty Dec 22, 1938, to practicing medicine without a license and was sentenced to pay a fine of \$250 and court costs of \$7, which he paid The investigation disclosed that Moore was prescribing and furnishing medicine to patients for internal use The board also showed that as far back as 1930 Moore had been warned to confine his practice to osteopathy

### MISSISSIPPI

**Changes in Health Officers**—Dr Norris C Knight has resigned as director of the Coahoma County health unit after five years in the position to take charge of the unit in Lauderdale County, with headquarters in Meridian Dr Guy R Post Holly Springs, health officer of Marshall County, will succeed Dr Knight in Coahoma County

**Society News**—Dr Conley H Sanford, Memphis, Tenn., among others, addressed the seventy-third annual meeting of the Clarksdale and Six Counties Medical Association in Clarksdale recently on "Clinical Manifestations of Vitamins"—The Northeast Mississippi Thirteen-County Medical Society was addressed at its fourth quarterly meeting in Tupelo recently by Drs Rome T Dabbs Verona Frank M Davis Corinth Van Buren Philpot Houston "Some Experiences in Simple Methods of Treating Fractures" Conley H Sanford, Memphis, "Types and Treatment of High Blood Pressure" and Henry King Wade Hot Springs Ark "Urinary Infections with Special Reference to Their Medical Management"

### MISSOURI

**Annual Medico-Military Symposium**—The Kansas City Southwest Clinical Society will hold its annual spring medico-military symposium in the auditorium of the Jackson County Medical Society Kansas City March 13-14 The speakers will include

- Dr Frank D Dickson Low Back Pain from the Orthopedic Stand point
- Dr Ira H Lockwood Some Obscure Causes of Low Back Pain
- Dr Fernando F Wilson Nonsurgical Treatment of Hemorrhoids
- Dr Peter T Bohm Nerve Root Disturbances Simulating Organic Diseases of Viscera
- Dr Cyrus C Sturgis Ann Arbor Mich The Historical Development of Our Knowledge and the Present Status of Blood Transfusion
- Dr Paul M Krall Kansas City Kan The Role of Certain Biological Compounds Normally Present in the Body in the Possible Etiology of Carcinoma
- Dr Donald R Black Pathology and Physiology as Applied to the Treatment of Diabetes
- Dr Arthur Lloyd Stockwell Management of Urinary Tract Infections
- Dr Joseph E Welker Diagnosis and Treatment of Cardiac Neuroses
- Dr Albert N Lemoine Treatment of Traumatic Injuries to the Eyeball
- Dr Harry C Lapp Common Complications in Gallbladder Disease
- Dr Arthur C Chsen Avitaminosis—A Study of Correlation
- Dr Hubert M Parker Indications and Contraindications for Calcium Therapy
- Dr John H Ogilvie Recognition of the Acute Abdomen Due to Trauma
- Dr John L Myers The Various Methods of Examining the Larynx (color movie)
- Dr John P Beeson Omaha Picture Map Reading (sound movie)
- Dr Lindsay S Milne The Role Played by Arthritis in the Aggravation of Injuries
- Dr Ralph R Coffey Evaluation of the Signs and Symptoms in the Differential Diagnosis of the Acute Abdomen
- Dr La Verne B Spake Kansas City Kan Complications and Sequelae of Sinusitis
- Dr Thomas C Orr Acute Nonmalignant Intestinal Obstruction
- Dr Sumner L Koch Chicago Infections of the Hand
- Dr Frederick B Campbell Significance of Bleeding from the Rectum and Treatment of the Simple Types
- Dr Carl R Ferris Fundamentals in the Treatment of Pneumonia
- Dr James R Elliott Treatment of Simple Fractures of the Wrist and Ankle
- Dr Paul F Stookey Staphylococcus Septicemia—The Use of Staphylococcus Antitoxins in Its Treatment
- Dr Edward T Gibson Emotional Factors in Visceral Symptomatology
- Dr Frank R Teachenor Spinal Cord Injuries
- Dr Ferdinand C Helwig Trauma and Malignancy

A joint meeting will be held with the Jackson County and Wyandotte County medical societies Monday evening with Dr Charles R Reynolds surgeon general, U S Army Washington D C, and Dr Sturgis as the speakers Their subjects will be The Present Responsibilities of the Medical Department of the Army and Some Common Sense Remarks Concerning the Menace and Treatment of Obesity respec-

tively Tuesday evening a dinner with the Kansas City Academy of Medicine will be addressed by Dr Harry P Smith professor of pathology, State University of Iowa College of Medicine, Iowa City, on "Recent Progress in the Study of Hemorrhage"

### NEW JERSEY

**Society News**—Dr Harvey F Doe, Montclair, of the state department of health, addressed the Cape May County Medical Society, Cape May Court House January 13, on pneumonia—Dr Elmer P Weigel, Plainfield, addressed the Morris County Medical Society, Greystone Park, January 19, on osteogenic sarcoma—Drs Bret Ratner and Marion B Sulzberger, New York, addressed the Passaic County Medical Society, Paterson, January 12 on Abdominal and Digestive Manifestations of Allergy in Children" and "Allergic Skin Disease of Children" respectively—Dr Edward H Dennen, New York, addressed the Union County Medical Society, Elizabeth, January 11, on "Choice of Instruments in Delivering with Forceps"—Dr Irvin E Deibert, Camden was elected president of the Society of Surgeons of New Jersey at the annual meeting in Newark January 28 and Dr Walter B Mount, Montclair, was reelected secretary Clinics were held at St Michael's Hospital and the Newark Eye and Ear Infirmary in the morning and after luncheon at the Robert Treat Hotel motion pictures of operations were shown

### NEW YORK

**Society News**—Dr Mark Williams, Binghamton, addressed the Broome County Medical Society, Binghamton, February 14 on Postpneumonic Empyema in Children" Dr Alexander D Langmuir, Albany, assistant director of the bureau of pneumonia control, New York State Department of Health, addressed the society January 10 on "Higher Types of Pneumonia"—Dr Russell L Cecil, New York addressed the Medical Society of the County of Albany, February 15 on "Modern Aspects of Pneumonia Therapy"—Dr Samuel A Levine, Boston addressed the Medical Society of the County of Westchester, White Plains, February 21 on auscultation of the heart

### New York City

**Exhibit on Hormones**—A preview of a sex hormone demonstration to be exhibited in the Hall of Science at the Golden Gate Exposition in San Francisco was held at the Hotel Astor January 23 by the Schering Corporation, which was invited to prepare the exhibit The central feature is a transparent female figure showing the manner in which endocrine secretions affect the various organs of the body

**New Type of High Voltage X-Ray Tube Developed**—A million volt x-ray tube small enough so that it does not require a special building has been developed for the new building of Memorial Hospital by the General Electric Company, according to a recent announcement The new mechanism can be installed with much less expense and it is much less heavy than previous tubes of this voltage The tube itself is 56 inches long and 3½ inches in diameter and is mounted vertically in the space usually occupied in x-ray machines by the iron core Tube and transformer are enclosed in a cylindric tank of two sections of steel bolted together A new feature is the use of gas instead of oil as the insulating fluid it was said that about 100 pounds of gas replaces about 12000 pounds of oil There are no moving parts and the control is entirely electrical

**Personal**—Dr Royal Whitman, London, England, formerly of New York, was recently made an honorary fellow of the Royal College of Surgeons of England—Dr Edward A Flemming, Forest Hills, was honored at a dinner Dec 15, 1938 in tribute to his work during ten years as trustee of the Medical Society of the County of Queens—Dr Philip I Smith Jr Brooklyn, was honored at a dinner January 18 in recognition of his thirty years of practice in the Saratoga and Bushwick sections Members of the surgical staffs of the Bushwick and Evangelical and Deaconess hospitals and other friends arranged the dinner—Dr Laura M Long Riegelman for the past nineteen years chief of the bureau of child hygiene in Brooklyn retired December 31 after forty years of service with the city department of health She was honored at a dinner given by her colleagues

**Society News**—Drs Alfred F Hocker and John V Blady addressed the New York Roentgen Society January 16 on "Sialography—Its Technique and Application in the Diagnosis of Diseases of the Salivary Glands"—Drs Baldwin H E W Lucke Philadelphia and Thomas Francis Jr addressed the New York Pathological Society January 26 on Reaction of



the Nasal Mucosa to Infection with the Virus of Epidemic Influenza" and "Carcinoma in Frogs Its Etiologic Relation to a Virus and Its Habits of Growth in Vivo and in Vitro" respectively—Friedrich Gudernatsch, Ph D, addressed the Bronx Pathological Society January 17 on "Genetic and Hormonal Factors in Development and Differentiation of Sex"—Dr Elaine P Ralli addressed the Bronx County Medical Society January 18 on "The Role of Nutrition in Health and Disease"—Drs Samuel S Rosenfeld and Leo Wilson, among others, addressed the Bronx Gynecological and Obstetrical Society January 23 on "Presacral Sympathectomy for Intractable Pelvic Pain" and "Uterine Contractibility" respectively

NORTH CAROLINA

**Society News**—Dr Emil Novak, Baltimore, addressed the Buncombe County Medical Society, Asheville, January 16, on "Gynecological Endocrinology"—Dr Lester A Crowell Jr, Lincolnton, among others addressed the Catawba Valley Medical Society in Morganton, January 10 on "The Practical Handling of Adult Uncomplicated Diabetes Mellitus"

**Changes in Health Officers**—Dr Joseph A Morris, Oxford has resigned as health officer of Granville County on account of ill health In point of service he was said to be the oldest health officer in the state He has served in Granville County since 1919—Dr Henry A Brandon, Yadkinville, has been chosen health officer of Yadkin County, succeeding Dr Locksley S Hall—Dr Ralph J Sykes Mount Airy, health officer of Surry County, has been appointed health officer of Halifax County He succeeds Dr Robert S McGeachey, Weldon who has gone to Craven County In Surry County Dr Robert B C Franklin, Chapel Hill, will succeed Dr Sykes

OHIO

**New State Health Officer**—Dr Roll H Markwith Akron, health officer of Summit County, has been appointed state health officer, succeeding Dr Walter H Hartung Dr Markwith graduated from Ohio State University College of Medicine Columbus, in 1917 and has been head of the Summit County health unit since 1921

**In Memory of Dr Todd**—Western Reserve University School of Medicine, Cleveland, sponsored a memorial meeting January 15 for the late Dr T Wingate Todd, Henry Willson Payne professor of anatomy, who died Dec 28 1938 Dr Elliott C Cutler, Boston, former professor of surgery at Western Reserve, gave an appreciation of Dr Todd Dr Roy W Scott spoke for the medical school, Elbert J Benton, Ph D, for the graduate school, William C Stillson, DDS for the school of dentistry, the Rev Joel B Hayden for the Brush Foundation, Dr Clyde L Cummer for the Academy of Medicine of Cleveland and Howard Whipple Green for the Cleveland Health Council Dr Jerome Gross arranged a musical program Winfred G Leutner, LL D, president of the university, presided

**Society News**—Dr Miles Tischer Hoerner, Dayton, discussed 'Diagnosis and Treatment of Jaundice' before the Greene County Medical Society, Xenia, January 5—Dr Frank C Andrus, Springfield, addressed the Clark County Medical Society, Springfield, February 16 on "Significance of Clinical Findings in Nephritis"—Dr Curtis F Garvin, Cleveland, addressed the Lorain County Medical Society, Lorain, January 10 on "Complications of Sulfanilamide Therapy"—At a meeting of the Tuscarawas County Medical Society January 12 in New Philadelphia Drs George L F Sackett and Harry L Farmer, Cleveland, spoke on 'Spontaneous Pneumothorax' and "Urography" respectively—Dr Clayton G Weigand, Indianapolis, addressed the Columbus Academy of Medicine February 6 on Practical Applications of Vitamin Therapy"

OKLAHOMA

**Personal**—Dr William H Kaeser, McAlester, has been appointed health superintendent of Pittsburg County—Dr Calvin E Bradley, Tulsa, has been appointed to the state board of medical examiners

**Society News**—Dr E Rankin Denny, Tulsa addressed the Garfield County Medical Society, Enid, January 26, on allergy—Dr Felix M Adams, Vinita, addressed the Tulsa County Medical Society, Tulsa, February 27, on Insulin Treatment of Dementia Praecox"

**New State Health Commissioner**—Dr Grady F Mathews, recently in charge of a health district with headquarters at Tahlequah has been appointed state health commissioner, replacing Dr Charles M Pearce Dr Mathews

who was selected from a group of four physicians suggested by the Oklahoma State Medical Association, graduated from the University of Oklahoma School of Medicine, Oklahoma City, in 1925

OREGON

**Graduate Course in Ophthalmology and Otolaryngology**—The Oregon Academy of Ophthalmology and Otolaryngology and the University of Oregon Medical School will present their fourth annual spring postgraduate course in ophthalmology and otolaryngology in Portland April 3-8 The guest lecturers will be Drs John J Shea, Memphis, Tenn, and Webb W Weeks, New York Additional information may be obtained from Dr Paul Bailey, 929 Medical Dental Building, Portland

PENNSYLVANIA

**Society News**—Dr Harold L Foss, Danville addressed the Delaware County Medical Society, Chester, February 9, on "Status of Cancer of the Colon in Pennsylvania"—A program on pneumonia was presented before the Fayette County Medical Society February 2 by Drs James A Mansmann Philip G Leavy and Murray B Ferderber, all of Pittsburgh—Dr William W Bolton, Upper Darby, chief of the division of syphilis and genitoinfectious diseases, Pennsylvania State Department of Health, addressed the McKeesport Academy of Medicine, January 23, on syphilis—At a meeting of the Lycoming County Medical Society, Williamsport, February 10, the speakers were Drs James Stanley Smith, on 'Use and Abuse of Sulfanilamide with Reference to Its Use in Treatment of Gonorrhea', William D Angle "Use of the Ophthalmoscope by the General Practitioner" and Louis E Audet, "Obesity", all are from Williamsport—Dr Carl E Ervin, Harrisburg addressed the Lebanon County Medical Society February 14 on undulant fever

Philadelphia

**Epidemic of Respiratory Disease**—Schools and hospitals reported a wave of respiratory infections during February Calls for nurses increased from 40 to 50 per cent, it was reported from private exchanges and the visiting nurses' service Hospitals reported full occupancy and many illnesses among their staffs, according to newspaper accounts

**Personal**—Dr Paul B Cassidy has been appointed director of St Vincent's Hospital for Women and Children, succeeding Dr John A McGlinn, who becomes director emeritus—Dr Ludwig Loeb for many years medical director of the National Stomach Hospital was honored at a dinner given by the medical staff and board of directors of the hospital January 26 Mr Arleigh P Hess, president of the hospital board, presented to Dr Loeb a silver plaque Dr Loeb is reported to be the only surviving founder of the hospital

**Fourth Postgraduate Institute**—The Philadelphia County Medical Society will present its fourth annual Postgraduate Institute March 13-17 at the Bellevue-Stratford Hotel The subject this year is "Blood Dyscrasias and Metabolic Disorders" About ninety Philadelphia physicians will take part in the program, presenting papers from fifteen to twenty minutes long morning and afternoon On the first day there will be a luncheon at which Dr Francis F Borzell, president of the county medical society, will preside and the speakers will be the Hon S Davis Wilson, mayor of the city, Dr Charles H Henninger, Pittsburgh, president-elect of the Medical Society of the State of Pennsylvania, and Dr Rufus S Reeves, director of the institute At a dinner of the county society March 15 Dr James S McLester, Birmingham, Ala will deliver the J Chalmers Da Costa Oration on 'Borderline Nutritional States'

Pittsburgh

**Chamber of Commerce Endorses Organized Medicine**—The Pittsburgh Chamber of Commerce recently passed a vote of confidence in organized medicine Copies of the action were sent to the President, Senators and Congressmen

**Society News**—Speakers before the Allegheny County Medical Society February 21 were Drs Franklin B Cooper, Oakmont, Pa, on "Treatment of Pneumonia" John G Wurtz, 'Thrombocytopenia', Frederic S Morris 'Internal Fixation for Fracture of the Femoral Neck' and Robert I Baxmeier 'Gastroscopic Diagnosis'—Speakers before the Pittsburgh Academy of Medicine February 14 were Drs John M Lichty on 'Pericardial Effusions' James O Wallace, 'Sclerosing Osteomyelitis' and Alexander H Colwell 'Chronic Leukemia with Unusual Bone Lesions,' a case report

## SOUTH CAROLINA

**Society News**—At a recent meeting of the Pee Dee Medical Association in Florence the guest speakers were Drs. Julian M. Ruffin, Durham, N. C., on pellagra and nicotinic acid; Madison Hines Roberts, Atlanta, on otitis media and mastoiditis in general practice; and James J. Ravenel, Charleston, on prostatic calculi.—Dr. Henry T. Chickering, New York, addressed the Columbia Medical Society January 9 on 'Treatment of Pneumonia' and Dr. Francis E. Zemp, Columbia, on 'Primary Jejunal Ulcer'.

## TENNESSEE

**State Health Officer Reappointed**—Dr. Wilson C. Williams, assistant professor of preventive medicine and public health, Vanderbilt University School of Medicine, Nashville, was recently reappointed state health commissioner. Dr. Williams after serving as health officer of Williamson County took graduate work at the Johns Hopkins University School of Hygiene and Public Health. Afterward he joined the staff of the state department of health and was appointed commissioner in 1935. He has served under two previous governors. He graduated at Vanderbilt in 1925.

## TEXAS

**Personal**—Dr. Benjamin M. Primer, Austin, has been appointed director of the Travis County health unit to succeed Dr. Bolivar J. Lloyd, who resigned because of ill health.—Mr. Justin F. Kimball, vice president of Baylor University in charge of the scientific schools and hospitals in Dallas, has resigned. Mr. Kimball was appointed to the Baylor position in 1929 after having served as superintendent of city schools in Dallas. In February 1938 he was honored at a dinner in recognition of his work in developing group hospitalization.

**The Eleventh Annual Dallas Spring Conference**—The eleventh annual spring clinical conference of the Dallas Southern Clinical Society will be held March 13-16 with headquarters at the Hotel Adolphus. Each morning there will be general assemblies with addresses by guest speakers, followed except on Monday by graduate lectures presented by Dallas physicians. Luncheon periods will be devoted to round table discussions for different groups, with guest speakers present. Clinics will be conducted each afternoon at the hotel, and on Wednesday there will be in addition surgical clinics at Baylor St. Paul, Parkland and Medical Arts hospitals. Monday evening there will be a smoker and Thursday evening the annual dinner with entertainment. Tuesday evening will be set aside for a clinicopathologic conference with the honor guests. Wednesday evening a symposium on diseases of the thyroid will be presented with Drs. Fuller Albright and Richard B. Cattell, Boston, and Louis J. Karnosh, Cleveland, as the speakers. The guests and the subjects they will discuss at the general assemblies are:

- Dr. Albright: Medical Aspects of the Renal Stone Problem
- Dr. Cattell: Differential Diagnosis of Large Bowel Lesions
- Dr. Sanford R. Gifford: Chicago Chronic Conjunctivitis
- Dr. Robert H. Herbst: Chicago Importance of Early Recognition of Obstructions of the Bladder Neck
- Dr. Karnosh: Treatment of Simple Mental Depression
- Dr. Dean M. Lierle: Iowa City Throat Manifestations of General Diseases
- Dr. Charles F. McKhann: Boston Respiratory Diseases in Infants and Children
- Dr. William S. Middleton: Madison Wis. Lymph Node Diseases Their Differential Diagnosis and Treatment
- Dr. Harry E. Mock: Chicago Physical Therapy—What It Is and What It Will Do
- Dr. Alfred C. Reed: San Francisco Amebiasis
- Dr. Wendell G. Scott: St. Louis Roentgenologic Methods Employed in the Diagnosis of Pulmonary Diseases
- Dr. Richard TeLinde: Baltimore Office Gynecology

There will be scientific and technical exhibits and a program of motion pictures. Dr. Robert A. Trumbull is president of the clinical society and Dr. W. Grady Reddick, director of clinics.

## WASHINGTON

**Society News**—A symposium on disease of the biliary tract was presented at a meeting of the King County Medical Society, Seattle, February 20, by Drs. Clyde R. Jensen, Thomas W. Blake, Charles E. Watts and John A. Duncan. Dr. Kenneth K. Sherwood discussed 'Symptomatology of Atrophic Arthritis'.—Drs. Willard F. Hollenbeck and Louis P. Gambee, both of Portland, addressed the Cowlitz County Medical Society, Longview, January 18 on 'Liver Damage in Gallbladder Diseases' and 'Surgery of the Gallbladder and Bile Ducts' respectively.

**Group Hospitalization Approved**—The board of trustees of the Washington State Medical Association at a meeting in Seattle January 8 approved the principle of group hospitalization and recommended that county societies assume the duty of promoting such plans in their communities. The board disapproved, however, of a society's organizing a hospital plan as one of its functions. The committee that made a detailed study and submitted a report to the trustees was as follows: Drs. Caspar W. Sharples, chairman, Albert J. Bowles, Herbert E. Coe and E. Weldon Young, all of Seattle.

## WISCONSIN

**State Health Board Election**—Dr. William Webber Kelly, Green Bay, was elected president of the state board of health at a meeting in Madison January 6. Dr. Stephen Cahana, Milwaukee, was made vice president and Dr. Cornelius A. Harper, Madison, remains secretary and state health officer.

**Bardeen Memorial Lecture**—Dr. Stephen W. Ranson, Chicago, delivered the Bardeen Memorial Lecture at the University of Wisconsin Medical School, Madison, February 28. His subject was 'The Hypothalamus'. Dr. Ranson is director of the Neurological Research Institute, Northwestern University Medical School, Chicago.

**Society News**—At the annual meeting of the Milwaukee Society of Clinical Surgery January 24 the speakers were Drs. William J. Carson, retiring president, on 'The Science of Surgery'; Karl F. Schlaepfer, incoming president, 'Nupercaine Spinal Anesthesia in General Surgery'; and Lucius W. Hipke, 'Gastrectomy—Results in Ten Consecutive Cases Ten Years After Operation'.

**University Develops Cancer Research Facilities**—Research on cancer at the University of Wisconsin, Madison, is to be centralized in a new building now in process of construction. Funds amounting to about \$240,000 have been provided for the building by a special bequest, by a contribution from the Wisconsin Alumni Research Foundation and a PWA grant of \$108,000. It will be 102 feet long and 50 feet wide and will be connected with the Memorial Service Institutes of the university and Wisconsin General Hospital. Two floors will be devoted to biologic research, one to x-ray diagnosis and the first floor to radiologic research and treatment. The new building cannot offer space to all the university's work on cancer, which is being pursued in zoology, plant pathology, agricultural chemistry, physics chemistry and various departments of the medical school but it will have conference rooms and will serve as a clearing house to unify the varied activities according to the *Wisconsin Medical Journal*. In the Wisconsin General Hospital cancer patients from all parts of the state are received making all types of the disease accessible to research workers. The entire development is being directed by a graduate school committee consisting of Drs. William S. Middleton, dean of the medical school, chairman; Edwin B. Fred, Ph.D., dean of the graduate school; and Michael F. Guyer, Ph.D., professor of zoology. Walter J. Meek, Ph.D., professor of physiology and associate dean of the medical school, is chairman of the building committee.

## GENERAL

**Society News**—At the annual meeting of the Federation of State Medical Boards of the United States in Chicago February 14 Dr. John R. Neal, Springfield, Ill., was made president elect and Dr. Roy B. Harrison, New Orleans, became president. Dr. Frank M. Fuller, Keokuk, Iowa, was elected vice president and Dr. Walter L. Biering, Des Moines, Iowa, reelected secretary.

**Examinations in Anesthesiology**—Applications for the examination to be given April 8 by the American Board of Anesthesiology are now closed. Applications for the oral examination in St. Louis in May will be received until March 13. The next written examination will be held in various places September 9. The oral examination, part II, will be held in Philadelphia October 14-15. Application for this examination must be made by July 11 to the secretary, Dr. Paul M. Wood, 745 Fifth Avenue, New York.

**Van Meter Prize Award**—The American Association for the Study of Goiter again offers the Van Meter Prize Award of \$300 and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The award will be made at the annual meeting of the association in Cincinnati May 22-24, provided essays of sufficient merit are submitted. The essays may cover either clinical or research investigations should not exceed 3,000

words in length, must be presented in English and must be typewritten, double spaced. A copy must reach the corresponding secretary, Dr W Blair Mosser, 133 Biddle Street, Kane, Pa., not later than April 15.

**Grants for Research on Sex Problems**—Requests for aid from the National Research Council's committee for research in problems of sex and reproduction must be received before April 1, it is announced. In addition to a statement of the research to be undertaken, the committee desires information about the proposed method of attack, the auspices of investigation and the uses to be made of the sum requested. Preference will be given to proposals for the study of neurologic, psychobiologic and behavioral problems. Requests may be addressed to the chairman of the committee, Robert M Yerkes, Ph D, Yale University School of Medicine, New Haven, Conn.

### LATIN AMERICA

**Mexican Laboratory Named for U S Entomologist**—The National School of Biological Sciences of Mexico recently opened a new laboratory of entomology, which is named in honor of Dr Leland O Howard, chief of the U S Bureau of Entomology from 1894 to 1927 and principal entomologist of the U S Department of Agriculture from 1927 to 1931, when he retired. Dr Howard was unable to be present at the ceremonies. Ambassador Josephus Daniels made an address in which he outlined Dr Howard's career.

**International Meetings This Year**—The Pan American Sanitary Bureau has issued a list of international meetings to be held in the Americas this year, including the following in Latin America:

Second Pan American Neuropsychiatric Week Lima Peru March 20 28  
Fourth Latin American Congress of Odontology Montevideo March 12 19 (postponed from December 1938)  
Eighth Pan American Child Congress San Jose Costa Rica August 28 to September 4  
Intergovernmental conference of American countries on rural hygiene Mexico City toward the end of 1939 (postponed from Nov. 10 1938)

### FOREIGN

**Society News**—The British College of Obstetricians and Gynaecologists will now be known as the Royal College of Obstetricians and Gynaecologists.—The fourth International Congress of Comparative Pathology will be held in Rome May 14-20 with sections devoted to human, veterinary and plant pathology.

**Red Cross Health Committee**—The Advisory Health Committee of the League of Red Cross Societies held its second meeting at the headquarters of the league in Paris last October. The countries represented were Colombia, France, Germany, Great Britain, Guatemala, Italy, Japan, Latvia, Siam, Sweden, Yugoslavia and the United States. Dr Hugh S Cumming, former surgeon general of the U S Public Health Service, represented the United States. The principal subject discussed was the health of infants and preschool children in rural areas in the various countries.

## Government Services

### Annual Report of Food and Drug Administration

During the fiscal year ended June 30, 1938, the last complete year of enforcement for the Food and Drugs Act of 1906, the Food and Drug Administration of the Department of Agriculture sampled or inspected 68,125 shipments in interstate commerce and imports for possible violations of the law. On interstate samples 1,992 seizures were made and 726 prosecutions were begun.

Two major tragedies attributable to unsafe drugs occurred during the year, the deaths of more than 100 persons caused by "Elixir of Sulfanilamide" and twelve deaths from an alleged cancer serum contaminated with tetanus toxin. In a drive to remove the elixir from the market, the administration's agents accounted for 1,905 pints, 9 fluid ounces, which was 99.2 per cent of the entire amount manufactured. The data show that 93 pints, 6 fluid ounces reached consumers and about half of that amount was consumed. In the investigation of the cancer serum deaths the administration examined 111 10 cc ampules. Forty-one of these bore the number of a lot which appeared to be the only one containing tetanus toxin, of these eighteen contained the toxin.

The administration made an extensive survey of rubber and membrane prophylactics against venereal disease and 181 con-

signments of these products labeled as useful in prevention of disease were seized when examination showed them to be defective. As a result, many producers withdrew stocks from the market and made drastic changes in manufacturing processes.

False claims on medicines accounted for criminal prosecutions against forty-five defendants and 117 seizures of the products of eighty-six shippers. Chemicals and preparations purporting to comply with the standards of the U S Pharmacopeia gave rise to forty-three seizures and prosecutions against thirteen manufacturers, the administration analyzed 2,072 samples, exclusive of ether. Of 2,916 cans of ether tested, 111 failed to meet the pharmacopeial standard. Criminal action was brought against one manufacturer for glandular products that did not meet the standard.

Totals of 1,564 samples of National Formulary chemicals and twenty-five glandular products were examined, resulting in criminal action against seven manufacturers.

Unofficial chemicals, including glandular products to the number of 2,757, the output of about 500 producers, were examined. Criminal prosecutions were instituted against nine manufacturers of unofficial chemicals and preparations and against three manufacturers of unofficial glandular products.

The administration's food activities included 297 seizures of fruits and vegetables for excessive spray residues, an increase over the previous year, due largely to crop increases, the report stated. In one state, however, certain growers sprayed their apples much later than was recommended and then refused to incur the cost of washing. As a result sixty-nine seizures were made of shipments from this state alone.

The problem of metallic contamination continued to be important. Two hundred and twenty-nine lots of imported sardines were examined and eighteen were refused entry because of the presence of excessive lead. A special campaign has been carried on with respect to maple products in an effort to induce producers to cease using lead bearing equipment and utensils. Examination of 300 samples resulted in twenty-two seizures. Ninety-five import lots were examined, of which forty one, amounting to 2,600,000 pounds, were refused entry. Although these operations were intended for the immediate protection of the consumer, they have had the effect of hastening fundamental corrections, the administration reported.

As a result of the "Elixir of Sulfanilamide" episode, attention was directed to the danger of use of diethylene glycol in flavoring extracts. In the course of a campaign 103 consignments of solvents and 104 shipments of flavors containing them were seized. Within a few months stocks of these solvents for food use and all food products containing them disappeared from the market.

More than 254,000 cans of cream for butter making were examined by state and federal forces, of which 6,957 were condemned. The salmon pack for 1937, amounting to about 7½ million cases, required no action, the report said. Twenty-seven lots of imported tuna, totaling 160,000 pounds, were detained, some because of lead and some because of decomposition. Of domestic tuna seven shipments were seized and one prosecution was instituted.

An important project of the year was a survey of the confectionery industry for the purpose of regulating certain manufacturers who rework and redistribute unfit stocks. Sanitary conditions were found to be deplorable in some factories; raw materials carelessly stored and objectionable, returned material was being reworked by some firms for cheap sale.

Of 379 plants examined, the majority were scrupulously clean, but seventy-eight small consignments, the product of thirty-eight manufacturers, were seized. Prosecution has already been recommended against five for shipping filthy candy and actions against others are in preparation.

Fines assessed by federal courts in food and drug cases under the statute ranged from as low as \$4 to a maximum actually paid of \$3,000.

The new Food, Drug and Cosmetic Act becomes completely effective next June 25. Sections designed to protect the consumer against dangerous drugs and cosmetics went into effect immediately on approval by the President June 25, 1938.

### CORRECTION

**Foreign Physicians Qualify for Licenses**—Under New York news February 25, page 755, THE JOURNAL stated that 622 of 1,063 foreign physicians who took the state medical examinations in January were successful. According to the New York Times this figure appeared for the results of the state medical examinations for 1937-1938.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Feb 4, 1939

#### Traumatic Rupture of the Common Bile Duct

Uncomplicated rupture of the common bile duct due to injury must be a very rare condition. Mr A. C. Lysaght observed at the Cardiff Royal Infirmary the following case, which he has reported in the *British Journal of Surgery*. A man aged 32, a steel erector, was struck in the back by a steel rafter weighing about 3 hundredweight, which was swinging on a crane, and was thrown forward on his stomach against a pile of steel girders. He felt excruciating pain and was taken to the hospital in an ambulance. On arrival, about an hour after the accident, he vomited undigested food, and he continued to do so. He was in severe abdominal pain, the legs were flexed, and there was boardlike rigidity of the abdominal muscles. There was bruising of the lower part of the back but none of the abdomen. The abdomen was exquisitely tender all over but especially in the right hypochondriac region. There was no dulness in the flanks, and dulness of the liver was present. The temperature was 96 F, the pulse rate 90 and the respiratory rate 18. Rupture of a viscus, probably the small intestine, was diagnosed.

The abdomen was opened, with the patient under spinal anesthesia supplemented by gas and oxygen, by a long paramedian incision to the right. The peritoneal cavity was full of bile-stained fluid. The small intestine showed no injury. The incision was enlarged upward for examination of the biliary organs. A small tear was found at the first and second parts of the duodenum, which was repaired. Morrison's pouch was full of bile, which reaccumulated after emptying. This was found to exude from a minute opening in the free border of the foramen of Winslow. When this was enlarged it was found that the common bile duct was completely severed. The lower end of the duct could not be found, it apparently had retracted. Closure of the upper end of the common bile duct and anastomosis of the gallbladder with the stomach was performed. The abdomen was closed with drainage, and recovery was uninterrupted.

#### Sir Robert Philip

Sir Robert Philip, professor of tuberculosis in the University of Edinburgh and until recently chairman of the National Association for the Prevention of Tuberculosis, has died at the age of 81. He was the first to evolve a system for the open air treatment of tuberculosis in all stages from the teachings of Bodington, Brehmer and other pioneers. The disease had long been regarded as a deadly inheritance in certain families and under the name decline was a favorite cause of death of sentimental Victorian novelists. The treatment consisted in keeping the patient in one room with freedom from drafts, which were thought to be injurious. Then came Koch's discovery of the bacillus of tuberculosis. In 1888 Philip published in the *British Medical Journal* a paper entitled 'A Contribution Toward the Etiology of Phthisis' in which he argued that, although the bacillus was the cause of the disease, clinicians had not a rational conception of the cause of death. He experimented on animals with sterilized tuberculous sputum, which proved to be very toxic. He was the first in this country to realize the importance of preventing infection to investigate the conditions under which the families of the patients lived and to teach them how to avoid infection. In 1887 he founded the first tuberculosis dispensary in the world, holding that for every patient with diagnosed open tuberculosis there

must be many infected contacts, who should be examined. Three years later Calmette founded a similar dispensary at Lille. Philip was the first in this country to realize the need for various coordinated institutions, the sanatorium, the farm colony, the open air school and the hospital for patients with advanced tuberculosis. The system became known as "the Edinburgh system." In 1890 he was awarded the Alvarenga prize of the College of Physicians of Philadelphia for an essay on pulmonary tuberculosis. In 1908 he attended the International Congress at Washington. Two years later he was asked what might be expected from a ten year program of operations proposed by a conference in Albany, N. Y. He wired in reply "Prosecute great program proposed, watch child as potential tuberculosis seedling, correct faulty compulsory environment and expect 40 per cent reduction by 1920 and practical disappearance within a generation and a half." In 1928 he received the Trudeau medal of the American Tuberculosis Association, given annually for the most meritorious contribution to the knowledge of tuberculosis.

### PARIS

(From Our Regular Correspondent)

Jan 28, 1939

#### A Symposium on Pulmonary Embolism

Reference was made in a previous letter to the experimental study of the etiology and mechanism of pulmonary embolism by Prof. Maurice Villaret and his co-workers. They found that the size of the embolus is of far less importance in giving rise to sudden death than hitherto believed. Complete obstruction of a large pulmonary artery by a foreign body will not be followed by an immediately fatal result in animals, whereas the intravenous injection of finely pulverized pumice stone, 10 cc per kilogram of the animal's weight, causes extensive and almost invariably fatal embolism. It appears that sudden death following occlusion of a small branch of the pulmonary artery is the result of a reflex set up by irritation of the vessel wall, which acts first on the respiratory and then on the cardiac centers.

At the November 30 meeting of the Société médicale des hôpitaux of Paris, pulmonary embolism in its experimental and clinical aspects was the subject of three papers. In the first, Prof. Villaret and his co-workers, after a brief summary of their experimental work, stated that recent studies by Leriche, Fontaine and Friedmann corroborated the observation that a neurovegetative reflex plays a very important part in embolism. Other investigators here had also confirmed the experimental work of Villaret and his associates. At present an effort is being made to determine whether there is a difference physiologically between the fatal reflexes which have their origin in the arterial zones and those which have their origin in the capillary zones. As to the mechanism of sudden death after embolism, it is not uniform, a fact which corresponds with the variation of the clinical pictures. With massive embolism, the mechanical obstruction of the circulation must be regarded as constituting the essential factor, but the factor of the neurovegetative reflex appears important to explain smaller embolisms.

#### PREVENTION OF EMBOLISM

The prevention of embolism presents less of a problem experimentally than the treatment. Brocq has shown that embolism can be prevented in rabbits by section of the vagus or of the sympathetic and in dogs by administration of atropine, ephedrine and sodium bicarbonate. Lesions such as congestion, hemorrhage or edema, so commonly observed in patients with pulmonary embolism, have been reproduced in animals by Delarue by various operations on the trunk of the vagus or sympathetic and on the cervical ganglions of the



### Prof Albert Fraenkel Is Dead

Albert Fraenkel, whose name is indivisibly linked with strophanthin therapy, died in Heidelberg Dec 22 1938, aged 74. He was especially influenced during his student days at Munich by the physiologist Voit and later at Strasbourg by Recklinghausen and Kussmaul. On account of a pulmonary disorder Fraenkel spent much time in sanatoriums. He thus came to enter practice at Badenweiler, a health resort in the Black Forest. Years later, although he had changed his place of residence, he continued to be known as Fraenkel of Badenweiler. In 1906 he moved to Strasbourg and there laid the foundations of that intravenous strophanthin therapy which was his principal contribution to science. He founded after the war a middle class sanatorium known as Speyerershof, at Heidelberg. This model institution fulfilled a great need of the most worthy class of the German population, namely educated persons in modest circumstances. Here Fraenkel found the opportunity to test the intravenous use of strophanthin with a large number of patients. He established graduate courses at the Speyerershof, and his methods thus came to attain wide recognition in Germany. Later he made his work known abroad by lectures in Anglo-Saxon countries.

Fraenkel emphasized the social significance of medical activity. As he repeatedly said, the social milieu was to him the most telling factor in his consideration of patients. The Rohrbach hospital in Heidelberg a well equipped sanatorium, was his creation. He was a kindly, well balanced person and an excellent physician of the highest scientific rank, one of those figures who contributed so richly to that international prestige of the German physician which endured for so many decades.

### ITALY

(From Our Regular Correspondent)

Jan 22 1939

#### Congress of Internal Medicine

The Societa Italiana di Medicina Interna recently held its annual meeting at Rome. Professor Maragliano discussed preventive medicine with special reference to immunization. An early diagnosis can be made from the history of the patient and by a careful clinical examination. It is not necessary to wait for the development of precise clinical symptoms.

#### MYOPATHIES

Professors Meldolesi of Rome Siedel of Munich and Putti of Bologna were official speakers on primary myopathies. They said that because the muscular pigment myoglobin is greatly reduced in primary myopathies the muscles look like pieces of fish. Knowledge of the nature and function of myoglobin has widened by the study of primary myopathy. Myoglobin is similar to hemoglobin. It binds bimolecular oxygen in the venous blood and induces an intramuscular storage of oxygen for the intracellular respiration of muscular tissues. It is formed in the muscular fibers from a factor which is a derivative of food proteins. The decrease in myoglobin in the muscles alters the metabolism of glucides, creatinine bodies, adenylyrophosphoric acid and the derivatives of the last in the muscle. Consequently there is little utilization of these substances when administered to the patient. Primary myopathy is an organic hereditary disease. Endocrine and pancreatic digestive alterations are frequent. American physicians report curative results from aminoacetic acid.

Professors Siedel and Meldolesi spoke on the chemical properties of myobilin, which is a bile pigment. In the primary myopathies there is destruction of myoglobin with consequent formation of myobilin and increased elimination of bilirubinoid substances in the urine, which gives a positive fluorescent reaction. The elimination of fluorescent substances through the

urine in some cases is 300 times as much as normal. Stereobilin, urobilin and myobilin are identifiable in the urine.

Professor Putti reported satisfactory results from myototomy or progressive functional correction and in twelve cases of primary myopathy. The treatment was followed by physical and reeducational exercises. The results two years after treatment are satisfactory.

#### THE MENOPAUSE

Professor Sebattini of Genoa University was speaker for the second official topic, the menopause. Whether the climacteric and the stopping of ovulation are due primarily to senile involution of the ovary and secondarily to a loss of the maturing functions of the structure from absence of hypophysial hormones in the aged, or the reverse, is still unknown. There is a tendency, however, to believe that the phenomena depend primarily on the ovary. The pathologic disturbances in the climacteric are due to either increased or diminished function of various endocrine glands. The intensity of the sympathetic and endocrine climacteric disorders depend on the constitution. Treatment with estrogenic substance attenuates the disturbances. The physiology of ovulation and menstruation simulates the constant movement of an uninterrupted chain. According to the speaker a true climacteric age in man does not exist. The phrase means either early senility or nervous exhaustion from syphilis, alcoholism or latent myocarditis.

#### ALTERATIONS IN ABDOMINAL ORGANS

The third official topic, associated syndromes of organs at the upper part of the abdomen, was discussed in common with the Societa di Chirurgia, which held its meeting in Rome at this time. Professor Antognetti of Rome concluded that pathologic alterations of a given organ induce simultaneous changes in other structures which are in functional correlation with the involved organ. The physiologic relations of the upper abdominal organs can be considered from the (1) embryologic, (2) vascular and lymphatic, (3) humoral, (4) reflex nervous and nervous and (5) functional synergic correlations.

Professor Pende emphasized the importance of studying associated syndromes of organs of the upper part of the abdomen from the angle of functional correlations of the organs, especially the transverse colon, duodenum and jejunum, stomach, liver, cholecystic and extrahepatic bile ducts, kidneys, adrenals and celiac plexus, including the two vagi and splanchnic nerves and the epigastric segment of the aorta. The fulcrum of physiopathologic correlations of the structures is the balance of insulin and epinephrine secretions, which maintain the regulating neurochemism of the structures. The speaker differentiated the syndromes in seven different nosographic categories as they give predominant symptoms of (1) anemia and dysemia, (2) disturbances of the digestive tract, (3) metabolic and lithiasic disorders, (4) hemodynamic diseases, (5) excretory disorders, (6) dysfunction of the organic powers of defense and (7) neurocenesiopathia.

## Marriages

JAMES LUCIUS DAVIS, Thacker Mines, W. Va., to Miss Katherine Longcor of Greendell, N. J. Nov. 19 1938.

MARION HENRY BERTLING to Mrs. Eleanor Rice Baker, both of Rock Creek, Ohio, at Cortland January 28.

WILLIAM FREDRIC DELP to Miss Dorothy Elizabeth Wallner, both of Pulaski, Va., Nov. 15, 1938.

DAVID GALE DUNCAN, Huntington, Ore., to Miss Miriam Puspanen of Portland January 7.

BEATRICE TOMBLIN to Mr. Henry Gravi, both of Los Angeles at Riverside, Calif., Dec. 31, 1938.

R. FORD RATLIFF, Lucedale, Miss., to Mrs. Nanmie Walker Ratliff of Vancleave January 25.



## Deaths

**John Douglas** ☉ New York, Columbia University College of Physicians and Surgeons, New York, 1898, clinical professor of surgery, New York University College of Medicine, member of the American Surgical Association, fellow of the American College of Surgeons, in 1917 chairman of the surgical section of the New York Academy of Medicine, past president of the New York Surgical Society and the Medical Society of the County of New York, served at various times on the staffs of St Luke's Hospital, Bellevue Hospital, Knickerbocker Hospital, General Memorial and Harlem Eye and Ear Hospital, on the medical draft board during the World War, author of numerous papers and reports on surgical subjects, aged 63, died, Dec 5, 1938, of heart disease

**James Wallace Esler** ☉ Washington, D C, University of Pennsylvania School of Medicine, Philadelphia, 1920, professor of clinical cardiology, Georgetown University School of Medicine formerly secretary of the Washington Heart Association, aged 44, on the staffs of the Garfield Memorial Hospital, Georgetown University Hospital, Central Dispensary and Emergency Hospital, where he died, Dec 15, 1938, of carcinoma of the stomach

**Wrey Gilmor Farwell** ☉ Medical Inspector, Commander, U S Navy, retired, Fort Lauderdale, Fla, University of Pennsylvania Department of Medicine, Philadelphia, 1904, fellow of the American College of Surgeons, served during the World War, entered the navy in 1904 and retired in 1925 for incapacity resulting from an incident of the service, aged 55, died in November 1938 of chronic myocarditis and coronary occlusion

**Andrew S Gregg**, Fayetteville, Ark, St Louis Medical College, 1881, member of the Arkansas Medical Society, past president of the Arkansas State Board of Health, past president of the Washington County Medical Society, health officer, fellow of the American College of Surgeons, on the staff of the Fayetteville City Hospital, aged 81, died, Nov 21, 1938, of coronary thrombosis

**John Penny Kaster** ☉ Topeka, Kan, Rush Medical College, Chicago, 1881, fellow of the American College of Surgeons, chief surgeon, Atchison, Topeka and Santa Fe Railway Company and Hospital Association, aged 81, died, Dec 13, 1938, in a hospital at Wichita, of arteriosclerosis and myocarditis with bundle branch block

**John Punton**, Kansas City, Mo, Miami Medical College, Cincinnati, 1883, member of the Missouri State Medical Association, at one time trustee and professor of nervous diseases, University Medical College of Kansas City, aged 85, died, Dec 3, 1938, of coronary thrombosis and hypostatic pneumonia

**Benjamin Franklin Coe** ☉ Indiana, Pa, College of Physicians and Surgeons, Baltimore, 1895, fellow of the American College of Surgeons, member of the Radiological Society of North America, member and president of the staff of the Indiana Hospital, aged 66, died, Nov 15, 1938, of heart disease

**I Oto Schobl**, Manila, P I, Universita Karlova Fakulta Lekarska Praha, 1904, at one time chief, division of biology, Bureau of Science, formerly associate professor of pathology and bacteriology, Temple University School of Medicine, Philadelphia, aged 61, died, Oct 13, 1938, in Tokyo, Japan

**Lewis Stuart Johnston**, San Antonio, Texas, Dallas Medical College, 1901, served during the World War, at one time acting assistant surgeon, U S Public Health Service, aged 63, died Dec 8, 1938 in El Paso, of sarcoma of the mesentery and pulmonary embolus following operation

**Irving Coburn MacDonald** ☉ Minneapolis, University of Minnesota College of Medicine and Surgery, Minneapolis, 1902, aged 64 on the staff of St Barnabas Hospital, where he died, Dec 5, 1938, of cerebral embolism, cerebral hemorrhage and coronary thrombosis

**Edward Bowe** ☉ Jacksonville, Ill, Rush Medical College, Chicago 1897, on the staffs of the Passavant Memorial Hospital and Our Savior's Hospital, former president and secretary of the Morgan County Medical Society, aged 65, died, Dec 16, 1938, of myocarditis

**Max Baruch** ☉ New York, Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg, Baden Germany, 1909, on the staff of the Central and Neurological Hospital, aged 55, died, Dec 13, 1938, of coronary thrombosis

**Edwin Bruce McDaniell**, Cedar Rapids, Iowa, Rush Medical College, Chicago, 1900, veteran of the Spanish-American War, for many years a medical missionary, aged 65, died Nov 2 1938, in Los Angeles

**John William Bowler** ☉ Hanover, N H, Dartmouth Medical School, Hanover, 1906, for many years professor of physical education at Dartmouth College, aged 73, died, Dec 27, 1938, of pneumonia

**Hunter Boyd Spencer**, Lynchburg, Va, University College of Medicine, Richmond, 1907, member of the Medical Society of Virginia and the American Roentgen Ray Society, aged 55, died, Nov 12, 1938

**Robert White Barton**, San Angelo, Texas, College of Physicians and Surgeons, Baltimore, 1884, aged 78, died, Dec 20, 1938, in the Shannon West Texas Memorial Hospital of chronic myocarditis

**Walter C Sims**, Richland, Ga, Atlanta Medical College, 1898, member of the Medical Association of Georgia, aged 66, died, Nov 20, 1938, of peritonitis and injuries received in an automobile accident

**De Witt C Greene**, Buffalo, University of Buffalo School of Medicine, 1883, member of the Medical Society of the State of New York, aged 81, died, Nov 25, 1938, of myocarditis and arteriosclerosis

**Joseph Conrad Pietroski**, Cicero, Ill, Chicago College of Medicine and Surgery, 1916, aged 49, died, Dec 24, 1938, in St Mary of Nazareth Hospital, Chicago, of coronary thrombosis

**Joseph Stannard Boynton**, Santa Rosa, Calif, University of Vermont College of Medicine, Burlington, 1884, aged 75, died, Nov 11, 1938, of arteriosclerosis and chronic myocarditis

**Lewis N Klove**, Minneapolis, University of Minnesota College of Medicine and Surgery, Minneapolis, 1903, aged 66, died, Nov 9, 1938, of hypertension and cerebral hemorrhage

**Oscar Barksdale** ☉ West Memphis, Ark, University of Tennessee College of Medicine, Memphis, 1914, served during the World War, aged 55, died, Dec 18, 1938, of myocarditis

**John Charles Phillips**, Wenham, Mass, Harvard University Medical School, Boston 1904, served during the World War, aged 62, died in November 1938 of heart disease

**Robert P Dalton**, Cape Girardeau, Mo, Barnes Medical College, St Louis, 1904, formerly member of the city board of health, aged 71, died, Dec 18, 1938, of myocarditis

**Homer Isaac Keeney**, San Francisco, Jefferson Medical College of Philadelphia, 1901, served during the World War, aged 62, died, Nov 21, 1938, of coronary occlusion

**Adolph Fallor** ☉ Chicago, Chicago Medical School, 1918, on the associate staff of the Evangelical Hospital, aged 61, died, Dec 3, 1938, of bronchopneumonia

**Hiram Milton Presler**, San Diego, Calif, Eclectic Medical Institute, Cincinnati, 1894, aged 73, died, Nov 27, 1938, of hypertension and coronary occlusion

**Francis John Vincent Marx** ☉ Westbury, N Y, University of Buffalo School of Medicine, 1923, aged 37, died in November 1938 in Phoenix, Ariz

**Charles Wesley Reed** ☉ Irwin, Pa, University of Kansas School of Medicine, Kansas City, 1932, aged 32, died, Nov 23, 1938, in a hospital at Tulsa, Okla

**Thomas Calvin Kelly**, Sidon, Miss, Medical College of Alabama, Mobile, 1904, aged 63, died, Dec 11, 1938, of hypertension and cerebral hemorrhage

**John Charles Quitmeyer**, Chicago, Chicago College of Medicine and Surgery, 1915, aged 48, was killed Dec 2, 1938, when he was struck by a truck

**Aaron Denenholz**, Brooklyn, New York University Medical College, 1897, on the staff of the Manhattan State Hospital, aged 63, died, Dec 1, 1938

**William Hall Richardson**, Milton Ore, St Louis University School of Medicine, 1905, aged 59, died in November 1938 of bronchopneumonia

**Charles H Griswold**, Modesto, Calif, Chicago Homeopathic Medical College, 1887, aged 77, died, Nov 27, 1938 of carcinoma of the pancreas

**John Richard Lyon**, Mount Pleasant, Ohio, Ohio Medical University, Columbus, 1895, aged 76, died, Nov 21, 1938, of coronary thrombosis

**William S Gibson**, Burbank, Calif, Eclectic Medical Institute, Cincinnati, 1882, aged 77, died, Nov 8, 1938, of atrophic cirrhosis of the liver

**Walter Edward Williams**, Olean N Y, Jefferson Medical College of Philadelphia, 1904, aged 61, died, Nov 18, 1938

**Thomas J Irwin**, Jellico, Tenn, Chattanooga (Tenn) Medical College, 1894, aged 70, died, Nov 23, 1938

**John R Vance**, Stanton Texas, Kentucky School of Medicine, Louisville, 1887, aged 82, died Dec 5, 1938

## Correspondence

### "CLINICAL LABORATORIES AND THE AMERICAN CHEMICAL SOCIETY"

*To the Editor*—The editorial "Clinical Laboratories and the American Chemical Society" in *THE JOURNAL* February 4 interests me. I infer that the work of clinical laboratories is "principally a commercial problem ancillary to the practice of medicine."

Undoubtedly this attitude fully explains why the American Hospital Association feels that the services of radiologists, physical therapists, anesthetists, cardiologists, pathologists and clinical pathologists should be included in group hospitalization projects, since, as has been stated in the journals of the hospital associations, these specialists cannot really be considered as practicing medicine, because they "merely carry out the orders of the practitioners of medicine, are subordinates, and assume no responsibility to the patient." Hence the term "ancillary" in the editorial sponsored by the American Medical Association strikes an ominously resonant note.

As a pathologist and clinical pathologist I find expression difficult under the circumstances. Having entered the field of pathology because I sought factual data relative to the mechanisms of disease, I have reaped a harvest of economic headaches which have only recently begun to clear up. Now I learn that I am in a line of work not only commercial but ancillary!

If pathology and clinical pathology do not constitute the practice of medicine—and some doubt seems to exist—then medicine could get along very well if physicians abandoned these specialties. Even now this branch is not overcrowded by those honestly interested in it as a career, and many definite trends are already seriously undermining the morale of those endeavoring to carry it on.

Chemists are capable of directing and developing the procedures of biochemical laboratories, and many of them possess sufficient clinical knowledge to permit certain biologic interpretations, but it seems quite illogical to assume that training in chemistry qualifies a person in hematology, serology, parasitology, clinical microscopy, bacteriology, and the miscellaneous diagnostic procedures of clinical pathology. Furthermore, it would be the height of absurdity for physicians to abandon pathologic anatomy to a chemist or any one without the necessary clinical training.

The situation in Pennsylvania is most interesting, especially when one realizes that Dr. I. D. Metzger has been the ardent exponent of his present point of view consistently for many years and that he has seldom received the support due him from the medical spokesmen of Philadelphia and of the state at large. It certainly behooves the learned profession of medicine to support him now.

The American Board of Pathology is now an accomplished fact and an integral unit of our national medical organization. By this board the specialties of pathologic anatomy and clinical pathology are clearly defined. Much work and a large field in the practice of medicine now belong to the certificated pathologist. There exist no other specialties that are not dependent on him to a very appreciable extent. His field, like that in other specialties, can be closely guarded to prevent exploitation.

Much of the present structure of modern scientific medicine is founded on the work of pathologists and clinical pathologists. We have only recently embarked on the development of our own American culture in these sciences which now analyze the mechanisms of disease. If they are turned over too completely to nonmedical personnel because we are somewhat dubious as to their status in the practice of medicine, such doubt might not long be entertained by the nonmedical group who take them over.

NORMAN W. ELTON, M.D., Buffalo

### SULFANILAMIDE IN THE PREVENTION OF PUERPERAL INFECTION

*To the Editor*—May I call your attention to a probable error in the communication "Sulfanilamide in the Prevention of Puerperal Infection" from your Paris correspondent, *THE JOURNAL*, February 4, page 459.

In an abstract of Dr. Picot's thesis, appearing in the *Presse medicale* (46 1935 [Dec 31] 1938), it is stated unequivocally that the drug used was not sulfanilamide but a derivative, *p*-benzylaminobenzenesulfonamide, commercially known as septazine. The title of this abstract reads: Guy Picot Contribution à l'étude de la prophylaxie de l'infection puerperale. Essai de chimiothérapie préventive (Benzyl-Amino-Benzene Sulfamide) [Travail de la Clinique Tarnier].

JENNIE PINCHACK, New York

Librarian, E. R. Squibb & Sons

### "ORCHITIS AFTER MUMPS"

*To the Editor*—Anent "Orchitis After Mumps" (*THE JOURNAL*, January 14, p. 170), I reported a case (*THE JOURNAL*, Sept. 2, 1916, p. 741) in which I grafted a piece of testicle into remnants of such a lost testicle in the hope of at least restoring a masculine voice to a man who had lost it with his testicles. The effect of the graft restored the voice in a surprising way not by physical presence but because it stimulated remains of the destroyed testicle into nearly normal development. I showed the patient at a meeting of the New York Surgical Society and the case was held to be more important than my case of pregnancy after ovarian grafting, the latter a case in which the tissues of the receptor happened to be taken out of foreign tissue. Later I tried various experiments for instituting tolerance but failed in that quest, I hope some one will do it. In my eighties I am past all useful work with the exception of stories for the boys when they make welcome calls.

ROBERT T. MORRIS, M.D., Stamford, Conn.

### A COMMENT ON BIOLOGICALLY CORRECT TRAFFIC EQUIPMENT

*To the Editor*—A recent interesting note (Fabing, H. D. A Neurologic Note on Traffic Lights. *THE JOURNAL*, Sept. 24, 1938, p. 1166) stressed the need for biologically, physiologically and psychologically sound technique for making our machine age civilization fit the human being who has to use and enjoy it. Quite rightly it was held that traffic is one of the important fields in which such techniques are necessary. This principle can and should be applied to the various problems arising from traffic facilitation and control. It is unfortunate, however, that the article goes on to recommend as biologically sound a type of traffic signal which has been tried out and discarded.

The type of signal recommended was of the clock type in which a hand indicates how much time the red, yellow or green will remain showing. This type of signal and its variations have been discarded for several reasons, one of the chief being one of practical motorist psychology. That is, it has been found that when a motorist is given a warning that a light is about to change he tends either to "beat the light" or to "run through the yellow," depending on whether he is stopped or is moving. This is a psychologic feature to be avoided, since it results in collisions.

Avoidance of the difficulty was provided by the committee of traffic experts who drew up the Manual for Standard Traffic Control Devices (American Association of State Highway Officials and National Conference on Street and Highway Safety, Manual of Uniform Traffic Control Devices, Washington, D. C., 1937). The manual recommends a warning yellow only for the driver who is coming to a halt.

The author contended that the standard three color signal was hard on the nervous system and cited increased heart beat, sweating and other autonomic nervous signs of being under strain. Of course, such nervous tension may occur in varying degrees under various situations. A ball game, the approach of a pretty girl, lack of experience in handling a car and many other factors might produce similar results. Color blindness might make it difficult for a driver to distinguish between the red and the green signal and thus cause extra strain. If so, he would do well to note that the standard code places the red signal always at the top of the three signal lenses and to advocate adoption of the standard in all cities where this has not yet been accomplished.

Certainly this nervous reaction to the standard signal cannot be explained on the basis of Pavlov's "conditioned neurosis" experiments unless some special condition such as color blindness is present. Pavlov's studies were quoted quite correctly as producing "neurotic" behavior on the part of a dog trained to obtain food at one signal and avoid it at another. It should be noted, however, that the dog was first trained to widely different signals and then gradually the two opposite signals were made more and more alike or else the signals were alternated continuously and rapidly so as to be practically simultaneous from the dog's point of view. The "neurosis" occurred when the two signals became very similar, that is, when the animal was unable to distinguish them with any certainty. In other words, the task became too difficult for the animal to perform with his natural ability. This result has been investigated further and confirmed more recently by American investigators (Anderson, O. D., and Liddell, H. S. Observations on Experimental Neurosis in Sheep, *Arch. Neurol. & Psychiat.* 34: 330-354 [Aug.] 1935; Liddell, H. S. The Experimental Neurosis and the Problem of Mental Disorder, *Am. J. Psychiat.* 94: 1035-1043 [March] 1938).

Certainly the average motorist has no difficulty in distinguishing between the red and the green of the standard signal light at an ordinary intersection, nor are they alternated in such a fashion that he is unable to tell what he is being commanded to do. Thus, the comparison of the human response to the red and green signals with the animal's response to signals which were undistinguishable does not hold.

Now let us return to the possibility of color blindness. Color blindness is known to affect but a relatively small percentage of the population, but it is quite possible that the colors used in some of the lenses on the market could be improved for the benefit of the red-green blind person.

Otherwise it seems that the present three color traffic signals as recommended by the Manual of Standard Traffic Control Devices are fairly well suited to the psychologic and physiologic requirements of the ordinary driver.

On the other hand, the contention that traffic facilities and control devices must be psychophysiologically and psychologically fitted to the needs of the driver certainly should apply to all phases of traffic. This means that in the design and installation of such facilities and equipment it is necessary to consider the psychology and physiology of vision, of the ability to read signs, of human inertia, of fatigue, of muscular skill and manipulation, of distraction and attention and of the effect of uncertainty on the driver's reaction time.

For instance directional signs at highway intersections must be of such size, letter design and text organization as to be read by the motorist when he is still a long distance away. He thus will have time to make up his mind as to what he is going to do and be able to do it without sudden turns or stops and their attendant collisions and accidents.

Again, highway lighting should be of such adequacy either from headlights or from overhead lighting that the driver will be able to see and act quickly. It has been shown that any uncertainty of vision whether from lighting or from other factors, reduces the speed of decision and action of the driver.

As another example, a clear view of the road ahead should be provided for a sufficient distance to allow safe passing and stopping at the speeds used on the highway. This means a distance which will allow time for perceiving and judging the speeds of oncoming cars, for passing the car ahead and for safe clearance at the end of the pass. Such passing distance, of course, cannot be provided at all points along the road, and at points where this is impossible the requirement should be for sufficient clear distance to give the driver time enough to execute a safe stop.

Strides toward all these objectives have been and are being made, although there is still much to be desired. I agree with Farning that the goal is highly desirable and efforts should be made to achieve it.

T. W. FORBES, PH. D., New Haven, Conn.  
Bureau for Street Traffic Research

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### POISONING FROM AIRPLANE DOPES

To the Editor—A patient works in an airplane factory where he is exposed to the fumes of airplane dope. Does this dope give rise to any symptoms? If so, what symptoms? The patient gets better slowly after lying off from work. C. W. BURGWIN, M. D. Guy's Mills, Pa.

ANSWER—During the period of the great war and for several years afterward one of the foremost industrial health problems centered about the chemical coating for fabric airplane wings. At that time poisonous materials were utilized. "Dope poisoning," an inelegant and medically undesirable term, was real, frequent and serious.

At the present time larger planes are almost uniformly provided with metal wings and other metal housings. Smaller planes, and particularly model planes and toys, make use of fabric wings and housings, so that "dopes" are still in some use. However, the chemical composition is changed, so that the earlier used toxic substances largely have disappeared. Lacquers are in wide use and these ordinarily contain various acetates, alcohols and toluene. Lacquer vapors are comparatively harmless, although the various acetates are minor respiratory irritants and toluene, if present, may lead to more extensive systemic damage. Toluene is in the series of coal tar hydrocarbons that includes benzene and xylene. Toluene is less dangerous than benzene, since it has a high boiling point and thus evaporates less freely. The action of toluene is somewhat similar to that of benzene and, if it has led to chronic involvement, blood changes may be expected including anemia and leukopenia. This comment refers in general to lacquers such as are used on airplane fabrics, but in the present instance if any other 'dope' than lacquer is utilized a special investigation of the particular product should be instituted.

#### References

- Young, Clifton A. Dope Poisoning as a Potential Hazard in Spray Coating Airplane Wings. *U. S. Nav. M. Bull.* 21: 63 (Jan.) 1933.
- Smith, W. S. Doping in Aircraft Works. *Ann. Rep. Chief Inspect. Factories and Workshs. Great Britain* for 1917: p. 18.

### MALE HORMONE IN HYPERTENSION

To the Editor—One of my patients asked me about the effect of injections of male sex hormones (testosterone propionate) as a treatment for arterial hypertension. He told me that some of his friends had used this kind of therapy successfully. What is your opinion?

MANFRED LANDSBERG, M. D. Cudahy, Wis.

ANSWER—There are no recent American reports on the administration of testis hormones in hypertensive arterial disease. From Vienna Steinach and his co-workers (Steinach, E., Peczenic, O., and Kun, H. *Wien klin. Wchschr.* Jan. 28, 1937, and Feb. 4, 1937) report reduction of the systolic tension in thirty-one of forty-nine male patients treated with androsterone benzoate. Reductions of the diastolic tensions were negligible. Greene (*Lancet* 2: 79 [July 9] 1938) reports that in twenty-one male patients between the ages of 58 and 77 there was no significant change in the arterial tension after long and liberal

administration of testosterone propionate The 'before and after' variation of the diastolic tensions averaged from 3 to 4 mm Thus the literature appears to deny any useful place to the testis hormone in the management of hypertensive disease This is to be expected, for there has been no evidence indicating that diminution of the testis hormone or hormones has any etiologic significance in hypertensive disease The primary principal of therapy involves the removal or at least the amelioration of etiologic factors These must be searched for they vary in each individual case

#### ERYTHROCYTE SEDIMENTATION IN CORONARY OCCLUSION

To the Editor—In a case of coronary thrombosis sedimentation rates taken during the week persistently show a fall of 2 mm in forty five minutes The patient during this period has been on morphine medication Would drug therapy such as morphine influence the sedimentation rate or is it possible that the rate is not influenced in coronary thrombosis until from seven to ten days after the onset of the occlusion?

LEO KELLER MD New York

ANSWER—While an increased erythrocyte sedimentation rate is a constant finding in coronary occlusion, it is not safe to say that a normal sedimentation rate is an impossibility There are other conditions in which an increased sedimentation rate is almost constantly present (notably active tuberculosis) yet occasionally a normal sedimentation rate will be found A considerable number of proved cases of coronary occlusion have been studied with especial reference to the sedimentation rate Numerous observations were made in each case These studies have shown an increased sedimentation rate in all proved cases of coronary occlusion at some time during the course of the disability In some instances the increased rate first appeared toward the end of the second week There is little likelihood that morphine would affect the sedimentation rate

Recent publications dealing with this subject

Shookhoff Charles Douglas A H and Rabinowitz M A *Ann Int Med* 9 1101 (Feb) 1936  
Riseman J E F and Brown M G *Am J M Sc* 194 392 (Sept) 1937

#### STARCH IN GLUTEN BREAD—MIXTURES OF DIFFERENT TYPES OF INSULIN

To the Editor—What is the amount of starch in ordinary gluten bread as compared with ordinary white bread made of the standard flour? What would be the proportion by weight or by volume of gluten bread as compared to white wheat bread? Is there any objection to mixing various types of insulin for instance as a combination of regular insulin with solution of zinc insulin crystals? I find that I may (not yet proved) get what I wish by a combination of 5 or 8 units of regular insulin with 15 or 18 units of the solution of zinc insulin crystals mentioned I am striving to get a one hypo a day combination I have tried all sorts of ways but seem now to be approaching success This I do by using a single needle which is used to give the small preliminary dose of regular insulin which acts promptly and will be effective until the slower solution of zinc insulin can come into the battle The zinc insulin solution reaches its maximum effect in about eight to nine hours Protamine zinc insulin while theoretically perfect for the one hypo a day does not in my hands give that result The daily dose is administered in the morning around 7 30 Two needles are used The first is left momentarily sticking in the flesh while the second is used only to extract the required dose of zinc type insulin The second needle is then removed the syringe slipped into the first needle still in the flesh and the dose injected slowly We are told not to mix various types of insulin but I can see no adequate logic in that admonition

MD Pennsylvania

ANSWER—The usefulness of gluten breads and other so called diabetic foods is limited as described in the General Decision of the Council on Foods (*THE JOURNAL* Feb 11, 1933 p 411) Gluten breads are not uniform The average of several analyses of wheat gluten bread shows the carbohydrate to be 28.9 per cent or approximately 30 per cent in contrast to the average of analyses of wheat bread which is 52.6 or approximately 53 per cent From this one might conclude that the carbohydrate in gluten bread was about three-fifths that of wheat bread The subject however, is not quite so simple, because the wheat gluten bread averages 25 per cent protein in contrast to the average wheat bread which contains 9.2 per cent protein A diabetic patient may convert 58 per cent of the protein into carbohydrate Consequently out of 100 Gm of gluten bread one would have  $25 \times 58 = 145$  Gm carbohydrate formed in contrast to  $9.2 \times 58 = 533$  Gm of carbohydrate derived from 100 Gm of wheat bread The content of fat in the two kinds is different Wheat gluten averages 3.6 per cent of fat and wheat bread 1.3 per cent However only 10 per cent of carbohydrate would be formed out of fat

In general it is safer to teach patients to use a standard wheat bread and if they do not employ scales they may be able to buy wheat bread which is either sliced or marked for slices so that

each slice contains 30 Gm (1 ounce) and in it would be found from 16 to 18 Gm of carbohydrate according to whether one figures the carbohydrate alone or that derived from carbohydrate, protein and fat The variation in carbohydrate in different makes of gluten breads is considerable

Theoretically there would appear to be no reason why one should not use regular insulin, protamine zinc insulin and a solution of zinc insulin crystals together While various attempts have been made to do this, such as the ingenious one described it has usually not been found practical in the treatment of large groups of cases, because there are so many variables in the chemistry of insulin and the treatment of diabetes

#### HAZARD FROM AMMONIA FUMES IN BEAUTY SHOP

To the Editor—A patient has a cough which for a short time was accompanied by hemoptysis I have made the usual complete studies and am treating her with satisfactory results thus far The diagnosis is fibroid phthisis However there is a question of occupational hazard involved She owns a beauty shop She states that she has been exposing herself to fumes of ammonia for more than ten years in the process of permanent waving She has noticed a tendency to cough whenever she is exposed to these fumes and she states that the other operators also are disturbed by them 1 Could this be an etiologic factor in any form of pulmonary disease? 2 What part might this play as a predisposing or aggravating factor in pulmonary disease? 3 Are there any precautionary measures which can be used to minimize these dangers?

MD West Virginia

ANSWER—1 In some permanent waving work cloth pads wet with aqueous ammonia are wrapped about strands of hair and then enclosed in electrical heating units, which bring about evaporation of the liquid present and lead to artificial waving This process lasts about fifteen minutes and it is the lot of many women to have coughed, sneezed, retched and shed tears as a result of this exposure to ammonia vapors—all in the quest of beauty Naturally beauty shop operators are more extensively exposed because of frequent repetition of the process As little as 400 parts of ammonia vapor per million of air will cause immediate irritation of the throat, and 100 parts per million is the maximum that should be tolerated in prolonged exposure On entering the respiratory tract ammonia immediately reacts with the tissue there present but only superficially Ammonia as such is not absorbed High concentrations of ammonia lead to spasm of the glottis and are thus irrespirable Lower, but still high concentrations may lead to extensive damage along the respiratory tract, chiefly characterized by pulmonary edema Action on the heart and respirations constitutes a reflex from local action along the respiratory tract In connection with severe coughing, bloody mucus may be produced, but the direct causation of an extensive hemoptysis is most improbable

2 It is well known that prolonged coughing aggravates almost any pulmonary disease including tuberculosis Hence it may be believed that long or frequent exposures to comparatively low concentrations of ammonia may aggravate many types of pulmonary disease

3 The prevention of this injury is simple by elimination of this type of permanent waving Other chemicals may be utilized for the same purpose, some at least of which are not injurious

#### ACRODERMATITIS CHRONICA ATROPHICANS

To the Editor—Please tell me the treatment for acrodermatitis chronica atrophicans

MD Ohio

ANSWER—The inquirer undoubtedly has reference to the entity called acrodermatitis chronica atrophicans This is one of the idiopathic atrophies of the skin It is a diffuse process and as its name indicates, favors the extremities, particularly the extensor surfaces

The essential cause of this atrophy is not known Some believe that the atrophy is due to a trophoneurosis Others feel that mechanical chemical or thermal insults acting on a predisposed skin are at fault Infections particularly tuberculosis and syphilis are blamed Lastly, disturbance of the endocrine glands is supposed to underlie acrodermatitis atrophicans

The skin should be protected from injury of exaggerated thermal changes, irritants of various kinds and trauma Foci of infection should be sought and eradicated Tuberculosis and syphilis if present should of course receive appropriate attention The entire nervous system should be examined Administration of thyroid or one of the other glandular substances or products can be considered if examination of the patient warrants it otherwise Local emollient applications can be used such as borated cold cream equal parts of hygroscopic wool fat and petrolatum olive oil, and liquid petrolatum

## INGESTION OF SOAPS

To the Editor—Please discuss for me the possible harmful effects following the ingestion of soap. Please furnish references to the literature.  
M D Texas

ANSWER—Soaps are the salts of fatty acids and bases. The fatty acids of ordinary soaps are oleic, palmitic and stearic. They combine with bases to form soaps soluble or but slightly soluble in aqueous mediums. The soluble soaps are compounds of potassium and sodium, the less soluble are of magnesium and calcium. The harmful effects from the ingestion of solutions of the soluble soaps depend on the concentration, the amount of free alkali and the soap itself. Dilute solutions in small quantities are harmless. The harmful effects of solutions with appreciable amounts of free alkali are due mainly to the corrosive action of the base on the mucous membranes of the digestive system and with aspiration, of the respiratory passages. Hartmann (according to Else Petri, Friedrich Henke and Otto Lubarsch, *Handbuch der speciellen pathologischen Anatomie und Histologie*, Berlin, Julius Springer, 1930, vol 10) concluded from experiments in animals with 0.5 per cent solutions of neutral potassium and sodium soaps that the necrosis and inflammation were due to the soap molecule, not alone to the alkali. The cause of sudden death from the ingestion of soap (Liebtrau *M Klin* 2 1228, 1906) is not clear, especially when the alkali content of the soap is small. Death of these patients has been ascribed to a generalized or blood toxic action, the latter in the sense of a hemolysis. The insoluble soaps in small quantities probably have no deleterious effects. The gastric secretions slowly convert the soap into free base and fatty acids (Hartsuch, P J. The Chemical Reaction Between Oleic Acid and Aqueous Solutions of Magnesium, *Arch Path* 25 17 [Jan] 1938). The effects of fat tissue hydrolysis and soap formation in the body is another problem (Hirsch, E F. Experimental Tissue Lesions with Mixtures of Human Fat, Soaps and Cholesterol, *ibid* p 35).

## FAMILIAL NYSTAGMUS

To the Editor—Recently while examining a group of preschool children I found two little girls of 5 and 6 (sisters) with a horizontal nystagmus. I could not elicit abnormalities of gait or tremors but all deep tendon reflexes were exaggerated. The mother says the children's father, their grandmother on the paternal side, two aunts on the paternal side and two first cousins about the same age have the same type of nystagmus. I have been unable to investigate the history except to ascertain that the father does have a horizontal nystagmus. Could you tell me whether there is a familial central nervous system lesion which could cause this? Are there similar histories on record? I should like to continue my investigation but wish to know whether it would be worth while and also wish I could have some idea as to diagnosis.  
M D Wisconsin

ANSWER—There is a familial central nervous system disease known as spasmus nutans in which nystagmus occurs in children especially when the head is fixed. There may be a nodding movement of the head in association with the nystagmus as well as strabismus and blepharospasm. The condition was first described by Barton, Bennet and Newnham. All these increased movements may occur in children who come from a family with a history of neuropathic traits or diathesis. It would be well worth while to study the two cases as well as the family and report in detail. The condition is due, no doubt, to an inherited or a congenital instability of the nerve centers supplying these structures.

## CUPREX FOR PEDICULOSIS

To the Editor—What is your opinion on a preparation for exterminating lice and nits called Cuprex put out by Merck & Company? Is there any advantage in using this over the older remedies? Are there any dangers attended by its use?  
M D New York

ANSWER—Apparently the composition of Cuprex has not always been described in the same manner. It is described in Merck's Index (1930) as 'a solution of a copper compound in organic solvents—clear, pale green, inflammable liquid.' According to Bresslau (*Ber Ges Physiol exper Pharmacol* 32 912, *Chemical Abstracts*, 1926, p 2223) Cuprex is a solution of copper salts of fatty acids. Schnellbach (*Schweiz Apoth Ztg* 64 91, *Chemical Abstracts*, 1926, p 2391) states that Cuprex is a solution of copper abietate in a mixture of benzene and paraffin oil. The most recent statement of the composition of Cuprex is the following, received from the manufacturer in November 1937: "liquid petrolatum 20 parts, tetralin (tetrahydronaphthalene) 12 parts, acetone 6 parts, and copper oleate 'fraction of a per cent'."

Merck & Co call attention to the inflammability of Cuprex and to the general irritant properties of all pediculicides which render their use for more than one or two applications inadvisable.

Although Cuprex has been marketed in this country for more than ten years, the files of the Council on Pharmacy and Chemistry, as well as the files of other available sources, reveal no published papers dealing with the comparative value of this preparation and other commonly used pediculicides.

Much information concerning various methods employed in the eradication of dermal parasites may be found in the special articles published in *THE JOURNAL* Oct 3, 1936, page 1126, and Feb 13, 1937, page 553. An interesting chapter on the treatment of pediculosis may also be found in the *Handbook of Therapy*.

## HEAD SHAVING AND HAIR GROWTH

To the Editor—Have you any information regarding whether or not by keeping the hair shaved from a baby's head for a period of twelve months or more the hair finally allowed to grow will be heavier in texture?

ARTHUR L. RICHARDSON, M.D., Pasadena, Calif.

ANSWER—There is no evidence that shaving causes hair to grow more thickly or changes in any way the texture of the hair. The only effect is that of moderate stimulation of the scalp, which benefits hair growth.

## BENZIDINE TEST FOR BLOOD

To the Editor—What reaction takes place and what is the name of the blue product formed when benzidine and barium peroxide in diacetic acid (50 per cent) give a positive test for occult blood in the stool?

RAYMOND H. GOODALE, M.D., Worcester, Mass.

ANSWER—The benzidine test for blood involves the oxidation of benzidine to a colored compound or mixture of compounds of unknown structure as the result of the combined action of peroxide and the iron in the hemoglobin. To eliminate the error from a positive test by other iron compounds, it is best to make the following modification: Add 2 cc. of glacial acetic acid to 5 cc. of the feces suspension and allow the mixture to digest at room temperature for from fifteen to thirty minutes, strain or filter and shake the filtrate with 5 cc. of ether. Separate the ether layer and apply the benzidine test, preferably by adding 2 cc. of a freshly prepared saturated solution of benzidine in glacial acetic acid to the ether solution plus 0.5 cc. of solution of hydrogen peroxide U.S.P. Mix well. Development of a blue appearance in from two to three minutes is a positive test for blood due to the hematin extracted by the ether.

## CARBON TETRACHLORIDE

To the Editor—I should like to ask you to publish a correction to a statement made in your July 30, 1938 issue. The first query on page 469 of your answer has just been brought to my attention. In speaking of the use of carbon tetrachloride extinguishers you state in the third paragraph of your answer that its vapors in concentrations above 100 parts per million of air may produce damage. When the concentration reaches 1,000 parts per million immediate injury is in prospect for persons who may breathe this vapor even for a few breaths. If you will refer to my article in *THE JOURNAL* for Nov. 21, 1936 under 'Comments and Conclusions' page 1686 you will see that 'it is concluded that 100 parts per million of carbon tetrachloride is a safe working concentration for continuous exposure of workmen during the working day (eight hours a day, five days a week). Concentrations considerably higher than 100 parts per million are safe for short periods. It is believed that 1,000 parts per million is a safe peak concentration for half an hour a day (probably much longer than the user of a fire extinguisher would be exposed), with an average of 100 parts per million during the rest of the day. I agree with your last paragraph, in which you state that although these extinguishers may be theoretically dangerous they rarely lead to an accident. Your advice to use the extinguisher as quickly as possible and then to leave the area is a good one but not because of the danger of phosgene alone. Under the conditions in which phosgene would be formed (great heat, metal surface closed space) there is likely to be at least as great a hazard from carbon monoxide poisoning which would be present regardless of the method used to combat the fire.'

HENRY FIELD SMITH, M.D., DR. P.H., Philadelphia

## VAGINAL ABSORPTION

To the Editor—In the January 14 issue of *THE JOURNAL* on page 173 under Queries and Minor Notes under the heading 'Absorption from Vaginal Mucosa and Uterus' the answer states that there is no absorption from the intact vaginal mucosa. This statement is not quite correct since it is known that the intact vaginal mucosa absorbs many substances. For example, vaginal suppositories containing estrogenic substances are constantly used and many other substances are known to be easily absorbed through the vagina. It is quite possible that toxins from bacteria are absorbed through the same route just as they are from other mucous membranes.

WILLIAM WOLF, M.D., New York.

# Medical Examinations and Licensure

## COMING EXAMINATIONS

### STATE AND TERRITORIAL BOARDS

**ALABAMA** Montgomery June 20 22 Sec Dr J N Baker 517 Dexter Ave Montgomery

**ARIZONA** Basic Science Tucson March 21 Sec Dr Robert L. Nugent Science Hall University of Arizona Tucson Medical Phoenix April 11 12 Sec Dr J H Pitterson 826 Security Bldg Phoenix

**ARKANSAS** Medical (Regular) Little Rock June 8 9 Sec State Medical Board of the Arkansas Medical Society Dr L J Kosminsky 317 State Line Texarkana Medical (Eclectic) Little Rock June 8 9 Sec Dr Clarence H Young 1415 Main St Little Rock

**CALIFORNIA** Written examinations San Francisco July 10 13 and Sacramento Oct 16 19 Oral examinations (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California) San Francisco March 22 Los Angeles August 7 and San Francisco Nov 15 Sec Dr Charles B Pinkham 420 State Office Bldg Sacramento

**COLORADO** Denver April 5 7 Sec Dr Harvey W Snyder 831 Republic Bldg Denver

**CONNECTICUT** Medical (Regular) Hartford March 14 15 Endorsement Hartford March 28 Sec Dr Thomas P Murdock 147 W Main St Meriden Medical (Homoeopathic) Derby March 14 Sec Dr Joseph H Evans 1488 Chapel St New Haven

**DELAWARE** Dover, July 11 13 Sec Medical Council of Delaware Dr Joseph S McDaniel 229 S State St Dover

**DISTRICT OF COLUMBIA** Basic Science Washington June 26 27 Medical Washington July 10 11 Sec Commission on Licensure Dr George C Ruhland 201 District Bldg Washington

**FLORIDA** Jacksonville June 19 20 Sec Dr William M Rowlett Box 786 Tampa

**GEORGIA** Atlanta June Joint Sec State Examining Boards Mr R C Coleman 111 State Capitol Atlanta

**HAWAII** Honolulu April 10 13 Sec Dr James A Morgan 48 Young Bldg Honolulu

**IDaho** Boise April 4 7 Address Dir Bureau of Occupational License Rm 355 State Capitol Bldg Boise

**ILLINOIS** Chicago April 11 13 June 20 22 and Oct 17 19 Super intendent of Registration Department of Registration and Education Mr Homer J Byrd Springfield

**INDIANA** Indianapolis June 20 22 Sec Board of Medical Registration and Examination Dr J W Bowers 301 State House Indianapolis

**IOWA** Basic Science Des Moines April 11 Dir Division of Licensure and Registration Mr H W Grefe State Department of Health Capitol Bldg Des Moines

**KANSAS** Kansas City June 20 21 Sec Board of Medical Registration and Examination Dr J F Hassig 905 N 7th St Kansas City

**KENTUCKY** Louisville June 7 9 Sec State Board of Health Dr A T McCormack 620 S Third St Louisville

**MAINE** Portland March 14 15 Sec Board of Registration of Medicine Dr Adam P Leighton 192 State St Portland

**MARYLAND** Medical (Regular) Baltimore June 20 23 Sec Dr John T O Mara 1215 Cathedral St Baltimore Medical (Homoeopathic) Baltimore June 20 21 Sec Dr John A Evans 612 W 40th St Baltimore

**MASSACHUSETTS** Boston March 14 16 Sec Board of Registration in Medicine Dr Stephen Rushmore 413 F State House Boston

**MICHIGAN** Ann Arbor and Detroit June 14 16 Sec Board of Registration in Medicine Dr J Earl McIntyre 100 W Allegan St Lansing

**MINNESOTA** Basic Science Minneapolis April 4 5 Sec Dr J Charney McKinley 126 Millard Hall University of Minnesota Minneapolis Medical Minneapolis April 18 20 Sec Dr Julian F Du Bois 350 St Peter St St Paul

**MISSISSIPPI** Jackson June Asst Sec State Board of Health Dr R N Whitfield Jackson

**MONTANA** Helena April 4 5 Sec Dr S A Cooney 216 Power Block Helena

**NEBRASKA** Basic Science Omaha May 23 Dir Bureau of Examining Boards Mrs Clark Perkins State House Lincoln

**NEW HAMPSHIRE** Concord March 9 10 Sec Board of Registration in Medicine Dr Fred E Clow State House Concord

**NEW JERSEY** Trenton June 20 21 Sec Dr Earl S Hallinger 28 W State St Trenton

**NEW MEXICO** Santa Fe April Sec Dr Le Grand Ward 135 Sena Plaza Santa Fe

**NEW YORK** Albany Buffalo New York and Syracuse June Chief Bureau of Professional Examinations Mr Herbert J Hamilton 315 Education Building State Education Department Albany

**NORTH CAROLINA** Raleigh June 19 Sec Dr William D James The Hamlet Hospital Hamlet

**NORTH DAKOTA** Grand Forks July 5 8 Sec Dr G M Williamson 4½ S Third St Grand Forks

**OKLAHOMA** Basic Science Oklahoma City May 15 Sec of State Hon C C Childress State Capitol Oklahoma City Medical Oklahoma City June 14 Sec Dr James D Osborn Jr Frederick

**OREGON** Basic Science Corvallis July 8 and Portland Oct 28 Sec State Board of Higher Education Mr Charles D Byrne University of Oregon Eugene

**PENNSYLVANIA** Philadelphia and Pittsburgh July Sec. Board of Medical Education and Licensure Dr James A Newpher 400 Education Bldg Harrisburg

**PUERTO RICO** San Juan March 7 Sec. Dr O Costa Mandry Department of Health San Juan

**RHODE ISLAND** Providence April 6 7 Chief Division of Examiners Mr Robert D Wholey 366 State Office Bldg Providence

**SOUTH CAROLINA** Columbia June 2 7 Sec Dr A Earle Boozer 505 Saluda Ave Columbia

**SOUTH DAKOTA** Rapid City July 18 19 Director Medical Licensure Dr G J Van Heuvelen State Board of Health Pierre

**VIRGINIA** Richmond June 21 23 Sec Dr J W Preston 30½ Franklin Road Roanoke

**WEST VIRGINIA** Charleston March 6-8 Sec. Public Health Council Dr Arthur E McClue State Capitol Charleston

WISCONSIN Basic Science Madison April 1 Sec Prof Robert N Bauer 3414 W Wisconsin Ave Milwaukee Medical Milwaukee June 27 30 Sec Dr Henry J Gramling 2203 S Layton Blvd Milwaukee

## NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL February 25 page 767

## Montana October Report

Dr S A Cooney, secretary, Montana State Board of Medical Examiners, reports the written examination held at Helena, Oct 4-5, 1938. The examination covered ten subjects. An average of 75 per cent was required to pass. Six candidates were examined, all of whom passed. Eighteen physicians were licensed by reciprocity and five physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad	Per Cent
College of Medical Evangelists	(1938)	88 1	
Loyola University School of Medicine	(1929)	82 9	
Northwestern University Medical School	(1937)	86 2	
Rush Medical College	(1936)	82 9	
University of Illinois College of Medicine	(1938)	87 2	
University of Minnesota Medical School	(1938)	81 8	

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Georgetown University School of Medicine	(1929)	Puerto Rico	
Loyola University School of Medicine	(1937)	Ohio	
Northwestern University Medical School	(1914)	Kansas	
University of Illinois College of Medicine	(1935)	Minnesota	
State Univ of Iowa College of Med	(1930) (1934)	(1937)	Iowa
Medical School of Maine	(1910)	(1910)	Maine
University of Minnesota Medical School	(1924)	(1937)	Minnesota
Washington University School of Medicine	(1924)	(1924)	Wisconsin
(1936) Missouri			
University of Nebraska College of Medicine	(1926)	(1932)	Nebraska
Cornell University Medical College	(1937)	(1937)	Oregon
Medical College of Virginia	(1936)	(1936)	Virginia
Marquette University School of Medicine	(1933)	(1933)	Wisconsin
Medizinische Fakultät der Universität Wien	(1934)	(1934)	N Dakota

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
College of Medical Evangelists	(1937) N	B M E	
University of Kansas School of Medicine	(1937) N	B M E	
University of Minnesota Medical School	(1937) N	B M E	
Cornell University Medical College	(1933) N	B M E	

## Iowa December Examination

Mr H W Grefe, director, Division of Licensure and Registration, reports the written examination held by the Iowa State Board of Medical Examiners at Des Moines, Dec 1-3 1938. The examination covered eight subjects and included 100 questions. An average of 75 per cent was required to pass. Eighteen candidates were examined, seventeen of whom passed and one failed. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Loyola University School of Medicine	(1938)	89 5*	
Northwestern University Medical School	(1938)	82 4	
Rush Medical College	(1937) 80 9*	87 9*	
School of Medicine of the Division of Biological Sciences	(1937)	79 3*	
State University of Iowa College of Medicine	(1938)	80 6* 82 8* 83 1* 84* 85 9*	
Washington University School of Medicine	(1937)	80 5*	
University of Alberta Faculty of Medicine	(1937)	81 6*	
Medizinische Fakultät der Universität Wien	(1926)	85 1*	
Ludwig Maximilians Universität Medizinische Fakultät München	(1936)	81 1*	
Universität Rostock Medizinische Fakultät	(1934)	81 5*	
Universität Bern Medizinische Fakultät	(1937)	89*	

School	FAILED	Year Grad	Per Cent
Rush Medical College	(1937)	75 1†	

Eight physicians were licensed by reciprocity and one physician was licensed by endorsement from October 28 through December 10. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Atlanta Medical College	(1915)	Georgia	
Rush Medical College	(1937)	Washington	
School of Med of the Division of Biological Sciences	(1937)	Missouri	
Creghton University School of Medicine	(1926)	(1935)	Nebraska
University of Nebraska College of Medicine	(1936)	(1936)	Nebraska
University of Buffalo School of Medicine	(1937)	(1937)	New York
University of Wisconsin Medical School	(1933)	(1933)	Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
University of Pennsylvania School of Medicine	(1933) N	B M E	

\* License withheld pending completion of internship  
† Failed in physiology only



## Book Notices

**Research in Mental Hospitals A Survey and Tentative Appraisal of Research Activities Facilities and Possibilities in State Hospitals and Other Tax Supported Institutions for the Mentally Ill and Defective in the United States** Conducted by the National Committee for Mental Hygiene 1936 1937 Paper Pp 1+1 New York City 1938

By information collected through questionnaires, personal interviews and visits, a survey was made of existing facilities for research in mental problems in private hospitals and public institutions. This book constitutes an appraisal of that review. It was found that twenty of the 273 public institutions could be designated as research centers because of the character and quality of their investigatory work the caliber of their personnel and the resources at their disposal for scientific study. In addition there are thirty-two public-supported hospitals that offer distinct possibilities for research work. Furthermore the report estimates that there are 150 of the 1700 staff physicians in the public mental institutions of the country who show a definite interest in and ability for investigative work. The survey furnishes tangible evidence that a creditable beginning has been made in the development of research in public institutions and that further desirable expansion might be fostered with moderate encouragement and financial support. The extension of research, the report concludes, will be dependent in large measure on the availability of men with eager and inquiring minds who possess the qualifications for exploratory endeavor. In other words, many institutions can be encouraged to devote further efforts to psychiatric research, but the most important method of extending desirable investigative studies appears to be by encouraging recent graduates in medicine whose records would indicate promising careers in psychiatric research to enter this field.

**Cranio Cerebral Injuries Their Diagnosis and Treatment** By Donald Munro A.B. M.D. F.A.C.S. Surgeon in Chief for Neurological Surgery at the Boston City Hospital Boston Cloth Price \$4 Pp 412 with 62 Illustrations New York Toronto & London Oxford University Press 1935

The increasing number of head injuries resulting from automobile accidents in all sections of the country has forced on almost every practitioner of medicine the necessity of treating them. The treatment of craniocerebral injuries has passed through several stages of development and as a result many conflicting hypotheses based on erroneous observation have been advanced. For that reason Munro's book fills a much needed place in a medical library a book to which the physician can refer for specific information concerning the most efficient methods of dealing with craniocerebral injuries. In the introduction Munro calls attention to the fact that the approximate number of fractured skulls in 1932 was 112,000. Unquestionably this number must be increasing and therefore the impracticability of expecting the few neurosurgical clinics of this country to care adequately for so many seriously injured patients is apparent. Munro is of the opinion that the problem of craniocerebral injury belongs to the general surgeon and that the neurologist and neurosurgeon should be consulted in the more complicated cases. This, of course, places a great responsibility on the general surgeon and makes it imperative that he acquaint himself with the most effective methods of treatment and provide himself with the necessary hospital and staff equipment. In this book an endeavor is made to present the information necessary for the general surgeon who either elects or is forced to treat craniocerebral injuries. It implies neither specialized knowledge nor technical skill. It has proved its worth in practice over a number of years and in a large active traumatic clinic. The book is based on experiences accumulated by all members of the staff, from house officers and residents to the chief of the service, and the methods that it describes have been equally effective in the treatment of patients suffering from craniocerebral injuries whether used by the most recent newcomer to the hospital or by any of his seniors. As a background for his discussion of the problem the author first elaborates on the

fundamental cerebral physiopathology and then proceeds to the importance of history and examination of the patient. A chapter on roentgenology precedes the chapters on general principles of treatment, which are followed by chapters on special nonoperative and operative methods of treatment. Chapters on the nonoperable and operable groups of craniocerebral injuries are followed by a discussion of the complications due to necessary treatment and a most important chapter on convalescent care. A chapter on craniocerebral injuries of the newborn is a valuable addition to the general discussion. The final chapters, on first aid in craniocerebral injuries and the mortality and morbidity statistics with illustrative cases, complete this most interesting and valuable book. The volume should be in the library of every physician who attempts either by choice or by necessity to treat injuries of the head, for it makes a working knowledge of this subject available in a simple and comprehensive form.

**The Medical Applications of the Short Wave Current** By William Bierman M.D. Attending Physical Therapist Mount Sinai Hospital New York City Including a Discussion of Its Physical and Technical Aspects By Myron M. Schwarzschild M.A. Physicist Beth Israel Hospital New York City Cloth Price \$5 Pp 379 with 55 Illustrations including 9 plates Baltimore William Wood & Company 1938

There has been much unjustified and largely commercially inspired enthusiasm about the alleged specific therapeutic value of short wave diathermy. This volume is the well directed result of the combined efforts of a competent physical therapist and a physicist with special interest in medical electricity for a critical and broad portrayal of the present status of this new physical therapeutic agent. A short introductory chapter on the history of high frequency therapy is followed by 102 pages of scholarly and exhaustive discussion by Schwarzschild of its physical and technical aspects. In the chapter on physiologic responses Bierman takes the same stand as other conservative observers that the primary action of the current is essentially due to the heat developed and that so called nonthermal or specific effects are still to be proved. There is a large and fairly well illustrated chapter on technique. The final and largest chapter deals with clinical application, giving a comprehensive summary of the uses of short wave diathermy along the entire realm of pathology based on the author's own experience as well as on reports in the international literature. Bierman's special field of research, fever therapy by means of short waves, receives exhaustive attention in this and in the preceding chapters. Students of physical therapy and interested clinicians will find an unbiased and large store of information in this excellent volume.

**New Jersey Formulary (N J F)** Compiled and Published by the Joint Committee on Professional Relations Consisting of the Committee on Pharmaceutical Problems of the Medical Society of New Jersey and the Committee on Professional Relations of the New Jersey Pharmaceutical Association Chester I. Ulmer M.D. Chairman Robert P. Fischell Pharm.D. Editor Third edition Paper Pp 64 Trenton New Jersey 1939

This booklet opens with suggestions to physicians which include a plea for prescription writing in place of the prescribing of controlled name products. This section includes the statement that "to combat commercial domination of therapeutics the Council on Pharmacy and Chemistry of the American Medical Association was formed. Physicians should avail themselves of the help which their own Council can give them." The booklet contains the usual tables of weights, measures and equivalents and then suggests various preparations which are designated "N J F" (New Jersey Formulary). These are essentially modifications of the National Formulary preparations included in the book. Typical prescriptions are given for sedatives, elixirs, analgesic capsules, tonics and carminatives. The general purpose of this book is excellent. The advisability of suggesting prescriptions to physicians has certain advantages and also certain disadvantages. One item which is obviously designed to supplant expensive proprietary preparations of this type is a baby oil, "Olei Infantilis, N J F," which contains 12.5 per cent of olive oil in light liquid petrolatum, with 1 part in 500 of the antiseptic chlorothymol and oil of rose to perfume. On the whole, this booklet appears to be as useful as similar formularies which are on the market. It is especially designed

however, for use in New Jersey, since it contains the "N J F" preparations which those in other states would not be familiar with. The idea of pharmacists and physicians cooperating in the preparation of such a book is preferable to the plan used in one other state of issuing such information from a joint committee of the Pharmaceutical Association and the Retail Druggists Association.

**Diseases of the Ear, Nose and Throat.** By Francis L. Lederer, B.Sc., M.D., F.A.C.S., Professor and Head of the Department of Laryngology, Rhinology and Otolaryngology, University of Illinois College of Medicine, Chicago. Fabrikoid. Price \$10. Pp. 885 with 457 illustrations including 16 color plates. Philadelphia: F. A. Davis Company, 1938.

To the available American textbooks in the field of otolaryngology may now be added a fine contribution by Dr. Francis L. Lederer of the University of Illinois College of Medicine. The textbook mechanically presents several features not available in other works, including excellent illustrations and innumerable black and white pictures, arrangement in two columns for easy reading, presentation in simple outline form which is a great aid to the medical student, and the collaboration of specialists in many of the chapters, which provides exceptional authenticity. Each of the sections is prefaced by a compact consideration of the special anatomy concerned. The diseases are considered in the classic oslerian form of definition, etiology, bacteriology, transmission, epidemiology, symptoms, prophylaxis and treatment. There are no references to bibliography or to individual authorities, the author taking full responsibility throughout for the statements that are made except for the recognition given in the preface. Perhaps for the medical student this is an ideal form. The index is detailed and exceedingly useful. The methods of treatment follow those generally accepted as established. Special recognition should be given to the pupils of Mr. Tom Jones, whose contributions to the illustrations are unique.

**Dr. Ida, India: The Life Story of Ida S. Scudder, M.D., B.Sc., F.A.C.S., K.I.H., President, Medical College for Women, Vellore, India.** By Mary Pauline Jeffery, M.D. Cloth. Price \$2. Pp. 212 with 19 illustrations. New York, London & Edinburgh: Fleming H. Revell Company, 1938.

American physicians who are inclined to feel pessimistic should read this story of their valiant colleague in Vellore, India. Dr. Ida Scudder, daughter and granddaughter of medical missionaries, decided there had been enough Scudders on the mission field and she was going to remain in America after her schooling was finished. Even when her mother became ill and she had to return to India to assist her father in the mission in remote Tindavanam, she went as a short-term missionary. It was while there that she experienced the heart-breaking experience which changed the course of her life. Three times in one night she heard Indian men refuse her father's services for their child wives in desperate labor, and the next morning she watched the funerals of the three girls as they passed the Scudder home. It was after a day of "much thought and prayer" that she made her decision to study medicine that she might help Indian women. Years later, Jan. 1, 1900, she landed again in India, bringing with her \$10,000 for the building of a hospital for women. While that first hospital was being built, Dr. Ida found her hands full, fighting the black death, then cholera and leprosy, and other afflictions of the Orient. Through the years that have followed, disease has been only one of her enemies. She has had to battle the shocking worship of the goddess Kali, the ignorance of charm doctors and the traditional system of medicine known as Ayurvedic, child marriage with its accompaniment of immature motherhood, and the caste system with its scorn of 45,000,000 Untouchables. Through her influence sanatoriums for the tuberculous have been established, a school for nurses started, dispensaries opened, hospitals built, and at last the Women's Medical College in Vellore. A children's home has been cared for by Dr. Ida herself with two of her colleagues. From a lovely, mischievous girl, Dr. Ida Scudder has developed into a poised and understanding woman, quite unspoiled by the praise and admiration accorded her by men and women from all parts of the globe. A tireless woman, always alert to help Indian women to help themselves. The book is interestingly written, not without humor. It should be worth reading from either the medical or the missionary point of view.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Issuance of Fictitious Diplomas and Licenses to Practice Medicine and Chiropractic as Scheme to Defraud.**—The appellants were convicted under an indictment charging the use of the mails for the purpose of executing a scheme to defraud and appealed to the United States circuit court of appeals, eighth circuit.

In addition to the appellants, five other persons were named defendants in the indictment, but the record does not show what disposition was made of the charges against these other defendants. The indictment alleged in substance that the defendants named therein obtained, prepared and issued to numerous persons fraudulent and fictitious medical and chiropractic diplomas and certificates and fictitious licenses to practice medicine and chiropractic.

The evidence showed that appellant Alexander was secretary of the Eclectic Medical University at Kansas City, Mo., from 1910 to 1915. That school went out of existence in 1916 and was succeeded by the Kansas City College of Medicine and Surgery. The latter college went out of existence in 1926 and was in turn succeeded by the American Medical University. Alexander was custodian of and had in his possession the records of these institutions. Numerous fictitious medical diplomas introduced in evidence came from these schools and were issued by Alexander. The diplomas dating back many years, were issued after the schools had gone out of existence to applicants who never attended the schools. One of the defendants, Laws, was secretary of the Eclectic State Medical Board of Arkansas from 1924 to 1933. He issued many fictitious licenses to practice medicine in that state to applicants most of whom did not pass any examination. Another defendant, Myrtle E. Long, was secretary of the Iowa State Board of Chiropractic Examiners from 1924 to 1934 and, at the request of appellant George M. Lindsay, she issued a fictitious chiropractic license to appellant George M. Lindsay Jr. for the sum of \$250.

Through appellant George M. Lindsay, appellant Debeh secured a fictitious high school diploma, a fictitious medical diploma from the American Medical University, a fictitious certificate of the Arkansas Eclectic Medical Society, and a fictitious medical license from the Eclectic State Medical Board of Arkansas, all for the sum of \$2,500. Large sums of money were paid in most instances for the spurious diplomas, certificates and licenses. Holders of some of the false diplomas and licenses testified that after receiving them they practiced medicine or chiropractic in various states. Debeh practiced in Arkansas, Pennsylvania, Ohio and West Virginia.

The appellants contended that the evidence did not justify their conviction. But, said the court, there was substantial proof of every element of the crime such as to warrant the jury in finding the appellants guilty. Appellants Date R. Alexander, George M. Lindsay and George M. Lindsay Jr. the court said, were the originators of the fraud. The scheme had for its direct object the defrauding of the public. The issuers of the fraudulent instruments acted through and in conjunction with the practitioners to represent to the public that the latter were duly qualified and legally authorized to practice. The interest of the originators of the scheme did not end when they delivered the diplomas and licenses. This is evidenced by the fact that when their false licensees got into trouble with the authorities they tried to aid and assist them to carry on the deception and gave advice in connection with their attempt to continue practice in certain states.

The evidence showed that Debeh knew nothing about the scheme in its inception. He was one of the persons to whom the bogus documents were issued and not one of the persons who issued them. He however knowingly participated in the scheme as evidenced by a signed statement given to a post office inspector in 1935. He declared that in February, 1933 he

had purchased from Lindsay a high school diploma, medical school diploma, certificate of internship and a license to practice medicine in Arkansas for the sum of \$2,500. He then went to Little Rock, Ark., and opened an office. Thus, the court said, the evidence clearly supported a finding that during 1933 and 1934 Debeh was working with the other appellants in furtherance of the scheme alleged in the indictment. The fact that he came in long after the plan had had its beginnings or that he did not take part in carrying out each phase of it did not absolve him of complicity.

After reviewing the record at length, the circuit court of appeals could find no error in it. The judgments of conviction were affirmed—*Alexander v United States*, 95 F (2d) 873.

**Malpractice Amputation of Forearm Attributed to Negligent Treatment of Cut on Finger**—The plaintiff sued the defendant, a physician, for malpractice, alleging that by reason of the defendant's negligent treatment of a finger injury the amputation of his forearm became necessary. The trial court gave judgment for the defendant and the plaintiff appealed to the Supreme Court of Michigan.

The plaintiff cut the little finger and palm of his left hand with a meat saw. About two and one-half hours later he consulted the defendant, who washed the cut with Dakin's solution (dilute solution of sodium hypochlorite) and applied a disinfectant powder. Two stitches were taken in the cut and the wound was bandaged. The defendant testified that he placed a pad underneath the hand and then wound 3 or 4 feet of gauze around it to form what he called a figure-of-eight bandage. He testified that the bandage extended to the wrist and bound all four fingers of the hand together, leaving only the thumb free. The plaintiff and two other witnesses, on the other hand, testified that only the wounded finger had been bandaged and that it was not supported by the other fingers. The plaintiff claimed that he was given no advice as to the care of the hand but was merely told to return for further treatment, which he did. The defendant admitted that he did not tell the plaintiff that the hand should be kept quiet and should not be used. The plaintiff was able to, and did, use the injured hand in driving his car and attending to the work around his farm.

The plaintiff visited the defendant's office several times during the two weeks immediately following the accident. When the wound failed to show signs of healing, the defendant advised the plaintiff to bathe the hand in hot water every two hours, but the plaintiff testified that he did this only several times a day. The hand steadily grew worse, and the defendant claimed that on several occasions he told the plaintiff that there was some infection in the wound and that he should go to a hospital but that the plaintiff stated he could not afford to do so. The plaintiff and his wife testified that at no time did the defendant tell the plaintiff to go to a hospital but that he went of his own accord after the defendant had admitted that the hand might be infected. At the hospital a surgeon first removed two joints of the little finger and thereafter, when the hand and arm became steadily worse, the forearm was amputated.

On appeal, the plaintiff's main claim of error was that the verdict was contrary to the weight of the evidence. Four physicians testified that the treatment given the plaintiff was proper and in accordance with the established practice in the community and like communities. One physician testified to the contrary, and another did not entirely exculpate the defendant from blame. There was evidence that one physician who testified in the plaintiff's favor was related to one of his attorneys. All the physicians agreed that proper treatment required immobilization of the plaintiff's hand and two testified that the failure of the defendant to advise the plaintiff to keep his hand quiet and not use it for work was improper practice. However, the court said, there was testimony to the effect that the defendant might properly have assumed that the bandage which he claimed he applied and the pain which would accompany movement would be sufficient to immobilize the hand without specific advice to the patient. The verdict, in the opinion of the court, was not against the great weight of the testimony.

The judgment for the defendant physician was therefore affirmed—*Moon v Quick (Mich)*, 279 N W 909.

## Society Proceedings

### COMING MEETINGS

- Alabama Medical Association of the State of Montgomery April 13-14  
Dr D L Cannon 519 Dexter Ave Montgomery Secretary  
American Association of Anatomists Boston Apr 68 Dr E R Clark  
University of Pennsylvania School of Medicine Philadelphia Secretary  
American Association of Pathologists and Bacteriologists Richmond, Va.  
Apr 67 Dr Howard T Karsner 2085 Adelbert Rd Cleveland  
Secretary  
American College of Physicians New Orleans March 27-31 Mr E R  
Loveland 4200 Pine St Philadelphia Executive Secretary  
American Pediatric Society Sky Top Pa Apr 27-29 Dr Hugh  
McCulloch 325 North Euclid Ave St Louis Secretary  
American Physiological Society Toronto Canada Apr 26-29 Dr A C  
Ivy 303 East Chicago Ave Chicago Secretary  
American Society for Pharmacology and Experimental Therapeutics  
Toronto Canada Apr 26-29 Dr G Philip Grabfield 319 Longwood  
Ave Boston Secretary  
American Society of Anesthetists New York Apr 14 Dr Paul M  
Wood 131 Riverside Drive New York Secretary  
American Society of Biological Chemists Toronto Canada Apr 26-29  
Dr C G King Univ of Pittsburgh Dept of Chemistry Pittsburgh  
Secretary  
Arizona State Medical Association Phoenix Apr 13-15 Dr D F  
Harbridge 15 East Monroe St Phoenix Secretary  
Federation of American Societies for Experimental Biology Toronto  
Canada Apr 26-29 Dr D R Hooker 19 West Chase St Baltimore  
Secretary  
Georgia Medical Association of Atlanta Apr 25-28 Dr Edgar D  
Shanks 478 Peachtree St N E Atlanta Secretary  
Iowa State Medical Society Des Moines Apr 25-27 Dr Robert L  
Parker 3510 Sixth Ave Des Moines Secretary  
Louisiana State Medical Society Alexandria Apr 24-26 Dr P T  
Talbot 1430 Tulane Ave New Orleans Secretary  
Maryland Medical and Chirurgical Faculty of Baltimore, Apr 23-26  
Dr Walter Dent Wise 1211 Cathedral St Baltimore Secretary  
Missouri State Medical Association Excelsior Springs Apr 10-12 Dr  
E J Goodwin 634 North Grand Blvd St Louis Secretary  
New York Medical Society of the State of Syracuse April 24-27 Dr  
Peter Irving 2 East 103d St New York Secretary  
Pacific Coast Surgical Association San Francisco Oakland Del Monte  
March 28-31 Dr H Glenn Bell University of California Hospital  
San Francisco Secretary  
South Dakota State Medical Association Aberdeen Apr 24-26 D  
Clarence E Sherwood Madison Secretary  
Southern Surgical Congress Atlanta Ga Mar 6-8 Dr B T  
Beasley 701 Hurt Bldg Atlanta Ga Secretary  
Tennessee State Medical Association Jackson Apr 11-13 Dr H H  
Shoulders 706 Church St Nashville Secretary

### CENTRAL SOCIETY FOR CLINICAL RESEARCH

Eleventh Annual Meeting Held in Chicago Nov 4 and 5 1933

The President, DR WILLIAM H BUNN, Youngstown, Ohio,  
in the Chair

#### Trichinosis in the Chicago Area

MARION HOOD, PH.D., and S W OLSEN, B.A., Chicago  
Numerous publications indicate that the incidence of trichinosis in the United States is approximately 14 per cent. As no report had been made from the Chicago area a series of 478 cases were studied. The material was obtained from unselected autopsies performed at several Chicago hospitals. Portions of the diaphragm were digested in artificial gastric juice and sedimented. This material was then examined. When approximately 100 Gm of tissue was used, 16 per cent of the specimens were found infected with *Trichina*. The results of this work are in accord with those of surveys from other localities. They show that trichinosis is an important problem in the Chicago area.

#### An Acoustic Study of Stethoscope Behavior

DRS FRANKLIN D JOHNSTON and EDWARD M KLINE, Ann Arbor, Mich. A cadaver with a telephone receiver placed inside the heart was used as an acoustic model to obtain quantitative data regarding the sound transmitting properties of different stethoscopes. The necessary apparatus was arranged so that when the end pieces of different units were placed at the same point on the intact wall of the chest the response over a wide range of frequency was easily obtained. Tests of different end pieces and tubings indicated that 1. The shallow chamber bell is superior to other bells especially for high pitched sounds. 2. A soft rubber nipple placed over the end of a bell improves its performance. 3. The diaphragm on a Bowles unit acts to filter out sounds of low frequency.

but it must be stiff to be efficient in this respect 4 The large Bowles units without the diaphragm are good receptors for sounds of all frequencies and they are further improved when a rubber sheath is placed over the aperture 5 Although changes in the length, the diameter of the hole and the nature of the rubber in different tubes cause some alterations in the response of a given end piece due to phenomena of absorption and resonance, these differences are relatively small

#### DISCUSSION

DR. M. A. BLANKENHORN, Cincinnati I should like to ask the authors if they can explain why the performance is better with a rubber-covered stethoscope bell and if they have studied or plan to study another important function of stethoscopes besides the transmission of sounds, namely that of excluding other sounds and noises which are so easily excluded from the laboratory but are never excluded from the places where one works I should like to ask also if they have studied or plan to study the effects of varying pressure of the bell against the wall of the chest These are all important variables in the hands of the clinician, they are not so important in the laboratory

DR. FRANKLIN D. JOHNSTON, Ann Arbor, Mich When the physician obtains information by the use of the stethoscope a twofold process is involved First, the stethoscope brings sound energy to the ears and he hears certain things Second, by experience and training these sounds are separated and interpreted so that rational conclusions are possible This last process is not measurable, but it is of tremendous importance Nevertheless, an objective study of the behavior of the stethoscope is valuable so that the beginner, particularly, will not be unnecessarily handicapped by the use of an inferior instrument In answer to Dr. Blankenhorn's question about how the rubber nipple placed over a bell improves its performance, I really do not know At first we thought the improvement noted with the nipple was due to a more perfect air-tight seal between the bell and the wall of the chest but this is not the case When the nipple is used the effective area of contact with the wall of the chest is slightly increased, and this may be a factor We did no work relating to extraneous sounds, although at many times during the course of the work vibrations coming through the air and especially through the building proved troublesome I think the only way that extraneous sounds can be dealt with by the physician is through the ability gained, by experience, in disregarding them The tissues of the cadaver were harder than those in the usual living chest, so that increasing the pressure of the shallow chamber units was not likely to obliterate the terminal air space, as may occur with an inexperienced student of auscultation This is an important cause for error and should be pointed out to the beginning student We have no data relating to this matter

#### Neosynephrin in Spinal Anesthesia

DRS. ROBBIE BRUNNER and GEZA DE TAKATS, Chicago The hypotension produced by spinal anesthesia was successfully controlled by the intramuscular injection of neosynephrin hydrochloride in 163 cases For control, 100 cases were selected in which ephedrine sulfate was used for the same purpose Aside from the stabilizing effect of neosynephrin on blood pressure, the tachycardia and restlessness produced by ephedrine were absent, on the contrary, bradycardia was produced by neosynephrin, the mechanism of which is analyzed The drug used with certain precautions and controlled dosage removes one of the great objections to spinal anesthesia, namely the severe fall in blood pressure during and shortly after operation

#### DISCUSSION

DR. K. K. CHEN, Indianapolis There is no question that neosynephrin can be used for the control of the fall in blood pressure in spinal anesthesia When one talks about the ephedrine group, one should think also of the action on the central nervous system Formerly physicians emphasized the effect only on the blood pressure, but now it is evident that the action of this group on the central nervous system must be taken into consideration Freedom from nervous symptoms

is an advantage of neosynephrin over ephedrine However, certain points should be raised and kept in mind First, there is the question of toxicity In our laboratory we found that when intravenously injected in mice neosynephrin is 135 times as toxic as ephedrine The authors use a 10 per cent solution, 0.5 cc would be 50 mg and 1 cc would be 100 mg In other words, they are employing a dose equivalent to that of ephedrine for spinal anesthesia Second the action of neosynephrin is brief, while ephedrine has a much more prolonged effect Before the use of ephedrine, epinephrine and later tyramine were tried for the maintenance of blood pressure I should classify neosynephrin as similar to tyramine The tachycardia under ephedrine depends on the state of the vagus nerve If atropine is injected first, tachycardia follows the use of ephedrine On the other hand, if no atropine is administered, either animals or men usually respond by a slowing of the pulse rate I am certainly much interested in the uniform occurrence of tachycardia with ephedrine therapy

DR. GEZA DE TAKATS, Chicago With the use of this drug we have a safeguard against a fall of blood pressure This has given us a certain degree of confidence, as we have not seen a single instance of lack of response The blood pressure does not always rise, but at least there is no fall We give a small dose at the induction of spinal anesthesia and usually ask the anesthetist to inject the second dose of neosynephrin at the time we note the fall The question of bradycardia was of some interest to us, because most of the patients were elderly and some of them had bradycardia before the operation Clinically we have not observed any untoward symptoms In one case a shifting pacemaker developed When this was observed it was readily abolished with atropine As regards Dr. Chen's question, I should say that the average duration of the pressor effect of neosynephrin is about thirty minutes As far as ephedrine is concerned, most of the patients with spinal anesthesia had either no atropine or only  $\frac{1}{160}$  grain (0.4 mg) subcutaneously We have not noticed any toxic effect with neosynephrin From 0.5 to 1 cc of a 1 per cent solution is used We have used ephedrine for many years with spinal anesthesia Our only objection to the drug is that in a certain group of patients ephedrine produces restlessness, so that it may be necessary to put them to sleep for no other reason

#### Pathogenesis of Hemorrhage in Artificially Induced Fever

DRS. SLOAN J. WILSON and CHARLES A. DOAN, Columbus, Ohio Petechial hemorrhages have been one of the most constant pathologic observations reported following artificially induced fever Necropsy on experimental animals and human subjects following lethal fever has revealed extensive hemorrhages and hepatic damage The mechanism has been attributed to anoxia In the present survey the influence of fever on the circulating blood platelets, prothrombin and fibrinogen have been studied in experimental animals and in the human subject as possibly important additional contributing factors Total platelet counts, qualitative and quantitative studies of megakaryocytes in serial sternal marrow punctures, quantitative determinations of prothrombin and fibrinogen and histologic studies of the liver have been made The hemorrhagic diathesis has been found to be directly proportional to the degree of damage occurring in one or both of these essential factors in the coagulation mechanism

#### DISCUSSION

DR. HOWARD L. ALT, Chicago At present I have under my care a girl aged 7 years who has had artificial fever induced nine times since December 1937 for the treatment of bronchial asthma The last treatment was given three weeks ago Ten days ago she began to have ecchymoses, and at the present time she has all the signs of thrombopenic purpura The platelet count is 20,000 per cubic millimeter In view of the report of Drs. Wilson and Doan it seems possible that there is a relation between the artificially induced fever and the purpura in this case

DR. LEE FOSHAY, Cincinnati Artificial fever therapy has been used and is being recommended for the treatment of

acute and chronic brucellosis. In this infection the brunt of damage to tissue is often borne by the liver, as evidenced by bilirubinemia, urobilinuria, increased prothrombin time, imperfect retractability of blood clots, subserous hemorrhages, occasionally large retroserosal extravasations of blood and often an enlarged and tender liver. I do not wish to be understood as advising against fever therapy in this disease, but I suggest that the facts presented by Wilson and Doan warrant extremely careful selection and preparation of patients with brucellosis before fever therapy is attempted.

DR E P K FENGER, Rochester, Minn. I wonder whether studies have been made of giving oxygen with fever therapy. There is known to be a consumption of about seven degrees of oxygen with fever. If studies were made with a view of giving oxygen with fever therapy it might head off these deleterious effects.

DR SLOAN J WILSON, Columbus, Ohio. Oxygen has been given intranasally during fever therapy to prevent anoxia. Hartman prevented a decrease of oxygen in the venous and arterial blood of experimental animals by the intranasal administration of oxygen. He was the first to suggest that oxygen be given to patients during fever therapy. He also stated that the efficacy of the barbiturates is decreased when oxygen is given.

#### Production of Hepatic Disease by Dietary Deficiency and Its Effect on the Anti-Pernicius Anemia Principle

DR FRANK H BETHELL, Ann Arbor, Mich. Extensive lipoidosis of the liver was produced in pregnant and in non-pregnant rats by diets possessing the relatively low protein contents of 8 per cent and 3 per cent respectively. Associated with hepatic damage there were macrocytic anemia and a megaloblastic reaction of the bone marrow. These changes could not be prevented by oral or parenteral administration of liver extract or by a high intake of yeast. Extracts made from the livers of experimental animals were administered parenterally to five patients with pernicious anemia in relapse. By means of the double reticulocyte response, normal rat liver extract being used as a control, a deficiency of the anti-pernicius anemia principle was demonstrated in the livers of rats made anemic by protein deficient diets.

#### DISCUSSION

DR C J WATSON, Minneapolis. Was the reticulocyte count spontaneously elevated in rat anemia while the hemoglobin and the red blood cell level were falling?

DR O O MEYER, Madison, Wis. I should like to ask whether the livers of the rats on deficient diets were larger than normal, and whether the speaker thought the deficiency in diet was responsible. Also was the extract made from a certain number of grams of liver or was it made by comparing rat for rat? It is possible that the difference in results may be due merely to the factor of dilution.

DR FRANK H BETHELL, Ann Arbor, Mich. In answer to Dr Watson's question, the reticulocyte counts of the rats with macrocytic anemia were elevated. In the rat the number of the reticulocytes fluctuates widely and is increased in almost every form of anemia. With regard to Dr Meyer's question, the livers of the anemic rats were slightly enlarged in proportion to the size of the rats. The doses of extracts were based on the grams of liver from which they were derived not on the weights of the individual rats. The latter method would not be suitable because of the general undernutrition of rats on low protein diets. The weight of the liver of rats on low protein diets was slightly less than that of animals on high protein diets owing in part, at least to the lower specific gravity of fat.

#### Monocytic Leukemia of the Schilling and the Naegeli Type

DRS CHARLES H WATKINS and BYRON E HALL, Rochester, Minn. Two types of monocytic leukemia are now generally recognized—the so called Naegeli type, which many authorities regard as a variant of myelogenous leukemia with a predomi-

nance of monocytes, and the Schilling type, which presumably is a variant form of leukemic reticulo-endotheliosis in which the monocytes are derived directly from reticular cells. In the past ten years we have observed twenty cases of the Naegeli type and four cases of the Schilling type. These two groups of cases are compared with respect to the clinical manifestations (age, sex, presenting symptoms, duration of illness and response to x-ray or radium therapy when either was given) as well as with regard to the hematologic and histologic pictures.

#### DISCUSSION

DR RAPHAEL ISAACS, Ann Arbor, Mich. In myelogenous leukemia immature monocytes may be pushed out of the bone marrow (Naegeli type of "monocytic leukemia") and in monocytic leukemia immature polymorphonuclear cell stages may be forced into the peripheral circulation (Schilling type of monocytic leukemia). Three clinical features help to distinguish monocytic leukemia from the myelogenous type. In the first the liver and spleen are enlarged to about the same linear measurement, whereas in the second the spleen eventually becomes disproportionately elongated. Oral lesions (ulcerative) are more frequent in true monocytic leukemia than in the myelogenous type. True monocytic leukemia responds poorly to roentgen therapy but does respond to arsenical medication. Our present view is that "myelogenous" leukemia which responds to arsenic is in reality monocytic. It is easy to tell the monoblast from the myeloblast or lymphoblast, as the true monoblast is the only one in which granules (red staining) appear in the cytoplasm.

DR BYRON E HALL, Rochester, Minn. There are many different views concerning the origin and developmental potencies of the mononuclear elements in the blood and blood forming organs. This is particularly true of the monocyte. However, we feel that the separation of monocytic leukemia into two groups is justified not only on the basis of the difference in the blood picture and the type of stem cell from which the monocyte is derived but because of the pathologic differences of the hemopoietic organs in each condition. It was our impression when we began this study that infiltration of the gums was more common in acute monocytic leukemia than in other forms of acute leukemia. As Dr Isaacs stated, this feature has been emphasized by many clinicians. We were therefore somewhat surprised to find that in our series lesions of the gums were no more frequent in monocytic leukemia than in myelogenous and other types of leukemia. As far as a comparison of the size of organs is concerned, in the Schilling group the liver was not palpable in any case, but enlargement of the spleen was demonstrable in all four cases and slight enlargement of the lymph nodes was noted in half of them. In the Naegeli group definite but in most cases slight enlargement of the lymph nodes was found in all but two cases. Enlargement of the spleen was demonstrable in fifteen, and enlargement of the liver was noted in thirteen of the twenty cases. Dr Isaacs stated that azure granules are observed only in monoblasts. We have seen azure granulations in the cytoplasm of stem cells in the Naegeli type of monocytic leukemia (monoblasts of many authors). They are common in genuine myeloblasts, as Naegeli, Pappenheim and others demonstrated many years ago, and frequently are seen in these cells in cases of myelogenous leukemia. In myelogenous leukemia one or several cellular lineages may be affected. For example, there have been many reports in the literature of eosinophilic leukemia. There are also cases on record of neutrophilic, basophilic and megakaryocytic leukemia. In each instance a single type of cell is involved primarily. In many of these cases, however, there has been a picture characteristic of chronic myelogenous leukemia during later stages of the disease. In the usual case of chronic myelogenous leukemia the majority if not all types of myeloid elements are involved in the leukemic process (panmyelosis). It is our opinion that the eosinophilic, basophilic and megakaryocytic types of leukemia are variant forms of myelogenous leukemia. The monocyte likewise may be primarily affected being derived from the myeloblast. We have attempted to show that cases in which this occurs differ hematologically and pathologically from cases of leukemic reticulo endotheliosis and that they should be classified as instances of a form of myelogenous leukemia.

### Bone Marrow in the Active Phase of Essential Thrombopenic Purpura

DR LOUIS R LIMARZI and EMIL M SCHLEICHER, M.S., Chicago Although essential thrombopenic purpura has been extensively studied, little attention has been paid to the bone marrow. In our studies of this disease during the active phase (four cases) the bone marrow showed a megakaryocytic hyperplasia with the presence of many young forms (promegakaryocytes). At this time the peripheral blood shows a reduction in number and an abnormality in size of the platelets. These characteristics of the bone marrow persist through remissions induced by blood transfusion, even though the peripheral blood has shown a moderate increase in the number of platelets. After splenectomy the bone marrow approaches normal with an increase in the platelets in the peripheral blood and a cessation of bleeding. In one patient whose episodes of bleeding were reduced but not abolished after splenectomy, the bone marrow still shows megakaryocytic hyperplasia with immature forms. Studies of bone marrow make possible an accurate differentiation of essential thrombopenic purpura from other inaccurately diagnosed hemorrhagic states (aleukemic myelosis, aplastic anemia and toxic purpura).

#### DISCUSSION

DR FRANK H BETHELL, Ann Arbor, Mich I have been performing sternal aspiration before deciding on splenectomy in cases of thrombopenic purpura. I agree with the authors that the procedure is of diagnostic value but I do not think that, for practical purposes, it is necessary to carry out such an involved technic as they have described. I aspirate a small amount of material from the sternum and make cover slip films at the bedside without the use of an anticoagulant. These reveal the characteristic increase in megakaryocytes in patients suitable for splenectomy.

DR LOUIS R LIMARZI, Chicago In our first studies of bone marrow we followed the usual procedure in obtaining marrow. The advantage of the method we described is that sinusoidal blood and fat are separated from the bone marrow cells. In other words, one obtains a concentration of marrow cells. It also offers a method of studying gross quantitative changes that take place in diseases like pernicious anemia or microcytic hypochromic anemia before and after the institution of therapy. This method of studying bone marrow has been followed in 600 patients as young as 6 weeks and as old as 80 years.

### A Specific Cell in the Peripheral Blood, Characteristic of Liver Disease

DR RAPHAEL ISAACS, Ann Arbor, Mich Characteristic of hepatic disease (cirrhosis, chronic passive congestion hepatitis, secondary hepatic disturbance in obstructive jaundice and cholelithiasis, leukemia) is the appearance in the blood stream of a specific cell which may constitute from 1 to 15 per cent of the leukocytes. The cells have an irregular wavy margin, with pseudopodia-like projections in the older forms. The average size varies from 15 by 13 to 18 by 18 microns with an oval nucleus averaging 12 by 9 microns. The cytoplasm stains a sky blue and has a foamy structure like that of a monocyte but the minute red staining granules of the latter are absent. A few large red-staining granules may be present. The tips of the pseudopods are hyaline. The chromatin in the nucleus is coarse with a heavy reticulum but is frequently so dense that but little detail of structure can be seen. There is no discrete nuclear membrane. There is no perinuclear clear zone, as in lymphocytes. With brilliant cresyl blue applied while the cells are wet and counterstaining with Wright's stain when dry, the cresyl blue granulation is in heavy masses near the nucleus and in finer particles near the periphery. Many of the cells with this stain show a clear pink-staining hyaline ectoplasm. The cells appear in the peripheral circulation in experimental liver poisoning in animals.

### The Clotting Time of Hemophilic Blood

DR ARMAND J QUICK, Milwaukee If thromboplastin is added hemophilic blood will coagulate as rapidly as normal blood, which indicates that a deficiency of thromboplastin is the

probable cause of the defective clotting. Furthermore, when oxalated hemophilic blood is centrifuged at a high speed the plasma on recalcification will coagulate much more slowly than if the plasma is obtained by a low rate of centrifugation. The coagulation of plasma from normal blood is only slightly influenced by the speed of centrifugation. This suggests that the platelets in hemophilia are more resistant to lysis and are removed by rapid centrifuging, thus leaving the plasma poor in thromboplastin. When oxalated hemophilic plasma is allowed to stand, its coagulation time when recalcified will become progressively shorter and will approach normal. These observations make it seem probable that the cause of the prolonged clotting time in hemophilia is the slow liberation of thromboplastin from platelets rather than the absence of any factor essential for coagulation.

#### DISCUSSION

DR CARROLL F BIRCH, Chicago As Dr Quick says, the important question is Why do the platelets not break up? One group of authors believes that the platelets have an actual increase in mechanical resistance, while another group holds that the platelets are normal although placed in an abnormal environment, hemophilic plasma. The latter group bases its evidence on the fact that hemophilic platelets behave normally when placed in normal plasma, they agglutinate and rupture within the average time.

### Leukothrombopenia with Increased Capillary Permeability

DRS FREDERICK W MADISON and THEODORE L SQUIPP, Milwaukee We have observed three adults with severe leukopenia, thrombopenia and strongly positive Rumpel-Leeds phenomena. The presenting complaints were extensive suppurative lesions in two and pathologic bleeding in one. In each, recovery from clinical symptoms occurred, but the two with pyogenic lesions thus far have made only partial hematologic recovery. Drug origin was ruled out in each. The erythrocyte count was not significantly involved in any case and responded to ordinary therapeutic procedures. In each instance the leukocyte and thrombocyte counts and the abnormal capillary permeability failed to respond to all medication except the use of epinephrine in one. We believe the leukothrombopenia present in these three patients is a definite clinical syndrome representing another manifestation of the selective, reversible inhibition of bone marrow seen in agranulocytic angina and in some cases of thrombopenic purpura. One of the three patients was found sensitive to milk and made prompt symptomatic and hematologic recovery under allergic control alone. In our opinion it is important to differentiate leukothrombopenia from typical agranulocytic angina and from leukopenic leukemia because of the difference in the clinical course, prognosis and therapeutic management.

### Oral and Intramuscular Administration of Vitamin K in Hemorrhagic Diathesis of Obstructive Jaundice

DRS HUGH R BUTT and ALBERT M SWELL and ARNOLD E OSTERBERG, PH.D., Rochester, Minn. The effect of concentrates of vitamin K prepared from various sources and administered orally and intramuscularly has been studied with reference to the qualitative and quantitative level of prothrombin during the preoperative and postoperative course in cases of various types of obstructive jaundice. A rough inverse relation between prothrombin coagulation time and quantitative prothrombin levels can be demonstrated. The intramuscular administration of the vitamin, while effective in K-avitaminous chicks, is considerably less useful in the human subject than is the oral administration of the preparation. A fall in quantitative prothrombin has been demonstrated postoperatively in a number of cases, a fact which emphasizes the necessity for careful observation.

#### DISCUSSION

DR EMORY D WARNER, Iowa City I should like to ask the authors first what, in their experience, is the level for prothrombin below which the patient is likely to bleed and second what if any correlation they have been able to work out between the extent of the decrease in prothrombin and the



duration and the intensity of the jaundice I have had three cases in which the prothrombin was at a low level and in which I got no prothrombin response by feeding vitamin K concentrate. The patients had advanced hepatic damage in the form of biliary cirrhosis. I felt that the hepatic damage accounted for the failure to respond to vitamin K therapy. It has been shown that hepatic damage will cause lowering of the prothrombin content of the plasma—almost to the vanishing point if the damage is extreme, as in chloroform poisoning in dogs. It is to be expected that in patients with extreme hepatic damage a response to vitamin K therapy cannot be obtained because the injured liver is incapable of producing prothrombin.

DR E. L. TUOHY, Duluth, Minn. Does the test for prothrombin furnish some index of hepatic capacity or function? Through the courtesy of Drs. Butt and Snell I had the opportunity to test out this material, with extremely favorable results, in a patient with carcinoma of the head of the pancreas, with painless, rapidly developing jaundice and a tendency to bleed. I gave it both preoperatively and postoperatively, and the response was exactly as the authors have shown. I should like to ask further if with this method of controlling jaundice there is any further need of attempting to rely to any degree on the administration of calcium, which formerly seems to have given the surgeons considerable comfort.

DR M. A. BLANKENHORN, Cincinnati. Is the plan of treatment the same when the bile is returned to the intestine at operation by anastomosis of the gallbladder as when the bile continues to be excluded from the intestine?

DR HEINRICH NECHELES, Chicago. Did these jaundiced patients with normal prothrombin time who did not receive any treatment with bile salts, blood transfusions or vitamin K bleed nevertheless?

DR RUSSELL M. WILDER, Rochester, Minn. Vitamin K occurs in many foods, so deficiency of it in diets is extraordinary. I should like to ask the authors to add a word about the effect of giving bile alone without vitamin K in these cases with diminished lengthening of the prothrombin time.

DR ARMAND J. QUICK, Milwaukee. This report indicates that clinical study of the problem has gone much further and has been much more successful than the laboratory study. The determination of prothrombin is at best a difficult matter. I fail to understand why there should be a difference in the results of the two methods used, the prothrombin time and the method developed by Dr. Smith and his co-workers. It means that there is still a great deal to be known about prothrombin. I might say that many of these jaundiced patients have slightly antithrombic plasma—in other words, it inhibits the action of thrombin, which might account for a more prolonged prothrombin time than can be accounted for by the actual decrease in prothrombin. If the plasma is highly concentrated, coagulation will be delayed. I just want to point out that the problem is still open as far as experimental work is concerned.

DR HUGH R. BUTT, Rochester, Minn. Warner, Brinkhous and Smith of the University of Iowa have reported that, in dogs with a quantitative level of prothrombin below 20 per cent, bleeding usually occurs. In man, however, the critical level of prothrombin at which bleeding occurs seems to be much higher. We have seen bleeding occur in man with a quantitative level of prothrombin as high as 40 or 50 per cent. I know of no theoretical explanation for this phenomenon, but Dr. Smith also feels that perhaps the critical level of prothrombin at which bleeding occurs for some reason is higher than that of dogs. We have noted some similarity between the elevation of the bilirubin content of the serum and the elevation of the prothrombin clotting time. It is well known that the hemorrhagic diathesis in patients with jaundice occurs most often when no bile is able to enter the intestinal tract. Certain groups of patients seem to bleed more frequently than others, and the frequent tendency to bleed is likely to occur from the following causes in order: (1) anatomic obstruction, such as occurs in carcinoma of the head of the pancreas or biliary ducts, (2) stricture of the biliary ducts, (3) complete external biliary fistula, (4) stone in the biliary duct and (5) diffuse hepatitis. In such cases we have often noted that as the bilirubin content rises the

level of prothrombin in the circulating blood decreases. I was interested to hear Dr. Warner say that he had observed three patients who did not respond to the administration of vitamin K and bile salts. No doubt as more cases are observed all physicians will have a similar experience. The condition perhaps represents an irreversible reaction such as can be observed in many other diseases due to vitamin deficiency.

In reply to Dr. Tuohy, the use of the level of prothrombin as an indication of hepatic function has been fairly well established by the work of Warner, Brinkhous and Smith. By injuring the liver of dogs with chloroform, they have shown that the level of prothrombin is decreased. From their studies they have suggested that the liver perhaps plays a major role in either the fabrication or the activation of the substance called prothrombin. Calcium chloride formerly was believed, and still is by some physicians, to be useful in the treatment of the hemorrhagic diathesis in patients with jaundice, and I believe that it has been well demonstrated by Walters and others to be of distinct benefit. However, the results of experimental research on this problem do not coincide with those of clinical experience. It has been rather definitely shown that the amount of calcium in any of its forms is not appreciably altered in patients with jaundice. Nevertheless, in spite of these theoretical data I do not see any harm in giving calcium, and certainly, since the problem of bleeding is still far from settled, it would seem that an excess of any material necessary for blood clotting might be of some benefit.

Dr. Blankenhorn has asked about the importance of reestablishing the flow of bile into the intestinal tract and Dr. Wilder wishes a more detailed explanation of the value of bile salts. The use of bile salts is based on the fact that in hepatic injury from any cause, and particularly when there is obstruction to the outflow of bile, the quantity and quality of bile salts entering the intestinal tract are poor. It has been well established that the presence of bile salts is necessary for proper absorption of fat-soluble materials. It is assumed that the substance called vitamin K comprises one or more fat-soluble substances, and for this reason bile salts are given to aid in better utilization of this material. Obviously, the first thing of importance is to reestablish the normal flow of bile into the intestinal tract. However, even after this is accomplished, the amount and quality of bile salts entering the intestine is poor. For this reason, we feel that the supplementary use of animal bile salts is important. It is true that if a patient is eating a diet which contains adequate amounts of vitamin K, provided he has only a mild degree of prothrombin deficiency, bile salts alone seem to be sufficient to maintain a proper level of prothrombin. However, if the prothrombin level is greatly decreased, bile salts alone have not proved as effective as vitamin K and bile salts administered together. We have not seen bleeding in patients who had a normal prothrombin clotting time. No doubt, as I have mentioned before, it can occur, since one cannot accurately predict from a single determination of prothrombin clotting time just what is the quantitative level of prothrombin in the circulating blood. As I have just demonstrated, in the patient with a stricture of the common duct the prothrombin clotting time was thirty seconds, while the quantitative level of prothrombin was 38 per cent of normal.

I agree with Dr. Quick that it is difficult to explain just why the quantitative measurement of prothrombin developed by Warner, Brinkhous and Smith does not check more closely than it does with the measurement of prothrombin clotting time developed by Dr. Quick. It seems to me that this discrepancy probably can be explained by the facts: first that both methods are indirect measurements of the substance called prothrombin and second that little is known about the substance designated as prothrombin. It is true that it is thought to be a protein, but little is known of its physical or chemical nature, and until these facts are known the question which Dr. Quick has raised must remain unanswered. We do feel that the methods of measuring prothrombin developed by the two groups of workers are good. The method developed by Quick seems to be better adapted for use in the average clinical laboratory. However, for detailed research in this problem, the quantitative method developed by Warner, Brinkhous and Smith is invaluable.

(To be continued)

## Current Medical Literature

### AMERICAN

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Titles marked with an asterisk (\*) are abstracted below.

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**Hydroxyethylapocupreine for Pneumonia**—MacLachlan and his collaborators gave hydroxyethylapocupreine dihydrochloride to 149 patients with pneumococcal pneumonia. The substance was taken orally in capsule form, 15 grains (1 Gm) every three hours day and night for from three to five days. In some cases it produced nausea and occasionally vomiting. However, in only a few cases was it necessary to discontinue the drug for this reason. For intravenous use a monohydrochloride solution is given, each 50 cc containing 15 grains and this is injected into the vein every three hours. The intravenous solution is given slowly in from seven to ten minutes. No patient less than 15 years of age has been treated with this substance. During the last year, of the authors' 149 chemically treated patients pneumococcal empyema developed in two, with surgical drainage and recovery. The mortality figure in pneumococcal pneumonia in adults during the last year has been greatly reduced in those patients who received hydroxyethylapocupreine. A comparison of the mortality figures of the chemically treated cases, which were smaller in number, with the serum-treated cases in Pittsburgh for the same types of pneumonia during the same period of time, shows almost identical results. Hydroxyethylapocupreine in this series has shown no evidence of disturbing vision.

**Incidence of Trichinella Spiralis in Man**—Pote gives the results of examining muscular tissue for trichinella larvae tissue from 1,060 unselected necropsies at Barnes and St. Louis City hospitals. All the subjects were more than 15 years of age and had died during hospitalization from some disease other than trichiniasis. Of these necropsies, on the bodies of individuals never suspected of having trichiniasis during life, 163

(15 37 per cent) showed the presence of trichinella larvae in the muscles. The parasites were apparently dead in 95 per cent of the cases. In two subjects, one 17 and the other 19 years of age, the trichinellae were completely calcified. On the other hand, in some cases the parasites moved vigorously and often continued to show signs of life for from one to six days after the muscle had been removed. The presence of live parasites was also demonstrated by feeding infested muscle to white rats and recovering the larval forms at the end of forty days. By these means viable parasites were shown in 5 per cent of the positive cases. The occupation of the infested subjects was determined but no significant association with any line of work was apparent. In 1 500 hog carcasses examined for trichinella, 0 8 per cent were found to be infested, which gives rise to the question whether man is getting all of his trichinella infestation from pork. It may be concluded that man's infestation comes from pork derived from the small packing plants which are not supervised by meat inspection services. It is to be noted that the infestations that occur sporadically are from pork from the establishments not under federal inspection. The author concludes that *Trichinella spiralis* infestation of man is not a serious lethal factor in Missouri, since in the 163 instances of infestation it was not held to have contributed to the actual cause of death.

**Urea Clearance After Hyperpyrexia in Rheumatic Patients**—Farr and Moen performed urea clearance tests on seven rheumatic patients before, during and after artificially induced hyperpyrexia. Of these seven patients two had rheumatic fever, three had subacute or chronic infectious arthritis, one had gonococcal arthritis and one had dermatomyositis. The average urea clearance during the period when the temperature was rising was 61 7 per cent of normal and during the period when the temperature was at a maximum the clearance averaged 75 per cent of normal. In two instances a severe oliguria resulted from the treatment, and these patients were able to void only after twelve hours. For the entire group the average control clearance was 105 per cent when the patients were afebrile. The data indicate that dehydration should be avoided during fever therapy.

#### American Journal of Physiology, Baltimore

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- Maintenance of Pregnancy by Progesterone in Rabbits Castrated on the Eleventh Day W M Allen and G P Heckel, Rochester N Y—p 31
- Ease of Body Heat Loss as a Basic Developmental and Functional Factor in Warm Blooded Animals C A Mills and Cordelia Ogle—p 36
- Kidney Function in Adrenal Cortical Insufficiency I Gersh and A Grollman Baltimore—p 66
- Effect of Intravenous Injections of Heparin in the Dog L B Jaques Toronto—p 98
- Mechanism of Action of Saliva in Blood Coagulation A J Glazko and D M Greenberg Berkeley Calif—p 108
- Effects of Formalin on Thyroid Stimulating and Gonadotropic Hormones of Cattle Anterior Pituitary Glands S J Hayward J H Pollock and L Loeb St Louis—p 113
- Cervical Sympathetic Stimulation and Basal Metabolism H B Friedgood and S Bevin, Boston—p 153
- Electrocardiographic Changes and Concentration of Calcium in Serum Following Intravenous Injection of Calcium Chloride H E Hoff P K Smith and A W Winkler New Haven Conn—p 162
- Manner of Strychnine Action on Nervous System P Heinbecker and S H Bartley St Louis—p 172
- \*Persistent Diabetes Following Injection of Anterior Pituitary Extract F C Dohan and F D W Lukens Philadelphia—p 188
- Defatiguing Effect of Adrenalin J V Luco Boston—p 196

**Persistent Diabetes After Pituitary Extract**—Dohan and Lukens confirm the work of Young, who has recently described the production in dogs of diabetes, which continued for months after the cessation of intraperitoneal injections of increasingly larger doses of a carefully prepared extract of the anterior pituitary gland, of Campbell and Best, who have had a similar experience, and of Evans, who reported the persistence of diabetes in two dogs after approximately nine months of treatment with a growth hormone preparation. The present report adds metabolic studies to illustrate the character of the diabetes so induced. While the intensity of the diabetes varied, the metabolic behavior of the animals was similar to that of partially depancreatized dogs. Histologic evidence also indicates damage to the islands of Langerhans.

## Archives of Ophthalmology, Chicago

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- Correction of Ptosis by Attachment of Strips of Orbicularis Muscle to the Superior Rectus Muscle J M Wheeler New York—p 1
- Role of Nonviolence in Lever Action Intracapsular Extraction of Cataract K C Dutt Sonpur Raj India—p 8
- New Method for Transplanting Pterygium E M Neher, Salt Lake City—p 30
- Some Physiologic and Pharmacologic Reactions of Isolated Iris Muscles P Heath and C W Geister Detroit—p 35
- Congenital Cyst of the Vitreous J V Cassidy, South Bend Ind—p 45
- \*Ocular Manifestations in Brucellosis (Undulant Fever) J Green St Louis—p 51
- Malignant Melanoma of the Choroid with Metastases Report of Case F J Pinkerton Honolulu Hawaii—p 68
- Higher Visibility in a Roentgenogram Illuminator C E Ferree and G Rand Baltimore—p 70
- Vascular Obliteration for Various Types of Keratitis Its Significance Regarding Nutrition of Corneal Epithelium T Gundersen Boston—p 76
- Congenital Grouped Pigmentation of the Retina Report of Case C A Perera New York—p 108
- Retinal Arterial Changes as Part of an Induced General Vasospastic Reaction Effect of Tobacco and Cold P L Cusick and W E Herrell Rochester Minn—p 111
- Herpes Zoster Ophthalmicus Report of Case F L P Koch Rochester Minn—p 118
- Ectopia Lentis Pathologic and Clinical Study C C Clarke New Haven Conn—p 124

**Ocular Manifestations in Brucellosis**—Green believes that since ocular manifestations occur in brucellosis more ophthalmologists, when confronted with a case in which the etiology is not determined, should take advantage of the opportunity to determine by laboratory methods the presence or absence of past or present infection with *Brucella*. Most ocular lesions occurring in the course of brucellosis do not destroy the integrity of the globe. Hence enucleation is not imperative. This fact explains the lack of any pathologic examination of a human eye that has been affected with brucellosis. Evidence is accumulating that some ocular maladies heretofore ascribed to other origins may be caused by brucellosis. The external ocular muscles, the cornea, the uveal tract, the retina and the optic nerve have all proved vulnerable. Almost every physician has been thwarted in his efforts to establish the cause of a chronic uveitis. The ophthalmologist should include in his list of possible etiologic factors a disease that is widespread and one that has been proved capable of affecting almost every tissue of the body (brucellosis).

## Archives of Otolaryngology, Chicago

29 1198 (Jan) 1939

- Parapharyngeal Hemorrhage Diagnosis and Treatment F W White and L Hubert New York—p 1
- Relation of Internal Ear Spaces to Meninges H B Perlman and J R Lindsay Chicago—p 12
- Osteomyelitis of Skull Complicating Mastoiditis and Frontal Sinusitis Report of Two Cases O C Hirst Philadelphia—p 24
- Unusual Form of Nasal Headache W G Mussun Cleveland—p 39
- Thrombosis of the Lateral Sinus Study of Fifteen Cases Including Histologic Examination J G Druss New York—p 42
- Incidence of Malignant Tumors of the Head and Neck Statistical Survey N D Fabricant Chicago—p 65
- Laryngeal Stenosis in Children with Special Reference to Treatment with Core Molds E J Patterson Pittsburgh—p 71
- Lingual Thyroid C Smith Spokane Wash—p 78
- Otitis Media and Orbital Cellulitis Complicating Scarlet Fever Preliminary Report on Loss of Hearing from This Disease H J Williams Philadelphia—p 82
- The Larynx in Infancy Study of Chronic Stridor C A Herthly Rochester N Y—p 90
- \*Chemoprophylaxis Against Impending Polymyositis Re E Ashley San Francisco—p 104
- \*Irritation of the Throat from Cigarette Smoke Study of Hygroscopic Agents H C Ballenger Chicago—p 115
- Galvanic Reaction in Guinea Pigs I Normal Galvanic Reaction A R Buchanan and Laura D Ladd University Miss—p 124
- Id II Reaction Following Labyrinthectomy A R Buchanan and Laura D Ladd University Miss—p 136
- Functional Examination of Hearing R Sonnenschein and N Ieshin Chicago—p 164

**Chemoprophylaxis for Polymyositis**—According to Ashley the experimental work of Armstrong Schultz and their collaborators offered the first definite hope of controlling infantile paralysis by the nasal instillation of chemicals. Up to this time immune serums and vaccines failed to protect monkeys against the inoculation of the virus. Their work paved the way for trials of chemicals in preventing the disease in human

beings. Certain chemicals applied to the olfactory tracts of monkeys have rendered the animals resistant to infection with the virus after repeated intranasal instillation. Fifty or sixty chemicals have been tested for this protective property, and while zinc sulfate is not toxic and seems to be the most effective it causes certain irritating and unpleasant symptoms and is not the ideal solution. Anosmia which develops after chemical treatment is probably an evidence of the completeness of the nerve blocking and an indication of the protection. The duration of the anosmia when zinc sulfate is used varies greatly in different persons, but apparently the sense of smell always returns. In this type of treatment is practical, the effectiveness of the protection will depend on the thoroughness of the nerve blocking. Functional tests for the return of the sense of smell should be the guide for further chemical application. While the experience during human epidemics has so far failed to show definite protection, further trials are indicated since previous methods of application have been faulty. If this treatment proves effective in man it will still not be an ideal prophylactic, as the protection afforded is short and as it fails to produce any immunity in the individual to the virus. Nevertheless it is the only method available which promises any hope of actually combating the disease.

**Throat Irritation from Cigarette Smoke**—Ballenger did not find, after a careful objective examination of 102 cigarette smokers, any significant difference in the irritation of the mucosa of the nose or throat from smoking cigarettes moistened with glycerin those moistened with diethylene glycol or those with no hygroscopic agent. The subjective symptoms or sensations of irritation, when present, were not marked enough in respect to distribution, character or degree to justify definite conclusions. Lymphoid hyperplasia of the pharynx does not appear to have any relation to the number of cigarettes smoked.

## Archives of Physical Therapy, Chicago

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- Dosage Measurement in Short Wave Diathermy E Mittelmann and D Kobak Chicago—p 725
- Athermic Short Wave Therapy P Liebesny New York—p 736
- Effect of the Elliott Treatment on Nasal Membrane F L Brant Minneapolis—p 740
- Elliott Therapy in Ophthalmology M S Udelf Cleveland—p 744
- Fever Therapy at High Humidities W Finkelstein New York—p 748
- Rehabilitation of the Physically Handicapped H H Kessler Newark N J—p 753
- Treatment of Colon Infestation by Irrigation and Hot Installation D de Rivas Philadelphia—p 756

## Arkansas Medical Society Journal, Fort Smith

35 141 162 (Jan) 1939

- Exploitation of the Medical Profession J S Jenkins Pine Bluff—p 141
- Intra Ocular Tumors A W Roberts Texarkana—p 145

## Bulletin New York Academy of Medicine, New York

15 1 60 (Jan) 1939

- Hemophilia W H Howell Baltimore—p 3
- Some Aspects of Intermediary Metabolism of the Steroid Hormone G F Marrian Toronto—p 27
- \*Infectious Mononucleosis J R Paul New Haven Conn—p 43

**Infectious Mononucleosis**—Paul believes that there are few diseases in which one is so fortunate as to have three definite diagnostic aids (clinical picture, blood counts and serologic test) and yet, in spite of them, the disease probably often escapes recognition. Sometimes the clinical symptoms are mild there seems to be such a thing as "walking infectious mononucleosis" and these and other cases may easily escape recognition if differential blood counts are not done. The classic physical signs of the disease are well known and do not require repetition but the author mentions three clinical features which are not common but are striking when they occur. 1 Ocular symptoms probably occur more frequently than one would be led to believe. In their early stages they are characterized by pain in the eyes or pain back of the eyes which regresses during the second week but leaves the patient with puffy eyelids. 2 A papulomacular rash is an irregular symptom but one which has been emphasized by Tidy. The eruption is diffuse or patchy and generally limited to the trunk. It is difficult to describe it by any other term than morbilliform, in two of the author's cases it was classified by the attending physician as a "drug

rash. It may be preceded or accompanied by an enanthem consisting of petechiae on the soft palate. Jaundice is another manifestation present in the second or third week of the disease. It is often definite and striking. A recent report from Sweden emphasizes its importance. Infectious mononucleosis is a benign condition which is self limiting in two or three weeks. However, it may be a long time (perhaps six months) before the glands return to normal size and a long time before the patient feels well again. So prominent is this postfebrile depression that in severe cases it seems to be part of the disease.

### Iowa State Medical Society Journal, Des Moines

29 146 (Jan) 1939

- Certain Diseases Associated with Changes in the Circulating Leukocytes C C Sturgis Ann Arbor Mich—p 1  
Use of Sulfanilamide in Otolaryngology and Ophthalmology C C Jones Des Moines—p 6  
Marginal Refractive Errors O L Thorburn Ames—p 11  
The Management of Glaucoma T I McKee Keokuk—p 14  
Lymphocytic Choriomeningitis in Iowa W H Presnell Charlotte—p 18

**Significance of Changes in Leukocytes**—Sturgis points out that a careful study of the circulating leukocytes yields valuable information concerning the diagnosis and prognosis of certain diseases, especially when this information is considered with other clinical data. In general, such knowledge is derived from a consideration of the number of leukocytes, the differential leukocyte count, the character of the nucleus as an indication of the maturity of the cell and certain abnormal changes which occur in the cytoplasm. Too much dependence should not be placed on single isolated observations, because repeated tests are desirable as a check on the accuracy of the estimations and because frequent determinations furnish data on which a curve may be constructed and this serves as a valuable indication concerning the general trend of any disease process. The author discusses the changes in the polymorphonuclear leukocytes in infection, infectious mononucleosis, agranulocytic anemia, and the leukemias.

### Journal Industrial Hygiene & Toxicology, Baltimore

21 128 (Jan) 1939

- Determination of Acid Insoluble Matter in the Sputums of Silicotics H Cavin I A Schreier G Martello and J D Hardy New York—p 1  
\*Basophilic Aggregation Test Applied to Cement Workers F R Holden and C E Ralston Pittsburgh—p 5  
Metabolism and Retention of Lead in Growing and Adult Rats J B Shields H H Mitchell and W A Ruth Urbana Ill—p 7  
Case of Fatal Gas Poisoning in Welding in a Closed Tank R J Wright Smith Melbourne Australia—p 24

**Basophilic Aggregation Test in Cement Workers**—Holden and Ralston found a significant increase in the basophilic aggregation count in sixty-three workmen exposed for an average of more than eleven years to limestone, shale and cement dust. No pathologic change in the cells suggestive of plumbism was found. The average basophilic aggregation count of seventy-three fellow workmen who were not exposed to dust was approximately the same as the average of all the workmen employed in the dusty areas. No evidence was found to indicate that the increased stippled cell counts obtained by Lehmann from the Thuringian cement workers is paralleled by a similar increase in basophilic aggregation counts made on cement workers in the United States.

### Journal-Lancet, Minneapolis

59 136 (Jan) 1939

- Foreign Protein in Ocular Therapy J D Alway Aberdeen S D—p 1  
Submucous Lipoma of the Rectum J K Anderson and W A Fansler Minneapolis—p 4  
Problems in Diagnosis and Treatment of Cholecystic Disease A M Snell Rochester Minn—p 7  
The Function of the Student Health Service in a Municipal University I W Sander Detroit—p 11  
The Modern Use of Peroral Endoscopy L R Boies Minneapolis—p 14  
The Rating of Industrial Disabilities R M Burns St Paul—p 17  
The Hard of Hearing Problem in a Student Health Service M M Rossman and L M Hickernell Syracuse N Y—p 20  
Old Tuberculin and Purified Protein Derivative of Tuberculin Comparative Study as Reviewed from Recent Literature I Kerlan Ashland Ky—p 22  
Basal Anesthesia with Sigmamol Preliminary Report S G Schmidt Chicago—p 26

### Journal of Nervous and Mental Disease, New York

89 1132 (Jan) 1939

- Vitamin B Deficiency and Nervous Diseases F H Lewy Philadelphia—p 1  
Pattern Features and Constitutional Susceptibility as Related to Organic Brain Disease with Special Reference to General Paralysis Beatrice Postle Columbus Ohio—p 26  
Feelings of Unreality and Displacement Preliminary Study Annette C Washburne Milwaukee—p 37  
Difficulties in Differential Diagnosis of Brain Tumor in Older Age Groups D W Hastings Philadelphia—p 44  
\*Hydration Studies in Epilepsy E Ziskind Esther Somerfeld Ziskind and Ruth Bolton Los Angeles—p 52  
Tumor of the Left Lateral Ventricle with Mental Symptoms S W Gross New York—p 66

**Hydration Studies in Epilepsy**—The Ziskinds and Bolton draw certain deductions relative to dehydration therapy in epilepsy from the study of sixteen epileptic patients and nine normal subjects who drank, after an overnight fast 7000 cc of tap water at a uniform rate of 1,000 cc each half hour. Body weight, urinary output and specific gravity were recorded at intervals of thirty minutes. Convulsions followed hydration in half of the epileptic patients. There were no convulsions in the nine normal subjects. Blood dilution and water retention were greater in the epileptic than in the nonepileptic subjects. This observation, if substantiated may have important bearing on the question of increased cell permeability in epilepsy. Blood dilution and water retention were greater in epileptic patients having seizures subsequent to hydration than in those not so affected. Although excessive amounts of water were a positive factor in precipitating seizures, average amounts did not have this effect. The results cast doubt on the efficacy of dehydration in controlling convulsions.

### Maine Medical Journal, Portland

30 120 (Jan) 1939

- Important Considerations in Serum Treatment of Pneumococcal Pneumonia F T Lord Boston—p 1  
Impressions Gained from Recent National Health Conference in Washington W F Braasch Rochester Minn—p 7  
Advantages and Disadvantages of Graduate Nursing in Small Hospitals Margaret A Hebert Gardiner—p 12  
Gunshot Wound of Pregnant Uterus Report of Case R W Belknap Damariscotta—p 13

### Medicine, Baltimore

17 381 518 (Dec) 1938

- The Coagulation of the Blood P Nolf Brussels Belgium—p 381  
\*Plasma Fibrinogen Response in Man Influence of Nutritional State Induced Hyperpyrexia Infectious Disease and Liver Damage T H Ham and Fanny C Curtis Boston—p 413  
Sedimentation Rate of Erythrocytes Influence of Technical Erythrocyte and Plasma Factors and Quantitative Comparison of Five Commonly Used Sedimentation Methods T H Ham and Fanny C Curtis Boston—p 447

**Plasma Fibrinogen Response in Man**—Ham and Curtis investigated the effect of nutritional deficiency and of protein feeding on the fibrinogen level in man and compared the fibrinogen response to artificial fever. The plasma fibrinogen response is compared to the variation in serum proteins, leukocytes and body temperature. Their conclusions are that 1 The plasma fibrinogen concentration in normal human subjects is relatively constant for any one individual and is not significantly influenced by the conditions of fasting, ingestion of food, rest and short violent exercise. The limits of concentration observed for normal adult men and women are from 190 to 330 mg per hundred cubic centimeters of plasma, with an average level of approximately 250 mg. 2 In uncomplicated and untreated cases of pernicious anemia in which dietary protein has been inadequate, the fibrinogen concentrations vary from below normal to normal levels with a lower average concentration than that of healthy subjects. 3 Nutritional deficiency in pernicious anemia, in scurvy and in pellagra does not prevent an increase of fibrinogen above normal in the presence of infection. 4 In normal subjects the daily ingestion of animal protein produces a moderate fibrinogen response, usually within normal limits. 5 Remission from pernicious anemia does not result in an increase of plasma fibrinogen when the diet is deficient in protein but is accompanied by an increase of fibrinogen to normal when the diet contains 50 Gm of protein daily. 6 Fever induced by high environmental tem-

perature causes either no elevation or only slight and irregular elevation of plasma fibrinogen, whereas the intravenous injection of typhoid vaccine causes both fever and a significant and prolonged elevation of the fibrinogen level. Therefore fever probably is not the only cause of the abnormally increased concentrations of fibrinogen observed in many febrile diseases. 7 In infectious disease the fibrinogen response may be independent of the temperature and the leukocyte changes and may occur despite a failure of the leukocyte response. 8 A failure of fibrinogen to increase above normal in instances of severe infection may be a poor prognostic sign and may suggest the presence of significant hepatic damage even though clinical signs of disease of the liver are lacking.

### Michigan State Medical Society Journal, Lansing

37 1053 1148 (Dec.) 1938

- The Management of Various Types of Colitis J A Barga Rochester Minn.—p 1067  
Correlation of Clinical and Laboratory Data in Diseases of Lymph Nodes R Isaac Ann Arbor—p 1072  
Lymph Gland Removal in Cancer of the Cervix Technique and Results F J Taussig St Louis—p 1074  
Hearing and Deafness O V Batson Philadelphia—p 1078  
Low Ileum Intussusception Caused by Meckel's Diverticulum Report of Case J Johns, Iowa—p 1083  
Latent Lobar Pneumonia J Freedman Detroit—p 1084  
Roller Skate Ambulatory Treatment of Fracture of the Patella Nina C Wilkerson Sturgis—p 1086  
Prolapse of the Uterus J L Brier Chicago—p 1089  
The Injection Treatment of Hernia F A Kelly Detroit—p 1095  
The Educational Value of Our Student Health Services I W Sander Detroit—p 1098  
Influence of Disease on History E A Wishropp Detroit—p 1101  
Quartan Malaria Case Report E O Jodar Detroit—p 1111  
Office Secretary's Psychology with Patients and Visitors H C Black Battle Creek—p 1112

### Nebraska State Medical Journal, Lincoln

24 140 (Jan.) 1939

- A Practitioner's Point of View of Polymyositis J Zahorsky St Louis—p 1  
\*Deficiency and Nutritional Disorders in Etiology and Treatment of Cardiac Disease F W Niehaus and W D Wright Omaha—p 4  
Automatic Birth Control C R Spicer Hastings—p 9  
Study of Twenty Two Cases of Hemolytic Jaundice and Effect of Splenectomy J C Sharpe, Omaha—p 10  
Pulmonary Emphysema in Acute Respiratory Infections E Korol and H A Scott Lincoln—p 15  
Surgical Complications in Pregnancy Six Case Reports E C Sage Omaha—p 19  
Analysis of 150 Cases of Carcinoma of the Rectum Anus and Rectosigmoid L E Moon Omaha—p 22  
Nodular Cirrhosis of Liver Case Report J C Eagan Madison—p 28

**Deficiency Disorders in Heart Disease**—Niehaus and Wright consider the influence of various nutritional and deficiency states in connection with heart disease. The chief complaints of persons with cardiac disorders are referable to the gastrointestinal tract, at least sharing equal mention with the respiratory system. At present vitamin B<sub>1</sub> appears to be the only one of the vitamins having important cardiovascular influence. With regard to the heart it seems significant that the myocardium is richly supplied with vitamin B<sub>1</sub>, being exceeded only by the liver and kidneys (Cowgill). This would seem to indicate an increased need rather than a storage place. Jones and Sure reported marked improvement in heart disease in patients receiving daily from 1,500 to 2,200 units of vitamin B. Their analysis, however, is not entirely convincing. Obesity has long been recognized as a handicap to the cardiovascular system. The very common occurrence of breathlessness with overweight is evidence that this condition imposes a circulatory load which is met with some difficulty. In addition to the local deleterious effect of deposition of fat around and within the wall of the heart, fat deposits in the rest of the body demand extra cardiac effort. While many other etiologic factors causing heart disease are obscure and difficult to influence, the factor of obesity offers a method by which these diseases may be prevented or, if present, more favorably influenced. The gratifying fall of blood pressure with weight reduction is a common experience. Undernutrition may be a factor in cardiovascular disease. This, unless very marked, usually does not have an important part in the cause of heart disease. Only with extreme

wasting of the skeletal muscles is the weight of the heart reduced from 20 to 50 per cent. But more often it is a factor in heart disease due to other etiologic agents, such as is manifested in cardiac cachexia. This disorder has been considered a toxemia but is more probably a deficiency state. This is frequently attended by anemia and hypoproteinemia. These factors prevent proper nourishment of the myocardium as well as of the rest of the body. A low intake of proteins or protein sparing foods as carbohydrates may be factors in impoverishing the blood. Besides this a deficient intake of vitamins B and C may be further factors. Vitamin C deficiency may result in capillary damage and permit easy exit of the blood from the capillaries. Anemia also prevents adequate nutrition of the myocardium. Impoverished blood may not supply sufficient oxygen to the heart, which may result in an anoxemia manifested by a typical anginal syndrome. This may occur in anemia, particularly in the presence of a defective coronary vascular system.

### New Jersey Medical Society Journal, Trenton

36 168 (Jan.) 1939

- The Present Status of Sulfanilamide Therapy T K Lewis Camden—p 5  
Treatment of Infections of Central Nervous System with Special Reference to Sulfanilamide Josephine B Neal New York—p 8  
Roentgen Therapy of Cancer by the Method of Chaoul G T Pack New York J S Gallo and B F Wilkinson Paterson—p 15  
Bilateral Cavernous Sinus Thrombosis, Recovery Without Operative Intervention Report of Case H D Barnshaw Camden—p 22  
Presenting Multiple Areas of Enteritis Report of Case G Blackburne Newark—p 24  
Health Maintenance in Industry C D Selby Detroit—p 26

### New York State Journal of Medicine, New York

39 1100 (Jan. 1) 1939

- The Significance of Hoarseness V E Negus London England—p 9  
Relation of Diabetes to Surgery I Abell Louisville Ky—p 13  
Diet and Dental Caries R W Bunting Ann Arbor Mich—p 18  
\*Type III Pneumococcus Pneumonia Effect of Para Aminobenzenesulfonyl Pyridine in Treatment E A Lawrence New York—p 27  
Blood Culture Aid in Determining Type in Lobar Pneumonia Not on Sulfanilamide in Type III Lobar Pneumonia and Septicemia R D Roecker and J Millett New York—p 26  
Tonics and Sedatives in Neurologic Practice H S Howe New York—p 31  
Benzedrine Sulfate Therapy Present Status E C Reifenshtein Jr and E Davidoff Syracuse—p 42  
The Tryptophan Reaction Aid to Early Diagnosis of Meningeal Tuberculosis J A Buchanan and H Ballweg Brooklyn—p 58  
Surgical Treatment of Diseases of the Colon T E Jones Cleveland—p 60  
Outline of Treatment for Syphilis Methods and Technique Followed in the Department of Dermatology of the Vanderbilt Clinic Part I of a Series A B Cannon New York—p 70

**Type III Pneumococcus Pneumonia**—Lawrence used sulapyridine in the treatment of two cases of type III pneumococcus pneumonia. Both patients recovered and the crisis occurred with rapid abatement of symptoms. Recovery was uneventful. Both patients were men more than 65 years of age, both were addicted to alcohol, and hypertension, auricular fibrillation and chronic bronchial asthma complicated the picture. Crisis occurred after only a small quantity (respectively 4 and 10 Gm) of the drug had been administered, possibly demonstrating the direct action of the drug on the invading organism regardless of the concentration of the drug in the blood (the initial dose was respectively 1 and 2 Gm). The only untoward symptoms produced by the drug were nausea, hiccuping and mild cyanosis, all of which rapidly cleared on cessation of the drug. The toxicity of the drug appears to be much less than that of sulfanilamide. Bacteriologically, in the reported cases, the main action of the drug is first to cause the loss of type specificity of the pneumococcus, which is then followed by complete decapsulation of the organism and finally by its inability to grow either on artificial mediums or in the mouse's peritoneum. It seems that there is a definite bacteriostatic action since improvement is observed so early in the disease. On mouse passage the reverse process is observed first the reappearance of the capsule and second the reestablishment of type specificity. There was no demonstrable change in the type of the original organism in spite of the complete decapsulation and mouse passage.

**Pennsylvania Medical Journal, Harrisburg**

42 337 464 (Jan) 1939

- The Control of Pneumonia M Finland Boston—p 349  
 Therapeutic Aspects of Cardiac Pain R L Levy, New York—p 361  
 The Follow Up Treatment of the Ambulatory Cardiac Patient W G Leaman Jr Philadelphia—p 365  
 New Thoughts on Diabetes E L Bortz Philadelphia—p 374  
 Pathologic Physiology and Pathology of Diabetes Mellitus Consideration of the Important Recent Discoveries S Warren Boston—p 376  
 Irradiation of Cutaneous Manifestations of Lymphoblastoma R G Pett Pittsburgh—p 387  
 Treatment of Tuberculosis of the Bladder L F Milliken Philadelphia—p 392  
 Use of Analgesia During Labor and Delivery R E Nicodemus, Danville—p 395  
 \*Sinusitis in Children A B Miller Pittsburgh—p 399  
 Edema Its Differentiation and Treatment R R Snowden, Pittsburgh—p 403

**Sinusitis in Children**—Miller declares that every acute cold is potentially an acute sinusitis. In children the acute exanthems, especially measles and scarlet fever, are often accompanied by severe acute sinusitis, which later leads to chronic involvement of the sinuses. Silverman reports an x-ray study of 300 cases of scarlet fever, 91 per cent of which showed definite sinusitis during the disease. The child who is undernourished, who has poor hygienic surroundings or an inadequate diet or who has some underlying constitutional condition is more apt to develop acute sinusitis just as he is more likely to develop chronic sinusitis. Anything which causes mechanical obstruction to normal nasal aeration and ventilation is another predisposing cause. The exciting causes are acute catarrhal fevers, acute exanthems, swimming and diving. Home treatment as a rule is sufficient in acute sinusitis and usually falls to the lot of the pediatrician or family practitioner. Adequate ventilation and drainage are important and should be accomplished by frequent use of astringent drops or sprays. Frequent use of inert liquid petrolatum drops in young children is contraindicated because of the danger of producing pneumonia. Only in the presence of some grave complication should any surgical procedure be undertaken in acute sinusitis and it should be as conservative as possible. The simple drainage of a subperiosteal collection of pus by incision through the periosteum is usually adequate. The ethmoidal labyrinth should never be attacked by the intranasal route in childhood because the possibility of meningitis is too grave. Osteomyelitis requires extensive surgical removal of bone. Unfortunately too many cases of acute sinusitis pass insidiously to the subacute and chronic state, the patients being discharged as cured. The prognosis of chronic sinusitis in children is better than in adults provided proper treatment is given. Treatment should be persisted in over a considerable period and a child should be observed periodically for several years before he is discharged as cured of chronic sinusitis.

**Philippine Islands Med Association Journal, Manila**

18 751 818 (Dec) 1938

- Pregnancy in Uterus Duplex Report of Three Cases Honoria Acosta Sison and J R Katigbak Manila—p 751  
 Present Status of Therapeutics in Pulmonary Tuberculosis M Quisumbing San Pablo Laguna—p 759  
 Further Studies of Sulfanilamide J A Fores Manila—p 765

**Public Health Reports, Washington, D C**

54 1 28 (Jan 6) 1939

- The Health of the Nation T Parran—p 1  
 \*Nonindustrial Injuries Among Male and Female Industrial Employees H P Brinton—p 6

**Nonindustrial Injuries**—Brinton reviews the data on nonindustrial injuries and sickness causing disability for eight consecutive days or longer reported to the United States Public Health Service by industrial sick benefit organizations. Examination of these reports shows a small but consistent excess in the rate of nonindustrial injuries among female industrial employees for all companies and for eleven companies which reported to the United States Public Health Service for the entire period 1925 through 1937. For one company an analysis of all nonindustrial injuries which lasted eight days or longer revealed that the difference between the male and female rates was largely due to a relative excess among women of injuries to the lower extremities and injuries to multiple parts of the body. The frequency of injuries was shown to vary according

to age as well as to sex. The injuries were found to be less serious among women than among men, while the average number of days lost per person was slightly greater for the former. When a company which reported disabilities lasting from one to seven days inclusive was selected, the relative excess of women became considerably greater. It appears from this study that, for the companies reporting, women were absent from work more often and for a longer time because of nonindustrial injuries than were men. This does not necessarily indicate that women are more prone to such injuries, as other factors, such as a different psychologic attitude toward injuries or a different attitude toward regularity of attendance at work, may play a part. The type of injury was classified in 86.6 per cent of the male injuries and in 85.4 per cent of the female injuries. Assuming that the unknown injuries are evenly distributed, it would appear that women had relatively fewer fractures than men but more sprains, cuts, bruises and burns. The proportion that fractures bear to all types of injury increased slightly with advancing age. There was an apparent tendency for the difference between the male and female percentages to be less in the older age period with respect to sprains and more with respect to burns, cuts and bruises.

**Rhode Island Medical Journal, Providence**

22 1 18 (Jan) 1939

- Early versus Late Operations in Acute Cholecystitis A V Migliaccio Providence—p 1  
 The Role of the Pathologist in the Cancer Problem B E Clarke Providence—p 4  
 The Role of the Radiologist in the Cancer Problem I Gerber Providence—p 6

**Rocky Mountain Medical Journal, Denver**

36 1 72 (Jan) 1939

- \*Serum Therapy in Pneumococcal Pneumonia and Reduction in Pneumonia Mortality C D Head Jr Washington D C—p 18  
 Common Forms of Diarrhea and Their Management J A Barger Rochester, Minn—p 23  
 Vaginal Hysterectomy and Its Indications J W Kennedy Philadelphia—p 29  
 Air Injection for Diagnosis of Brain Disease P R Weeks and J K Orr, Denver—p 33

**Reduction of Pneumonia Mortality by Serum Therapy**—Head points out that the need for all possible speed in the bacteriologic diagnosis and serum treatment of pneumonia is clearly shown by the lower mortality when this treatment is begun early after onset. The sooner serum is given after onset, the lower will the mortality be. Pneumonia is a medical emergency just as acute appendicitis is a surgical emergency. The physician who waits for dulness, bronchial breathing and other signs of consolidation to appear before making a diagnosis of pneumonia has allowed the most propitious time for treatment to pass. The patient who suddenly develops chills, pain in the side, cough with rusty sputum and fever should be considered to have pneumonia until proved otherwise. Failure of a patient to respond to serum after from twelve to eighteen hours calls for a complete bacteriologic restudy of the case, that is, typing of the pneumococcus and a culture of the blood. It has occasionally happened that a patient has received serum of a type corresponding to the organism found in his sputum, without favorable response, and a culture of his blood showed a pneumococcus of a different type.

**Virginia Medical Monthly, Richmond**

66 1 64 (Jan) 1939

- Effects of Protracted and Recurrent Congestive Heart Failure on the Liver F A Willius Rochester Minn—p 1  
 The Problem in Caring for the Mentally Sick in Virginia R F Gayle Jr Richmond—p 6  
 The Syphilis Problem in Roanoke W W S Butler Roanoke—p 12  
 Treatment of Benign Rectal Stricture (Lymphogranuloma Venereum) H J Warthen Richmond—p 20  
 Sulfanilamide with Report of Treatment of Case of Puerperal Septicemia A F Robertson Jr Staunton—p 24  
 Diverticulitis of the Cecum Case Report J S Staley Marion—p 25  
 The Hygiene of Swimming H M Taylor Jacksonville Fla—p 32  
 Relation of the Veterinarian to the Medical Profession W H Feldman Rochester Minn—p 36  
 New Operation for Treatment of Salpingitis P Jacobson, Petersburg—p 42  
 Sirenomelus Case Report C W Putney Staunton—p 44  
 Aniline Dye Dermatoconjunctivitis Report of Case W F Bryce Richmond—p 47



## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Brain, London

61 339 464 (Dec.) 1938

- Tumors of the Thalamus. Clinicopathologic Study. G. E. Smyth and K. Stern—p. 339
- \*Cortical Deafness Without Aphasia. W. E. Le G. Clark and W. R. Russell—p. 375
- \*Cerebral Subcortical Myelinopathy in Carbon Monoxide Poisoning. Y. K. Hsu and Y. L. Cheng—p. 384
- Olfactory Aloesthesia. I. D. Spillane—p. 393
- Differences Between Experimental Rigidities in Cats. E. G. T. Liddell—p. 402
- Observations on Nervous Release. E. G. T. Liddell—p. 410
- Deformity of the Hindbrain Associated with Internal Hydrocephalus. Its Relation to Arnold Chiari Malformation. A. A. McConnell and H. L. Parker—p. 415
- Familial Neuromyelitis Optica. Its Occurrence in Identical Twins. D. McAlpine—p. 430
- Disturbances of Sensibility in Dystrophia Myotonica. O. Maas—p. 449

**Cortical Deafness Without Aphasia.**—Since Henschen (1918) collected sixteen cases of cortical deafness which up to that date had been reported with postmortem examination, Bramwell (1927) and Misch (1928) have each reported a further case. Now Clark and Russell present a case unlike other recorded cases in that the lesions were both subcortical and were so limited that there was no associated aphasia.

**Myelinopathy in Carbon Monoxide Poisoning.**—Hsu and Cheng made postmortem examinations of three cases of carbon monoxide poisoning. One of these showed typical bilateral hemorrhagic softening in the globus pallidus with no significant changes in the white matter and two presented diffuse changes in the deeper cerebral white substance. Clinically these two cases belong to the so called relapsing type that is, secondary changes appeared after recovery from the initial disturbances. One of these patients presented symptoms of catatonia and parkinsonism and died four months after the poisoning. In the other patient bronchopneumonia and empyema developed and he died four weeks later. Both brains showed a more or less diffuse degeneration of the white matter with progressive changes of glia cells and patches of demyelination. There was no bilateral softening of the globus pallidus. A direct influence of the poison, or its anoxic effect on the nervous tissue, is emphasized as a prominent pathogenic factor in these cases.

## British Medical Journal, London

2 1351 1402 (Dec. 31) 1938

- Ulcerative Colitis. Clinical Aspects. E. R. Cullinan—p. 1351
- \*Id. Personality Studies. E. Wittkower—p. 1356
- Apical Bronchogenic Carcinoma. D. Owen, T. F. Hewer and P. H. Whitaker—p. 1360
- \*Outbreak of Sonne Dysentery. C. J. Trimble and W. C. V. Brothwood—p. 1365
- Rheumatic Headache. J. Cyriaque—p. 1367

**Ulcerative Colitis.**—Wittkower observed, from the psychologic point of view, forty unselected cases of ulcerative colitis. In thirty-seven cases psychologic abnormalities and disorders, far beyond the range of individual differences in the average population, were found to antedate the initial onset of the colitis. A dated clinical and life history, taken independently and verified by relatives, showed that disturbing events in the patient's life had preceded the onset, return and increase of symptoms more often than can be due to chance. Almost all the patients showed character disorders, obvious neuroses or psychoses. Seventeen patients who were overconscientious, overscrupulous, too orderly, most particular in cleanliness, obstinate and the like had obsessions. Twelve, characterized by emotional lability, temper tantrums, childishness, self centeredness and suggestibility, had hysterics. A group of six patients less well defined than the others contained some schizothymes and depressives. Five patients could not be grouped. The precipitating conflict situations, although fairly uniform within the various groups, showed no universally common similarities. If the relative significance of somatic and psychologic factors in the etiology of ulcerative colitis is assessed, little can be said in favor of a primary bacteriologic or dietetic origin. The psychologic factor seems the

most constant cause. The riddle of the etiology of ulcerative colitis is still far from being solved. The psychologic background described is not necessarily the cause of the obscure disorder but it is certainly an important factor in the disease. Many problems in relation to the physical and psychologic aspects of the disorder await discovery. The observations appear to justify an attempt at psychotherapy for selected early cases of ulcerative colitis.

**Sonne Dysentery.**—Trimble and Brothwood report an outbreak of Sonne dysentery due to contaminated milk. It was not found possible to determine the source from which the milk became contaminated. Administrative action was followed by a prompt cessation of the outbreak, except for two "secondary" cases which illustrates that instructions were not carried out faithfully. The outbreak demonstrates the importance of repeated examination of the feces of those infected if secondary cases are not to occur through a person's ignorance of the fact that he is still excreting the organism long after he appears to have recovered. It is particularly important that repeated examinations should be made of the persons actually handling milk and that they should be scrupulous in their personal cleanliness. The milk was supplied to twenty-four households, but only twelve were affected by the outbreak. Eighty-six persons partook of the milk incriminated in the outbreak, but only twenty-one became ill.

## Medical Journal of Australia, Sydney

2 1061 1102 (Dec. 24) 1938

- The Public Health Laboratory in Relation to the National Health Service. H. A. Woodruff—p. 1061
- Streptococcal Pharyngitis and Its Complications. F. V. Scholes—p. 1065
- Chauli Therapy. Specialized Form of X-Ray Treatment. E. W. Frecker—p. 1077

## New Zealand Medical Journal, Wellington

37 313 372 (Dec.) 1938

- The Work of the Mayo Clinic. M. A. Falconer—p. 316
- Polycythemia. Account of Five Cases. G. H. Robertson—p. 326
- \*Prevention of Paralytic Ileus. J. Cairney—p. 334
- Treatment of Laws Studied Serologically. G. Dempster—p. 338

**Prevention of Paralytic Ileus.**—In his discussion of the prevention of paralytic ileus, Cairney does not include the ileus due to peritonitis. Prophylaxis at operation (laparotomy) consists principally in the avoidance of every form of unnecessary trauma. In the postoperative prevention of paralytic ileus the author advocates that for the first forty-eight hours the patient be given from one-sixth to one-fourth grain (0.01 to 0.016 Gm.) of morphine as necessary for the relief of pain and restlessness but not more often than every four hours. On the third morning the abdomen should be examined with a stethoscope. If audible peristalsis is present an enema is ordered, and if the result is satisfactory any suitable aperient may be given in just sufficient quantity to ensure a daily action of the bowels. If on the third morning audible peristalsis is absent and distention is commencing, prostigmine and acetylcholine are administered, followed by an enema. In some cases this is all that is necessary, in others the prostigmine and acetylcholine are repeated at intervals as indicated and radiant heat is applied to the abdomen. In these cases the occasional administration of morphine may have to be continued but is generally required only at night to ensure adequate rest. If on the third morning peristalsis is not audible but there is no sign of abdominal distention, the choice lies between delaying the administration of the enema, on the assumption that peristalsis will be in evidence some hours later, and the administration of prostigmine and acetylcholine. In no case is an aperient administered until a satisfactory result has been obtained from an enema. Each patient must be treated individually.

## South African Medical Journal, Cape Town

12 903 938 (Dec. 24) 1938

- Treatment of Malaria in the Transvaal. S. Anneke—p. 905
- Veneral Affections of the Anus and Rectum. L. F. Freed—p. 909
- Proseptasine in Treatment of Gonorrhea. D. Landau—p. 917
- Scurvy in Namaqualand. J. Henson—p. 918
- The Injection Treatment of Hernia. W. P. Steenkamp—p. 919
- Recent Advances in the Investigation of Peripheral Vascular Disease. C. F. M. Saint—p. 922
- Backward Displacements of the Uterus. E. C. Crichton—p. 923

# Archives des Maladies de l'Appareil Digestif, Paris

28 1041 1164 (Dec) 1938 Partial Index

- \*Splenoperivisceral and Spleno-Ulcerous Syndrome Extrasplic Lesions in Course of Splenomegalies Called Pylethrombosis J Caroli, P Guerin and L Scalfi—p 1051
- Lipomas of Cecum R Didier—p 1070
- Late Gastric Ulcer Case N D Hoang—p 1078

## Splenoperivisceral and Spleno-Ulcerous Syndrome—

Caroli and his associates direct attention to two anatomoclinical syndromes which may be associated or occur isolated the splenoperivisceral syndrome and the spleno-ulcerous syndrome. In the splenoperivisceral syndrome the adhesions around the digestive tract coexisting with the splenomegaly may be limited to the duodenal bulb, or in other cases they may extend over the entire abdomen. One of the cases described in this report is of a hitherto unreported instance of association of hepatosplenic cirrhosis of undetermined origin and of ulcer of the duodenum. The fatal digestive hemorrhages which complicated this case seemed to be due to rupture of varices of the cardia. This case raises the question whether the involvement of the peritoneum is not perhaps the cause of the splenomegaly rather than an associated or secondary complication. Regarding the spleno-ulcerous syndrome, the authors say that they do not believe that this syndrome is purely coincidental but that it is probably grafted on the organic and functional alterations of parasplenomegalic gastritis. In one of the cases the muscular hypertrophy of the gastric wall demonstrated clearly what severe changes may be located in the stomach. Without doubt, they explain to a considerable extent the frequent postoperative persistence of hemorrhagic accidents. On the basis of two observations, the authors were able to show that the coexistence of ulcerous complications are of interest in relation not only to the spleen but likewise to the hepatosplenic cirrhoses, which may or may not be of alcoholic origin.

# Journal Belge de Neurol et de Psychiat, Brussels

38 903 974 (Dec) 1938

- Regulation of Cerebral Circulation J J Bouckaert—p 903
- \*Is Parkinsonian Tremor Synchronous or Asynchronous? R Nyssen R Busschaert and R Dellaert—p 913
- Tumor of Benign Appearance in Gasserian Region E Eyraud—p 918
- Anatomoclinical Study of Case of Postvaccinal Encephalitis P Van Gehuchten and M Falcon—p 932
- Pathogenic Consideration of Certain Forms of Schizophrenia in Asthenic and Dysplastic Persons in Connection with Case of Acromeria Tremor of Head and Lactic Secretion M Cahane and Tatiana Cahane—p 942

## Nature of Parkinsonian Tremor—Nyssen and his asso-

ciates say that in the course of previous investigations relative to certain clinical characteristics of parkinsonian tremor and to the influence of certain factors on the amplitude and frequency of this tremor they observed in a considerable number of subjects that the members do not tremble in a synchronous manner. Since this observation was in disagreement with the opinions of other observers, the authors decided to investigate this problem systematically. They studied fifteen patients with paralysis agitans and thirty patients with encephalitic parkinsonism. The tremor was registered by means of the mechanographic method. For a comparison of the frequencies of the tremor in two symmetrical homolateral or crossed members, the registration was always made simultaneously. The differences of the frequencies of two members were expressed in percentages. For instance if, during a period of ten seconds, the right hand registered fifty oscillations and the left hand sixty it was said that the tremor of the left hand is 20 per cent more rapid. To the question whether there is synchronism in parkinsonian tremor the authors reply that among their forty-five patients they detected a single case of relatively stable synchronism between two limbs. This patient presented identical frequencies in the right hand and the right foot. However, a comparison of the frequency of the right members with those of the left members presented the same asynchronism found in the majority of patients. The asynchronism observed in the other forty-four patients varied between 30 and 100 per cent. Further the authors investigated whether the degree of asynchronism differed according to whether the compared members were symmetrical homolateral or crossed. The detected averages do not indicate this but in

some subjects the asynchronism of the tremor was more pronounced in the symmetrical members, in others more in the homolateral or crossed members. The authors intend to continue their studies in order to detect the factors that will explain the asynchronism in parkinsonian tremor.

# Journal de Medecine de Lyon, Lyons

20 134 (Jan 5) 1939

- \*Duration and Degree of Immunity Conferred by Different Antityphoid Paratyphoid Vaccines J Chalier and J Ledru—p 1
- Typhoid in the Vaccinated J Chalier and J Ledru—p 9
- Treatment of Pneumococcal Angina and Stomatitis by Local Application of Sterilized Oxbile J Chalier and J Ledru—p 13
- Superficial Adenopathies in Course of Measles and German Measles J Chalier L Revol J Viallier and A Desbiez—p 19

## Antityphoid-Paratyphoid Vaccines—Chalier and Ledru

maintain that the value of antityphoid-paratyphoid vaccination cannot be denied. When it is administered by the subcutaneous route and in suitable doses it greatly diminishes the morbidity. However, they gained the impression that the different modes of vaccination are not all of the same value. They advise against the oral administration. The lipovaccines confer an immunity of short duration. The ether vaccine of Vincent produces the most reliable and the longest lasting immunity. The attacks of typhoid which developed in spite of this vaccination occurred mostly in subjects who had not been correctly vaccinated, not having received more than two injections. The heated TAB (triple) vaccine, especially when reduced to two injections, seemed less efficacious. Its immunizing power is of shorter duration and allows more refractory cases to persist. During the war and postwar years, typhoid in those vaccinated with ether vaccine was an extreme rarity. Less exceptional is typhoid of those vaccinated with heated triple vaccine, who may develop it as early as one or two years after the vaccination. The ether vaccine often provokes strong reactions, but these may be necessary for the development of a lasting immunity. The question therefore arises whether it might not be advisable to return to this mode of vaccination, with the multiplicity of injections which it requires but at the same time with reward of a reliable and lasting immunity.

# Presse Medicale, Paris

47 1740 (Jan 7) 1939

- Sites of Origin of Ovarian Hormones Hyperplasia of Endometrium as Test of Hyperestrinism J Wallart—p 17
- \*Icterus in Diabetic Patients P Ducas and P Uhry—p 19

## Icterus in Diabetic Patients—Ducas and Uhry say that

the concurrence of diabetes and icterus is less frequent than might be supposed. When the two disorders concur in persons over 50, the question arises whether it is merely a coexistence of diseases or a multiple manifestation of a complex diathesis. However, when the association occurs in children or young adults, the various factors that could be incriminated as possible causes of the icterus in old persons, such as alcoholism, lithiasis, malaria, syphilis and chronic intestinal intoxication, have not had time to develop or exert their effects and thus it is especially interesting to study the concurrence of diabetes and icterus in the young. The authors describe several cases of concurrence of diabetes and icterus in young persons. One patient was a man aged 22 who had had diabetes since the age of 14 and who developed a spirochetal icterus which led to an attack of acidosis and to a temporary decrease in the carbohydrate tolerance. Two other patients were boys aged 12 and 13 who had had diabetes for several years. In these cases the icterus was accompanied by hepatomegaly. The authors say that these histories reflect those reported by other authors. They show that the form and evolution of the icterus are little modified by the diabetic condition and that the aspects of icterus vary according to its etiology and are identical with those of nondiabetic persons. The only point which merits especial attention in the diabetic patients with icterus is the existence of an enlargement of the liver. This hepatomegaly may appear before the icterus or simultaneously with it. It may be slightly painful, but as a rule it is accompanied neither by ascites nor by splenomegaly. Generally it is transitory and disappears with the icterus, nevertheless it may persist for a long time after the icterus has already disappeared.

Discussing the significance of this hepatomegaly, the authors show that it probably plays a part in the genesis of the icterus. In conclusion they stress that the icterus of diabetic persons, especially of young diabetic patients, does not have a uniform etiology, that it is comparatively rare and that the prognosis is as variable and as difficult to establish as is the case in non-diabetic persons. Its effect on the diabetes becomes manifest, as a rule, by a transitory aggravation of the diabetic disorder. The diet of these patients must be carefully watched, that is, the intake of fats should not be too high and that of sugars not too restricted.

### Schweizerische medizinische Wochenschrift, Basel

69 124 (Jan 7) 1939 Partial Index

Clinical Aspects of Infectious Diseases R. Strahelin—p 1

Adequate and Inadequate Nutritional Preparations E. Burgi—p 7

\*Impairment of Heart in Tonsillitis H. W. Hotz—p 10

Meniere's Disease Case R. Guyot—p 12

**Impairment of Heart in Tonsillitis**—Hotz says that during the first part of 1938 tonsillitis assumed epidemic proportions at the medical clinic of the University of Zurich. The contagiousness of the tonsillitis was considerable, several room infections were observed and many of the nursing staff contracted it. Other unusual aspects of this epidemic of tonsillitis were frequent articular symptoms and electrocardiographic changes. It was decided to make electrocardiographic tests on all patients who had had inflammatory disorders of the tonsils, and abnormalities were observed in a surprisingly large number. It is noteworthy that if the occasional rhythmic disturbances are disregarded these electrocardiographically detectable disturbances often fail to cause clinical manifestations. The pathologic aspects of the electrocardiogram are usually transitory, moreover, they generally do not appear during the severest period of the disease but rather after the symptoms of sore throat and fever have already disappeared. As a rule there is no parallelism between the severity of the clinical aspects and the electrocardiographic disturbances, for severe electrocardiographic changes may appear in cases of tonsillitis that are comparatively mild and of short duration, and vice versa. The author cites and illustrates some of the electrocardiographic changes that he observed in acute cases of tonsillitis and says that other investigators observed similar changes during chronic tonsillitis and saw them disappear after tonsillectomy. In the concluding summary the author says that acute tonsillitis leads in a large percentage of cases (according to Otto in 60 per cent) to electrocardiographic changes which are probably the result of transitory, probably toxic, influences on the myocardium and the cardiac conduction system. Occasionally, myocarditic or coronaritic disorders may develop. The author admits that it would be impractical to subject every patient with tonsillitis to electrocardiography, however, he emphasizes that physical exertion should be avoided during the period of convalescence and the patients should be carefully watched. Patients with chronic tonsillitis should be subjected if possible to electrocardiography, and tonsillectomy should be resorted to if pathologic changes are observed.

### Giornale di Clinica Medica, Parma

19 1683 1823 (Dec 30) 1938 Partial Index

\*Sign of Pain in Phrenic Nerve in Diseases of Abdominal Organs C. Roncoroni—p 1683

V<sub>1</sub> Antigen of Bacterium Typhi L. Soletta—p 1692

Permeious Anemia of Pretended Known Etiology A. Terzani—p 1721

**Phrenic Nerve in Diseases of Abdominal Organs**—According to Roncoroni a reflex pain in the cervical point of the phrenic nerve (right supraclavicular fossa) is frequent in several diseases of the abdominal organs. It may be spontaneous or induced by palpation over the phrenic nerve on its passage on the anterior scalenus muscle (right supraclavicular fossa). The author investigated the presence of phrenic pain in 130 patients suffering from any of various diseases of the abdominal organs. He found that phrenic pain exists in all cases of diseases of organs in the right side of the abdomen and in pericholecystitis and cholecystitis both with and without calculi. The sign may be positive (presence of phrenic pain) in appendicitis (either acute or chronic), periduodentitis and duodenal ulcer whenever the cystic point is painful and not otherwise. It is negative

(absence of pain) in both the right and the left sides, in gastric ulcer, in gastric cancer, in renal calculi and in pyelonephritis. According to the author the sign is of diagnostic value, showing pathologic conditions of either or both the gallbladder and the perihaptic peritoneum. He believes that pain in the phrenic nerve shows a reaction of irritability of the nerve to a direct involvement of its peritoneal branches in the local inflammatory process. Involvement of the peritoneal phrenic branches in the local pathologic process induces a painful reaction which is transmitted to the upper segments of the nerve.

### Prensa Medica Argentina, Buenos Aires

25 2437 2490 (Dec 28) 1938 Partial Index

Hypovitaminosis in Clinical Diseases M. R. Castex and M. Schtenegart—p 2437

\*Alterations of Liver in Erythroblastic Anemia with Jaundice. M. Acuna and A. A. Bonduel—p 2444

Treatment of Achylic Hypochromic Anemia E. S. Mazzei—p 2453

**Liver in Erythroblastic Anemia**—According to Acuna and Bonduel, the liver becomes involved in the course of hemolytic erythroblastic anemia which results from the contact of the structure with hemoglobin from hemolysis. The lesion in the liver permits the passage of direct bilirubin to the blood with consequent development of jaundice with a clinical picture which is similar to that of hemolytic jaundice (Minkowsky-Chauffard's type). The authors made a clinical study and tests for the function of the liver in several children and adolescents who were suffering from erythroblastic anemia with jaundice. They found that the patients have periodic aggravations which are controlled by transfusion. The crisis of the blood is that of intense anemia with presence of a large number of immature erythrocytes and leukocytes. Frequently the blood picture is that of von Jaksch's pseudo-leukemia. The liver is enlarged. Material from the liver which is taken by a biopsy shows various alterations of the structure, especially acute infiltration with pigments derived from hemoglobin. The Kupffer cells of the liver are engorged with transformed hemoglobin. Serial tests for function of the liver show insufficiency, which depends on the intensity and evolution of erythroblastic anemia. It intensifies in the periods of deglobulization and improves during the periods of amelioration of anemia. The elimination of hippuric acid is diminished. Bilirubinemia and galactosuria are increased. Hyperbilirubinemia is indirect early in the development of the disease and direct as the latter progresses. Hunter and Harrison tests for bilirubin in the urine gave positive results. Urobilinuria is increased especially during the periods of deglobulization and in advanced phases of the disease. The authors therefore conclude that erythroblastic anemia with jaundice and congenital splenomegaly hemolytic jaundice (Minkowsky-Chauffard's type) are two different clinical forms of congenital hemolytic jaundice.

### Klinische Wochenschrift, Berlin

17 1785 1824 (Dec 17) 1938 Partial Index

Vitamin C Requirements and C Hypovitaminosis Rietschel—p 1787

\*Carbohydrates and Minerals in Their Significance for Metabolic Disturbances of Pregnancy H. Albers—p 1792

Action of Vitamin D and D<sub>2</sub> on Rickets and Spasmodophilia H. Bischoff and H. Brieger—p 1795

Pathogenesis and Treatment of Bronchitis Fibrinosa O. Roth—p 1795

Dependence of Growth on Growth Hormone of Hypophysis and on Hormone of Thyroid W. Albrecht and K. Fellinger—p 1801

Quantitative Chemical Method for Determination of Mucin Content of Gastric Juice Saliva and Sputum J. Glass—p 1802

Standardization of Thoracic Leads of Electrocardiogram Remarks on Early Picture of Infarct of Posterior Wall and of Recurrent Infarct of Anterior Wall W. Nehb—p 1807

**Carbohydrates and Minerals in Pregnancy**—Discussing the carbohydrate metabolism during pregnancy, Albers says that the blood sugar level is generally low during pregnancy. On the basis of a large number of metabolic tests it has been concluded that the glycogen fixation is reduced or that there is a considerable glycogenolysis. However, in spite of the low blood sugar content a tendency toward increased mobilization of the sugar can be demonstrated by means of sugar tolerance tests. The changes in the course of the carbohydrate metabolism are the result of the incretory changes of pregnancy. The anterior lobe of the hypophysis, the thyroid

and the adrenal system promote the contra-insular process. Some forms of glycosuria are not caused by insufficiency of the insular apparatus but rather by hyperfunction of the contra-insular system. The regulation by thecretory system of processes in the intermediate carbohydrate metabolism helps to explain conditions like alimentary and extra-insular glycosuria of pregnancy. The author stresses the importance of the differentiation between true diabetes mellitus and the extra-insular glycosuria of pregnancy. In the extra-insular glycosuria of pregnancy the blood sugar content is not related to the elimination, the sugar tolerance test produces normal results and the elimination of sugar is independent of the carbohydrate intake, moreover, the glycosuria is refractory to insulin therapy. If the examination of the pregnant woman who has glycosuria discloses true diabetes mellitus the customary dietetic and insulin therapy must be instituted, but if the glycosuria is of the extra-insular type treatment is either unnecessary or it is of a type exactly opposite to that of diabetes mellitus, that is, the pregnant woman must be given more carbohydrates than she eliminates so that the balance will be a positive one. During the later periods of pregnancy the glycosuria usually decreases and often disappears entirely. The author shows further that in some hepatic impairments of pregnancy carbohydrate therapy is advisable and that it promises favorable results also in hyperemesis gravidarum, severe dropsy of pregnancy, preeclampsia and eclampsia. In the course of a hyperemesis the urine of the patient should be examined from time to time for the presence of sodium chloride. If on addition to the urine of a 1 per cent solution of silver nitrate there appears a sediment of thick white floccules, hypochloremia is absent, but if the urine remains clear a sodium chloride deficiency of the blood must be suspected and searched for and the rest nitrogen content must be tested. The intravenous administration of sodium chloride increases the salt content of the blood and reduces the rest nitrogen. But although hypochloremia is so far the only disorder curable by mineral therapy the author thinks that the late toxicoses might perhaps be influenced indirectly by minerals.

### Monatsschrift für Kinderheilkunde, Berlin

76 305 444 (Dec 15) 1938 Partial Index

- Aspects of Congenital Deformities of Skeleton Ilse Besdziek —p 305  
\*Treatment of Atrophies in Nurslings with Extracts of Liver and of Posterior Lobe of Hypophysis Anna von Szasz and S von Gardos —p 322  
German Measles a Virus Disease Y Hiro and S Tasaka —p 328

**Atrophies in Nurslings**—According to von Szasz and von Gardos the entire organism, including the cretory glands, are involved in atrophy of nurslings. The symptomatology of the atrophy differs depending on which organ dominates the disease process with its atrophy. The authors observed some cases with symptoms of atrophy of the liver and of the posterior lobe of the hypophysis. After listing the characteristics of the normal liver in nurslings they mention the changes that develop during atrophy and then they discuss the treatment. They show that, in cases of grave atrophy with small liver, the hepatic function can be improved (1) by nourishment with foods that have comparatively high carbohydrate and sodium chloride contents, however, the tolerance must not be exceeded, (2) by the parenteral administration of solutions of sugar and of sugar and salt, (3) by feeding with vegetables that have a high vitamin content, (4) by injecting blood serum (5) by intramuscular injections of liver extract, and (6) by the administration of liver sugar and solution of posterior pituitary. As the size of the liver increases, the general condition and the tolerance improve. The administration of solution of posterior pituitary is indicated (1) in the severe forms of atrophy with polyuria and polydipsia, provided hydrostasis and edema are absent, (2) in Leiner's dermatitis and generalized eczemas, when it should be given in small doses during the erythematous stage until vasoconstriction results and (3) in cases of severe meteorism which result from intestinal paralysis and complicated toxic and septic disorders. However, the administration of solution of posterior pituitary is contraindicated in the forms of atrophy that are accompanied by vasoconstriction and edema.

### Klinicheskaya Meditsina, Moscow

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**Early Diagnosis of Gastric Cancer**—According to Bruskin, more than 50 per cent of the patients suffering from cancer of the stomach come to the surgical services or to the oncologic institutes in an advanced inoperable state. The mortality from gastric cancer in Moscow during the years 1929-1931 amounted to 40 per cent of the total mortality from malignant neoplasms. During the years 1926-1934, 250 cases of gastric cancer were treated at the Central Oncologic Institute of Moscow. The distribution according to sex was 60 per cent in men and 40 per cent in women. The histories of the majority of the patients revealed the existence of a long standing gastric complaint. This, in the opinion of the author, suggests an etiologic relationship between the preexisting states such as gastritis, ulcer and polyposis, and the subsequent cancer. The former may therefore be properly regarded as precancerous states particularly in patients beyond 40 years of age. The symptom complex of the early stage of the gastric cancer is frequently vague. Dyspeptic complaints, progressive emaciation and blood in the feces in a middle aged person are to be regarded as suggestive of gastric cancer. The author stresses particularly the value of the x-ray study of the mucosal relief in the early diagnosis. The proper procedure in doubtful cases is an exploratory laparotomy combined, when necessary, with a gastrotomy. Conservative waiting in such cases will clear the diagnosis but will rob the patient of a chance of recovery. The early recognition and treatment of inflammatory processes of the stomach (gastritides) in the middle aged is to be regarded as prophylaxis against later development of a blastomatotic process.

### Acta Medica Scandinavica, Stockholm

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- \*Central Control of Metabolism of Fats C D de Langen —p 427  
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**Central Control of Metabolism of Fats**—De Langen says that in a previous paper he pointed out that hyperlipemia not only accompanies anemia resulting from bleeding but also occurs when anemia is the result of injections of a hemolyzing substance. In both cases the fats and lipoids in the blood do not increase gradually in proportion as the hemoglobin content and the number of red blood cells decrease suddenly. If the anemia is not further increased, the fat curve rises as sharply as it previously dropped and becomes normal in the course of a few days. If the bleeding or the hydroxylamine injections are repeated, the same phenomenon is observed to occur at the same stage of the process. This rapid development of hyperlipemia gives the impression that it is under central control. A number of different methods have been applied in the effort to prove and localize this central control of the metabolism of fats. The author found that in rabbits which have been anemized about 50 per cent by one or other of the two processes mentioned and in which the spinal cord is cut between the third and fourth thoracic vertebrae, continued bleeding or injection of hydroxylamine does not elicit

hyperlipemia nor did it occur when the anemia was brought below 40 per cent. This absence of any increase in fats, which otherwise occurs regularly, suggests the possible existence of a central control. It was noted that lipemia can be induced in rabbits by the administration of sulfonmethane. After a highly lipemic serum had been observed in a patient with barbituric poisoning, the author studied the effect of barbituric acid preparations and of other hypnotics on the fat content of the blood. It was found that the various hypnotics differ in their effect on the fat metabolism. Barbituric acid preparations have a narcotic effect on the mesencephalon and various experiments with narcosis of the mesencephalon demonstrated that the hypophysis is involved in the fat metabolism. Discussing the problem as to how the increase in the fat content of the blood is brought about, the author calls attention to the role of the liver. There are a number of indications suggesting that the liver plays a major part in the metabolism of fats. The varying composition of the fats contained therein lend great probability to this hypothesis. In hyperlipemia, such as was produced by artificial anemia and by mesencephalic narcosis, fat accumulated in great quantities in that organ. The sudden rising and falling of the blood fat in anemic hyperlipemia suggests a regulating mechanism of a neurogenic nature. The great increase of fat in the blood produced by the action of barbituric acids and certain other hypnotics strengthens the conviction regarding this central regulation. Observations also support the view that there must be a center in the mesencephalon that plays some part in the regulation of the metabolism of fats. The results of investigation of the influence exerted by the anterior and by the posterior lobe of the hypophysis justify the supposition that the latter gland affects the center both positively and negatively. The fact that the influence of this center on the metabolism of fats is inhibited when the spinal cord is cut at the third thoracic vertebra indicates that the necessary stimuli connected are transmitted to the abdominal organs by the nerve pathways communicating with it. Finally, the changes noted as taking place in the liver during hyperlipemia point to the liver as the central organ which, in response to a central regulating mechanism, brings about the metabolism of fats.

**Porphyria and Classification of Porphyrins**—Eldahl differentiates forms of porphyrinuria without symptoms from those with symptoms. Discussing the group without symptoms, he mentions (1) the hereditary type, which may be either constant or periodic, (2) the symptomatic type, which is observed in fever, anemia and so on and (3) the medicinal type, which develops after medication with arsenphenamine and with certain hypnotics. With the group of porphyrinurias which present symptoms, the author classes (1) the disorder that is designated as porphyria, (2) the toxic form, which is caused by arsenic, lead or hypnotics, and (3) hydroa vacciniforme. He gives especial attention to the entity known as acute porphyria. This is an acute disease with the following symptoms: violent abdominal pains, obstinate constipation (rarely diarrhea), organic illness of the cerebrum and the medulla (insomnia, psychoses, multiple pareses), hepatic and renal insufficiency, elimination of chromogen and porphyrin in the urine. The cause is supposed to be a congenital and severe abnormality in the intermediary metabolism, a latent or relative insufficiency of the porphyrin synthesis, which through some cause may become absolute. The synthesis probably takes in the liver. Eliciting causes may be infections, overwork, psychic trauma and chemicals in small amounts. The prognosis is unfavorable. An acute attack is often fatal. The mortality varies but it averages around 70 per cent. The disorder is most frequent in women (about 70 per cent of all cases), those between the ages of 20 and 30 develop it most often and have the highest mortality. Porphyria may run in families. It has been traced through three generations. Regarding the treatment, the author says that in many cases dietetic treatment has been employed, an innocuous diet, such as the one formerly used in hepatic and renal diseases. Some authors use diuretics. This, however, does not seem justified when it is considered that edemas are never seen in porphyria. This treatment seems to have augmented the existing toxic injury to the organs. Sodium carbonate has been tried, because the urine in porphyria is strongly acid. The author doubts

that any effect has been obtained. Liver preparations have been used in many cases. The author employed the therapy which is now common in hepatic injuries and hepatitis, namely insulin and dextrose.

**Polycythemia Treated by Irradiation of Pylorus**—Andersen and his associates point out that in 1931 Hitzenger advanced the theory that pernicious anemia and polycythemia are diametrically opposite diseases, representing respectively the result of an underproduction and an overproduction of the intrinsic factor. In 1934 Hitzenger advocated resection of the pylorus organ as being the only causal therapy in polycythemia, but he acknowledged that resection is advisable only in cases simultaneously involving a juxta-pyloric ulcer. In two cases of polycythemia without ulcer, Hitzenger tried roentgen irradiation of the stomach. In one case the hemoglobin (Sahl) dropped from 140 to 100 per cent, the red cells from 8.9 to 5.6 million. In the other case the hemoglobin fell from 128 to 110 per cent, the erythrocytes from 9.5 to 7 millions. The result, however, was not permanent as the blood values rose again after a few months. Later Hitzenger seems to have abandoned irradiation of the stomach and recommended universal roentgen irradiation of the body as proposed by Sgalitzer. When the authors began their investigations on polycythemia they were unaware of Hitzenger's two cases. Based on Meulengracht's work on pernicious anemia they decided to try roentgen treatment of the isolated pylorus to obtain a diminution of the supposed overproduction of the intrinsic factor. This was regarded as more rational than the weakening of the bone marrow by irradiation of the entire osseous system. Discussing the technic of the roentgen irradiation, they say that the pyloric region can be reached through a cutaneous circular area approximately 9 cm in diameter. In order to locate the field, the patient is placed on the trochoscopes in a position identical to the posture occupied during the subsequent irradiation, i. e. resting on the back and with the same number of cushions under the head. Slight movements or even deep breathing may result in considerable displacement of the field. The patient is given a small portion of a fluid contrasting agent and a few minutes later the region is observed by fluoroscopic examination. In order to locate the field on the abdomen, the authors devised a localizer consisting of a metal ring with a diameter of 9 cm. The ring was placed on the abdomen under the fluoroscope so that it circumscribed the pylorus and the descending part of the duodenum. After the fluoroscope has been removed the circumscribed cutaneous area is marked off with a colored pencil. First the authors gave a series of four irradiations with two day intervals, at each irradiation 200 roentgens was applied through a filter of 0.5 mm of copper, with 150 kilovolts, 5 milliamperes and at a focus-skin distance of 40 cm. The next series consisted of three irradiations of 200 roentgens each, between the first and the second series there was an interval of one month. Thereafter the roentgen treatment was twice repeated with monthly pauses a series of three separate irradiations of 200 roentgens having been given at each treatment. The authors employed this treatment in a woman aged 77 who had polycythemia. In response to this roentgen irradiation of the pylorus the erythrocytes decreased from 11 to 4.1 million and the hemoglobin dropped from 138 to 100 per cent. The color index increased from 0.6 to 1.2 the mean diameter of the red cells from 7.29 to 7.81 microns.

### Ugeskrift for Læger, Copenhagen

100 1317 1340 (Nov. 24) 1938

- Determinations of Vitamin A. H. Møllgaard—p. 1317  
Ascorbic Acid Relation of Blood Plasma and Kidney Threshold for Ascorbic Acid in Patients with Cutaneous Diseases and in Normal Persons. P. W. Bræstrup and P. Hansen—p. 1324  
\*Attempt at Preventing Serum Sickness by Aid of Ascorbic Acid. E. Schjødtt and P. K. Sjøgaard—p. 1327

**Attempt at Preventing Serum Sickness by Aid of Ascorbic Acid**—Schjødtt and Sjøgaard's material comprises sixteen pneumonia patients given serum treatment. While the seven control patients all had serum sickness, three of the nine patients in whom daily doses intravenously of from 100 to 200 mg of ascorbic acid were administered for from five to eighteen days after the temperature had fallen had no serum sickness and six developed it in only slight degree.

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## EXCESSIVE PHYSICAL EXERTION AND ITS EFFECT ON THE KIDNEYS

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MANCHESTER, N H

The kidney is an organ of secretion and excretion that can carry a heavy load over a short period even while temporarily deranged from normal because of this extra load placed on it and yet has a most emphatic power of reconstruction and early return to normal when this load has been removed.

When one considers the masses as practically always overeating and underexercising, it appears that a certain degree of overload becomes somewhat normal. Not only do the masses overeat at each meal, in many cases they eat too often and nibble or lunch between meals too much.

Further to be considered are the forms of food eaten by the average person. The overindulgence in sweets and alcoholic drinks and the excessive ingestion of proteins merely emphasize the fact and make one the more appreciative of the high degree of resuscitation and regeneration given man when it comes to his kidneys.

Possibly no organs in the body suffer more disconcert and greater punishment throughout life than do the kidneys. On the other hand, possibly no organ, outside of the heart, is more essential to normal health. In the terms of the automobile salesman, the kidneys absorb grief in volumes and yet stand up and repeat this resuscitation and regeneration over and over again.

The particular interest of this special observation is the direct effect on the kidneys of extreme physical exertion over a period short of two hours as shown by the urinalyses made previous to and immediately after this extreme test of physical exertion.

This research was carried on with some twenty men each one being well trained, properly prepared and well schooled in distance running. By means of a thorough physical examination they were declared in good physical condition just previous to entering the contest.

In August 1937 these twenty trained and conditioned men competed in the well known Mount Washington run. During this run the contestants, starting at the base of Mount Washington, made the ascent by the famous carriage road to the summit, a distance of 8 miles. This 8 mile run has an average incline of 22 degrees during the entire distance, a rise of 4,800 feet. There are eighty curves in the road.

Thus it will be seen that this is a hard pull from start to finish. Not a foot of the distance is accomplished on level going. Because this is one of the

outstanding distance runs of this country the observations and research made in this instance are of extreme importance as far as any direct influence on the kidneys is concerned.

Possibly some data on the amount of foot-pounds of work used in making this run would be of interest. This is especially true because, with a background of such an amount of energy output, the influence on the kidneys becomes more valuable as a clinical entity. It further goes to show what remarkable regenerative organs the kidneys are.

An interesting phase of distance running is the foot-pound work done by the individual runner during each race. Set aside a penny a day and double it each day for one month, that will give an idea of what a distance runner accomplishes in compound interest of foot-pound work during any distance race. In 1875 when Professor Amen established the first record speed ascent on foot by the carriage road, the foot-pound work in accomplishing this feat was the same as it is today. This record stood for twenty-nine years.

In 1904 this record was lowered by fifteen minutes and stood at this mark for the next thirty-two years, resisting several attempts to break it. The foot-pound work was the same as used by Amen and by the one who lowered the record thirty-two years later. The difference was simply the variation in physical condition of the two men. In other words, the reserve left after each stride in foot-pounds was greater in the second runner than in the first. Each time the runner makes a stride in ascending the Mount Washington carriage road he uses 92 foot-pounds of work. Every distance runner must be in superb physical condition. The leg muscles must coordinate at all times during the entire run up the mountain. There must be even timing of the stride, and its constant length must not alter an inch. A well trained and properly conditioned muscle will not become fatigued even over a long period of exertion. The leg muscles have been massaged, lubricated and set into place so deftly that perfect coordination results during the entire run with a runner in good physical condition.

Every time a muscle is put under tension, energy material is lost. This energy material is termed glycogen or muscle sugar. Every fiber of each leg muscle must have a constant replacement of loss in this chemical substance if the individual fibers are to continue to function normally.

These runners ascending Mount Washington by the carriage road use in excess of 760,320 foot-pounds of work. This gives a foot-pound work tonnage of 380 tons. The heart, lungs, liver, and glands such as the pituitary and adrenal work as the second hand of a watch.



Red Blood Cells Four specimens showed many (from ten to twenty cells in each field) Three showed a few (from three to five cells in one out of every five fields) Two showed an occasional cell (from one to three cells in an occasional field) One showed one cell in every five to ten fields In eight none were seen

**Casts** Five showed many casts (from five to ten in each field hyaline and fine granular, short, narrow type) Two showed a few (from one to three in each field hyaline and fine granular, short, narrow type) Two showed a few granular casts only (short, narrow type from one to three in each field) Three showed a few hyaline casts only (short, narrow type from one to three in each field) One showed a rare hyaline cast only (short narrow type one in every three to five fields) In five none were seen

**Squamous Epithelium** Five showed a few (from three to five cells) in one or two out of every five fields examined Eight showed from one to three cells in an occasional field Two showed one cell in every five to ten fields In three none were seen

**Calcium Oxalate** Four showed many of these crystals (from twenty to thirty) in each field Five showed a few crystals (from three to ten) in each field One showed one, two or three crystals in an occasional field In eight none were seen Those seen were of the smaller variety

**Triple Phosphates** Eight showed a few (from two to five) crystals in an occasional field One showed an occasional crystal or two in an occasional field In nine none were seen

**Uric Acid** Seven showed many (from three to ten) crystals in each field Six showed a few (from one to five) crystals in an occasional field One showed a crystal or two in an occasional field, and in four none were seen

#### COMPARATIVE ANALYSIS WITH COMMENT

**Color**—Previous to the run three specimens were amber and after the run sixteen were a dark amber Previous to the run ten were yellow and after the run two were a deep yellow Previous to the run five were pale Hyperactivity of the skin combined with markedly augmented respirations no doubt resulted in a concentrated urine following the run with resulting deeper color

**Appearance**—Previous to the run all specimens were clear with the exception of five, which were but slightly cloudy when first voided After the run all were cloudy when first voided The forced circulation through the kidneys during the entire run produced some cellular or protein destruction resulting in the clouding

**Specific Gravity**—Previous to the run the highest was 1026 and the lowest was 1006 Following the run the highest was 1030 and the lowest was 1006 (The same individual specimen recorded 1006 on the two occasions) With the excessive activity of the skin and the respiratory and circulatory action, one would expect a rise in the specific gravity It would seem that the excellent physical condition of the runners would reflect a more favorable balance in the variation of specific gravity than in untrained persons This proves the fact

**Reaction**—Previous to the run all but one of the specimens gave an alkaline reaction (no doubt owing to the diet rather than to any nervous or emotional factor) Following the run all but three of these had become acid Here again the augmented circulation and the more complete cutaneous and pulmonary elimination no doubt played a very important part in the change from blue to red

**Albumin**—Previous to the run only four specimens showed any trace of albumin What their showing was for a week or more previous to this date is problematic As previously stated, no history of past urethral infections was ascertained

Following the run only three were free from some degree of albumin Here the destruction of protein in the kidney itself as well as in the blood stream would be a physiologic factor of the majority under such a severe physical strain

**Sugar**—Previous to the run 55 per cent of the specimens showed sugar present Following the run 77 per cent showed sugar present In the former instance, no doubt anxiety and apprehension play an important part None of the men gave a history of having shown sugar in the urine previously so far as they were aware of this fact The increase of 22 per cent following the run merely goes to show that excessive physical exertion has its emphatic but transitory influence on the pancreas and liver

**Examination of Sediments**—**White Blood Cells** Previous to the run twelve or 66 per cent of the specimens showed these present in the sediment in varying degrees Following the

run this percentage was increased to 93 per cent With the augmented circulation resulting in a higher kidney tension, this increase of 27 per cent is not beyond reason

**Red Blood Cells** Previous to the run two, or 11 per cent, showed their presence in a meager degree, how long this had been evident I cannot state

Following the run this was elevated to 50 per cent Here again the augmented circulation and resulting increase in intracapillary renal pressure must have been the causative factor

**Casts** Previous to the run seven, or 38 per cent, showed the presence of casts in a greater or lesser degree Following the run this was elevated to 66 per cent This increase of 28 per cent was no doubt due to the greater degree of temporary destruction of kidney tissue secondary to excessive physical exertion and its concomitant factors

**Calcium Oxalate Crystals** Previous to the run fifteen, or 83 per cent, showed the presence of calcium oxalate crystals Following the run the percentage was the same

#### SUMMARY

It is interesting to note the changes in the individual specimens voided just previous to as compared with the same individual specimens voided immediately at the completion of the run

1 *Color*—All specimens showed concentration, in other words a darker urine was voided at the finish than at the start This was true for each individual

2 *Appearance*—Previous to the run five were slightly cloudy At the finish the same individuals showed a definitely cloudy urine The same individual specimens showed an increase in specific gravity of from 2 to 10 points, with the exception of one specimen voided previous to the run but not in quantity sufficient to register the specific gravity None of these specimens gave evidence of the presence of albumin

All the other specimens voided at the finish were either cloudy or slightly cloudy These specimens were all clear at the start It is an interesting fact to note that of these thirteen specimens voided and clear at the start four showed no change in specific gravity at the finish while of the other nine specimens six showed an increase in specific gravity of from 2 to 12 points and three registered the same specific gravity as that of the specimen voided just previous to the start of the race

Further of these thirteen specimens showing clear at the start four gave evidence of albumin, one of these showed many casts in the urine (hyaline and fine, granular, short, narrow type), one showed an occasional white blood cell in the sediment, one showed a few white blood cells in the sediment The other specimen showed no cellular evidence or casts in the sediment

3 *Specific Gravity*—Ten of the specimens showed at the finish of the race from 2 to 12 points increase in specific gravity with an average individual increase of 6 points Four of the individual specimens showed the same specific gravity at the finish as at the start Three of the individual specimens showed a decrease one a loss of 6 points, one of 4 points and the other of 2 points In one instance the specific gravity at the start was not obtainable because of an insufficient amount of urine, thus no comparison could be made in the specimens of this individual

In each instance in which there was an increase in specific gravity, the albumin was absent previous to the run and present following the run This was also true in cases in which no change was found in specific gravity before and after the run The same can be stated regarding the two specimens showing a decrease in specific gravity at the finish as compared to the start

Previous to the race the albumin was not present, following the race tests for albumin were positive

4 *Reaction*—All but one specimen showed an alkaline reaction before the race. One specimen was acid. Probably this alkaline reaction, as previously stated, was due to the diet, since all the men ate at the same place for the two meals previous to the run. The man giving the acid reaction previous to the run arrived the morning of the race and therefore had eaten elsewhere. Since all specimens were refrigerated, this seems a very plausible deduction regarding the effect of the diet in this instance.

Following the race fourteen urines turned to acid. Three that had been alkaline in reaction previous to the race remained the same following the race. Peculiar

increase in specific gravity at the finish, one of 8 points and the other of 6 points. Six runners whose urines were negative to the solution at the start were positive at the finish. Of these six runners there was no change in specific gravity at the finish in the urine of two. Four showed an increase in specific gravity as follows: respectively 2 points, 4 points, 8 points and 12 points. Two runners gave negative results before and after the race. These showed increased specific gravity of 8 and 10 points respectively.

7 *White Blood Cells*—Twelve specimens showed white blood cells in varying degrees previous to the run (no check on previous urethritis). Eleven of these showed white blood cells in varying amounts following the race. One runner showing the presence of white

### Urinalyses

Specimen	Color	Appearance	Specific Gravity	Reaction	Albumin	Sugar	Urates	White Blood Cells	Red Blood Cells	Casts	Squamous Epithelium	Calcium Oxalate Crystals	Triple Phosphates	Uric Acid
1 Before	Yellow	Clear	1.022	Alkaline	0	Yes	Amorphous	Occ	None	None	Few	Few	None	Few
After	Amber	Sl cl *	1.022	Alkaline	S p t	Yes	Amorphous	Many	None	F hyl	Occ	None	None	Few
2 Before	Yellow	Clear	1.020	Alkaline	0	Yes	Amorphous	Occ	None	None	None	Few	Few	Few
After	Amber	Cloudy	1.020	Acid	S p t	Yes	Amorphous	Many	Many	F hyl	Occ	Many	Few	Few
3 Before	Pale	Clear	1.022	Alkaline	0	None	Amorphous	Occ	None	None	None	Few	Few	Few
After	Yellow	Sl cl	1.028	Alkaline	Trace	Yes	Amorphous	Rare	Many	I hyl	Occ	None	Few	Few
4 Before	Amber	Clear	1.020	Alkaline	0	Yes	Amorphous	Occ	None	Hy gra	Few	Few	None	Few
After	Amber	Sl cl	1.016	Alkaline	S p t	Yes	Amorphous	Rare	Few	F hyl	Occ	None	Few	Few
5 Before	Yellow	Clear	1.006	Alkaline	0	None	Amorphous	Rare	Few	Hy gra	Few	Few	Few	Few
After	Amber	Cloudy	1.006	Acid	S p t	Yes	Amorphous	Rare	Rare	R hyl	Occ	Few	Few	Few
6 Before	Pale	Sl cl	1.010	Alkaline	0	Yes	Amorphous	Rare	None	Gran	Few	Few	Few	Few
After	Amber	Sl cl	1.018	Acid	S p t	0	Amorphous	Occ	Occ	None	Occ	Few	Few	Few
7 Before	Pale	Clear	1.008	Alkaline	0	0	Amorphous	Rare	None	Hy gra	Few	Few	None	None
After	Amber	Sl cl	1.018	Acid	S p t	0	Amorphous	Occ	Occ	None	Occ	Few	Few	Many
8 Before	Yellow	Clear	1.012	Acid	0	Yes	Amorphous	Occ	None	Hy l	Few	Yes	Yes	None
After	Amber	Cloudy	1.018	Acid	0	0	Amorphous	Many	Many	Gran	Occ	Few	Yes	Many
9 Before	Pale	Clear	1.010	Alkaline	0	0	Amorphous	Occ	None	None	Few	Yes	Yes	None
After	Amber	Cloudy	1.010	Acid	S p t	Yes	Amorphous	Rare	Few	Many	Rare	None	None	Many
10 Before	Yellow	Sl cl	1.016	Alkaline	0	0	Amorphous	Rare	Few	None	Rare	Yes	Yes	None
After	Amber	Sl cl	1.026	Acid	S t	Yes	Amorphous	Occ	None	None	Rare	None	None	Many
11 Before	Amber	Clear	1.020	Alkaline	0	Yes	Amorphous	None	None	Gran	None	Yes	None	Yes
After	Amber	Sl cl	1.018	Acid	S p t	Yes	Amorphous	Rare	None	Few	None	None	None	Many
12 Before	Yellow	Sl cl	1.018	Alkaline	0	0	Amorphous	None	None	None	None	Yes	Yes	Many
After	Amber	Sl cl	1.026	Acid	0	0	Amorphous	Few	Few	Many	Few	Many	None	Many
13 Before	Yellow	Clear	1.018	Alkaline	S p t	0	Amorphous	Few	None	None	Few	Yes	Yes	None
After	Amber	Sl cl	1.022	Acid	S p t	Yes	Amorphous	None	None	Few	Few	Many	Few	None
14 Before	Yellow	Sl cl	1.022	Alkaline	0	0	Amorphous	None	None	None	Yes	Yes	None	None
After	Amber	Sl cl	1.024	Acid	S p t	Yes	Amorphous	Many	None	Many	Few	Many	None	Many
15 Before	Yellow	Clear	1.012	Alkaline	S p t	Yes	Amorphous	None	None	Many	None	None	None	None
After	Yellow	Sl cl	1.020	Acid	Trace	Yes	Amorphous	Many	None	None	None	Few	None	None
16 Before	Pale	Clear	1.018	Alkaline	S p t	No	Amorphous	None	None	None	None	None	None	None
After	Amber	Sl cl	1.030	Acid	S p t	Yes	Amorphous	Few	None	Many	Few	None	Few	None
17 Before	Amber	Clear	1.026	Alkaline	S p t	Yes	Amorphous	Occ	None	None	Few	Yes	None	Yes
After	Amber	Cloudy	1.020	Acid	Trace	Yes	Amorphous	Few	Many	Many	Few	Yes	None	None
18 Before	Yellow	Sl cl	1.020	Alkaline	None	Yes	Amorphous	None	None	None	None	None	None	None
After	Amber	Sl cl	1.020	Acid	None	S t	Amorphous	Few	None	None	None	None	None	Yes

\* Sl cl slightly cloudy S p t slightest possible trace Occ occasional F hyl few hyaline F gra few granular Gran granular Hy gra hyaline granular

to himself, the one runner who showed an acid reaction previous to the race remained the same following the race.

5 *Albumin*—Eleven men whose urines were normal previous to the race showed the presence of albumin following the race. Four were positive both before and after the race. Three did not show the presence of albumin either before or after the race.

*Sugar*—Ten specimens were positive to Benedict's solution previous to the race. In eight of these cases the specimens were still positive at the finish of the race with a slight decrease in amount in one. Two of these specimens showed no change in specific gravity. Two showed an increase in specific gravity. Three showed a decrease in specific gravity. In one case there was an insufficient amount of the specimen to make a specific gravity test. The other two runners whose urines were positive to Benedict's solution before the start were negative at the finish. Both of these two showed an

blood cells in sediment previous to the run gave no evidence in urinary sediment after the run. (Evidently they were flooded away by the voiding previous to the run). Six runners who gave no evidence of white blood cells in the sediment previous to the run all showed them present in varying degrees following the run. Here intracapillary renal tension could be the causative factor.

8 *Red Blood Cells*—Two specimens showed red blood cells present in the sediment previous to the run. In one of these red blood cells persisted after the run and one showed none in the sediment after the run. Sixteen did not show red blood cells in the sediment previous to the run. Following the race nine of these showed the presence of red blood cells in the sediment in varying amounts while seven showed no red blood cells in the sediment.

9 *Casts*—Eleven did not show evidence of casts in the sediment previous to the run. Following the race

nine of these same runners showed casts in varying numbers (hyaline and fine granular, short, narrow variety) while two did not show casts in the sediment. Seven showed the presence of casts in the sediment previous to the run in varying numbers (hyaline and fine granular, short narrow type). Following the race four of these still showed casts of the same relative types and numbers, while in the other three instances no casts were found in the sediment.

Some kidneys show a fuller degree of compensation and a higher degree of resistance than others. This would seem to be a personal factor as to fitness.

**10 Calcium Oxalate Crystals**—Fifteen showed calcium oxalate crystals present in varying amounts in the sediment previous to the run. Three gave no evidence of these present in the sediment previous to the run. This undoubtedly shows the influence of anxiety and apprehension in producing these crystals. Following the run, of the fifteen showing the presence of these crystals previous to the run nine still persisted in varying amounts, while six gave no evidence of these crystals in the sediment. Previous to the race three gave no evidence of calcium oxalate crystals in the sediment while after the race one of these showed these crystals in the sediment and the other two still gave no evidence of the presence of these crystals.

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## RELATION OF PHYSICAL EXERTION AND EMOTION TO PRECIPITATION OF CORONARY THROMBI

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Until quite recently it was generally agreed that excessive physical exertion or emotion was intimately connected with the precipitation of coronary thrombi. Fitzhugh and Hamilton<sup>1</sup> and Sproull,<sup>2</sup> from analyses of the histories of their cases, concluded that coronary occlusion was preceded as a rule by departures from ordinary habits of living. During the last two years, however, some doubt has been expressed regarding this relationship. Phipps<sup>3</sup> and later Master and his co-workers<sup>4</sup> in statistical surveys have shown that approximately 40 per cent of attacks of coronary thrombosis are initiated while the patient is either asleep or at rest and that in only a small number is the attack immediately related to unusual exertion or emotion. The latter authors conclude that their results seem to eliminate exertion or excitement as factors in the precipitation of coronary thrombi. Such a conclusion implies that coronary thrombi are initiated and progress to the point of occlusion in a short space of time—an inference that has no pathologic basis. Actually there is definite evidence to prove that hours or even days elapse between the time of the inception of the thrombus and the moment when occlusion, with its resulting cardiac pain, occurs. To demonstrate this, one has only to study the structure of the occluding thrombus in a person who, previously in apparently

good health, collapses and dies with the onset of cardiac pain and before infarction has had time to take place. If a serial section is made through the entire length of the thrombus, some levels will show the process to be many hours or days old. The following two cases illustrate the gradual nature of the formation of a thrombus.

**CASE 1**—A man aged 54 collapsed suddenly on the street and died before he could be hospitalized. No previous history was obtained. Autopsy revealed marked coronary sclerosis and recent thrombosis of the left anterior descending coronary branch. The left circumflex artery, at its immediate origin, showed a localized area of intimal hemorrhage without thrombosis of the adjacent lumen. The thrombus in the left anterior descending branch measured 1.5 cm in length. The affected part of this artery was embedded in one block and sectioned serially at intervals of 7 microns from one end to the other, the sections being cut horizontally. Every section was stained and examined.

At certain levels the thrombus consisted, morphologically, of two distinct portions. First there was a small, oval, radiating mass of condensed material which was localized to one side of the lumen and which showed invasion by fibroblasts in some sections. Second there were masses of more loosely arranged networks of fibrin and platelets in which red cells and leukocytes were enmeshed (fig 1). In many of the sections only the latter type of thrombus material could be found and in some it occupied the entire lumen.

The older portion of the thrombus was attached to the endothelium immediately adjacent to a point of marked hemorrhage into the inner aspect of an atheromatous focus. The serial sections failed to reveal a break in the tissues lying between the hemorrhage and the thrombus nor was there any atheromatous material incorporated in the thrombus. At the point of attachment of the older thrombus mass a rounded structure resembling a thrombosed capillary was seen in the subendothelial tissue. Otherwise there was little evidence of intimal vascularization. The occluding thrombus lay on one side of a point of stenosis of the lumen but the relation of the stenosing plaque to the direction of blood flow was not ascertained.

**CASE 2**—A man aged 68 was found dead in a hotel bedroom. He was fully dressed and was kneeling at the side of his bed. From the degree of rigor mortis that had set in it was estimated that death had occurred about three and one-half hours after he had left work, at which time he had not complained of any pain but appeared to be in his usual state of good health. Autopsy revealed a recent thrombus occluding the left circumflex coronary artery at a point about 0.7 cm from its origin. Immediately proximal to the thrombus the lumen was markedly stenosed by an atheromatous plaque. At the distal extremity of the thrombus the intima was slightly raised by a small, reddish black mass which appeared to be a hemorrhage into an atheromatous focus. A similar but larger intimal hemorrhage was noted in the left anterior descending branch about 1 cm from its origin. The endothelium overlying both intimal hemorrhages appeared to be intact. The hemorrhage in the left anterior descending branch showed no gross evidence of thrombus formation in association with it nor was there any stenosis of the lumen in its vicinity. The thrombosed portion of the left circumflex artery was embedded in one block and was sectioned serially at intervals of 10 microns throughout its entire extent. The sections were cut longitudinally in an attempt to demonstrate the relation of the occluding thrombus to the point of stenosis previously mentioned. Sections were mounted and stained at intervals of about 200 microns.

Microscopically the thrombus consisted first of an older organizing portion which was adherent to the intima immediately distal to the apex of the stenosing atheromatous plaque (fig 2). From the amount of fibroblastic proliferation in this part of the thrombus there is reason to believe that it was at least three days old. Secondly there was a mass of fibrin and platelets with enmeshed red cells which was attached to the older thrombus and which apparently completed the occluding process.

From the Department of Pathology of the Regina General Hospital.  
1 Fitzhugh Greene and Hamilton B. E. Coronary Thrombosis and Fatal Angina Pectoris. *J. A. M. A.* 100: 475 (Feb. 18) 1933.  
2 Sproull John. New England *J. Med.* 215: 443 (Sept. 3) 1936.  
3 Phipps Ladis. Contributory Causes of Coronary Thrombosis. *J. A. M. A.* 106: 761 (March 7) 1936.  
4 Master A. M., Dick Simon and Jaffe H. L. Factors and Events Associated with Onset of Coronary Artery Thrombosis. *J. A. M. A.* 109: 546 (Aug. 21) 1937.

Two points of microscopic hemorrhage were noted in the intima underlying the thrombus. Immediately below the attachment of the older portion of the thrombus there was a mass of pink-staining organizing material which resembled clotted blood and in which a large amount of hemosiderin was demonstrated by Perl's stain (fig 3). A few small capillaries were seen in this area of old hemorrhage. Distal to the entire thrombus



Fig 1—An oval mass of radiating and organizing thrombus material attached to the endothelium at a point at which hemorrhage had occurred into an atheromatous focus (case 1). To the left of this older thrombus a small fragment of more recently formed thrombus material lies free in the lumen. In other sections this propagated thrombus occluded the lumen completely. Hematoxylin and eosin stain slightly reduced from a photomicrograph with a magnification of 80 diameters.

mass, and apparently in no relation to it, the endothelium was elevated by an intimal hemorrhage in which the red cells were intact. Random sections made through the discrete hemorrhage noted in the left anterior descending branch showed the adjacent lumen to be free from thrombus formation. This hemorrhage had occurred into a large atheromatous focus, and in the sections studied it was separated from the lumen by a thin layer of dense tissue. In the latter layer, numerous capillaries were seen to enter the hemorrhagic focus and to run in the direction of the lumen, although their actual connection with the lumen was not demonstrated.

Because of the evidence of organization, the invasion by fibroblasts, in the older portion of the thrombus in each of these two cases the inception of a thrombus must have occurred at least three days before death. There is no reason to believe that any unusual symptoms were experienced either at the time of the initial thrombus inception or in the ensuing latent period. Both persons were pursuing their ordinary activities until just before their fatal attacks, and patient 2 was known to have been without complaints and in good spirits three and one-half hours before his death. In this case microscopic examination of that part of the myocardium supplied by the occluded artery failed to reveal any evidence of infarction. It may be concluded, therefore, that death had followed coronary occlusion so rapidly that sufficient time had not elapsed for infarction to occur. In other words, this case does not belong to the "silent" group in which coronary thrombosis with infarction occurs without definite signs and symptoms resulting. The immediate cause of death in each of the two cases appeared to be the terminal occlusion of the coronary lumen by a recently formed mass of thrombus material superimposed on and propagated from an older thrombus which was at least three days old. The formation of a thrombus in these two persons, then, was a gradual and not a

rapid process. Therefore, to eliminate physical exertion or emotion as a precipitating factor in coronary thrombosis, the activities of the patient should be investigated not only for the few hours prior to the attack but for many days previously.

On purely pathologic grounds there is reason to believe that such physical and mental states, both of which result in temporary hypertension, cannot be excluded as precipitating factors of coronary thrombosis. In both of the cases reported here, as well as in thirty-one of thirty-six consecutive cases reported elsewhere,<sup>5</sup> hemorrhagic foci were seen in the intima at the site of thrombotic occlusion (fig 3). The mechanism of production of intimal hemorrhage has already been described in detail,<sup>6</sup> my original observations and in part my conclusions having been confirmed by Wartman<sup>7</sup> and by Winternitz and his co-workers.<sup>8</sup> Stated briefly, this lesion results not from the backflow of blood through an intimal defect produced by the rupture of an atheromatous "abscess" as was previously thought, but from the rupture of discrete capillaries which are derived from the coronary lumen. Intimal capillaries are a common finding in the tissues adjoining most intimal hemorrhages, and if a careful section is done they may sometimes be shown to arise from the lumen of the artery and to enter the hemorrhagic focus. Capillary rupture with ensuing hemorrhage into the intima is not confined always to the points of thrombotic occlusion.

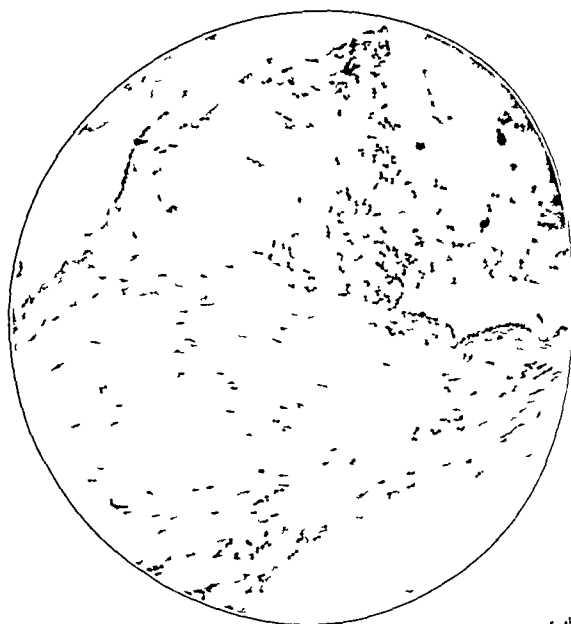


Fig 2—Longitudinal section through the occluded portion of a coronary artery in case 2. An older organizing mass of thrombus is attached to the apex of a stenosing arteriosclerotic plaque. Arising from this older thrombus is a large mass of more recently formed thrombus material which completed the occluding process. Hematoxylin and eosin stain slightly reduced from a photomicrograph with a magnification of 130 diameters.

sion. The hemorrhagic lesions are frequently multiple, as in the two cases cited in this report, and they may and do occur without associated thrombosis of the adjacent coronary lumen. However, it has been suggested that if the hemorrhage with its concomitant

- 5 Paterson J. C. Capillary Rupture with Intimal Hemorrhage as Causative Factor in Coronary Thrombosis. *Arch. Path.* 25: 474 (April) 1938.
- 6 Paterson J. C. Vascularization and Hemorrhage of Intima of Arteriosclerotic Coronary Arteries. *Arch. Path.* 22: 313 (Sept.) 1936.
- 7 Wartman W. B. *Am. Heart J.* 15: 429 (April) 1938.
- 8 Winternitz M. C., Thomas R. M. and Le Compte P. M. *The Biology of Arteriosclerosis*. Springfield, Ill. Charles C. Thomas 1934.

tissue damage occurs at a point at which a stenosing arteriosclerotic plaque has produced stagnation and eddying of blood, conditions may then be favorable for the deposition of a thrombus.<sup>5</sup>

In the final analysis, then, the factors responsible for the rupture of intimal capillaries should be the immediate causes of the precipitation of coronary thrombi. Two principal factors appear to be involved in the mechanism of capillary rupture: (1) softening, by atheroma, of the tissues surrounding and supporting the capillary wall, and (2) high intracapillary blood pressure. The influence of atheromatous degeneration on the production of capillary rupture has been

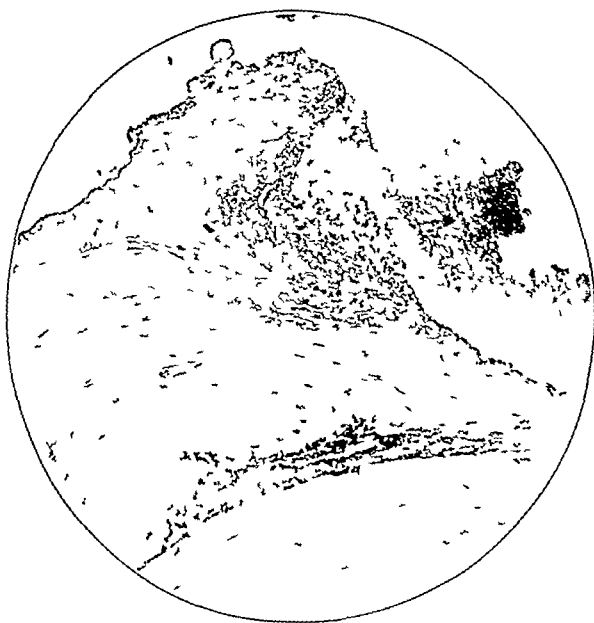


Fig. 3—A similar section to that shown in figure 2 showing an area of old intimal hemorrhage in the tissues underlying the attachment of the older thrombus. Perl's stain and hematoxylin and eosin stain slightly reduced from a photomicrograph with a magnification of 70 diameters.

described in detail elsewhere.<sup>9</sup> Intimal hemorrhages have been found to occur almost exclusively in areas of atheromatous degeneration. It is assumed that softening, which is a physical character of atheroma, allows the pressure of blood within the capillary to dilate its walls to such an extent that rupture eventually occurs. This assumption is borne out by the fact that intimal capillaries are usually of small caliber as they traverse the denser intimal layers, while they are frequently dilated in areas of atheroma. Furthermore, the age incidence of coronary thrombosis and intimal hemorrhage corresponds roughly with that in which atheroma usually develops, i. e. late middle age. Younger persons with characteristically dense and fibrous arteriosclerotic lesions, and elderly persons with heavily calcified plaques, are not so prone either to intimal hemorrhage or to coronary thrombosis.

The factor of high intracapillary blood pressure as a cause of capillary rupture is equally important, and it is with this factor that excessive exercise or emotion is concerned. Intimal capillaries, because they arise directly from the main coronary lumen, are exposed constantly to a relatively high pressure of blood. They are not, like other capillaries, at the end of a long series of arteries and arterioles which absorb much of the pressure by friction. Therefore it seems logical to assume that intimal capillaries, because of their

peculiar position, will be sensitive to sudden increases in the coronary blood pressure. If such an increase in the coronary blood pressure occurs, these capillaries will be in imminent danger of dilatation and rupture, particularly if the surrounding tissues are in a state of lability from atheromatous degeneration. Sudden and temporary increases in the coronary blood pressure are encountered commonly in circumstances of unusual exertion and emotion. With strenuous muscular exercise the systolic blood pressure is said to rise to from 160 to 180 mm of mercury. A corresponding rise in the diastolic pressure, although to a lesser degree, also occurs. Emotional stress, often but not always, results in a similar sudden increase in the systolic and diastolic pressures. For example, I have heard of a marked increase in the blood pressure of a young woman each time she recounted the details of a particularly harrowing experience.<sup>10</sup> This woman showed a normal variation in blood pressure of from 120 to 140 mm systolic and from 80 to 95 mm diastolic. During an emotional upset the systolic pressure varied from 150 to 180 mm and the diastolic from 100 to 120 mm.

It is suggested, therefore, that high coronary blood pressure, the result of strenuous exercise or of emotion (or of persistent hypertension), is one of the underlying causes of capillary rupture and intimal hemorrhage in arteriosclerotic coronary arteries. If conditions are favorable, the various changes which result from capillary rupture may then be the initiating factors in the deposition of coronary thrombi.

#### SUMMARY AND CONCLUSIONS

The formation of coronary thrombi is a gradual process, sometimes occupying several days before occlusion of the coronary lumen with its resulting cardiac pain is produced. Therefore the activities of a patient immediately preceding the onset of an attack of coronary thrombosis have no relation to the etiology of the precipitation of a thrombus but are purely coincidental. The pathologic appearances in a series of fatal cases of coronary thrombosis suggest strongly that excessive exercise and emotional stress are intimately concerned in the mechanism of coronary artery thrombosis.

<sup>10</sup> Prof. Duncan Graham, University of Toronto. Personal communication to the author.

**Medical Logic**—My main conclusion lies in advocating a new recourse to scientific logic in the sense of Francis Bacon to a 'taking thought for the morrow,' in spite of the Biblical injunction to the contrary. The last wave of pure reasoning beginning three centuries ago, would seem, indeed, to have started something. Experimentation and inductive logic, doubt and the penetration into the field of causation, have carried us thus far in the process of unraveling nature. Do we now need a new kind of reasoning? I leave this to the examination of the logicians in whom I have more confidence for their stimulus to scientific discovery than some of my fellow experimenters would grant them. What we now need, I believe is a new line of approach to a very old problem, namely, to the nature of life. I foresee not, in all probability, the centuries that have been required to establish the methods of experimentation that have given us real insight into the nature of causes but years at least before the essential nature of life is revealed. Claude Bernard gave us real hope through his insistence that biological problems are not only approachable experimentally, but that the laws of life are essentially those that govern inorganic bodies. Vital phenomena differ from inorganic phenomena in their spontaneity, their unpredictability.—Gay, Frederick P. *Medical Logic*, *Bull. History of Medicine* 7: 6 (Jan.) 1939.



# THE EFFECT OF TOBACCO SMOKING ON THE ALIMENTARY TRACT

AN EXPERIMENTAL STUDY OF MAN  
AND ANIMALS

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Present day concepts concerning the effects of tobacco smoking on gastrointestinal activities are based chiefly on clinical or personal experience. Many physicians can cite the history of one or more patients who were relieved of peptic ulcer, the ulcer syndrome or "unstable colon" when tobacco smoking was prohibited. However, little experimental data exist on which to base an explanation of the clinical observations referred to, and one is forced to reason a priori from the effects of various and frequently toxic doses of nicotine on animals and their isolated tissues or from the acute toxic manifestations experienced as a result of the "first smoke."

We have studied systematically the effect of smoking from one to several cigarettes on the various activities of the alimentary tract of normal human subjects, of patients with ulcer and of dogs. None of our subjects were required to smoke until the stage of acute toxic manifestations resulted, with the exception of three patients with duodenal ulcer, who reported that they became sick when they smoked "on an empty stomach."

## SALIVARY SECRETION

We first studied the effect of smoking on salivary secretion. Fifteen chronic cigaret smokers and five nonsmokers served as subjects. We used the method of Holck and Carlson<sup>1</sup> except that we did not use an ejector for the removal of the saliva.

The flow of saliva was stimulated in every subject except two of the chronic smokers. The group averages are shown in table 1.

Smoking stimulates the flow of saliva reflexly, the buccal mucosa is irritated by the smoke. The flow of saliva is not stimulated by the nicotine absorbed from two or three cigarettes. This was shown by injecting 0.4 mg. of nicotine subcutaneously into five smokers and five nonsmokers. This is the amount of nicotine that is usually absorbed from two cigarettes of the type used in our experiments. This amount of nicotine did not stimulate the flow of saliva (table 2).

No salivary stimulation occurred in two of the chronic smokers. The failure of tobacco smoke to cause salivary secretion in occasional subjects must be due to a "conditioned or learned inhibition" of salivary secretion to smoking, to an insensitive buccal mucosa or to a nicotine block of sensitive salivary ganglions.<sup>2</sup>

## GASTRIC MOTILITY

**Hunger Motility.**—We found that the hunger contractions of the stomach in man cease after the first few puffs of smoke. The hunger contractions when inhibited by smoking one cigaret may not recur for

from fifteen to sixty minutes after cessation of smoking. These observations confirm those of Carlson<sup>3</sup> and Danielopolu.<sup>4</sup>

The promptness with which the contractions are inhibited was interpreted by Carlson<sup>3</sup> as indicating a reflex inhibition and not a nicotine inhibition. By a series of analytic experiments on the dog we have found the motor pathway by which the contractions are inhibited. The observed facts will be listed. The subcutaneous injection of 1 mg. of nicotine into well trained, unanesthetized dogs did not inhibit the hunger contractions, but the inhalation of cigaret smoke by well trained dogs inhibited hunger contractions promptly. When three dogs who had undergone celiac ganglectomy and splanchnicotomy inhaled the smoke, inhibition occurred. In three dogs with the vagi sectioned above the diaphragm the inhalation of the smoke had no effect on hunger contractions.

Thus tobacco smoke inhibits hunger contractions through a reflex mechanism, the motor side of the reflex arc is in the vagi. The evidence also shows that ordinary amounts of nicotine do not produce gastric motor effects by acting directly on the local gastric ganglions, by raising the blood sugar content or by causing a discharge of epinephrine. Although tobacco smoking inhibits hunger motility through a reflex mechanism, it does not follow necessarily that all the effects of smoking on the alimentary tract are similarly produced.

TABLE 1—Effect of Cigaret Smoking on Salivary Secretion  
(Two or Three Cigarets Were Smoked)

	Basal Control (Average Cc per 15 Min.)	Smoking (Average Cc per 15 Min.)	After Smoking (Average Cc per 15 Min.)
Ordinary cigarettes Smokers* (15)	60 variation 1 to 10	106 variation 20 to 200	60 variation 3 to 10
Nonsmokers (5)	6 variation 2 to 10	126 variation 70 to 200	64 variation 20 to 110
Denicotinized † cigaret	Control 10 Min.	Smoking 10 Min.	Post-smoking 10 Min.
Smokers	49	87	49
Nonsmokers	49	94	49
Ordinary cigarettes Smokers	47	86	40
Nonsmokers	49	117	49

\* One subject showed no change on smoking; another a 14 per cent decrease in salivary output.  
† The smoke of the denicotinized cigarettes contained less than 1 per cent nicotine.

**Emptying Time of a Test Meal.**—Our experiment on the effect of smoking cigarettes on the emptying time of a test meal were performed as follows. The subject reported in the morning without breakfast. All the subjects were accustomed to taking the stomach tube. The stomach was emptied of its fasting contents, and 250 cc. of beef tea with three crackers was ingested. After one hour the stomach was emptied. Two or three tests were performed on each subject without smoking and two or three tests with smoking. In the smoking tests the subjects smoked two cigarettes during one and one-half hours before the test meal and three or four cigarettes while the meal was in the stomach; i.e., one cigaret each fifteen or twenty minutes. The tests were performed on seven normal chronic smokers and on twenty-two patients with duodenal ulcer, and all experi-

From the Department of Physiology and Pharmacology, Northwestern University Medical School.

Read before the Section on Gastro-Enterology and Proctology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

1. Holck, H. G. O., and Carlson, A. J. Alleged Influence of Glycerine and Diethylene Glycol upon the Irritating Qualities of Cigarette Smoke. *Proc. Soc. Exper. Biol. & Med.* 36: 302 (April) 1937.

2. Dale, H. H., and Laidlaw, P. P. Note on the Reversed Action of the Chorda Tympani on Salivary Secretion. *J. Physiol.* 43: 196, 1911.

3. Carlson, A. J. The Control of Hunger in Health and Disease. Chicago University of Chicago Press, 1916.

4. Danielopolu, D., Simici, D., and Dumitriu, C. Action du tabac sur la motilité de l'estomac étudiée chez l'homme, à l'aide de la méthode graphique. *Compt. rend. Soc. de biol.* 92: 335 (Feb. 21) 1923.

torated their saliva. All but three of the patients with ulcer were chronic smokers, the nonsmokers were asked not to inhale, so as to avoid the symptoms of acute intoxication.

The normal chronic smokers as a group showed no significant difference in rate of gastric emptying

TABLE 2—Effect of Subcutaneous Injection of 0.4 Mg of Nicotine on the Salivary Flow in Man

Subject	Saliva			Systolic Blood Pressure		Symptoms
	Control Cc per 20 Min	After Injection Cc per 20 Min	Cc per 20 Min	Before	10 Min After	
1 Nonsmoker	30	20	40	108	124	Definite feeling of fullness in head and a little vertigo
2 Nonsmoker	100	80	75	116	106	Definite feeling of fullness in head and a little vertigo
3 Nonsmoker	135	140	120	98	92	Dizziness
4 Nonsmoker	40	25	20	128	124	Dizziness
5 Nonsmoker	50	45	45	124	94	Dizziness
Average nonsmokers	75	64	62	115	108	
6 Smoker	100	100	100	110	118	Slight feeling of fullness in head
7 Smoker	140	140	140	120	124	None
8 Smoker	95	90	80	112	122	Slight feeling of fullness in head
9 Smoker	00	40	40	94	98	None
10 Smoker	40	40	40	128	122	None
Average smokers	85	85	82	113	117	

whether they smoked or did not smoke. Two, however, showed a slight but significant delay (subjects 3 and 4). The acidity of the gastric contents was definitely diminished in four of the seven subjects. This decreased the average acidity of the group (table 3).

In the patients with ulcer (table 3) smoking had no significant effect on the rate of gastric emptying of the group as a whole, neither did smoking influence the acidity of the gastric contents of the group. In only one subject (subject 13, a smoker) was a significant delay observed. The average retention in this patient was 50 per cent.

Thus the smoking of from three to four cigarettes during one hour by normal smokers or by patients with duodenal ulcer usually did not delay the emptying of a test meal from the stomach. When any effect was observed, it was in the direction of an inhibition of gastric evacuation and gastric secretion. Dickson and Wilson<sup>5</sup> observed a slight decrease in gastric motility in four subjects when several pipes or cigarettes were smoked just before or during the evacuation of a barium sulfate meal. Of course this tendency toward reduced gastric motility and toward retention may be exaggerated when solid food is ingested, but we have not performed experiments to determine the truth of such an assumption.

#### GASTRIC SECRETION

Gray<sup>6</sup> is the only author who has made a serious attempt to study the effect of smoking on gastric secretion. He studied fifty patients with functional gastric symptoms attributable to smoking and reported that smoking on an empty stomach or after a test meal increased the volume of fasting contents and caused hyperacidity in some patients complaining of heartburn, hypoacidity associated with gastritis in others and a variable response in patients with duodenal ulcer. He

did not present values for acidity and did not state the number of determinations made on each patient. Neither did he state that he had his patients avoid the swallowing of saliva, which might alter the gastric values observed.

Skaller<sup>7</sup> studied the effect of nicotine on the secretion of animals with a gastric pouch but he did not record values for acid and he used relatively enormous doses of nicotine (20 mg), hence his work is of little value.

**Continuous Fasting Secretion**—We have studied the effect of smoking from four to seven cigarettes over a period of one hour and fifty minutes on the fasting secretion of twenty-five smokers, fifteen nonsmokers and twenty patients with duodenal ulcer. The fasting contents were removed with a Rehfuess tube, and the subjects were told to expectorate all saliva. The basal secretion for four ten-minute periods was determined by continuous aspiration, and then smoking was started, the volume of secretion obtained every ten minutes was recorded and the acidity titrated. This was repeated at least twice and usually three times on each subject.

In only one of the forty normal subjects (subject 12), were the volume and acidity of the fasting secretion augmented. In seventeen of the forty no statistically significant change occurred, while in twenty-two an appreciable decrease in volume and acidity resulted.

In only one of the twenty patients with ulcer (a nonsmoker) did any significant increase in gastric acidity of the basal secretion result, eight showed no significant change, eleven showed a decrease in acidity. The results are summarized in table 4. The differences between the results obtained with demicotinized and with ordinary cigarettes were not statistically significant. There was a tendency, however, for the demicotinized cigarettes to depress gastric secretion less.

These tests were repeated on six chronic smokers and six nonsmokers who were told to swallow their saliva. On smoking, either no change or a slight decrease in acidity resulted.

The effects of smoking two cigarettes on the fasting secretion of four dogs with a Pavlov pouch was studied.

TABLE 3—Effect of Smoking on the Emptying Time and Acidity of the Gastric Contents in Chronic Smokers and in Patients with Ulcer Who Smoked\*

Subjects	Control No Smoking		On Smoking 3 or 4 Cigarettes	
	Volume Recover- ed Cc	Acidity Chlorine Units		Volume Recover- ed Cc
		Free	Total	
Chronic smokers with out ulcer (7)†	630	33	54	67
Smokers with ulcers (22)‡	920	52	62	92
				50
				61

\* Saliva was not swallowed. A bouillon test meal with three crackers was used. Three or four cigarettes were smoked in one hour.

† Two showed a slight but significant retention; the acidity was significantly diminished in four.

‡ In one a significant retention occurred with smoking. In no instance was the rate of evacuation significantly lessened.

These dogs smoked through a small trocar inserted into the trachea during local anesthesia at intervals for an hour. A slight depression of the volume and acidity of the secretion resulted. We also perfused 50 cc of water, through which the smoke of two cigarettes had been drawn, through the stomach of a dog with a pouch made of the entire stomach. No stimulation of acid secretion

<sup>5</sup> Dickson W. H. and Wilson M. J. The Control of the Motility of the Human Stomach by Drugs and Other Means. J. Pharm. & Exper. Therap. 24: 33 (Aug.) 1924.

<sup>6</sup> Gray Irving. Gastric Response to Tobacco Smoking. Am. J. Surg. 7: 489 (Oct.) 1929.

<sup>7</sup> Skaller M. Die Entstehung und Behandlung des Magensaftflusses der Gekochtenraucher. Berl. Klin. Wchnschr. 2: 2189 1909.

occurred, although an increase in mucous secretion resulted. We also introduced into the intestine of dogs with a pouch of the entire stomach a similar quantity of water through which the smoke of two cigarettes had been drawn, gastric secretion was not stimulated. When the smoke of four cigarettes was used, some of the dogs vomited, as might be expected, and the secretion of acid was depressed.

TABLE 4—Effect of Cigaret Smoking on Fasting Gastric Secretion in the Normal Subject and the Patient with Ulcer

Subject	Control, 30 Min *					Smoking 4 to 7 Cigaretts				
	10 Minute Volume Cc	Acidity (Chlorine Units)		Total HCl Output Mg		10 Minute Volume Cc	Acidity (Chlorine Units)		Total HCl Output Mg	
		Free	Total	Free	Total		Free	Total	Free	Total
Normal smokers (25)†	13.4	46.9	57.3	22.0	28.0†	9.8	32.2	42.5	11.5	10.2
						10.1	41.1	51.8	10.2	10.9
Normal nonsmokers (10)	12.0	30.7	42.2	14.8	10.3†	9.7	28.0	36.5	9.7	12.6
Patients with ulcer (20)‡	23.2	45.2	55.3	38.9	47.0	19.8	37.2	48.0	20.9	33.0
						20.6	37.9	49.3	29.8	37.4

\* Saliva was not swallowed, the stomach was emptied by continuous aspiration, the basal ten minute flow was determined for forty minutes then from four to seven cigarettes, four for nonsmokers, were smoked during 1.5 hours; the flow of juice being recorded every ten minutes.  
† Denicotinized cigarettes containing less than 1 per cent nicotine were used.  
‡ The difference between the acid output of normal smokers and of nonsmokers is of doubtful statistical significance. A larger series of subjects would be required to demonstrate a difference if it exists.

When nicotine was given subcutaneously to fasting dogs with gastric pouches in a dose of 0.2, 0.4 or 1 mg., or in doses representing the nicotine absorbed from the smoke of one, two and five cigarettes of the kind we used in our work, a stimulation of acid production did not occur. Either no change or a decrease in acid production of the fasting stomach resulted. Depression always occurred if there was nausea and vomiting. Numerous experiments were performed.

Summarizing, the smoking of an ordinary number of cigarettes increased the acid output of the fasting stomach in only two of sixty human subjects, and the increase was so slight as to be of doubtful practical significance. Depression of gastric acidity occurred much more frequently. In dogs nicotine (0.2, 0.4 and 1 mg.) or tobacco smoke in any form either had no effect or caused a decrease in the secretion of acid by the fasting stomach.

**Digestive Secretion**—The results shown in table 3 demonstrate that the smoking of three or four cigarettes after a test meal does not cause a significant increase in the acidity of the gastric contents.

This observation on the human subjects was checked by experiments on three dogs with a Pavlov pouch. The response of the three dogs to a standard meal was determined in four experiments with and without the subcutaneous injection of 1 mg. of nicotine. The results in table 5 show that the nicotine had no effect on the secretory response of two of the dogs but depressed the acid output of the third, a smaller dog.

**Conditioned Gastric Secretion Reflex to Smoking**—The possibility of a conditioned gastric secretion reflex to smoking was considered because two subjects showed a slight increase in gastric acidity after smoking, whereas our dogs showed either no change or a depression of acid output. This possibility was studied with

twenty normal subjects, ten smokers and ten nonsmokers. The twenty subjects were specially selected because none of them on repeated tests showed an increase in acid output on smoking. The ten chronic smokers were asked to stop smoking for one week. Then the twenty subjects were asked to smoke a cigarette just before eating their meals and one or more immediately after eating. In this way we hoped that smoking would serve as a conditioned stimulator of gastric secretion, just as smelling or tasting food does.

In six of the twenty subjects an increase in the acidity of the gastric juice occurred in response to smoking, but the increase was not marked. The volume was increased in only two of the six subjects during one of the postconditioning test weeks. A human subject when conditioned to a dessert, such as an orange, responds by showing an increase in both volume and acidity. Thus we doubt whether any of the subjects were actually conditioned to secrete in response to smoking. We cite the observed facts, however, because in sleep the acidity of gastric juice may increase without an increase in volume.

**The Effect of Learning to Smoke on the Fasting Secretion of the Stomach**—The process of learning to smoke by the nonsmokers in the preceding experiment rendered it possible to determine the effect of smoking a minimum of six cigarettes a day on the fasting secretion of the stomach of a controlled group of ten human subjects. This was of interest because the average acidity of the fasting secretion of twenty-five smokers was higher than that of fifteen nonsmokers, although the difference was of doubtful significance from the statistical point of view (table 4).

The results are shown in table 6. A significant increase in acidity occurred in only one subject of the ten. When the averages of the ten subjects were determined, a significant difference before and after smoking was not found, the trend is toward a slight decrease. The group studied was too small to warrant any definite conclusion, however.

TABLE 5—Effect of a Subcutaneous Injection of 1 Mg. of Nicotine on the Gastric Secretory Response to a Standard Meal of a Dog with a Pavlov Pouch the Secretion Being Collected for Six Hours

	Dog 1		Dog 2		Dog 3	
	Volume Cc	Total HCl Output Mg	Volume Cc	Total HCl Output Mg	Volume Cc	Total HCl Output Mg
Control average for 4 experiments	43.7	148.0	34.8	97.4	12.9	57.2
Nicotine 1 mg. * average 4 experiments	46.0	150.0	34.2	93.0	9.6	16.1

\* Amount of nicotine usually absorbed on smoking five of the kind of cigarettes employed in our work.

**Secretion of Bile**—Inhalation of the smoke from one or two cigarettes or the subcutaneous or intravenous injection of from 0.2 to 1 mg. of nicotine was found to have no effect on the bile output of six anesthetized dogs with a biliary fistula, except as related to marked changes in blood pressure. These doses had no effect on the intragallbladder pressure of four dogs.

**Pancreatic Secretion**—In anesthetized dogs with the pancreatic duct cannulated the inhalation of smoke from two cigarettes or the injection of from 0.2 to 1 mg. of nicotine had no effect on the continuous secretion. When a continuous flow of pancreatic juice was main-

tained by the constant injection of secretin at a timed rate, the aforementioned doses of nicotine and smoke had no effect. The same was true when 2 mg of nicotine was given intravenously over a fifteen minute period, but when 2 mg of nicotine was injected at once intravenously, so as to cause a temporary fall in blood pressure followed by a marked and prolonged rise, then, as reported by Edmunds,<sup>8</sup> the flow of pancreatic juice

TABLE 6—The Effect of Taking up the Smoking of Cigarets on the Fasting Secretion of the Stomach

Subject	Before Smoking			After Taking Up Smoking 4-6 Weeks			Results
	Vol ume Cc per 10 Min	Acidity (Chlorine Units)		Vol ume, Cc per 10 Min	Acidity (Chlorine Units)		
		Free	Total		Free	Total	
1	3.5	2.5	5	2	0	5	No change
2	12	8.5	92	18	87	100	Increase ?
3	8	15	22	4.5	20	2.5	No change
4	9	6.5	75	10	3.5	45	Slight decrease
5	10	12	2.5	8	57	67	Increase*
6	8	2.5	5	5	2.5	7.5	No change
7	2.5	2.5	32	12.5	35	50	No change
8	7	37	52	6	20	35	Slight decrease
9	6	25	35	14	0	5	Decrease
10	12	67	77	11	3.5	4.5	Decrease
Average†	10	33	47	9.1	28	33	

\* This increase in acidity was significant.

† The differences after taking up smoking are not significant. The group was too small to warrant any conclusion.

was decreased. This type of response would occur in man only when marked alterations in blood pressure result from smoking.

In the experiments on the effect of smoking on the biliary and pancreatic secretion of the dog, the blood pressure was recorded. The tracheal inhalation of the smoke of one or two cigarettes caused a rise in blood pressure of from 10 to 40 mm of mercury in twelve of eighteen dogs and a fall of 20 mm in the remaining three.

**Cardiovascular Effects**—Three (ulcer patients) of sixty chronic smokers with an empty stomach and a gastric tube in place threw up the tubes and fainted after smoking two or more cigarettes. These subjects told us beforehand that during fasting their tolerance for tobacco was very low. These patients were advised to quit smoking.

**Effect of Cigaret Smoking on the Number and Consistency of the Stools and on Gastrointestinal Passage Time**—It is generally believed that smoking increases the motility of the colon and promotes the urge to defecate. In a questionnaire study conducted by Walsh, Ivy, Laing and Sippy<sup>9</sup> among more than 1,000 students of college age, less than 1 per cent reported that smoking tended to "constipate." Of the men 13.7 per cent and of the women 17.3 per cent reported that excessive smoking tended to cause extra stools. However, the idea that smoking increases the frequency of urges or augments the activity of the colon may belong to the same category as the idea that smoking is conducive to peptic ulcer and aggravates its symptoms. That is, the anxiety factor, for example, may be at the same time the cause of excessive smoking and the aggravation of the peptic ulcer or of the unstable colon. It is well known among medical students that during examination week the consumption of cigarettes and the passage of extra stools are increased.

8. Edmunds C. W. The Antagonism of the Adrenal Glands Against the Pancreas. *J. Pharmacol. & Exper. Therap.* 1:135, 1909-1910.  
9. Walsh E. L., Laing G., Sippy B. W. and Ivy A. C. Unpublished data.

Pharmacologically, Hatcher<sup>10</sup> has shown that application of nicotine to the floor of the fourth ventricle increases the excitability not only of the vomiting center but also of the defecatory center and excites the motility of the colon. The intravenous injection of nicotine in the dog increases the motor activity of the colon.

For our study we used twenty medical students, ten smokers and ten nonsmokers, who were selected because they manifested stable habits as to stools. Two of the nonsmokers were selected because one normally defecated only every other day and the other every third day and because we thought that they should show an effect, if the others did not. We similarly selected three students who normally defecated twice daily. The tests were performed at a period when the students were not burdened with examinations and when they could follow a definite daily routine.

The dietary habits were ascertained and a dietary menu was prescribed so as to keep the quantity and quality of the food intake constant, i. e. the only variable factor was smoking or nonsmoking. During the experimental periods knotted colored strings were used as markers, the strings being given with the noon meal. The nonsmoking and smoking periods were seven days in length, and each stool was examined. The time of the first and last appearance of the daily markers was noted, as well as the time of passage of 75 per cent of the markers for any particular day. The smokers

TABLE 7—Effect of Cigaret Smoking on the Stool and Gastrointestinal Passage Time of Smokers With and Without Smoking

		Character of Stools				Passage Time Average Hours			Results of Smoking	
		Scybulous	Normally Formed	Nonformett	Diarrheal	First	75%	Last		
1	No S	11	0	5	6	0	16.6	31.0	41.2	No change
	S	10	0	6	4	0	16.1	30.1	46.9	
2	No S	4	0	4	0	0	36.5	52.5	64.3	Daily stool pos sible
	S	6	0	6	0	0	36.2	56.3	68.6	
3	No S	7	0	5	2	0	19.2	43.2	50.6	Speeded passage
	S	8	0	6	2	0	19.2	33.2	39.7	
4	No S	11	0	0	11	0	19.2	26.6	26.6	No change
	S	10	0	2	8	0	19.8	22.8	24.7	
5	No S	7	0	7	0	0	29.9	52.4	54.0	No change
	S	6	0	6	0	0	29.1	49.7	61.2	
6	No S	12	0	12	0	0	22.6	32.3	64.0	Movements more complete
	S	9	1	8	0	0	25.9	49.1	62.1	
7	No S	9	0	6	3	0	23.4	30.7	43.3	Movements more complete
	S	6	0	5	1	0	27.8	33.8	49.1	
8	No S	6	0	3	3	0	25.2	49.5	63.0	Daily stool pos sible
	S	7	2	5	0	0	32.8	50.5	62.1	
9	No S	6	0	5	1	0	45.8	66.5	101.4	Daily stool pos sible
	S	7	0	5	2	0	44.1	66.0	87.6	
10	No S	7	0	7	0	0	41.8	54.6	62.8	Movement more complete
	S	5	0	5	0	0	57.0	57.7	68.5	
Group average										
No smoking		80	0	54	26	0	28.0	45.9	57.1	No significant change in group
Smoking		74	0.3	54	17	0	37.1	43.9	57.0	

\* Firm and segmented first part.

† Mushy.

‡ Subjects 7 and 8 reported that they had observed previously that when they stopped smoking the stools became softer.

ceased for a week and then resumed smoking, the nonsmokers were observed for one week and then they started to learn to smoke and continued to smoke for at least four weeks. A minimum of six cigarettes a day were smoked, and the nonsmokers were instructed to smoke slowly at the start, so as to avoid subjective toxic symptoms.

10. Hatcher R. A. and Weiss S. Studies on Vomiting. *J. Pharmacol. & Exper. Therap.* 22:139 (Oct.) 1923.

The data cannot all be presented, but the essential portion of the results is recorded in tables 7, 8 and 9. Although the number of subjects and the time they were studied is limited, several points of interest are to be noted. (We feel that we should apologize for the limited number of subjects, but it is expensive to maintain even twenty subjects on a diet for several weeks.)

TABLE 8—Effect of Cigaret Smoking on the Stool and Gastrointestinal Passage Time of Nonsmokers Learning to Smoke Gradually

Subject	No. of Stools a Week	Character of Stools				Passage Time Average Hours			Results of Smoking
		Scybulous	Normally Formed*	Nonformed†	Diarrheal	First	75%	Last	
1 No S	8	0	5	3	0	30.5	33.8	43.5	Diarrhea
S	7	0	4	1	2	28.1	25.1	44.5	
2 No S	13	1	10	2	0	18.0	23.9	43.7	More firm stools
S	13	2	9	1	0	18.7	29.5	48.5	
3 No S	7	0	6	1	0	20.0	47.5	50.0	Increased urges
S	9	1	6	2	0	22.7	41.3	53.3	
4 No S	3	2	1	0	0	83.0	116.7	126.7	Increased urges
S	5	2	3	0	0	91.4	116.8	118.2	
5 No S	5	0	5	0	0	74.0	38.0	48.0	No change
S	6	0	6	0	0	2.0	38.8	43.7	
6 No S	2	0	2	0	0	54.8	78.1	104.0	Speeded passage
S	2	1	2	0	0	41.1	54.2	73.7	
7 No S	7	2	4	0	0	46.0	77.6	80.4	More firm
S	8	4	4	0	0	63.1	58.4	92.1	
8 No S	8	0	5	3	0	18.1	39.2	40.1	Diarrhea
S	9	1	6	1	1	29.0	43.1	59.4	
9 No S	3	0	4	1	0	24.5	35.5	58.2	No change
S	6	0	4	2	0	24.0	36.9	48.9	
10 No S	5	0	0	0	0	61.5	93.9	103.9	Decreased stools
S	3	1	0	0	0	57.4	88.3	94.2	
Group average									
No smoking	6.1	1.0	4.3	1.0	0	38.5	55.7	66.7	Tendency to increased number of movements
Smoking	6.9	1.1	4.4	0.7	0.3	41.1	58.9	69.6	

\* Firm and segmented first part  
† Mushy

The results may be briefly summarized as follows:  
1 In five of the twenty subjects smoking had no effect.  
2 In twelve of the twenty subjects smoking tended to increase the propulsive activity of the colon, but the gastrointestinal time was speeded up in only two of the twelve. Smoking made a daily stool possible in three of the twelve and it made the movements more complete in three more. It caused alternate diarrhea and constipation in two of the ten subjects who were learning to smoke.  
3 Smoking caused a decrease in the number of stools or increased their firmness in three of the twenty subjects.  
4 There was no correlation between these effects and the number of cigarettes smoked daily. As is well known, there is a considerable individual variation in tolerance to tobacco.

The results obtained by a systematic study confirm the general impression now currently accepted that smoking tends to augment the motor activity of the colon.

APPETITE

Smoking, at least excessively, is reported by numerous smokers to decrease appetite. We obtained no data on this question. It certainly depresses hunger motility, which in turn may diminish appetite.

COMMENT

In order to understand the variable effects of smoking on the alimentary tract, several well known facts must be borne in mind. First, acutely toxic doses of tobacco or nicotine provoke vomiting and defecation or diarrhea, these acts are under reflex control. In the

presence of mild nausea gastric tone and motility are depressed, but just before or during the act of vomiting the stomach, particularly the pyloric antrum, is very active. Second, the degree of tolerance and habituation to tobacco is subject to considerable individual variation. Third, the habitual user of tobacco experiences a certain pleasure, a reposeful euphoria or a pacification, which favors digestive activities as long as the limit of tolerance is not too closely approached. Fourth, it should be remembered that in any particular person the functioning of one of the bodily systems may be affected more than another.

In view of the development of some tolerance to tobacco, it is not surprising that many chronic smokers, when they smoke their ordinary number of cigarettes, manifest no significant changes in the activities of the stomach and colon. When the limit of tolerance is approached, it should be expected that the activities of these organs will be influenced. The activity of the stomach tends to be depressed and that of the colon to be stimulated. Hunger motility is the activity of the stomach most readily and uniformly depressed by smoking. Of course depression of gastric motility as the limit of tolerance is reached may cause gastric retention accompanied by a relative hyperacidity. But in only two of our sixty human subjects did we observe an increase in acidity or a gastric retention of any significance when they smoked to the extent that the symptoms of nicotine intoxication were not produced.

Because the usual effect of smoking, when it has an effect, on gastric activity is depression, it does not necessarily follow that all persons will so respond. For example, the stomach of an occasional subject as the limit of tolerance is approached may show that type of vagal hypermotility which precedes the act of vomiting. Or, if the vomiting center has been

TABLE 9—Summary of Results of Smoking on the Stools and Gastrointestinal Passage Time

I No change	3
Chronic smokers subjects 1, 4, 5	
Nonsmokers subjects 5, 9	
II Augmented propulsive activity	12
A Speeded gastrointestinal passage	
Chronic smokers subject 3	
Nonsmokers subject 6	
(Gastrointestinal passage time not significantly changed in the remainder)	
B Made daily stool possible	
Chronic smokers subjects 2, 8, 9	
Nonsmokers none	
C Increased urges	2
Chronic smokers none	
Nonsmokers subjects 3, 4	
D Produced diarrhea or alternate constipation and diarrhea	
Chronic smokers none	
Nonsmokers subjects 1, 8	
E Made movements more complete though less frequent	3
Chronic smokers subjects 6, 7, 10	
Nonsmokers none	
III Decreased number of stools or made stools more firm	
Chronic smokers none (see subject 7, 8)	
Nonsmokers subjects 2, 7, 10	

sensitized by hunger or the unpleasant taste of a barium sulfate meal, smoking may cause a vagal type of hypermotility of the pyloric antrum.

It should be mentioned that some of the apparently deleterious effects of tobacco smoking in some patients with gastrointestinal complaints may be secondary to cardiovascular disturbances. In some subjects tobacco smoking causes rather marked peripheral vascular changes. Although small doses of nicotine enhance

the excitability of the vomiting center, Hatcher<sup>11</sup> has expressed the belief that nicotine given intravenously reflexly provokes emesis by a peripheral, probably a cardiac, action. This was emphasized by the three patients with ulcer who after smoking two or three cigarettes vomited the tube and fainted. They knew and so informed us that their tolerance to tobacco was less when they had not eaten breakfast. In this connection it is known that hunger sensitizes the mechanism of nausea and vomiting,<sup>12</sup> but the effect of fasting per se on cardiac and vasomotor stability has not been studied.

The profession has available certain rather easily applied tests for determining the effect of smoking on the cardiovascular system. It would seem that those persons who show marked changes in the heart rate, the blood pressure or the peripheral capillary bed in response to smoking should be advised not to smoke. Further, those persons who on smoking have extrasystoles (we had one such subject) or an inversion of the T wave, as recently shown by Graybiel, Starr and White,<sup>13</sup> should be advised not to smoke. Obviously these changes are objective tests for the determination of the deleterious action of smoking on the cardiovascular system of the patient.

When this study was undertaken we had hoped, by using a simple test of gastric function, to find some response to smoking in patients with ulcer which would show objectively and decisively that a particular patient should not smoke. We do not believe that this hope was clearly attained in the case of the patient with ulcer. However, it can be argued that those patients (one of twenty-two) who manifest a definite delay of gastric evacuation on smoking should not smoke. Although we believe that patients with peptic ulcer should be cautioned not to strain their tolerance to tobacco, our results do not indicate that the routine prohibition of the use of tobacco by such patients is necessary. In this regard one cannot rely, apparently, on clinical impressions, because the views expressed vary so widely.<sup>14</sup>

We came closer to attaining our hope in the case of the effect of smoking on the colon. Our results on subjects with presumably normal colons indicate that the prohibition of smoking by patients with any tendency toward irritability of the colon should be seriously considered. This indication will not be established until the effect of smoking on the gastrointestinal and colonic behavior or passage time of such patients has been demonstrated by objective methods. Unfortunately much more effort and time are required to show objectively and decisively that smoking may or may not have a deleterious effect on the colon than to make the same demonstration on the cardiovascular system.

#### SUMMARY

Smoking reflexly stimulates the secretion of saliva in most subjects. It reflexly inhibits or depresses the hunger motility of the stomach. When the smoking of an ordinary number of cigarettes has any effect on the stomach, it tends to depress secretion and to retard evacuation. Only in the occasional person does

smoking tend to cause significant gastric retention and an increase in acidity. Smoking tends to augment the motility of the colon. Smoking affects the secretion of bile and pancreatic juice only when marked alterations in blood pressure occur. As a person approaches his limit of tolerance to tobacco, undesirable changes occur in the activities of the alimentary tract. All patients with peptic ulcer or with colonic disturbances who smoke should be cautioned regarding the undesirable effects of straining their tolerance to tobacco. None of the data we have obtained can be interpreted as directly indicating that smoking has a beneficial effect on the activities of the alimentary tract.

#### ABSTRACT OF DISCUSSION

DR SIDNEY A. PORTIS, Chicago. Some years ago German investigators brought out the idea that the increase of duodenal ulcer in women was associated with their increased addiction to tobacco. Many physicians have observed that patients who have a recurrence of ulcer symptoms when not on management have been habitual users of tobacco, however, it is difficult to evaluate whether this recurrence would not have taken place in the absence of smoking, because it is known that many patients have a recurrence in spite of what is done. I presume that the authors' patients all are on ulcer management during the period of observation, and on such management it is difficult to detect the results of the effects of tobacco. I should like to ask whether they have any evidence on patients during the quiescent period of ulcer who on return to smoking have had a recurrence of symptoms. Further, have there been appreciable differences in the secretory and motor activity of these patients when they began again to use tobacco? If smoking inhibits the hunger contractions and, therefore, lessens the appetite in patients, may then not the lessened desire for food in turn lessen neutralization of gastric secretion and in turn be a factor in the continuance of the ulcer picture? If the neutralization of gastric secretion is an important factor in the life cycle of an ulcer, it would be logical to conclude that the lessened hunger contractions might prolong the period of active ulceration, further, if gastric evacuation is inhibited and pyloric closure lengthened, smoking may be detrimental to an ulcer patient. The results reported today regarding the movements of the colon are interesting, however, the effect of tobacco on the nervous system as a whole may in turn produce variable manifestations in colonic movements, just as the colon may mirror other extracolonic stimuli. I have seen patients who have had constant constipation from the use of tobacco. Further, Drs. Schnedorf and Ivy show in their small group of patients that the smokers had a tendency to hyperacidity more often than the nonsmokers. It is well known that hyperacidity may predispose to constipation. Many clinicians recommend the gradual withdrawal of tobacco. I believe that if tobacco is to be eliminated it should be stopped abruptly. One must use common sense in directing patients in the use of tobacco. If it is felt that an occasional cigaret is not harmful and that the symptoms do not warrant abstinence, one might as well treat the patient as well as the disease.

DR ANDREW C. IVY, Chicago. The German evidence referred to by Dr. Portis was evidence of this type. During a certain period of several years, the incidence of duodenal ulcer or peptic ulcer increased in Germany so many per cent and during that same period the consumption of cigarettes increased so many per cent. That is like most of the evidence that one finds in the literature with regard to the effect of smoking on the alimentary tract. It doesn't mean anything at all, it is not evidence. All of our patients were on ulcer management. Of course, it is generally reported by smokers at large that the excessive smoking of cigarettes decreases their appetite and that they will lose weight if they smoke too many cigarettes. That may be a factor, as pointed out by Dr. Portis. Six of our twenty subjects smoking was a part of the stool habit. In three of them smoking was necessary in order to defecate daily. In three others smoking was necessary in order for the bowel movement to be complete. Now of course that is simply a psychic effect. One can do other things, for example, one can drink a glass of water

11. Hatcher, R. A. The Mechanism of Vomiting. *Physiological Rev.* 4: 479 (July) 1924.  
12. Ivy, A. C., Moedman, D. A. and Keane, J. The Small Intestine in Hunger. *Am. J. Physiol.* 72: 99 (March) 1925.  
13. Graybiel, Ashton, Starr, R. S. and White, P. D. Electrocardiographic Changes Following the Inhalation of Tobacco Smoke. *Am. Heart J.* 15: 89 (Jan.) 1938.  
14. Jankau, Ludwig. Der Tabak und seine Einwirkung auf den menschlichen Organismus. München: Seitz & Schauer 1894.



before stool, and that will become a psychologic factor in the stool habit. In this evidence that we have brought forward we have not taken into consideration the effect of smoking on the central nervous system. Nervous states affect the activities of the alimentary tract. We pointed out that three of our patients who smoked on an empty stomach collapsed, indicating that the effect of smoking on the cardiovascular system of some subjects is very important and, as shown by Dr. Bishop, cardiovascular disturbances may produce gastrointestinal disturbances. Smoking reflexly stimulates the secretion of saliva in most persons. It reflexly inhibits or depresses the hunger motility of the stomach. When the smoking of an ordinary number of cigarettes has any effect on the stomach, it tends to depress secretion and to retard evacuation. Only in the occasional person does smoking tend to cause a significant gastric retention and an increase in acidity. Smoking tends to augment the motility of the colon. Smoking affects the secretion of bile and pancreatic juice only when marked alterations in blood pressure occur. As a person approaches his limit of tolerance to tobacco, undesirable changes occur in the activity of the alimentary tract. Patients with peptic ulcer or colonic disturbances who smoke should be cautioned regarding the undesirable effects of straining their tolerance to tobacco. None of the data that we have obtained can be interpreted as directly indicating that smoking has a beneficial effect on the activity of the alimentary tract.

## MEDICALLY SUPERVISED VACATIONAL MIGRATIONS

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Huge seasonal migrations take place in the United States every year with apparent regularity and with constantly growing volume. More than 35,000,000 people take part in these migrations, using all means of transportation and spending the incredible but carefully estimated sum of \$5,000,000,000 yearly. These migrations are not studied from a medical point of view nor are they directed or supervised. They lack a conscious, well recognized purpose and are governed mostly by vogues, whims and fads born out of hearsay evidence. The public might derive optimal health benefits from these migrations but never will unless the medical profession will recognize and develop the enormous possibilities lying dormant within them.

The following data on the five important factors of these migrations were collected by inquiries to state health, conservation and highway departments.

1 *Seasonal Characteristics*—The greater portion (about 70 per cent) of the migrations take place in the summer, about 20 per cent in the winter and about 10 per cent in the fall and spring.

2 *Geographic Data*—Inhabitants of all forty-eight states take part in the migrations, but there is a distinct predominance of the northeastern and midwestern states. Typical vacation states are (a) New England, New York and New Jersey, (b) Florida and the Gulf states, (c) California, (d) the Great Lake states and (e) the desert states (New Mexico, Arizona and Colorado).

3 *Geologic Milieus*—The milieus most popular are, in the order mentioned, (a) seashores, lakeshores, (b) altitudes and (c) deserts.

4 *Duration of Stay*—Tourists staying less than ten days within a state constitute about 65 per cent of the migrants. Vacationists, staying more than ten days within a state, constitute about 35 per cent of the migrants.

5 *Distance Covered*—Interstate migrations (a) long distance migration, which is typical with tourists in summer and vacationists in winter, and (b) short distance migration by vacationists in summer. Intrastate migrations—very short vacational migrations within a state, usually in the summer, for instance from valley to mountain and from inland to seashore.

### MOTIVATING FACTOR

The instinctive motivating factor of these mass migrations is the drive for a climatic change. Climate is a long range view of weather in a given locality. Based on broad biologic effects, climates may be divided into two general groups, (1) sedative and (2) stimulating.

The sedative climate is characterized by stability of weather—by insignificant fluctuations of temperature, barometric pressure and humidity by the lack of winds and storms. The stimulating climate is characterized by sudden and wide atmospheric fluctuations. While one considers the Northern climates generally as stimulating and the Southern climates as sedative, one must consider the element of relativity. This can be illustrated with three types of persons: (1) the New England fisherman, (2) the New York business man and (3) the Florida farmer. Each one of these is healthy in his own environment. The late fall climate of North Carolina will be stimulating to the Florida farmer and sedative to the New York business man. The New York business man will find the fall climate of Maine stimulating, while the New England fisherman, accustomed to drenching waves and strong winds, will find it mild. The migration to a less stimulating climate may be called "the escape." The migration to a more stimulating climate may be called "the challenge."

### CLIMATIC SEDATION

The climatic sedation, "the escape" from the hardships of winter, is a good protective therapeutic measure. Its chief indications are: 1. Constitutional (a) for the feeble aged and (b) for the delicate child. 2. Debilitating diseases, such as (a) rheumatic heart disease, (b) chronic nephritis and (c) rheumatoid arthritis.

### CLIMATIC STIMULATION

The exposure to a more stimulating climate starts a slight disturbance in the system. Marked and typical fluctuations in the blood cell count and in the blood chemistry can be observed, and parallel changes in the basal and mineral metabolism occur. Thus the organism immediately attempts to correct by mobilization of its interrelated forces of defense, neurovascular, hematogenic, chemical and endocrine. By successive exposures the amplitude of these climatic microdamages decrease as the acclimatization progresses. Parallel with the process of acclimatization, preexisting chronic disorders may be overcome with the same systemic effort.

While climatic stimulation has its definite zone of contraindications, it is indicated whenever stimulation of the hemopoietic organs, a higher basal and mineral metabolism, increased depth of breathing or more vigorous physical heat regulation is deemed necessary in preventing or treating disease.

The chief requisite of successful climatic therapy is to find the optimal amount of climatic stimulation. There is an ineffective underexposure to climate and a harmful overexposure. The optimal amount of exposure, the therapeutic dose, varies with (1) the

season and climate selected, (2) the condition, constitution and age of the patient and (3) the nature and stage of chronic disorder to be influenced

The three main forms of climatic therapy are (1) plain climatic change, (2) selective utilization of climatic factors (sunning, bathing, open-air exposure) and (3) use of climate as a background in special types of therapy, such as mud treatments for arthritis, carbon dioxide baths for cardiovascular diseases and inhalation therapy in chronic bronchial conditions

The average American is not chiefly concerned with improving his state of health during his vacation. His conscious motives are wanderlust and the craving for a good time. He fulfils his desires in this respect but neglects his chance to improve his physical condition at the same time. It is different with the European. Based on ten years of European medical activity devoted to the study of health resorts and to treating chronic sick, it is safe to say that, of a hundred chronic sick Europeans visiting continental health resorts, seventy-five or more are sent there by the family physician or by a consultant. During their stay, they are under the supervision of the spa physician. It is traditional with the European to take his vacation regularly and to consider it to be a very important constructive period of life. Whether he feels ill or not, he consults his physician about the site of his vacation. If he suffers from a chronic disorder, he prefers to be sent to the peaceful atmosphere of a health resort with medical supervision where, removed from home environment, taken away from his phobias and idiosyncrasies, he devotes his time to "the cure," which involves an emotional readjustment as well as a somatic rehabilitation. This emotional armistice and the shedding of faulty habits of living are just as essential to the future welfare of the chronic sick as the sedative or stimulative climatic factors of baths, packs and drinking cures. Whereas the European vacation is medically directed and supervised, the American vacation is undirected.

The pitfalls of undirected mass migrations may be grouped as (1) qualitative (a) faulty selection of the place of vacation, (b) disregard for climatic contraindications and (c) continuation of faulty habits of living during the vacation, as in eating, clothing and sleep, (2) quantitative (a) too short a vacation, (b) insufficient utilization of climatic factors, (c) over-exposure to the climate with consequent reactions and (d) excessive activity during the vacation. These mistakes are due mainly to the fact that the migrations are ungoverned, are undirected from start to finish and lack a planned health program. The American public does not know that for the healthy individual a medical vacation guidance is advisable and that in the sick it is imperative. People should be taught to know this.

#### COMMENT

It would be inadvisable to transplant European methods of treatment and medical economics to our country. It would be short sighted, however, to fail to exploit some of the conclusions of centuries of empirical continental medicine. A bigger mistake would be to leave unnoticed the results of painstaking analytic research in the biology of European climate. No doubt the handbooks of European balneology and climatic therapy place too much importance on technical detail, offering too many hydrotherapeutic prescriptions. However, many of their institutions have

survived the test of time and of modern biologic research. Some of these valuable assets of Europe are

- 1 The congenial scientific cooperation between the family physician and the spa practitioner in exchanging information about the patient

- 2 The compulsory medical examination, supervision and thorough case history in scores of European spas

- 3 The forty seashore sanatoriums for underdeveloped, sickly children on the 40 miles of seashore of Belgium

- 4 The biological climate research stations in Bad Elster and in Wyk on Fohr, operated by the universities of Hamburg and Leipzig

- 5 The cooperation of the state, railroads, utilities and charitable funds in maintaining several thousand beds in sanatoriums built in spas and health resorts for chronic sick children and adults in France

- 6 The handling of the chronic sick and convalescents of the state workers' insurance institution of Hungary

- 7 The national committee for exploring mineral waters and muds in Austria

- 8 The Harrogate Spa Booklet and the Spa Register of England

Health resorts in specific climatic locations may become the ideal migratory goals of the medically supervised mass vacationing of the future. The present situation of the American health resorts is somewhat discouraging. There are only a dozen of the first order. They necessitate travel of several hundred miles from some parts of the country. Less than 1 per cent of the migrators select them as vacation grounds. Nearly all of them have shown a decline of patronage in the last few years. This decrease of patronage is due partly to economic causes but mostly to lack of physicians' interest, because of lack of reliable information in the literature concerning spas, lack of medical supervision in spas and unfounded claims in spa booklets. Our health resorts are real national assets. They should multiply in number, as they are indispensable in the care of the chronic sick.

The chronic sick of America consist of the real forgotten people. These hundreds of thousands who cannot find help in surgery and do not respond to medication are considered the *crux medicorum* by the general practitioner. They start their vacation with insufficient medical advice or no advice at all. If they can afford to stay at a medically supervised health resort they will receive care, but this is not within the reach of the major portion of our migrants. In resorts lacking a well organized medical institution the general practitioner is too busy during the vacation season. He can devote sufficient time neither to the chronic sick nor to the study of the effects of his climate. He finds it difficult to answer the many questions asked by the bewildered vacationist. He should be able to answer them with scientific certainty, but the basic facts are not yet established. Undirected, they accept whatever is offered. No wonder they fall prey to quacks, charlatans and cultists, who follow them like vultures.

To develop the modern American climatic therapy, the following steps seem to be important: (1) an inventory of our natural resources, (2) development of institutions and (3) education of (a) a new type of specialist, (b) the general practitioner and (c) the public. Nature did not bestow all its natural resources on Europe. On the contrary, Europe has no Florida,

California, Nevada or Colorado and nothing like Yellowstone Park, with its mineral thermal springs and mud volcanoes. America is fortunate to find within its boundaries an array of specific climatic types, all types of seashores from Nordic to subtropical, high altitudes and deserts. But the biologic effects of our different climatic types have to be evaluated. Our thermal mineral springs, muds and moors must be standardized, indications and limitations must be determined, unwarranted claims must be weeded out.

The American Medical Association has a committee on spas and health resorts. This committee has a tremendous job. To be efficient, it should be supported by state committees and interstate special field committees.

The medically supervised health resort is the logical place to care for the vacationist properly. A health resort should be characterized by (1) the presence of natural resources with therapeutic value, (2) suitable physical facilities for administering the natural therapeutic agents, (3) competent medical supervision and medical records and (4) provisional facilities for research work.

The development of American health resorts should not follow a plan of imitating completely those of Europe. The development must be based on our national characteristics, type of resources and standards of living.

#### INSTITUTIONS

1 *Physical Therapy Institution*—The institution most needed for the development of this problem is a type which would fully utilize the natural resources of a given place, especially equipped for diagnosis and modern physical therapy. This type of institution would take care of the ambulatory chronic sick patient and the healthy vacationist in need of medical advice.

2 *Sanatorium*—Another type of institution needed is the sanatorium devoted to the care of diseases beneficially influenced by the local climate. Sanatoriums should be built on seashores, deserts and forests, in high altitudes and in valleys with southern exposure. These sanatoriums would serve chronic patients in need of the effect of certain climates and of constant medical supervision.

3 A climate research station and a biologic research laboratory will be indispensable in the future concept of a health resort. They can be coupled with either the physical therapy institution or the sanatorium. The staff of these institutions should consist of general practitioners who are specialists in physical therapy and climatology and specialists in other fields as the need for them arises.

A well equipped general hospital is a necessity, independently from the health resort problem.

#### EDUCATION

Physical therapy in its broad aspects of electrotherapy, hydrotherapy, mechanotherapy, climatology, with their extensive ramifications is too big a problem for a general practitioner as a postgraduate study if he is not prepared in the fundamentals in his undergraduate years. He cannot acquire a good background in the subject during working years in practice by nibbling on fragments here and there in abstracts of foreign articles.

A new type of medical specialist will be needed in American health resorts if the vacationist will be directed to the spas. In the mind of this new type of

spa specialist, or climate therapist, the knowledge of all branches of physical therapy should be blended with all other scientific information essential to general practice. He must be acquainted with the problems of heredity and constitution, as his main job will be to influence constitutional factors in chronic disease. He must know psychotherapy and medical climatology.

Physical therapy should be taught in our universities, and the teaching of it should start in the preclinical years. The courses could be molded into physiology and therapeutics. In the clinical years the effect of physical therapy in disease should be taught. Introduction to the problems of climatic therapy and spa medicine with field trips to spas and health resorts is the routine to follow. A required graduate training of at least three years' internship should precede the recognition of a specialist in physical therapy. The first year should be spent in a general rotating internship, the second year in specialized sanatoriums or hospitals located in reputable health resorts and approved for the purpose of internship by the American Medical Association, the third year to be divided among the different health resorts in the United States to obtain a comprehensive view of the field in which he is to specialize.

#### THE GENERAL PRACTITIONER

The general practitioner is an important link in this new field of medical endeavor. His cooperation is one of the main pillars of success of this crusade. He can be reached only by postgraduate courses, lectures in his county societies, hospital staff meetings and medical periodicals. Organized excursions to leading health resorts should be planned for general practitioners regularly, to get them acquainted with the work.

#### THE PUBLIC

Every means of conveying information should be used to inform the public about the benefits of medically supervised vacationing. (1) lectures given by leading medical men in clubs, schools, social organizations and health resorts, (2) newspaper campaigns, (3) movie shorts, (4) scientific pamphlets on health resorts and (5) courses on hygiene in high schools and colleges.

#### BENEFITS

Who will benefit by this new field of medical activity?

A *The Public*—The chronic sick belong in spas during their vacation. In the suitably selected climatic background of the spa, spurred by or protected from climatic stimulation, they can be guided in a systemic rehabilitation in habit reforms and in emotional readjustment. For the healthy vacationist, an individually planned vacation, molded to personal requirements, is an important link in the problem of keeping fit. Through careful planning of the hygienic aspects of the migrations, which is partly an interstate problem, reductions in epidemics will ensue and experience will be gained useful in other aspects of public health.

B *Medical Science*—Through penetration into these unexplored medical fields, future possibilities of scientific progress will arise. New biologic facts may be revealed. New methods of treatments will be found.

C *The Medical Profession*—The general practitioner gains a closer contact with the patient in planning his vacation and will enjoy scientific cooperation with the spa practitioner instead of losing his undirected patient to cultists and charlatans. Whether young medical men will find future satisfaction in the field

of American climatic therapy depends mainly on the strength of the leadership displayed in developing this complicated set of problems

**D The Health Resorts**—Since reputable health resorts are the most logical places for medically supervised vacationing of both ailing and healthy, they will be the first to reap the benefits

#### SUMMARY

1 An estimated 35,000,000 people take part in undirected seasonal vacational migrations in America

2 They are confronted with a climatic change, stimulating or sedative, which if properly selected can be utilized in preventing and influencing disease

3 A comparison of Europe and America shows that the health-promoting natural resources of the former are far more effectively developed than those of this country

4 The chronic sick as well as the healthy vacationist would greatly benefit by individually planned, medically supervised vacationing, preferably in a health resort

5 A comprehensive plan embodies suggestions for the development of American climatic therapy

7 The plan will benefit the American public, medical science and the medical profession at large

59 East Olive Street

## Clinical Notes, Suggestions and New Instruments

### PENETRATION OF TISSUE BY GREASE UNDER PRESSURE OF 7000 POUNDS

F HILTON SMITH M.D. SALINAS CALIF

The increasing use of high pressures in industry undoubtedly will result in many accidental penetrations of tissue by foreign materials. A case of destruction of a finger by fuel oil ejected from a Diesel engine has been reported in *THE JOURNAL*.<sup>1</sup> The present case concerns a more widespread hazard as the type of lubricating mechanism involved is becoming common

#### REPORT OF CASE

J W, an automobile mechanic aged 31, was lubricating the springs of a passenger car with a device which ejects grease from a hollow needle inserted into grease fittings. His right hand which held the "gun" slipped, and the needle barely touched the skin at the volar base of the left index finger. The valve automatically tripped and grease with an asphalt base under a pressure of 7000 pounds was forced into the finger. The digit immediately became numb, and the patient felt weak and faint. A half hour after the accident the objective signs were not marked. There was little swelling of the finger or hand motion was unimpaired and painless and the only visible injury was a small wound just above the proximal crease of the left index finger. Through this opening about a drachm (4 cc) of thick clean grease was expressed. Since the patient's hands were covered with road dirt at the time of the accident tetanus antitoxin 1,500 units, was given immediately and he was instructed to apply compresses of hot magnesium sulfate solution. Twelve hours later the finger and hand were slightly swollen although not tense or edematous. The epitrochlear and axillary nodes were not enlarged or tender. The temperature was 98.2 F. The pain however, had become so intense that use of opiates was necessary. The patient was sent to the hospital where a blood count revealed 92 per cent hemoglobin 4600 000 erythrocytes and 8000 leukocytes with 81 per cent poly-

morphonuclears, 15 per cent small lymphocytes, 3 per cent large lymphocytes and 1 per cent mononuclears

The urine was acid and its specific gravity 1.024, there was no albumin or sugar. Microscopic examination showed a few squamous epithelial cells, one or two pus cells per high power field and an occasional erythrocyte

Nitrous oxide anesthesia was administered and lateral incisions made through the pulp of the finger at the middle and proximal phalanges. About a half ounce (15 cc) of grease was expressed from the finger and milked down from the palm of the hand. After this the hand was elevated and magnesium sulfate compresses were applied. These were continued for the next five or six days and on two occasions the hand was saturated with ether in an attempt to dissolve the remaining grease. Roentgenograms taken at this time showed no bony involvement

Despite the fact that wide incision had been done before the onset of any considerable edema, moist gangrene of the finger developed on the fourth postoperative day. The epidermis overlying the entire finger became loosened and the gangrenous portion beneath showed small beads of grease oozing from the



Fig 1—Moist gangrene of finger ten days after the accident. The point of entrance of the grease was just above the proximal edge of skin

intensely red moist surface. This tissue peeled off in layers and was saturated with grease. Dry heat was applied, and the distal and middle portions of the finger soon became dehydrated into oily masses of insensitive tissue. The skin overlying the proximal phalanx and metacarpophalangeal joint became raised in large blisters and the underlying tissue showed the same intensely red oily appearance noted more distally. On the ninth day after admission metacarpophalangeal disarticulation was performed and the flaps of skin left open. At the time of this operation the palmar space was probed. With but few objective signs to indicate its presence, an ounce (30 cc) of grease was milked down from this space and an additional half ounce (15 cc) was found in the tissues of the wrist. After this operation the temperature varied from 99 to 101 F for four days. The wound healed slowly, small amounts of grease appearing on the dressings for five weeks. Two months after the accident the patient was able to resume work, although there was still transient edema of the hand when he performed hard labor

Pathologic examination of the finger was made by Dr David A Wood. Sections taken through the soft tissues showed numerous subcutaneous abscesses infiltrated by myriads of polymorphonuclear leukocytes. There was considerable necrosis of the subcutaneous connective tissue. In areas there was much fibroblastic proliferation and giant cells of the foreign body type. Fat stains revealed occasional small droplets of fat along the periphery of the abscesses. The grease itself, as sold, is sterile neutral in reaction and composed of grease with an asphalt base incorporated in a sodium soap. It also contains a small amount of brown oil dye but the quantity is negligible

1 Rees, C. E. Penetration of Tissue by Fuel Oil Under High Pressure from Diesel Engine. *J. A. M. A.* 109:866 (Sept. 11) 1937

and should not be injurious to living tissue. The contamination occurs in the gun itself and the road dirt which covers the fittings of the car.

## COMMENT

The lubricants in use in many stations where automobiles are serviced are forced into grease fittings under pressures ranging



Fig. 2—Lateral view. Tissue beneath the blisters was identical with that of the denuded terminal phalanx.

from 500 to 7,000 pounds. This is a far cry from the familiar grease cup of a decade ago. Few modern grease racks depend entirely on the hand type of gun to force lubricants into spring shackles, universal joints or other parts of the car provided

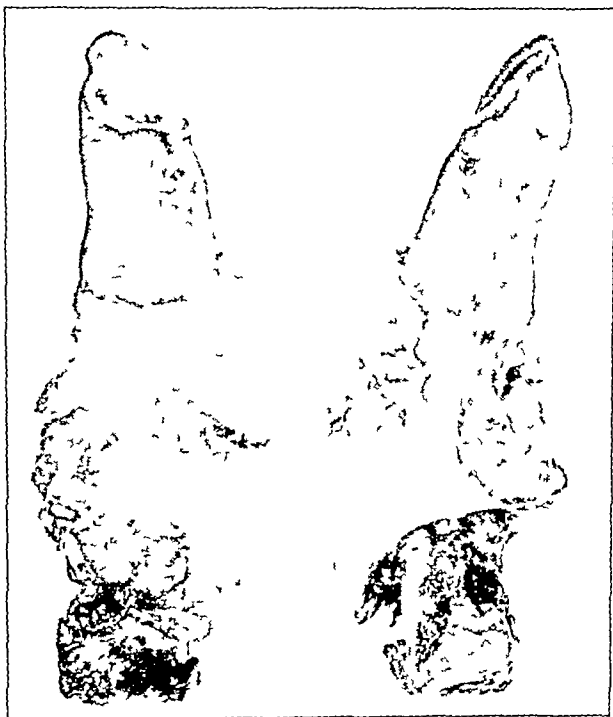


Fig. 3—Showing dry gangrene of the dorsal surface and the lateral and volar surface.

with fittings. The efficiency of the lubrication depends on satisfactory filling of bearing spaces and to expedite the work tremendous pressures are employed. The air pressure going from the compressor to the lubricants is increased as much as forty times, and a thin stream of grease is forced through a hollow

needle-like ejector into the fitting. Thus a pressure of 140 pounds in the tank (that usually employed) will provide a pressure of 6,000 pounds at the outlet. Grease issuing from the orifice of such a device is a missile capable of causing considerable damage, easily penetrating human tissue. Familiarity of operators with the old style systems has given them a feeling of safety which does not apply to newer, higher pressure lubricating machines. The small opening in the needle which pierces the fitting should be regarded with all the precautions applicable to the muzzle of a loaded rifle.

In the event of accidents of the type just described early and extensive incision is the treatment of choice. It should be borne in mind that even without edema the history of such an injury is just cause for immediate and wide opening of the tissues and attempted expression of the foreign material. It seems possible, however, that with such pressures irreparable damage can take place at the instant of injection.

Bank of America Building

## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT  
HOWARD A. CARTER, Secretary

### GENERAL ELECTRIC SUNLAMPS ACCEPTABLE

Manufacturer: General Electric Company, 1285 Boston Avenue, Bridgeport, Conn.

The General Electric Sunlamps generate ultraviolet and heat radiation. There is evidence that the ultraviolet radiation produces vitamin D in the body, which has a favorable influence on the metabolism of calcium and phosphorus in general and the prevention of rickets in particular. These sunlamps come in three models, Miami BM3, California BM7 and Florida BM6. Each lamp makes use of the S-1 type General Electric Mazda Sunlight Bulb.

The Mazda Sunlight Lamp Type S-1, the source of radiation, may be described as a combination of tungsten electrodes in parallel with a tungsten filament. These are enclosed in a special glass bulb along with a little pool of mercury. The current first flows only through the filament but, as the temperature increases, the mercury vaporizes and an arc is formed between the ends of the tungsten electrodes. The process requires only a few seconds, although a few minutes is required for the lamp to begin radiating ultraviolet energy at its maximum efficiency. The mercury arc between the electrodes produces the major portion of the effective ultraviolet radiation. The result of the combination produces radiations in the visible and the infra-red as well as in the ultraviolet zones. The bulb is made of Pyrex glass, which absorbs most of the radiation in the ultraviolet region shorter than approximately 2,800 angstrom units.

These lamps operate only on alternating current. Type S-1 requires an input of 450 watts. The lamp stands are equipped with special transformers in the base to secure the proper voltage, since the S-1 bulbs do not fit in the ordinary lamp socket.

The General Electric Sunlamps generate 50 microwatts per square centimeter at a distance of 45 inches from the rim of the reflector. At this distance a period of sixteen minutes under these lamps is equivalent to twenty minutes under midsummer sunshine. A minimum perceptible erythema may be produced at a distance of 45 mm in twenty minutes on the average untanned skin.

Based on the evidence that radiation from the Mazda Sunlight Lamps Type S-1 may produce a minimum perceptible erythema at the prescribed distance, are prophylactic for rickets and play an important role in tooth formation and maintenance of normal structure, the Council on Physical Therapy voted to include the General Electric Sunlamps Models Miami BM3, California BM7 and Florida BM6 in its list of accepted devices.



General Electric Sunlamp BMJ 5

# HOSPITAL SERVICE IN THE UNITED STATES

## EIGHTEENTH ANNUAL PRESENTATION OF HOSPITAL DATA BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

A number of records in hospital service were broken in 1938, as revealed in the Annual Census of Hospitals just completed

The number of registered hospitals increased over that of the previous year for the first time in eight years, births in hospitals went over the million mark, the number of beds increased 36,832, a figure well above the average annual increase of 24,677 beds a year for thirty years, from 1909 to 1938 inclusive

Hospitals admitted patients in 1938 at the rate of one every 33 seconds

There are 6,166 hospitals, 1,161,380 beds, 56,747 bassinets, 1,026,771 births, 965,706 average census and 9,421,075 patients admitted

In addition to the 6,166 hospitals registered, 136 are opened and their registration is pending, sixty-seven

patient days in general hospitals numbered 106,897,550, or 30.3 per cent of the total

The 4,286 general hospitals admitted 8,545,930 patients, or 90.7 per cent of the total admissions to all registered hospitals, and the average length of stay of patients in general hospitals was 12.5 days

In 1938 the average daily census increased 21,270, the number of empty beds increased 15,562 and the number of empty general beds increased 8,643

The rate of occupancy in general hospitals was 68.9 per cent of capacity

### BED OCCUPANCY IN HOSPITALS

The average census of 965,706 patients in all registered hospitals left an average of 195,674 idle beds. The number of idle beds had been around 180,000 dur-

### SUMMARY OF HOSPITAL DATA

	Number	Beds	Bassinets	Patients Admitted in 1938
1 Registered hospitals and sanatoriums approved for internships, residencies and fellowships	986	409,768	25,659	4,960,053
2 Other hospitals, sanatoriums and related institutions, registered	5,180	751,612	31,088	4,461,022
Total registered	6,166	1,161,380	56,747	9,421,075
				Number
3 Refused registration after investigation (capacity 18,372)				636
4 Unclassified emergency stations, clinics, offices, cottages, and so on, with bed care (capacity unknown)				2,529
5 Prospective hospitals and sanatoriums				
a Opened Registration pending				136
b Under construction				67
c Planned Construction pending				185

are under construction and 185 are planned and being developed

The rate of growth in registered hospitals was equivalent to one hospital of 101 beds for each day in the year 1938, Sundays and holidays included

Governmental hospitals were responsible for 71.6 per cent of the total increase in beds in 1938 and for 89.5 per cent of the increase in 1937. Nongovernmental beds increased 3.1 per cent over the previous year, while governmental beds, federal, state and local, increased 3.3 per cent

Bassinets increased 1,181 in 1938, and 93,859 more births were reported for 1938 than for 1937

One person in fourteen became a hospital bed patient during the year 1938, according to the population as estimated by the United States Bureau of Census July 1, 1938

The figures for patients admitted and average daily census of patients throughout this article are exclusive of newborn infants and do not include outpatients

Patient days in all hospitals aggregated 352,482,690, a gain of 7,763,550 over the preceding year. The

ing recent years. In general hospitals there were 132,454 idle beds as compared with 123,811 in the preceding year. Even in nervous and mental hospitals the average number of empty beds increased during the year from 23,710 to 29,485, although need for more mental hospital facilities is obvious in most states. Idle beds in tuberculosis hospitals were reduced from 11,951 to 9,780. The average number of unoccupied beds in governmental hospitals for the year was 78,449, a considerable increase over 69,869 for the previous year. Occupancy of church hospitals fell from 68.6 per cent to 67.4 per cent, showing their average daily number of idle beds to be 38,945. The idle beds in nonprofit hospitals averaged 91,367 and in all nongovernmental hospitals 117,225

The compilations on these pages show too clearly to justify repetition in the text the percentages of beds occupied in all kinds of hospitals, grouped according to control and to type of service, for the years 1929, 1933, 1937 and 1938, also the average number of unoccupied beds in hospitals grouped in a similar manner for the years 1929, 1937 and 1938



While the past year was characterized by increased use of existing hospital facilities, this increased occupancy has not kept pace with the building program, by which there was a net increase of 36,832 beds

HOSPITAL FACILITIES AS SHOWN BY THE  
ANNUAL CENSUS

For a knowledge of hospital facilities in total, attention is invited to the summary of hospital data on the opening page of this article and to the totals of the

Percentage of Beds Occupied

	1929	1933	1937	1938
According to Ownership or Control				
Federal	76.8	70.0	52.5	51.8
State	94.6	94.5	90.5	94.7
County	80.7	80.8	88.1	8.1
City	74.3	83.0	81.8	81.1
City county	80.2	70.5	73.0	72.5
Total governmental	68.9	90.1	91.1	90.4
Church	66.7	54.9	68.6	67.4
Fraternal	68.7	64.5	67.0	76.1
Associations and restricted corporations			70.6	60.0
Industrial	44.4	44.4		
Independent associations	65.9	58.5		
Total nonprofit			69.7	68.4
Individual and partnership	41.2	41.1	51.6	50.1
Corporations (unrestricted as to profit)			58.7	58.9
Total proprietary			50.0	44.4
Total nongovernmental	64.6	50.3	67.2	61.1
According to Type of Service				
General	60.5	59.9	70.0	68.9
Nervous and mental	90.7	90.1	90.8	91.0
Tuberculosis	82.7	80.3	84.4	81.1
Maternity	62.8	60.8	63.7	62.0
Industrial	54.6	44.2	44.6	42.5
Eye ear nose and throat	47.7	40.6	37.3	34.2
Children's	60.9	65.9	68.9	69.1
Orthopedic	80.2	76.9	80.9	78.9
Isolation	36.1	41.2	42.6	40.9
Convalescent and rest	70.9	69.2	71.2	73.6
Hospital departments of institutions	63.0	60.1	66.4	67.0
All other hospitals	74.6	79.3	58.1	64.7
Total all hospitals	80.1	78.8	84.0	83.2

columns in table 1 and table 2. The total number of registered hospitals is now 6,166 as compared with 6,128 one year ago. This is the first time since the annual census of 1930 that the number of registered hospitals was greater than for the preceding year. The total number of beds available in all registered hospitals is 1,161,380, or an increase of 36,832 over last year. Bassinets now number 56,747, or an increase of 1,181 over last year.

Those registered hospitals which have been approved for internships, residencies and fellowships now number 986, their total capacity is 409,768 beds and 25,659 bassinets. Furthermore, they admitted 4,960,053 patients, or 52.6 per cent of total admissions to all registered hospitals.

The hospitals which after investigation were refused registration number 636 with a capacity of 18,372 beds and 2,131 bassinets.

Regarding the hospital facilities for the future, a healthy expansion is indicated by reports received from 136 hospitals which are open but for which there has not been time for investigation and registration. Sixty-seven new hospitals are known to be under construction and another 185 have been planned and are being

developed. In addition to the hospitals listed and those being developed there are numerous facilities which for want of a better term are called "unclassified," including emergency stations, clinics, offices, cottages and so on, with facilities for bed care and nursing along with the medical care. Records in the office vouch for the existence of 2,529 of these auxiliary institutions.

CHANGES IN GOVERNMENTAL HOSPITALS  
DURING THE YEAR

There are now 1,728 governmental hospitals in the register as compared with 1,722 a year ago, an increase of six. The total capacity of all registered governmental hospitals is 815,136. There is a slight decrease in the number of bassinets.

Federal institutions increased in number but reported slightly fewer beds. The state hospitals number 523, one more than a year ago, and their capacity has increased from 508,913 to 541,279.

The mental hospitals were asked to report their rated capacity. In the figures on mental hospitals published in 1937 for the year 1936 and in 1938 for the year 1937 there were special data on the rated capacity of state mental hospitals. There is being prepared for publication a special report on mental hospitals which will comment at length on the extent of hospital facilities, their rate of occupancy and their status of overcrowding.

Both the number of county hospitals and their bed capacity increased in the past twelve month period, but there was a marked decrease in the number of bassinets provided in county hospitals. City hospitals declined both in number and in capacity. City-county hospitals increased with respect to the number of hospital number of beds and number of bassinets.

Analysis of General Hospitals by Control

	Hospitals	Beds	Bassinets	Patients Admitted	Average Census
Federal	260	47,706	767	397,116	6,112
State	52	17,332	916	298,667	11,671
County	210	29,664	2,238	466,590	22,228
City	220	46,343	4,063	866,306	36,132
City county	8	5,883	507	191,310	8,863
Total governmental general	740	147,350	8,513	2,100,189	11,614
Church	833	107,739	16,140	2,481,907	71,191
Fraternal	10	1,176	104	17,444	1,011
Associations and restricted corporations	1,329	128,190	90,739	2,938,592	3,067
Total nonprofit general	2,197	237,095	37,013	5,483,173	15,770
Individual and partnership	947	29,360	4,962	461,446	10,177
Corporations (unrestricted as to profit)	362	18,514	3,136	431,022	10,250
Total proprietary general	1,309	40,874	7,398	892,568	9,067
Grand total general hospitals	4,286	420,374	52,924	8,040,900	9,970

The returns from nongovernmental hospitals show an increase in number from 4,406 to 4,438, in beds from 335,799 to 346,244 and in bassinets from 46,644 to 47,636. Church hospitals showed considerable growth for the year both in number and in capacity, as did all nonprofit corporations and associations and those run by individuals and partnerships. However, the corporations unrestricted as to profit, or frequently referred to

as corporations for profit, continued their downward trend from 530 to 493 in number and from 28,085 to 26,550 in capacity

#### CHANGES DURING THE YEAR IN HOSPITALS BY TYPE OF SERVICE

As usual, the general hospitals outnumber those of any other classification. We now find a total of 4,286 registered general hospitals as compared with 4,245 last

#### How Hospitals Shared in Patients Admitted

	Number of Patients Admitted		Share (per Cent) of All Patients Admitted	
	1931	1938	1931	1938
According to Ownership or Control				
Federal	301 149	445 891	4.2	4.7
State	388 934	549 637	5.4	5.8
County	340,936	502 066	4.8	5.9
City	689 209	928 924	9.6	9.9
City county	198 450	130 762	1.5	1.4
Total governmental	1,833 078	2 607 200	25.6	27.7
Church	2 013 302	2 531 796	28.1	26.9
Fraternal	44 700	28 619	0.6	0.3
Associations and restricted corporations		3 287 631		34.9
Individual and partnership	409 184	490 503	6.4	5.3
Corporations (unrestricted as to profit)		470 130		5.0
Industrial	91 166		1.3	
Independent associations	2 714 406		37.9	
Total nongovernmental	2 822 898	6 813 795	74.4	72.3
According to Type of Service				
General	6 321 861	8 040 030	88.3	90.7
Nervous and mental	97 889	128 703	1.4	2.1
Tuberculosis	80 502	100 801	1.1	1.1
Maternity	91 496	66 140	1.3	0.7
Industrial	93 415	42 666	1.3	0.5
Eye ear nose and throat	113 762	90 863	1.6	1.0
Children's	83 416	93 420	1.2	1.0
Orthopedic	37 842	33 386	0.5	0.4
Isolation	40 010	34 017	0.6	0.4
Convalescent and rest	20 678	36 260	0.4	0.4
Hospital departments of institutions	131 291	142 714	1.8	1.5
All other hospitals	30 604	36 160	0.5	0.4

year. For the same period there has been a net increase of 13,233 beds in general hospitals and 1,256 bassinets.

The nervous and mental hospitals show a marked increase both in number and in capacity, and the same is true of maternity, children's, and convalescent and rest hospitals. There is a slight decrease in the number of tuberculosis, industrial, eye, ear, nose and throat and isolation hospitals and in the number of institutional hospitals.

#### Summary of Growth of Hospitals 1909 to 1938

Year	Federal Hospitals		State Hospitals		All Other Hospitals		Total	
	Number	Capacity	Number	Capacity	Number	Capacity	Number	Capacity
1909	71	8 827	232	189 049	4 006	220 189	4 309	421 065
1914	93	12 609	294	232 834	4 600	287 040	5 037	532 481
1918	110	18 810	303	262 204	4 910	331 182	5 323	612 201
1923	220	53 869	601	402 206	6 009	399 640	6 830	705 722
1928	294	61 760	590	369 709	5 963	461 410	6 847	892 964
1931	291	69 170	576	419 282	5 746	480 663	6 613	974 110
1932	301	74 101	608	442 601	5 693	497 602	6 602	1 014 304
1933	300	70 630	557	439 646	5 380	491 765	6 437	1 027 046
1934	313	77 860	544	473 080	5 477	497 701	6 334	1 040 101
1935	316	83 303	526	483 094	5 404	500 792	6 466	1 060 179
1936	313	84 234	524	503 306	5 342	509 181	6 189	1 090 721
1937	309	97 001	522	508 913	5 217	517 654	6 128	1 124 568
1938	330	97 245	523	541 279	5 313	527 803	6 166	1 161 327

More significant than the changes in facilities noted here are the figures showing increase and decrease in the number of patients admitted and the average census of patients in the same institutions. The admissions and patient population are therefore set down by years for ready reference and comparison in table 2.

#### TRENDS SHOWN BY COMPARISON OF 1927 AND 1938

The principal sources of statistics on the entire field of hospital facilities are (1) the various editions of the American Medical Directory and (2) the Hospital Numbers of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. The first edition of the directory (1906) contained an incomplete list of hospitals. By 1909, when the second edition was published, a fairly complete list of all the hospitals in the country, eliminating those believed unsatisfactory to print, was published. Each subsequent issue of the directory has contained a revised and fairly complete list of hospitals.

The directory, therefore, was practically the only source of information about all the hospital facilities from 1909 to 1920. In the latter year a beginning was made on the Annual Census of Hospitals and the first

#### Unoccupied Beds in Hospitals

	1927	1937	1938
According to Ownership or Control			
Federal	13 868	17 132	16 778
State	21 664	23 022	28 440
County	12 620	19 804	16 309
City	14 688	14 440	14 174
City-county	2 807	2 471	2 693
Total governmental	65 622	69 869	78 440
Church	37 785	36 170	38 940
Fraternal	1,606	1 081	957
Associations and restricted corporations		46 380	51 430
Industrial	3 107		
Independent associations	54 794		
Total nonprofit		84 196	91 367
Individual and partnership	17 303	14 499	14 938
Corporations (unrestricted as to profit)		11 608	10 920
Total proprietary		26 107	25 858
Total nongovernmental	114 715	110 243	117 225
According to Type of Service			
General	123 020	123 811	132 404
Nervous and mental	18 979	23 710	29 485
Tuberculosis	10 603	11 901	9 780
Maternity	2 022	1 986	2 270
Industrial	3 180	1 986	1,510
Eye ear nose and throat	1 383	801	912
Children's	1 807	1 600	1 649
Orthopedic	1 175	1 117	1 505
Isolation	4 740	3 304	3 624
Convalescent and rest	1 886	1 601	1 541
Hospital departments of institutions	9 148	7 023	7 078
All other hospitals	2 264	1 067	3 806
Total unoccupied beds—all hospitals	190 267	180 112	190 674

Hospital Number of THE JOURNAL was published in 1921. The early and middle twenties were a formative period in the development of the annual census and the annual Hospital Number. Improvement was shown in each subsequent Hospital Number of THE JOURNAL.

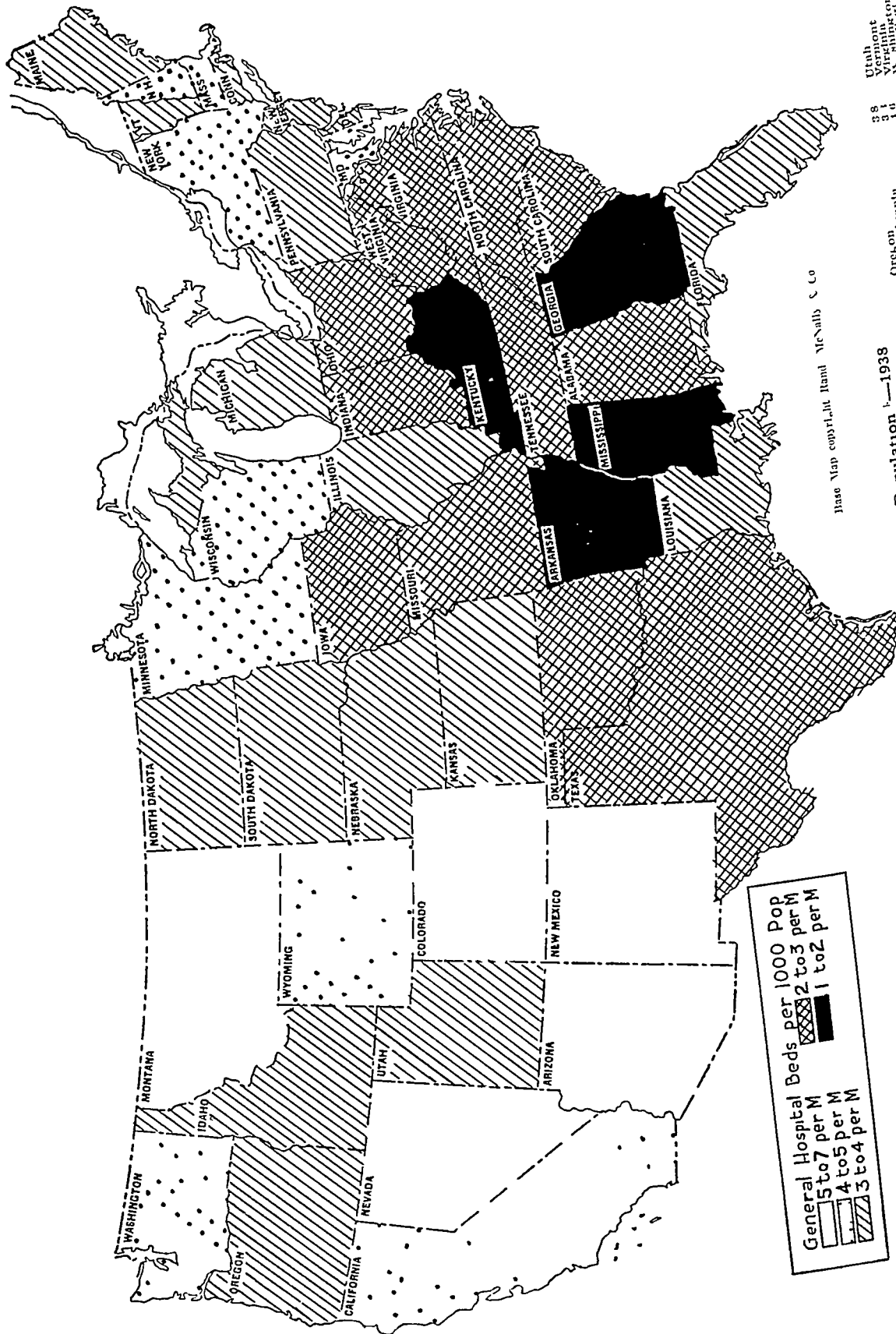
Through patient and courteous contact with hospitals and by persistent effort, asking for only a small amount of information but persisting until the maximum number of hospitals was heard from, the Association by 1927 was enjoying a response to its annual census representing usually more than 90 per cent of all the registered hospitals, and for most years 96 per cent of the hospitals and around 99 per cent of the entire bed capacity.

Therefore from 1927 to 1938 inclusive—eleven years—we are able now to present figures that are believed to be the most accurate available. Some definite trends of hospital development as to types of service and as to ownership or control may be observed.

In the eleven year period we find that the number of hospitals has diminished from 6,807 to 6,166. This

# HOSPITAL SERVICE

Jour. A. M. A.  
March 11, 1938

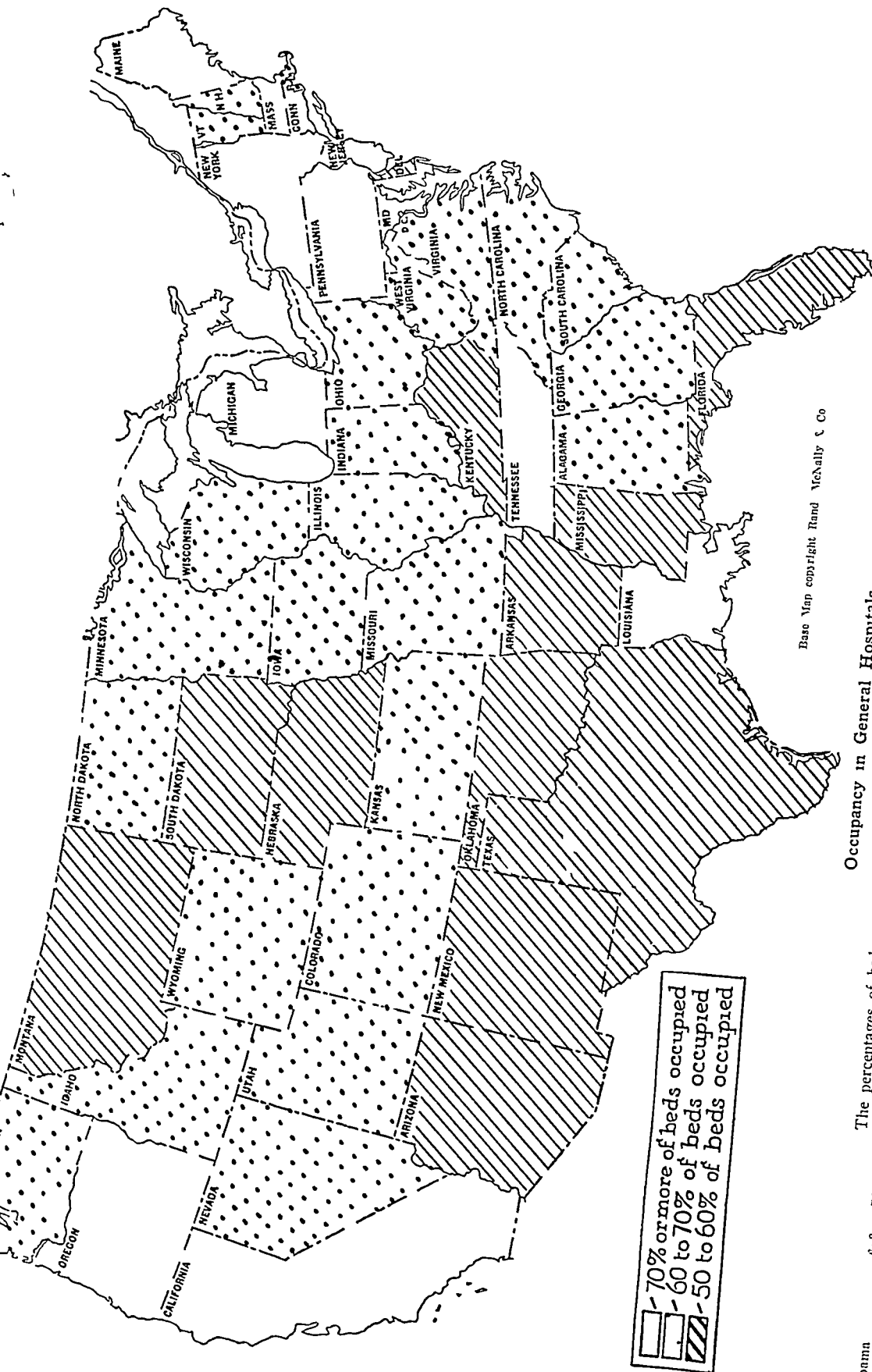


General Hospital Beds per 1000 Pop  
 5 to 7 per M  
 2 to 3 per M  
 1 to 2 per M  
 3 to 4 per M

Base Map copyright Rand McNally & Co

## General Hospital Beds per Thousand Population 1938

Alabama	21	Missouri	32	New Jersey	42	Oregon	32	Utah	38
Arizona	19	Minnesota	32	New Mexico	37	Ohio	32	Vermont	38
Arkansas	19	Mississippi	32	North Carolina	37	Oklahoma	32	Washington	38
California	19	Alabama	32	South Carolina	37	Illinois	32	West Virginia	38
Colorado	19	Georgia	32	Tennessee	37	Indiana	32	Wyoming	38
Connecticut	19	Florida	32	Texas	37	Iowa	32	Idaho	38
Delaware	19	Kentucky	32	Utah	37	Wisconsin	32	Montana	38
District of Columbia	19	Louisiana	32	New York	37	Michigan	32	Nebraska	38
Hawaii	19	Maine	32	North Dakota	37	Minnesota	32	Colorado	38
Illinois	19	Maryland	32	South Dakota	37	Wisconsin	32	Arizona	38
Indiana	19	Massachusetts	32	Tennessee	37	Michigan	32	New Mexico	38
Iowa	19	Michigan	32	Texas	37	Minnesota	32	Utah	38
Kansas	19	Minnesota	32	Virginia	37	Wisconsin	32	Vermont	38
Kentucky	19	Mississippi	32	West Virginia	37	Michigan	32	Washington	38
Louisiana	19	Alabama	32	Wyoming	37	Minnesota	32	West Virginia	38
Maine	19	Georgia	32	Idaho	37	Wisconsin	32	Wyoming	38
Maryland	19	Florida	32	Montana	37	Michigan	32	Idaho	38
Massachusetts	19	Kentucky	32	Nebraska	37	Minnesota	32	Montana	38
Michigan	19	Louisiana	32	Colorado	37	Wisconsin	32	Nebraska	38
Minnesota	19	Maine	32	Arizona	37	Michigan	32	Colorado	38
Mississippi	19	Maryland	32	New Mexico	37	Minnesota	32	Arizona	38
Missouri	19	Massachusetts	32	Utah	37	Wisconsin	32	New Mexico	38
Montana	19	Michigan	32	New York	37	Michigan	32	Utah	38
Nebraska	19	Minnesota	32	North Carolina	37	Minnesota	32	Vermont	38
Nevada	19	Mississippi	32	South Carolina	37	Wisconsin	32	Washington	38
New Hampshire	19	Alabama	32	Tennessee	37	Michigan	32	West Virginia	38
New Jersey	19	Georgia	32	Texas	37	Minnesota	32	Wyoming	38
New Mexico	19	Florida	32	Utah	37	Wisconsin	32	Idaho	38
New York	19	Kentucky	32	New York	37	Michigan	32	Montana	38
North Carolina	19	Louisiana	32	North Dakota	37	Minnesota	32	Nebraska	38
North Dakota	19	Maine	32	South Dakota	37	Wisconsin	32	Colorado	38
Ohio	19	Maryland	32	Tennessee	37	Michigan	32	Arizona	38
Oklahoma	19	Massachusetts	32	Texas	37	Minnesota	32	New Mexico	38
Oregon	19	Michigan	32	Virginia	37	Wisconsin	32	Utah	38
South Carolina	19	Minnesota	32	West Virginia	37	Michigan	32	Vermont	38
South Dakota	19	Mississippi	32	Wyoming	37	Minnesota	32	Washington	38
Tennessee	19	Alabama	32	Idaho	37	Wisconsin	32	West Virginia	38
Texas	19	Georgia	32	Montana	37	Michigan	32	Wyoming	38
Utah	19	Florida	32	Nebraska	37	Minnesota	32	Idaho	38
Vermont	19	Kentucky	32	Colorado	37	Wisconsin	32	Montana	38
Washington	19	Louisiana	32	Arizona	37	Michigan	32	Nebraska	38
West Virginia	19	Maine	32	New Mexico	37	Minnesota	32	Colorado	38
Wisconsin	19	Maryland	32	Utah	37	Wisconsin	32	Arizona	38
Wyoming	19	Massachusetts	32	New York	37	Michigan	32	New Mexico	38



### Occupancy in General Hospitals

The percentages of beds occupied in general hospitals during the year 1938, by states, were as follows

Alabama	69.5	Minnesota	62.9
Arizona	57.0	Mississippi	57.0
Arkansas	78.9	Montana	70.5
California	70.5	Nebraska	56.4
Colorado	72.5	Nevada	58.2
Connecticut	72.4	New Hampshire	62.5
Delaware	73.3	New Jersey	61.4
Florida	62.9	New Mexico	53.0
Georgia	57.0	New York	68.4
Idaho	78.9	North Carolina	58.2
Illinois	69.5	Ohio	62.5
Indiana	67.1	Oklahoma	61.4
Iowa	63.1	Pennsylvania	71.0
Kansas	80.2	Rhode Island	79.3
Kentucky	68.8	South Carolina	63.3
Louisiana	64.6	South Dakota	63.0
Maine	69.2	Tennessee	69.8
Maryland	67.1	Texas	74.1
Massachusetts	63.1	Utah	70.9
Michigan	63.1	Vermont	71.1
Minnesota	62.9	Virginia	68.8
Mississippi	57.0	Washington	65.5
Montana	70.5	West Virginia	63.3
Nebraska	56.4	Wisconsin	62.0
Nevada	58.2	Wyoming	60.7
New Hampshire	62.5		
New Jersey	61.4		
New Mexico	53.0		
New York	68.4		
North Carolina	58.2		
Ohio	62.5		
Oklahoma	61.4		
Pennsylvania	71.0		
Rhode Island	79.3		
South Carolina	63.3		
South Dakota	63.0		
Tennessee	69.8		
Texas	74.1		
Utah	70.9		
Vermont	71.1		
Virginia	68.8		
Washington	65.5		
West Virginia	63.3		
Wisconsin	62.0		
Wyoming	60.7		

reduction in number is due to several factors Among them is a tendency for smaller hospitals to combine with larger ones in the development of city and town hospital systems The reduction is due also in part to increasing strictness with which the Essentials of a Registered

ably reduced in numbers, having fallen from seventy seven to thirty-eight, isolation hospitals from ninety eight to fifty-four, and convalescent and rest from 159 to 121 These same hospitals also showed a falling off in their number of beds and in average census of patients

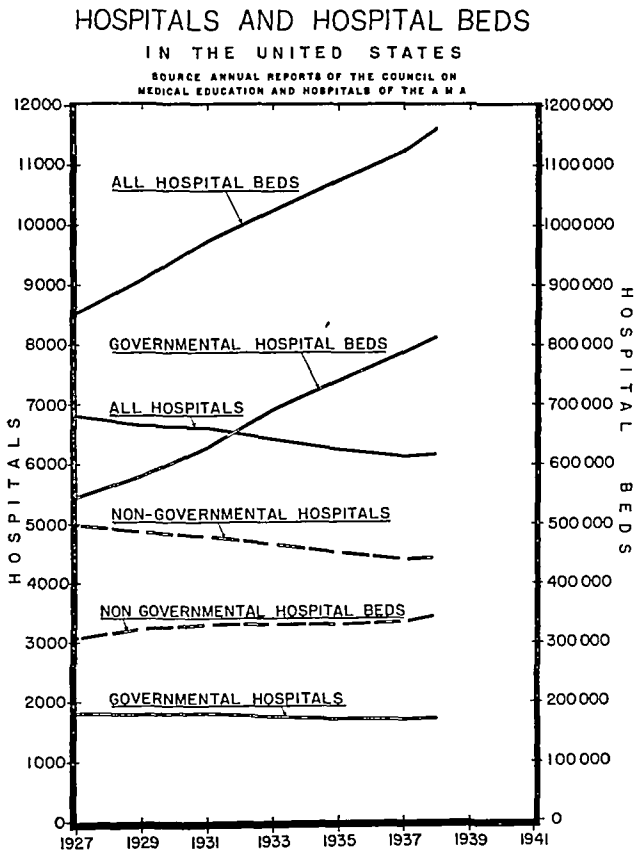
Without doubt much of the slump in number and capacity of some of the special types of hospitals just mentioned is related to a corresponding increase in the number of patients in the general hospitals We find that, while the general hospitals declined in number from 4,322 to 4,286, at the same time their beds increased from 345,364 to 425,324 and the average census from 228,084 to 292,870

Most striking of all changes, perhaps, is that of nervous and mental hospitals, which increased in number only from 563 to 592 but in bed capacity from 373,364

Totals According to Type of Service 1938  
Condensed from Table 2

	Hospitals	Beds	Bassi	Patients	Average	Patient
	Admitted	Census	Days			
General	4 2 6	425 324	52 924	8 74 930	292 870	106 89 550
Nervous and mental	592	591 872	137	198 03	562 137	205 23 60
Tuberculosis	493	76 022	41	100 801	66 242	24 18 370
Maternity	120	5 969	3 361	66 14	999	1 50 135
Industrial	37	2 092	2	42 606	1 482	510 9 0
Eye ear nose and throat	38	1 092		90 863	1 680	391 200
Children s	52	5 410	115	93 170	1 761	1 12 16
Orthopedic	75	7 12		33 3 6	070	2 051 300
Isolation	54	6 145	17	34 017	2 511	916 15
Convalescent and rest	121	5 846	54	36 26	4 50	1 571 325
Hospital departments of institutions	235	21 808	112	142 714	14 770	5 376 4 0
All other hospitals	63	10 925	4	16 16	7 069	2 580 185
Totals	6 166	1 161 380	50 747	9 471 075	96 706	352 482 690

Hospital have been applied from year to year after the Council on Medical Education and Hospitals began its program of registration in 1926 and the inspection of hospitals in 1927



Reference to the accompanying table of changes during the eleven year period 1927 to 1938 will reward the reader with the most complete picture anywhere to be found of the changes in amounts of hospital facilities that have taken place during that period Among the several groups of hospitals as to the type of service, the eye, ear nose and throat hospitals have been consider-

Increase in Hospital Facilities—1927 to 1938

	Hospitals		Beds		Average Cen.	
	1927	1938	1927	1938	1927	1938
According to Ownership or Control						
Federal	501	350	60 444	97 248	47 134	135 40
State	592	523	354 786	541 210	52 734	513 529
County	480	490	58 907	96 671	47 704	89 37
City	366	317	63 327	75 180	46 383	61 06
City-county	70	68	7 105	9 868	5 190	1 110
Total governmental	1 509	1 725	1 101 669	1 710 196	47 054	135 47
Church	1 060	951	108 582	119 571	17 513	89 10
Fraternals	85	58	4 935	4 127	193	3 140
Associations and restricted corporations		1 715		165 853		111 413
Individual and partnership	1 652	1 158	39 115	39 155	91 99	15 250
Corporations (unrestricted as to profit)		493		27 540		15 600
Total nongovernmental	4 098	4 438	305 149	346 244	90 165	229 09
According to Type of Service						
General	4 322	4 286	345 364	425 324	228 084	292 870
Nervous and mental	563	592	373 364	591 872	349 667	562 337
Tuberculosis	505	493	63 170	76 022	50 784	66 242
Maternity	178	120	5 747	5 969	3 665	3 399
Industrial	168	37	7 059	2 092	3 719	1 1
Eye ear nose and throat	77	38	2 832	1 092	1 502	1 040
Children s	58	52	5 410	5 410	5 481	5 678
Orthopedic	62	75	5 895	7 115	4 436	9 511
Isolation	98	54	8 895	6 145	3 964	4 705
Convalescent and rest	159	121	8 143	5 846	5 889	4 705
Hospital departments of institutions	5 0	235	21 930	21 808	17 433	14 770
All other hospitals	64	6	6 189	10 925	5 119	7 099
Total all hospitals	6 507	6 166	5 371 818	1 161 380	677 889	96 706

to 591,822 The average census of mental hospital bounded from 349 667 in 1927 to 562 337 in 1938 In this issue the occupancy figures which are given by years show considerable additions each year to the capacity of mental hospitals and the end of building has not yet come, if we are to judge by the amount of interest and the comparative unanimity of opinion with regard to the need for additional facilities in this particular field

Tuberculosis hospitals were represented by 508 institutions in 1927 and 493 in 1938 The number of beds increased from 63 170 to 76,022 and the average census from 50 784 to 66 242 Additional beds for tuberculosis are available in general and other hospitals as shown in the special report on tuberculosis facilities published in THE JOURNAL, Dec 7, 1935 At that time a total of 95,198 beds available for the treatment of tuberculous patients included 14,468 in general hospitals and 9,478 in nervous and mental institutions Aside from the numerical increase in beds there are indications too that any given quantity of facilities can take care of more patients than formerly because of the

Table 1.—HOSPITAL FACILITIES BY STATES AND BY CONTROL A GOVERNMENT HOSPITALS

Marginal No	Federal				State				County				City				Total Governmental				
	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	
1	Alabama	5,231	6,811	1,814	7	6,360	4,077	6,007	7	741	44	12,022	499	2	100	14	2,464	55	23	9,549	
2	Arizona	20,186	72,126	13,711	2	1,953	1,569	9,511	7	308	42	6,101	2,36	3	275	24	3,379	97	29	3,328	
3	Arkansas	4,082	7,616	1,679	4	4,739	2,854	4,830	1	200	6	1,142	190	3	241	52	17,782	1,905	12	7,296	
4	California	7,022	14,402	6,048	18	27,315	30,715	20,072	57	16,113	592	168,787	13,095	2	642	51	20,814	3,37	18	7,826	
5	Colorado	2,069	10,087	1,491	4	4,884	2,170	4,540	3	202	19	3,860	148	4	813	27	6,650	515	19	11,908	
6	Connecticut	1,275	1,931	218	14	10,720	10,733	9,779	14	10,720	10,733	9,779		5	250	117	16,451	2,178	6	1,947	
7	Delaware	1	23	361	17	15	1,919	4	1,330	1	1,919	4	1,330		8	653	54	10,798	4,73	13	11,084
8	Dist. of Columbia	8,489	73,249	7,980	6	5,733	3,671	5,293	8	653	54	10,798	4,73	5	250	117	16,451	2,178	31	8,263	
9	Florida	6,810	1,044	624	4	7,946	9,140	7,776	5	202	28	4,323	152	7	1,103	173	35,050	881	32	12,579	
10	Georgia	8,501	18,079	2,041	4	1,553	1,233	1,476	4	184	41	6,333	152	8	646	43	8,134	472	32	12,579	
11	Idaho	3,310	4,052	2,041	4	1,553	1,233	1,476	4	184	41	6,333	152	1	24	6	628	7	12	2,101	
12	Illinois	9,162	7,901	5,298	20	39,034	28,012	30,734	22	9,044	213	83,838	5,927	20	2,847	134	24,001	2,278	71	57,497	
13	Indiana	4,941	4,957	1,877	17	12,954	38,180	12,417	32	2,044	63	23,517	1,669	4	748	67	11,601	632	57	17,800	
14	Iowa	1,407	7,460	1,427	17	12,954	38,180	12,417	32	2,044	63	23,517	1,669	8	248	58	5,263	115	40	14,531	
15	Kansas	7,622	18,175	1,041	13	7,601	24,110	7,353	11	762	21	9,068	178	6	248	58	5,263	115	34	9,848	
16	Kentucky	0,101	6,767	1,084	7	7,280	2,323	7,100	3	215	17	2,633	158	1	100	26	2,640	162	24	11,341	
17	Louisiana	4,750	9,197	1,984	8	9,733	122	9,272	9,247	3	215	17	2,633	158	1	100	26	2,640	162	13	11,341
18	Maine	3,408	3,207	1,110	6	4,963	1,342	2,889	1	103	20	1,392	61	2	220	26	2,640	162	11	4,863	
19	Maryland	8,225	3,806	1,817	13	9,931	60	1,043	8,711	1	103	20	1,392	61	3	149	60	10,735	1,168	23	13,269
20	Massachusetts	8,370	9,068	2,614	28	34,983	52	18,499	25,680	8	1,388	40	10,222	1,251	29	6,413	47	86,079	4,430	74	45,009
21	Michigan	6,190	4,807	1,931	15	19,022	36,081	18,713	28	7,681	46	10,222	1,251	32	1,004	398	17,176	3,692	59	21,845	
22	Minnesota	1,100	5,162	912	18	10,614	53	10,917	14,484	16	1,682	21	4,016	1,554	5	1,044	12	12,251	1,31	59	21,845
23	Mississippi	3,103	7,361	981	11	5,592	44	16,018	4,897	2	60	7	1,271	24	1	50	8	1,163	32	71	67,417
24	Missouri	1,410	6,720	1,251	11	11,287	10	16,018	4,897	4	390	60	6,883	292	16	7,684	220	52,292	7,005	36	20,840
25	Montana	8,411	29,642	267	2	1,920	7,768	2,083	6	101	29	1,962	187	3	102	33	3,768	106	18	8,814	
26	Nebraska	4,329	9,349	2,527	10	5,880	31	5,639	5,675	1	412	12	1,563	310	2	136	15	1,614	63	12	853
27	Nevada	4,120	1,387	6	1	346	822	2,780	7	387	36	4,031	240	2	136	15	1,614	63	12	853	
28	New Hampshire	1,170	315	23	16	10,007	4	7,841	10,084	24	10,103	202	17,746	8,636	10	2,900	59	30,468	2,082	53	30,942
29	New Jersey	15,121	3,073	1,135	16	10,007	4	7,841	10,084	45	6,038	117	27,107	0,40	40	22,014	1,033	313,608	20,703	168	182,236
30	New Mexico	1,747	3,073	1,135	9	1,245	5	1,388	1,024	12	755	37	7,105	620	3	380	27	5,773	160	23	2,670
31	New York	24,899	6,371	6,512	49	64,448	83	31,824	89,477	45	6,038	117	27,107	0,40	1	10	1	6	125	55	30,942
32	North Carolina	1,010	16,162	912	9	8,451	5,073	7,083	22	3,299	62	12,725	2,064	1	10	1	6	125	55	30,942	
33	North Dakota	6,739	22	4,210	4	3,538	1,207	2,918	1	30	3	240	20	21	4,300	284	51,132	3,134	34	10,861	
34	Ohio	6,271	11,245	2,370	22	20,857	42	20,907	20,528	22	3,299	62	12,725	2,064	21	4,300	284	51,132	3,134	11	3,933
35	Oklahoma	1,171	72	15,462	12	9,683	27	13,170	9,011	3	141	18	2,014	66	7	221	32	4,642	66	26	11,568
36	Oregon	0,172	17	4,040	0,40	5,641	5,385	5,465	1	68	384	6	682	28	1	68	384	6	682	19	7,400
37	Pennsylvania	2,230	2,915	1,770	34	31,278	180	53,510	30,141	18	10,068	5	4,120	9,150	10	7,931	66	33,253	6,13	70	62,107
38	Rhode Island	1,062	0,634	68	3	5,493	13	2,062	4,440	10	1,005	80	19,474	733	2	205	18	2,803	216	9	8,814
39	South Carolina	11,801	38	6,863	423	3	5,587	2,231	5,144	1	18	3	622	10	2	205	18	2,803	216	21	7,751
40	Tennessee	1,110	10,590	682	7	6,049	2,937	5,926	0	2,148	13	2,606	1,132	3	61	21	1,430	303	21	7,751	
41	Texas	14,312	10,107	2,370	14	10,642	11	415	17,740	15	773	70	13,115	506	3	1,110	118	28,290	808	23	11,231
42	Utah	2,102	1,915	107	2	1,023	523	1,461	60	13,047	91	27,621	12,401	3	93	23	1,594	52	63	23,723	
43	Vermont	2,068	2,319	220	5	1,581	523	1,461	60	13,047	91	27,621	12,401	3	93	23	1,594	52	63	23,723	
44	Virginia	8,271	22	14,117	1,604	13	11,609	40	14,127	11,719	2	83	13	1,081	5	1,047	46	4,082	801	7	1,709
45	Washington	11,010	2,667	2,667	6	5,316	3,822	7,697	14	1,915	69	20,740	1,078	2	340	246	2,46	238	28	15,300	
46	West Virginia	1,210	1,631	101	11	4,920	18	8,921	4,725	4	182	12	2,505	126	2	147	20	2,946	708	6	13,253
47	Wisconsin	4,150	10	1,998	11	5,172	26	15,474	6,335	60	13,047	91	27,621	12,401	11	700	92	15,209	304	18	5,430
48	Wyoming	4,160	12	5,251	572	4	1,112	12	3,423	3	256	42	5,857	169						87	21,699
Totals (1924)	3,042	772	416,581	7,440	573	541,249	1,127	539,637	322,880	400	66,621	2,681	532,068	80,202	317	75,189	4,089	928,921	61,006	1,798	815,170
1	Alabama	5,231	6,811	1,814	7	6,360	4,077	6,007	7	741	44	12,022	499	2	100	14	2,464	55	23	9,549	
2	Arizona	20,186	72,126	13,711	2	1,953	1,569	9,511	7	308	42	6,101	2,36	3	275	24	3,379	97	29	3,328	
3	Arkansas	4,082	7,616	1,679	4	4,739	2,854	4,830	1	200	6	1,142	190	3	241	52	17,782	1,905	12	7,296	
4	California	7,022	14,402	6,048	18	27,315	30,715	20,072	57	16,113	592	168,787	13,095	2	642	51	20,814	3,37	18	7,826	
5	Colorado	2,069	10,087	1,491	4	4,884	2,170	4,540	3	202	19	3,860	148	4	813	27	6,650	515	19	11,908	
6	Connecticut	1,275	1,931	218	14	10,720	10,733	9,779	14	10,720	10,733	9,779		5	250	117	16,451	2,178	6	1,947	
7	Delaware	1	23	361	17	15	1,919	4	1,330	1	1,919	4	1,330		8	653	54	10,798	4,73	13	11,084
8	Dist. of Columbia	8,489	73,249	7,980	6	5,733	3,671	5,293	8	653	54	10,798	4,73	5	250	117	16,451	2,178	31	8,263	
9	Florida	6,810	1,044	624	4	7,946	9,140	7,776	5	202	28	4,323	152	7	1,103	173	35,050	881	32	12,579	
10	Georgia	8,501	18,079	2,041	4	1,553	1,233	1,476	4	184	41	6,333	152	8	646	43	8,134	472	32	12,579	
11	Idaho	3,310	4,052	2,041	4	1,553	1,233	1,476	4	184	41	6,333	152	1	24	6	628	7	12	2,101	
12	Illinois	9,162	7,901	5,298	20	39,034	28,012	30,734	22	9,044	213	83,838	5,927	20	2,847	134	24,001	2,278	71	57,497	
13	Indiana	4,941	4,957	1,877	17	12,954	38,180	12,417	32	2,044	63	23,517	1,669	4	748	67	11,601	632	57	17,800	
14	Iowa	1,407	7,460	1,427	17	12,954	38,180	12,417	32	2,044	63	23,517	1,669	8	248	58	5,263	115	40	14,531	
15	Kansas	7,622	18,175	1,041	13	7,601	24,110	7,353													



rapid advance in methods of treatment. In the fight against tuberculosis a greater degree of control has been achieved than is claimed in most other fields. A supplementary report on tuberculosis facilities in the United States is now in the process of preparation and will be available within a few months.

The hospital departments of institutions which numbered 530 eleven years ago and number 235 at the

hospitals that fill an indispensable function for the inmates of the institutions which they are designed to serve.

#### GROWTH OF GOVERNMENTAL HOSPITALS 1927 TO 1938

Turning now to find out what increases and decreases have been made in the eleven year period by the different governmental and nongovernmental groups of ho-

TABLE 1—HOSPITAL FACILITIES BY STATES AND BY CONTROL  
B NONPROFIT ORGANIZATIONS

Marginal No	Church					Fraternal					Nonprofit Corporations and Associations					Total Nonprofit				
	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census	Hospitals	Beds	Bassinets	Patients Admitted	Average Census
1 Alabama	7	688	71	19,068	4.7						18	1,087	104	23,428	5.90	25	1,775	176	43,096	10.67
2 Arizona	7	768	85	10,726	4.9	1	25		14	18	13	510	39	7,035	2.26	21	1,303	124	23,778	7.33
3 Arkansas	9	1,015	85	21,405	5.46	1	75		1,199	60	8	628	37	9,519	2.13	18	1,618	177	37,123	8.19
4 California	42	4,987	819	127,024	3,608	3	370	10	3,697	2.9	70	6,548	901	133,047	4.55	115	11,905	1,330	263,668	8,422
5 Colorado	29	2,591	300	45,082	1,707	2	171		127	03	21	1,942	80	12,661	1,218	52	4,744	440	58,410	2,075
6 Connecticut	5	1,105	230	34,741	917						35	5,211	773	104,111	3,867	40	6,318	1,003	138,577	4,416
7 Delaware	1	106	18	2,046	54						7	817	135	16,210	4.84	8	923	166	18,396	5.37
8 Dist Columbia	4	894	147	24,470	604						10	1,735	316	38,142	1,237	14	2,629	463	67,612	1,939
9 Florida	7	731	134	14,514	390	3	175	4	1,162	122	19	1,178	146	19,163	5.47	25	2,084	284	30,139	1,069
10 Georgia	6	566	90	15,945	397	1	64		313	50	19	1,217	163	29,093	7.78	26	1,847	253	45,550	1,224
11 Idaho	11	707	146	18,705	505						3	77	16	849	44	14	784	162	19,557	5.49
12 Illinois	87	12,069	1,906	257,151	7,406	4	339	25	5,092	107	85	9,062	1,509	104,306	5,850	119	21,410	3,440	456,549	13,467
13 Indiana	29	3,986	634	97,151	2,622	1	85		243	60	21	1,336	215	30,348	831	51	5,424	889	197,147	3,313
14 Iowa	42	4,063	606	83,551	2,537	1	50		18	48	24	1,163	219	21,812	622	67	5,916	825	105,411	3,271
15 Kansas	39	3,072	470	65,820	1,892						23	8,212	147	1,003	449	62	3,924	615	81,619	2,415
16 Kentucky	12	1,744	225	41,991	1,227	1	20		83	20	30	1,722	187	27,351	8.33	43	3,496	415	69,151	2,109
17 Louisiana	10	1,425	146	40,881	1,021	2	135	12	1,136	80	14	1,053	79	29,132	645	26	2,613	237	1,133	1,433
18 Maine	5	392	41	8,192	252						26	1,339	244	31,342	1,148	31	1,931	285	39,241	1,409
19 Maryland	10	2,179	226	37,319	1,687						28	3,759	335	59,915	2,849	38	5,935	561	97,294	3,287
20 Massachusetts	16	2,608	418	53,127	1,940	1	60		34	62	111	11,190	1,526	213,414	7,875	125	13,858	2,244	266,875	8,110
21 Michigan	34	4,116	751	107,691	3,125	2	154		353	141	69	6,405	899	131,573	4,537	95	11,075	1,650	299,647	7,883
22 Minnesota	35	4,888	539	85,784	2,891	1	60		235	61	44	2,843	474	68,063	1,890	80	6,591	1,013	134,676	4,253
23 Mississippi	2	189	22	6,511	113						21	1,103	136	27,381	521	28	1,288	158	33,897	675
24 Missouri	40	5,992	731	107,860	3,931	4	335		2,051	261	31	2,636	316	41,544	1,586	75	8,866	1,047	153,550	5,775
25 Montana	23	1,918	309	33,873	1,035						6	257	44	5,297	119	29	2,705	353	59,110	1,157
26 Nebraska	25	2,512	360	46,919	1,456						6	227	41	7,108	141	34	2,609	401	54,111	1,917
27 Nevada	1	54	12	1,817	50						2	60	11	72	27	3	114	23	2,547	77
28 New Hampshire	5	349	58	8,110	228						27	1,412	262	25,914	835	32	1,761	370	40,379	1,063
29 New Jersey	18	3,463	469	60,425	2,282	2	155		236	80	73	9,290	1,310	188,736	6,733	93	12,888	1,859	295,397	9,009
30 New Mexico	13	797	98	12,112	434	1	46		76	42	9	764	23	3,285	1,06	27	1,907	121	15,473	652
31 New York	81	12,131	1,607	198,624	9,401	4	240	5	1,325	292	219	31,076	3,971	617,109	23,721	304	43,441	5,853	811,071	33,471
32 North Carolina	15	1,056	116	26,447	766	1	20		17	12	71	4,348	512	105,992	2,669	87	5,494	628	174,456	3,443
33 North Dakota	21	1,678	246	35,547	1,044						8	707	63	7,256	184	29	1,850	339	49,835	1,055
34 Ohio	44	6,821	982	158,197	4,951	4	44		1,506	303	92	8,184	1,160	178,434	5,234	140	17,450	2,142	338,134	10,455
35 Oklahoma	9	923	162	23,399	605	2	81	13	1,768	45	10	314	47	6,574	141	21	1,361	222	30,971	703
36 Oregon	16	1,966	245	54,163	1,288	1	50		235	50	8	414	79	5,574	226	25	2,430	347	59,677	1,814
37 Pennsylvania	40	6,394	843	111,858	4,421	5	381		1,556	347	192	25,943	3,192	480,594	19,015	237	32,718	4,035	594,068	21,671
38 Rhode Island	3	451	43	4,789	288						13	1,876	338	33,905	1,333	16	2,397	351	38,094	1,191
39 South Carolina	5	356	45	9,162	253	3	155	6	1,218	107	21	1,666	161	38,791	1,086	31	2,077	219	49,111	1,666
40 South Dakota	13	1,097	172	22,167	638						10	357	76	7,633	202	23	1,434	248	30,800	900
41 Tennessee	6	1,013	142	36,517	869						28	1,900	193	31,434	1,040	34	2,913	335	67,091	2,115
42 Texas	46	4,441	641	113,395	2,557	4	285	12	2,205	217	36	1,908	163	39,641	945	86	6,634	816	155,144	5,147
43 Utah	6	1,015	170	21,252	712	1	20		59	20	4	150	54	5,404	80	11	1,191	250	25,469	1,590
44 Vermont	3	220	27	4,651	167						17	1,705	159	22,811	1,432	20	1,975	196	35,469	1,454
45 Virginia	3	346	38	6,052	169	1	155	10	2,353	64	40	3,108	357	71,073	1,951	44	3,579	401	105,418	3,084
46 Washington	21	2,840	443	53,501	1,610	1	20		112	20	25	1,022	314	42,975	1,254	47	4,482	597	96,548	2,684
47 West Virginia	9	996	120	18,612	543						18	1,411	142	29,012	965	27	2,447	262	48,594	1,564
48 Wisconsin	61	6,828	973	128,760	4,287						30	1,086	324	43,875	1,201	91	8,814	1,291	179,651	6,410
49 Wyoming	2	49	10	1,065	27						3	87	15	1,429	38	5	136	25	2,491	61
50 Totals (1938)	981	119,521	17,320	2,531,796	80,576	58	4,127	102	28,619	3,140	1,718	165,813	22,421	3,287,631	114,418	2,757	280,011	29,543	5,548,100	198,144
51 (1937)	975	115,283	16,851	2,490,114	79,113	61	4,786	128	30,125	3,205	1,617	157,688	21,383	3,168,917	111,303	2,693	277,757	28,362	5,606,155	192,611
52 (1936)	969	133,268	16,360	2,286,064	74,037	64	4,938	116	33,077	3,341	1,678	167,650	21,222	2,939,651	104,169	2,711	275,474	27,398	5,285,917	181,541
53 (1935)	970	113,268	16,033	1,950,308	69,592	69	5,360	141	33,026	3,670	1,601	149,040	19,018	2,493,981	94,468	2,640	268,168	30,119	4,411,115	161,650
54 (1934)	970	113,268	16,067	1,786,522	63,851	72	5,411	150	34,700	3,691	1,604	149,038	20,014	2,342,513	89,615	2,646	267,712	36,251	4,163,135	151,667
55 (1933)	984	115,840	16,190	1,753,063	63,621	72	5,399	152	36,817	3,487										
56 (1932)	1,001	117,055	16,125	1,918,214	70,119	74	5,550	152	41,390	3,706										
57 (1931)	1,011	116,935	15,861	2,013,352	73,911	76	5,528	161	44,790	3,820										
58 (1930)	1,017	116,816	15,615	1,915,102	75,162	77	5,666	149	37,779	3,779										
59 (1929)	1,024	113,555	15,037	1,757,700	75,700	70	5,283	158	3,627											
60 (1928)	1,055	114,613	13,190			87	5,298	196												
61 (1927)	1,060	108,582			72,813	85	4,935			3,193										

present time were designed to take care of the sick inmates in custodial institutions such as orphanages, homes for the aged, prisons and schools. Statistics given here for these institutions are intended to cover the hospital patients and do not include other inmates. The bed capacity of these hospital departments, 21,808 remains practically the same as eleven years ago and the average census of patients has increased from 12,453 to 14,730. The figures obviously indicate just what the institutions themselves report—that most of such departments have been closed and that sick inmates are now hospitalized mainly in general hospitals. Evidently many of the 235 that still persist are well developed

pitals, we find that the total number of governmental hospitals, including federal state, county, city and city county, was 1,809 in 1927 and 1,728 in 1938. This group of governmental hospitals had a combined bed capacity of 545,169, which has been augmented in the eleven years to 815,136. The average census in these facilities was 470,157 in 1927 and 736,687 in 1938. The very largely custodial nature of governmental hospitalization is, of course, well understood and particularly in relation to the state mental hospitals.

Over against this picture there is the record of the more active and more acute nongovernmental hospital, which now number 4,438 as compared with 4,998 eleven

years ago. The beds have mounted from 308,149 to 346,244 and the average census from 201,675 to 229,019. Striking as is the quantitative increase in hospital facilities for acute or active cases, there is also to be noted the increasing rapidity of turnover. Each year the average length of stay, particularly in general hospitals, is clipped shorter and shorter, now being twelve and one-half days.

available and in many cases are quite adequate for the community for which they are designed to serve.

Those nonprofit organizations which are designated as church hospitals numbered 1,060 at the beginning of the period and now show a total of 981. Their beds have increased from 108,582 to 119,521 and a corresponding increase is noted in patients cared for. It is common to refer to these as church hospitals largely

Table 1—HOSPITAL FACILITIES BY STATES AND BY CONTROL  
C PROPRIETARY

Marginal No	Individual and Partnership					Corporations (Unrestricted as to Profit)					Total Proprietary					TOTAL NONGOVERNMENTAL					Marginal No
	Hospitals	Beds	Basinets	Patients Admitted	Average Census	Hospitals	Beds	Basinets	Patients Admitted	Average Census	Hospitals	Beds	Basinets	Patients Admitted	Average Census	Hospitals	Beds	Basinets	Patients Admitted	Average Census	
1 Alabama	31	1,391	140	28,467	636	7	400	49	8,916	197	38	1,791	189	37,442	833	63	3,566	364	80,358	1,920	1
2 Arizona	9	169	4	731	90	1	21	6	436	10	10	210	10	1,167	100	31	1,313	134	24,945	633	2
3 Arkansas	23	60	63	10,909	271	6	190	26	1,907	47	29	791	89	12,116	318	47	2,415	216	44,739	1,137	3
4 California	105	3,119	414	44,931	1,909	41	2,317	339	51,363	1,485	146	5,436	753	95,294	2,394	261	17,341	2,483	359,962	11,616	4
5 Colorado	25	586	86	7,762	349	6	277	12	2,184	140	31	863	98	9,946	489	83	5,607	538	63,416	3,567	5
6 Connecticut	7	150	4	991	81	12	611	4	1,804	411	19	768	8	2,295	492	59	7,084	1,011	141,167	5,216	6
7 Delaware						1	10	6	241	7				241	7	9	933	162	18,567	545	7
8 Dist. Columbia	2	45		108	28						2	45		108	28	16	2,674	463	62,720	1,867	8
9 Florida	25	776	120	11,634	269	5	176	27	4,192	99	31	952	147	15,626	368	20	3,036	431	50,965	1,427	9
10 Georgia	41	1,135	120	21,326	576	11	513	69	12,866	285	52	1,643	189	34,192	861	78	3,450	442	79,531	2,095	10
11 Idaho	14	336	63	6,465	160	3	66	18	1,364	29	17	422	81	7,829	189	31	1,206	243	27,356	792	11
12 Illinois	34	795	110	8,695	418	21	1,640	194	23,085	899	55	2,438	304	31,780	1,117	234	23,908	3,744	488,379	14,779	12
13 Indiana	14	265	75	5,751	133	8	470	22	8,474	255	23	726	97	14,225	383	74	6,153	986	141,967	3,901	13
14 Iowa	37	562	134	11,062	266	7	203	27	2,815	132	44	755	161	13,817	398	111	6,041	986	119,238	3,625	14
15 Kansas	17	284	49	4,407	139	5	176	22	2,411	109	22	460	71	6,818	248	84	4,354	686	88,437	2,589	15
16 Kentucky	15	407	40	5,301	196	13	479	42	9,642	337	23	886	82	14,943	453	71	4,372	497	84,400	2,533	16
17 Louisiana	17	374	53	10,029	144	12	612	70	1,415	237	29	986	123	27,444	501	55	3,599	360	95,597	2,254	17
18 Maine	12	287	66	4,144	165	8	288	50	5,058	173	20	575	106	9,202	325	51	2,506	391	48,736	1,728	18
19 Maryland	9	330	5	1,132	242	4	250	4	3,870	136	13	385	45	5,002	378	51	6,523	606	102,296	4,914	19
20 Massachusetts	23	505	93	5,601	263	26	1,455	251	25,828	904	49	1,960	344	31,429	1,167	177	15,818	2,388	298,324	10,981	20
21 Michigan	39	947	151	17,842	562	12	534	53	9,019	411	51	1,481	194	22,861	973	146	12,556	1,844	262,508	8,776	21
22 Minnesota	69	1,102	277	21,667	531	13	922	55	24,077	507	52	2,154	332	45,744	1,058	162	8,745	1,345	109,826	5,906	22
23 Mississippi	27	809	109	15,330	319	3	110	13	2,526	41	30	919	122	18,036	300	58	2,207	280	51,943	904	23
24 Missouri	27	745	160	9,240	351	8	251	41	2,621	154	35	1,029	201	11,861	485	110	9,895	1,248	165,316	6,963	24
25 Montana	9	189	46	4,093	82	3	172	26	3,482	90	12	361	72	7,455	172	41	2,966	425	46,635	1,329	25
26 Nebraska	44	722	171	11,749	274	3	154	10	1,256	123	47	816	186	13,065	397	81	3,675	587	67,182	1,994	26
27 Nevada						1	31	11	1,063	22	1	31	11	1,063	22	4	145	34	3,605	99	27
28 New Hampshire						2	186	25	2,243	154	2	186	25	2,243	154	34	1,947	345	36,316	1,217	28
29 New Jersey	12	308	23	1,672	175	10	452	25	2,819	272	22	790	53	4,491	441	115	13,078	1,892	239,888	9,542	29
30 New Mexico	7	129	28	2,793	50	3	85	17	991	22	10	214	45	3,784	72	33	3,421	166	19,567	704	30
31 New York	68	2,264	459	24,997	1,311	43	5,072	661	62,047	2,244	111	5,066	1,120	81,954	3,555	415	49,363	6,703	903,015	36,969	31
32 North Carolina	23	330	43	10,220	402	13	625	46	12,613	334	36	1,358	89	22,893	736	123	6,782	717	155,349	4,209	32
33 North Dakota	8	101	38	1,466	37	2	34	7	710	14	10	135	45	2,116	51	39	2,120	354	45,069	1,219	33
34 Ohio	21	664	46	7,797	440	20	1,293	35	4,533	933	41	1,957	81	22,350	1,393	181	17,405	2,223	350,487	11,881	34
35 Oklahoma	53	1,379	296	30,567	631	16	735	102	14,137	360	69	2,314	328	44,704	991	90	3,675	550	75,695	1,786	35
36 Oregon	14	361	71	6,728	157	15	631	94	12,892	324	29	992	165	19,620	511	54	3,422	512	79,592	2,325	36
37 Pennsylvania	33	1,096	132	8,922	365	12	802	176	13,563	439	45	1,608	258	27,785	1,064	282	34,526	4,293	616,703	21,417	37
38 Rhode Island	2	34		49	26						2	34		49	26	18	2,351	351	38,143	1,647	38
39 South Carolina	7	165	14	4,227	135	1	35		204	21	8	200	14	4,491	160	39	2,277	226	53,662	1,552	39
40 South Dakota	11	277	53	4,797	113	3	111	18	2,893	77	14	388	71	7,190	199	37	1,792	319	36,990	1,030	40
41 Tennessee	28	750	60	12,605	327	9	399	36	5,140	112	35	1,042	96	17,746	439	71	4,015	431	55,737	2,577	41
42 Texas	116	2,411	352	54,618	1,016	42	1,674	297	39,823	881	158	4,125	559	94,501	1,917	244	10,759	1,375	249,641	5,636	42
43 Utah	7	142	45	2,016	57	2	70	18	631	21	9	212	66	2,707	73	20	1,403	296	29,422	885	43
44 Vermont	2	24	10	229	13	5	71	10	855	24	5	95	20	1,184	47	25	2,020	206	28,646	1,646	44
45 Virginia	12	670	61	10,606	399	5	951	110	27,775	633	37	1,651	171	33,381	1,032	51	5,230	516	112,859	3,216	45
46 Washington	24	564	97	11,819	374	7	270	40	3,701	109	31	834	146	11,590	353	75	5,216	943	112,068	3,167	46
47 West Virginia	15	613	67	19,375	353	10	1,449	131	38,763	937	34	2,102	198	58,120	1,290	61	4,540	400	106,644	2,798	47
48 Wisconsin	31	513	132	9,645	217	12	561	36	4,044	364	43	1,014	178	14,559	601	134	9,888	1,477	187,224	6,089	48
49 Wyoming	10	179	39	2,675	78	1	20	5	345	5	11	199	44	3,020	83	16	337	67	5,514	148	49
50 Totals (1913)	1,188	50,193	4,557	495,553	12,255	493	26,550	3,236	470,156	16,670	1,681	56,743	7,703	965,689	20,655	4,438	346,244	47,636	6,513,795	229,019	50
51 (1937)	1,183	29,957	4,766	508,350	15,458	579	25,085	3,516	507,077	16,477	1,713	58,042	8,282	1,015,426	21,935	4,406	335,789	46,644	6,711,592	211,631	51
52 (1936)	1,904	28,496	4,356	437,797	13,672	590	28,511	3,679	497,457	16,462	1,754	57,007	7,985	975,254	20,124	4,465	332,881	45,815	6,194,026	211,631	52
53 (1935)	1,255	29,913	4,384	413,997	14,212	627	34,946	4,357	582,590	18,699	1,892	61,856	8,741	946,587	22,090	4,422	331,442	44,893	5,424,162	200,589	53
54 (1934)	1,710	29,479	4,391	366,313	12,046	629	33,012	4,035	458,303	15,985	1,939	67,501	8,479	824,616	25,031	4,581	330,217	44,650	4,988,257	185,098	54
55 (1933)	1,475	28,385	4,062	331,801	13,746											4,661	332,573	44,619	4,682,444	184,197	55
56 (1932)	1,592	27,750	5,094	425,956	16,309											4,758	334,957	44,572	5,175,568	193,277	56
57 (1931)	1,560	26,764	5,152	459,184	17,012											4,707	332,591	44,222	5,322,895	206,065	57
58 (1930)	1,690	28,557	5,292		19,948											4,907	336,143	47,251		212,645	58
59 (1929)	1,611	37,977	5,212		20,604											4,870	421,596	41,877		209,851	59
60 (1928)	1,699	39,710	4,943													5,079	425,500	37,641			60
61 (1927)	1,682	39,118			21,779											4,993	398,149				61

Figures for the beginning of this eleven year period are not available for incorporated hospitals (for profit and not for profit). Classification on this basis was established in 1934 and figures for subsequent years in these two classifications are presented in table 1.

TABLE 2—HOSPITAL FACILITIES BY STATES AND BY TYPE OF SERVICE

Marginal No		General				Nervous and Mental				Tuberculosis				Maternity				Industrial				Eye, Ear, Nose and Throat				Marginal No		
		Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census			
1	Alabama	66	6,219	445	109,556	4,089	4	6,689	2,474	5,944	7	432	544	203	1	59	12	112	38							1		
2	Arizona	42	2,365	248	40,698	1,347	1	528	386	840	15	1,831	3,029	1,194	1	41	2	34	12							2		
3	Arkansas	48	3,163	247	48,383	1,848	2	5,332	2,066	5,600	2	732	938	717	1	41	2	34	12							3		
4	California	278	28,927	3,025	540,019	21,087	33	32,006	21,854	20,771	45	5,701	7,200	5,062	8	463	163	3,687	247							4		
5	Colorado	69	5,662	615	95,662	3,635	8	5,740	2,770	5,144	15	1,406	1,081	1,015	2	61	29	37	36							5		
6	Connecticut	38	6,148	1,024	145,495	4,437	19	9,432	5,365	9,271	7	1,611	1,264	1,457	1	9	11	81	3							6		
7	Delaware	10	1,038	164	19,704	553	2	1,633	425	1,567	3	224	129	190												7		
8	District of Columbia	15	5,303	590	81,960	4,922	3	6,249	1,016	6,166	5	574	1,065	514	2	255	133	3,984	14							8		
9	Florida	73	5,300	600	98,277	3,046	6	5,044	1,654	4,881	5	574	1,065	514	1	16	14	20	12							9		
10	Georgia	89	8,856	681	174,937	7,732	3	8,849	2,649	8,672	4	649	808	720	1	25	15	69	20							10		
11	Idaho	37	1,607	286	75,377	1,638	3	1,273	292	1,464	1	172	302	125	1	16	14	20	12							11		
12	Illinois	211	27,936	3,773	557,621	18,000	29	42,875	14	12,372	29,320	26	3,610	4	3,860	3,171	8	221	13							12		
13	Indiana	90	8,921	1,233	183,463	5,412	14	13,450	3,637	13,176	10	1,515	1,774	1,308	7	387	347	7,748	28							13		
14	Iowa	116	7,169	1,075	164,768	4,220	14	11,719	3,806	6,797	5	790	683	695	2	52	27	265	19							14		
15	Kansas	93	5,947	771	169,873	3,738	8	6,888	1,688	6,797	3	420	456	357	4	43	134	74	29							15		
16	Kentucky	52	6,827	487	179,306	5,385	10	8,769	4,893	8,449	4	1,110	2	456	2	48	31	135	57							16		
17	Louisiana	44	2,903	403	77,331	2,946	6	7,318	2,698	6,707	4	337	416	243	1	43	19	108	42							17		
18	Maine	41	7,353	773	165,111	5,438	15	3,395	12	10,601	30,006	23	4,367	1,551	1,217	1	14	14	411	10						18		
19	Maryland	143	21,348	2,707	365,525	12,631	28	31,395	10,601	30,006	23	4,367	1,551	1,217	7	400	343	9,838	313							19		
20	Massachusetts	163	17,273	2,301	365,525	12,631	19	23,370	7	6,353	22,468	29	4,046	4,723	3,131	3	189	28	610	103						20		
21	Michigan	168	11,169	1,591	272,327	7,749	16	15,751	18	4,210	14,208	15	2,046	6	1,686	1,875	3	222	82	1,636	136					21		
22	Minnesota	65	2,762	346	69,291	1,776	6	5,580	3,229	5,133	2	403	292	219	3	412	259	3,727	249							22		
23	Mississippi	103	10,715	1,230	209,248	7,307	19	15,638	6	4,711	14,432	6	1,866	2,195	1,641	1	8	40	377	249						23		
24	Missouri	83	3,169	443	70,363	2,676	1	7,112	460	1,850	1	268	208	203	1	40	27	100	10							24		
25	Montana	48	4,968	640	70,363	2,676	5	5,417	880	5,112	1	161	175	154	1	22	39	163	49							25		
26	Nebraska	35	2,141	366	79,486	3,849	2	2,766	710	2,666	2	246	177	100	1	34	19	392	10							26		
27	Nevada	91	13,766	1,935	262,966	9,780	24	23,748	1	5,960	22,733	19	3,641	7	4,959	3,091	3	241	306	6,677	236					27		
28	New Hampshire	41	5,078	722	141,766	4,651	2	626	228	801	17	767	571	13,090	507	1	45	4	39	1						28		
29	New Jersey	334	59,078	7,221	1,417,606	48,551	66	99,060	48	30,580	92,863	62	11,580	11	10,139	10,371	2	767	571	13,090	507					29		
30	New Mexico	113	6,842	818	168,794	4,832	9	7,514	3,431	7,063	20	2,460	3,682	2,090	1	45	4	39	1							30		
31	New York	43	2,408	397	49,214	1,410	2	3,663	559	2,684	1	401	217	225	2	316	171	4,041	155							31		
32	North Carolina	173	19,496	2,494	406,969	13,609	29	27,917	8	7,401	27,737	21	3,719	3,503	3,071	10	316	171	4,041	155						32		
33	North Dakota	53	3,038	528	87,864	2,794	7	8,208	2,610	8,243	6	1,065	2,349	932	1	22	70	276	10							33		
34	Ohio	227	32,462	4,303	667,834	23,784	44	43,475	4	9,640	42,001	17	4,247	4,682	3,978	10	446	189	5,127	303						34		
35	Oklahoma	100	5,746	669	102,976	3,110	6	5,880	2,610	8,243	6	1,065	2,349	932	1	155	155	3,139	169							35		
36	Oregon	43	3,145	239	38,620	2,794	3	3,874	742	3,201	2	525	343	496	1	73	11	167	52							36		
37	Pennsylvania	227	32,462	4,303	667,834	23,784	44	43,475	4	9,640	42,001	17	4,247	4,682	3,978	10	446	189	5,127	303						37		
38	Rhode Island	51	5,668	381	45,605	1,410	3	5,623	454	2,284	2	307	1,003	523	1	73	11	167	52							38		
39	South Carolina	63	5,668	587	120,714	3,922	3	7,114	1,663	4,066	6	808	1,003	523	1	73	11	167	52							39		
40	South Dakota	217	32,462	4,303	667,834	23,784	44	43,475	4	9,640	42,001	17	4,247	4,682	3,978	10	446	189	5,127	303						40		
41	Texas	23	1,458	327	76,761	1,232	2	1,623	625	1,411	3	297	271	180	1	40	40	526	31							41		
42	Utah	80	7,591	697	176,921	4,973	10	11,386	4,757	10,969	9	1,328	1,019	1,130	2	49	40	526	31							42		
43	Vermont	24	1,458	327	76,761	1,232	2	1,623	625	1,411	3	297	271	180	1	40	40	526	31							43		
44	Virginia	80	7,591	697	176,921	4,973	10	11,386	4,757	10,969	9	1,328	1,019	1,130	2	49	40	526	31							44		
45	Washington	81	7,253	1,068	141,211	4,588	8	9,000	2,963	8,245	11	1,297	2,035	1,155	4	104	61	245	72							45		
46	West Virginia	62	5,091	503	118,294	3,113	5	3,968	1,184	3,920	6	762	572	743	1	23	2	36	2							46		
47	Wisconsin	177	11,943	1,680	236,771	7,505	51	16,460	5	6,245	15,600	21	2,168	2,277	1,987	1	70	14	131	42						47		
48	Wyoming	23	1,113	135	19,961	976	3	1,577	780	1,501	1	371	58	28												48		
49	Totals (1938)	4,256	47,324	52,924	8,545,970	292,870	4	502	501,824	177	108,701	623,337	479	70,022	11	100,801	64,242	120	5,007	1,301	66,114	3,099	17	2,972	2	49,608	1,482	49
50	Totals (1937)	4,215	41,021	51,068	8,340,773	288,280	4	570	540,616	184	107,624	644,906	469	76,751	11	100,801	64,242	111	5,466	1,301	66,114	3,099	17	2,972	2	49,608	1,482	50
51	Totals (1936)	4,207	40,760	49,034	7,755,848	271,658	534	548,942	106	184,635	624,906	469	76,751	11	100,801	64,242	111	5,466	1,301	66,114	3,099	17	2,972	2	49,608	1,482	51	
52	Totals (1935)	4,207	40,760	49,034	7,755,848	271,658	534	548,942	106	184,635	624,906	469	76,751	11	100,801	64,242	111	5,466	1,301	66,114	3,099	17	2,972	2	49,608	1,482	52	
53	Totals (1934)	4,108	39,342	47,850	6,991,551	267,305	634	513,845	81	172,835	588,941	405	70,673	13	88	113	60	738	4,001	1,301	66,114	3,099	17	2,972	2	49,608	1,482	53
54	Totals (1933)	4,108	39,342	47,850	6,991,551	267,305	634	513,845	81	172,835	588,941	405	70,673	13	88	113	60	738	4,001	1,301	66,114	3,099	17	2,972	2	49,608	1,482	54
55	Totals (1932)	4,108	39,342	47,850	6,991,551	267,305	634	513,845	81	172,835	588,941	405	70,673	13	88	113	60	738	4,001	1,301	66,114	3,099	17	2,972	2	49,608		

TABLE 2.—HOSPITAL FACILITIES BY STATES AND BY TYPE OF SERVICE—Continued

Marginal No	Children's				Orthopedic				Isolation				Convalescent and Rest				Hospital Departments of Institutions				All Other Hospitals				Totals				Marginal No			
	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census	Hospitals	Beds	Patients Admitted	Average Census				
1	Alabama	1	50	1,069	29	1	45	215	33																86	13,115	458	117,786	10,497	1		
2	Arizona	1	83	692	56	2	13	254	127	1	10	157	6	12	370	1,444	281	0	1,16	8,060	75	75	4	707	48	60	4,841	44,171	8,411	2		
3	Arkansas	4	250	10,121	263	2	13	254	127	1	10	157	6	12	370	1,444	281	0	1,16	8,060	75	75	4	707	48	50	9,711	2,7	7,930	3		
4	California	1	200	3,037	134	1	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	378	70,255	3,100	609,704	50,728	4
5	Colorado	1	200	3,037	134	1	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	101	13,433	644	100,100	10,100	5
6	Connecticut	1	200	3,037	134	1	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	75	18,722	1,043	156,531	15,788	6
7	Delaware	1	200	3,037	134	1	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	15	2,885	106	90,248	2,340	7
8	District of Columbia	1	200	3,037	134	1	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	25	13,748	653	104,144	12,025	8
9	Florida	1	40	1,660	33	2	115	375	72	1	22	90	10	4	696	3,841	426	1	105	53	100		53	100	91	11,290	610	91	11,290	610	9	
10	Georgia	1	40	1,660	33	2	115	375	72	1	22	90	10	4	696	3,841	426	1	105	53	100		53	100	110	16,074	708	146,696	13,112	10		
11	Idaho	2	3,2	4,313	215	3	480	694	322	3	480	4,768	208	8	523	2,073	353	11	508	15	10,012	951	1,708	1,206	20	81,800	413	643,800	60,836	11		
12	Illinois	1	200	3,037	134	1	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	131	23,043	1,300	600,840	20,872	12
13	Indiana	1	200	3,037	134	1	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	151	20,572	1,196	160,807	17,009	13
14	Iowa	1	75	1,100	48	2	90	460	82	1	45	3	407	18	2	70	112	66	9	8,079	340	5,500	311	318	113	118	14,332	802	122,803	11,400	14	
15	Kansas	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	95	15,723	625	117,741	12,851	15
16	Kentucky	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	62	16,182	487	107,637	12,851	16
17	Louisiana	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	79	19,732	77	142,332	16,704	17
18	Maine	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	18
19	Maryland	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	19
20	Massachusetts	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	20
21	Michigan	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	21
22	Minnesota	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	22
23	Mississippi	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	23
24	Missouri	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	24
25	Montana	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	25
26	Nebraska	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	26
27	Nevada	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	27
28	New Hampshire	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	28
29	New Jersey	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	29
30	New Mexico	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	30
31	New York	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	31
32	North Carolina	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	32
33	North Dakota	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	33
34	Ohio	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	34
35	Oklahoma	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	35
36	Oregon	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	36
37	Rhode Island	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	37
38	South Carolina	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	38
39	South Dakota	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	39
40	Tennessee	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	40
41	Texas	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	41
42	Vermont	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	42
43	Virginia	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	43
44	Washington	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,203	100	2,1	60,908	3,050	413,067	52,004	44
45	West Virginia	1	100	487	70	2	200	100	180	2	223	2	8,000	101	2	22	41	14	4	447	10	3,385	293	101	1,2							

the first time in history this number has passed beyond the 1,000,000 mark. What percentage this is of all births for the year 1938 is not known because the final statistics for the year are not yet to be had. The latest available statistics give the total live births both inside and outside of hospitals for 1937 as 2,203,337.

The accompanying compilation of statistics on births in hospitals shows the figures for 1929, 1937 and 1938

#### Births in Hospitals

	1929	1937	1938
<b>According to Ownership or Control</b>			
Federal	2,206	6,608	7,827
State	9,120	18,800	22,784
County	17,527	46,807	49,640
City	45,187	77,441	86,767
City-county	8,806	10,044	11,521
<b>Total governmental</b>	<b>83,441</b>	<b>1,09,400</b>	<b>178,534</b>
Church	269,726	306,110	336,606
Fraternal	1,730	1,898	1,603
Associations and restricted corporations		363,916	403,298
Industrial	4,327		
Independent associations	283,136		
<b>Total nonprofit</b>		<b>671,909</b>	<b>741,857</b>
Individual and partnership	39,436	49,834	54,107
Corporations (unrestricted as to profit)		51,719	52,443
<b>Total proprietary</b>		<b>101,553</b>	<b>106,550</b>
<b>Total nongovernmental</b>	<b>538,305</b>	<b>773,512</b>	<b>848,231</b>
<b>According to Type of Service</b>			
General	566,177	687,231	976,970
Maternity	53,010	44,449	47,781
Children's	862	1,642	1,517
Hospital departments of institutions	277	189	211
All other hospitals	1,561	401	392
<b>Total births in all hospitals</b>	<b>621,896</b>	<b>902,912</b>	<b>1,026,771</b>

thereby affording comparison between this year and last and also over a ten year period. In 1929 there were 621,896 births in hospitals and 83,541 of these, or 13.4 per cent, were in governmental hospitals, including all federal, state, county, city and city-county hospitals. Those same groups of governmental hospitals reported for 1938 a total of 178,534 births or 17.4 per cent of the births reported in all hospitals. The increase has been due mainly to extension of government aid

#### Hospitals, Sanatoriums and Related Institutions

	Hospitals	Beds	Bassinets	Births	Patients Average
Hospitals and sanatoriums	4,974	981,503	54,191	1,005,260	9,070,000
Related institutions	1,192	179,827	2,503	21,511	3,010,020
<b>Total registered hospitals</b>	<b>6,166</b>	<b>1,161,330</b>	<b>56,694</b>	<b>1,026,771</b>	<b>9,080,020</b>

to indigents and other beneficiaries. The large number of births in state hospitals comes mainly from the state university and charity hospitals used for teaching purposes. The county, city and city-county hospitals would, of course, participate in the general increased use of hospitals for maternity purposes, much the same as the nonprofit or other voluntary hospitals.

The Indian hospitals maintained by the Department of the Interior reported a total of 4,237 births.

While almost any size and type of a hospital or medical institution is at least occasionally used for childbirth, the largest share of this work by far goes to the general hospitals. In 1929 the general hospitals reported 566,177 births or 91 per cent of the total births for that year. In 1938 the general hospitals

reported 976,970 births, or 95.1 per cent of all the births for that year.

In 1929 there were 47,939 bassinets and the number of births was equivalent to thirteen per bassinet. In 1938 there were 56,747 bassinets and the births were equivalent to eighteen per bassinet.

#### SUPPLY AND UTILIZATION OF BEDS IN GENERAL HOSPITALS

In determining whether and where there is need of additional hospital facilities, it is obviously necessary first to ascertain the extent to which existing facilities are being utilized. In the accompanying table the states are arranged in the order of the number of their general hospital beds per thousand of population. Mississippi,

#### Supply and Utilization of Beds in General Hospitals

State	Beds per Thousand Population	Per Cent of Occupancy	Group Average
Mississippi	1.4	54	
Arkansas	1.5	50	
Kentucky	1.8	37	
Georgia	1.9	64	
North Carolina	2.0	83	
Tennessee	2.0	10	
South Carolina	2.1	69	
Alabama	2.1	66	
Texas	2.2	50	
Oklahoma	2.3	54	
Indiana	2.4	67	
West Virginia	2.7	67	
Missouri	2.7	65	
Iowa	2.8	63	
Virginia	2.8	60	
Ohio	2.9	70	
New Jersey	3.2	71	
Kansas	3.2	63	
Louisiana	3.2	79	
Florida	3.2	57	
Idaho	3.3	60	
Pennsylvania	3.3	71	
Nebraska	3.4	58	
Maine	3.4	70	
North Dakota	3.4	61	
Connecticut	3.5	79	
Illinois	3.5	66	
Michigan	3.6	73	
Utah	3.6	60	
South Dakota	3.7	50	
Oregon	3.8	11	
Vermont	3.9	67	
Delaware	3.9	58	
Wisconsin	4.1	64	
New Hampshire	4.2	61	
Minnesota	4.2	10	
New York	4.2	19	
Washington	4.4	63	
Maryland	4.4	73	
Rhode Island	4.6	70	
California	4.7	73	
Wyoming	4.7	61	
Massachusetts	4.8	72	
New Mexico	5.0	57	
Colorado	5.3	64	
Arizona	5.6	58	
Montana	5.9	56	
Nevada	6.2	63	
District of Columbia	8.6	80	

Population estimated by the United States Bureau of Census July 1, 1937.

having the least hospital facilities, has 1.4 beds per thousand. At the other end of the scale, the District of Columbia has 8.6 beds per thousand, many of which, however, serve not the inhabitants of the District only but federal employees throughout the country.

Dividing the states into groups having hospital facilities in the ratio of 1 to 2, 2 to 3, 3 to 4, and so on, beds per thousand, the utilization of these facilities (per cent of occupancy) in each group steadily rises as the number of hospital beds increases. Four states with from

1 to 2 beds per thousand show a use of 59 per cent. The next group, twelve states, with hospital beds running from 2 to 3 per thousand, report 65 per cent occupancy. The next group, seventeen states with a ratio of from 3 to 4 beds per thousand, keep these beds 69 per cent filled. In ten states, with from 4 to 5 beds per thousand, utilization is 73 per cent. In four states having from 5 to 6 beds per thousand, occupancy drops to 60 per cent.

It is obvious, therefore, that hospital facilities are most used where they are most abundant and that where the ratio of beds to population is lowest the rate of occupancy is also lowest. In other words, hospitals have been built in response to a community demand and have not, as a rule, been built where there is no demand. Doubtless some states would show a higher rate of occupancy if additional funds were available for hospitalization of the indigent. In other states, education is needed to overcome popular prejudice. In any case, no single formula for hospital facilities is applicable to all parts of the country or to the habits and customs of all the people.

#### METHODS OF REGISTERING AND APPROVING HOSPITALS

The vast majority of hospitals in the Register have been in operation for a number of years and are therefore, more or less, permanent fixtures. Contact is maintained with them through the annual census and

#### *Hospitals in Alaska, Canal Zone, Guam, Hawaii, Philippine Islands, Puerto Rico and Virgin Islands*

	Hospitals	Beds	Basinsets
Alaska	19	530	66
Canal Zone	9	1 620	40
Guam	1	171	10
Hawaii	47	5 154	272
Philippine Islands	117	10 320	690
Puerto Rico	61	6 079	338
Virgin Islands	5	348	41
Totals (1938)	200	24 932	1 407
(1937)	243	22 464	1 382
(1936)	280	20 710	1 289
(1935)	233	19 416	1 100
(1934)	221	18 430	1 020
(1933)	210	18 794	1 036

through correspondence between the Council's office and the hospital field. Those registered hospitals which are approved for the training of interns and for residencies in specialties are subject to regular, thorough inspection by members of the Council's staff of hospital examiners. The inspected hospitals, therefore, receive more than one half of all the patients admitted to all hospitals each year. In addition to the approved hospitals the Council's examiners have visited more than a thousand other registered hospitals.

Other ways of knowing whether a hospital deserves continued registration include constant correspondence with officials of local and state medical societies and the cooperation of other agencies which are active in the evaluation of individual hospitals, including the American College of Surgeons, American Hospital Association, Catholic and Protestant hospital associations and various other national, regional and state organizations.

The Council must also have complete information regarding all prospective hospitals, projects, plans and prospects for new buildings, alterations and changes in capacity or status. Much of this information is obtained through the service of newspaper clipping bureaus and

through systematic checking of telephone directories, the news sections of hospital and medical journals, and lists of hospitals maintained by local and national governmental agencies. Most helpful are the hospitals themselves.

In the case of a new hospital or one that has changed ownership or status, the institution itself supplies information regarding its capacity, equipment, type of service and list of physicians, and in general it outlines the work which it is designed to do. When this information is received at the Council's office, the record of each physician is examined in the biographic files of the American Medical Association. Information and advice are obtained from officials of constituent and component medical societies where the hospital is located, also from state, city and county health departments. Inspections are made on request. A personal visit by a member of the Council's staff is sometimes made either through a special trip or when inspecting hospitals for intern and resident training in that district. When sufficient evidence has been obtained to justify a decision, the hospital's application and supporting data are laid before the Council in session.

These means of evaluating hospital service are employed as a matter of justice to the hospital and, above all, for protection to the public.

#### HOSPITALS REFUSED REGISTRATION

The 636 institutions refused registration are not included in our compilation of statistics. Their capacity equals a little more than 1 per cent of that of the registered hospitals. From the standpoint of hospitalization, therefore, they are not needed.

These concerns, because of alleged unethical or questionable practices, admission to their staffs of members who are seriously unqualified either morally or professionally, flagrant methods of advertising or for other valid reasons, are deemed unworthy of being included in any published list of reputable hospitals. Not only are they left out of the Register and the American Medical Directory but their names are consistently omitted from all publications of the Association and they are refused admission to the advertising columns.

The public is thus helped to distinguish between the good and the bad in hospitals. As a result, it is considered a disgrace among hospitals and physicians to be refused registration, and institutions that are rejected are frequently aroused and correct the objectionable practices in order that they may be recognized. Public and professional opinion forces many such institutions to sell their buildings to more reputable owners or to close up.

The Register is used as a basic list of hospitals. Industrial and governmental agencies use it in selecting hospitalization for their dependents and beneficiaries. Physicians consult it when referring patients.

Other organizations have shared largely in the good work that the American Medical Association has accomplished by its vigilance in distinguishing between the fit and the unfit in the hospital field. The American College of Surgeons has cooperated by refusing to consider for its approval an unregistered hospital, and the American Hospital Association has followed the Register in considering applications for institutional membership. It is evident also that the public in general limits its patronage and its donations to hospitals that are considered worthy of a place in the Register.

Opportunity is always open to unregistered hospitals to mend their ways and merit registration.



## INTERNSHIPS, RESIDENCIES AND FELLOWSHIPS

## NUMBER OF INTERNSHIPS

At present 734 hospitals are approved for the training of interns. These provide a total of 7,373 internships, but only about 6,100 positions are available each year. A comparison with the number of graduates in the United States, 5,194 in 1938, indicates that approximately 900 positions cannot be filled from our own medical schools.

Obviously this does not represent the actual number of vacancies, for many positions are held by second year

TABLE A—Growth of Internships

	Number of Hospitals	Available Internships	Medical Graduates (U S)
1914	603	3 095	3 594
1920	510	3 119	3 120
1930	614	5 531	4 567
1934	712	7,167	5 377
1938	729	7 373	5 194

interns, foreign graduates and applicants from Canadian medical schools. (Total graduates, United States and Canada, 5,691.)

The fact remains, however, that currently a relative shortage of interns exists and many hospitals are finding it difficult to complete their house staffs. An institution faced with this problem should attempt to employ second year interns either on a rotating basis or in the capacity of general residents. Should the difficulty persist the hospital might find it advantageous to transfer its entire educational service to a general residency plan.

## TYPES OF INTERNSHIPS

The Council on Medical Education and Hospitals approves rotating and mixed internships and straight intern services in medicine, surgery, pediatrics and pathology. Of the approved intern hospitals 622 offer a full rotating service with assignments in medicine, surgery, pediatrics, obstetrics and the laboratories. Sixty-nine have mixed internships which represent more than one of the clinical specialties but do not include all of the divisions listed above. Fifteen hospitals offer straight internships limited to a single specialty, while twenty-three have straight services in addition to the rotating or mixed types.

At present there are twenty-seven hospitals offering straight internships in medicine, twenty-six in surgery, thirteen in pediatrics and fifteen in pathology. A few are providing straight internships in the limited fields of cardiology, dermatology and syphilology, obstetrics, ophthalmology-otolaryngology, neurology, psychiatry, neurosurgery, radiology and urology. It is now generally agreed that training in limited specialties should be reserved for residents, fellows or other graduate students who have already fulfilled the educational requirements of the intern year.

## LENGTH OF INTERNSHIPS

By reference to table B and the corresponding tabulation in the Hospital Number of the THE JOURNAL March 26, 1938, it will be noted that there has been little change in the length of internships. Most of the services are still on a one year basis, although an appreciable number extend over a period of eighteen months or two years. A total of 578 hospitals have internships of one year's duration, while twenty-six are of eighteen months and eighty-four of two years or more.

## MINIMUM NUMBER OF INTERNS

In estimating the quality of intern training, one of the factors to be considered is the case load in relation to the size of the house staff. While it is difficult to state the optimum relationship that should exist, it has been determined by actual study of educational services that the average ratio in some of the leading hospitals is approximately one intern to 450 or 500 admissions a year.

Since hospitals approved for intern training are required to maintain an annual admission rate of 2,000 patients or more, it is apparent that any institution offering an educational program in accordance with the Essentials of the Council should employ at least three and preferably four interns. It has frequently been noted that single internships and services employing only two men are poorly organized and far too often present an indiscriminate assignment of duties based largely on institutional rather than educational needs. Usually there is an unbalanced service with interns being required to devote an excessive amount of time to surgery, emergencies and ordinary routine procedures.

Hospitals that are not in position to offer an organized training program for at least three interns should not assume the educational responsibilities of the fifth year of medicine. Their type of service is better suited to the continued training of second year men who wish to secure additional hospital experience of a general nature.

At present there are forty hospitals which employ less than three interns. Nearly twenty have a capacity in excess of 150 beds and admit more than 3,000 patients a year. These institutions should consider the

TABLE B—Number and Length of Internships According to Type

Type	12 Months	14 Months	15 Months	16 Months	18 Months	21 Months	22 Months	Over 21 Months	Variable	Total	Number of Interns
Rotating	504	1	2	1	23	1	75	3	19	629	5,700
Straight	8									8	41
Mixed	59				3	1	5		1	69	473
Combination	7						1		10	23	137
	578	1	2	1	26	1	81	3	30	720	6,351

advisability of transferring their educational service to a general or mixed residency basis as recommended above.

## CANCELLATION OF CONTRACTS

Since July 1, 1938, the Council has received notification of 138 internships and residencies terminated without fulfillment of contracts. Reports received from hospitals and individuals concerned indicate that 114 appointments were discontinued by mutual consent, seventeen were vacated without the approval of the hospital and seven ended in dismissal for infraction of the rules. As far as can be determined, the cancellations resulted from the following causes:

More desirable appointment available	44
To enter private practice	21
General dissatisfaction	20
Illness	11
Financial difficulties	11
Failure to complete medical course	10
Dismissal for infraction of rules	7
Various personal reasons	7
Illness at home	4
Failure of hospital to verify appointment	3

The Council expects both the hospital and the appointee to observe the terms of the residency or internship agreement. This should preferably be in the form of a written contract best to protect the interest of both parties. On the part of the hospital

#### General Hospitals by Size

State	Under 10 Beds	10-25	26-50	51-100	101-200	201-300	Over 300	Total
Alabama		14	25	16	8	2	3	66
Arizona	1	8	21	6	5	1		42
Arkansas	1	20	11	9	4	2	1	48
California	5	68	53	34	39	19	20	238
Colorado	6	25	14	9	0	4	2	60
Connecticut	1	1	6	9	7	9	5	38
Delaware		1	2	3	3	1		10
District of Columbia				2	2	4	7	15
Florida		20	22	15	12	2	2	73
Georgia	2	32	26	15	8	3	3	89
Idaho		16	12	6	3			37
Illinois	2	33	32	61	56	12	15	211
Indiana		20	23	16	17	6	3	90
Iowa	4	42	30	18	19	2	1	116
Kansas	2	40	17	22	6	5	1	93
Kentucky	2	22	19	13	11	4	1	72
Louisiana	1	22	7	9	6	2	5	62
Maine		16	18	9	4	2		49
Maryland		4	11	6	13	4	6	44
Massachusetts	1	20	29	32	35	10	10	143
Michigan	4	51	40	25	27	5	11	163
Minnesota	6	78	40	16	16	7	5	168
Mississippi		24	26	13	1	1		65
Missouri	2	15	25	18	17	9	7	93
Montana		17	17	10	8		1	53
Nebraska	5	45	12	12	10	2	2	88
Nevada		5	6	2	1			14
New Hampshire		6	12	12	5			35
New Jersey		6	16	23	21	16	9	91
New Mexico	1	18	13	5	2	1	1	41
New York	3	37	53	88	80	30	43	334
North Carolina	1	17	45	37	11		2	113
North Dakota	3	12	12	10	6			43
Ohio	5	26	37	29	27	16	13	153
Oklahoma	3	47	35	10	5	3	3	106
Oregon		16	16	13	3	2	3	53
Pennsylvania	1	14	42	70	57	19	24	227
Rhode Island			3	2	5	3	13	23
South Carolina		7	14	15	5	2	2	45
South Dakota		23	11	9	7	1		51
Tennessee		22	18	8	7	4	4	63
Texas	7	116	63	33	16	6	6	247
Utah	2	7	7	3	2	3	1	25
Vermont		4	8	7	5			24
Virginia	1	14	24	23	11	1	6	80
Washington		24	18	16	15	4	4	81
West Virginia		7	18	20	13	4		62
Wisconsin	3	42	37	19	27	5	4	137
Wyoming	1	11	5	3	2	1		23
Totals	76	1,135	1,054	861	618	242	239	4,286

there is an obligation to furnish instruction and clinical training in accordance with the essentials governing intern or residency training. Consequently if conspicuous defects exist in the quality of the educational service the position of the hospital is immediately impaired. On the other hand, it is expected that interns and residents conform to the traditions of the profession, that they conduct themselves in an ethical manner and that their action be such as to protect the welfare of patients and the interests of the hospital if circumstances should develop that would necessitate readjustment of contracts. Hospitals have always been generous in granting leave of absence or permitting the appointee to withdraw from active service when requests are based on justifiable grounds. It is expected that interns and residents be equally considerate of the hospital needs and that ample time be given to permit the management and staff to rearrange the services or employ a satisfactory substitute. Failure to fulfil a contract in the absence of a satisfactory explanation will be recorded in the biographic files of the American Medical Association. Notice of such action is sent to the intern's medical school and may be furnished on request to hospitals where new appointments are sought and to licensing and certifying boards. Termination of contracts without consent is viewed with such seriousness

that the Washington State Medical Association has recently passed a resolution requiring applicants for county medical society membership to submit evidence that internship contracts have been satisfactorily fulfilled. Further reference to incompleting internships is contained in the A M A Interns' Manual, pages 16 and 17.

#### GRADUATES OF FOREIGN MEDICAL SCHOOLS

The influx of graduates from foreign medical schools is continuing as a problem of major importance from the point of view of hospital training, licensure and subsequent adjustment in the field of medical practice. During the academic year 1937-1938 there were 1,346 citizens of the United States enrolled in faculties of medicine abroad and 318 completed the medical course. This is only part of the problem, however, since in 1937 there were 919 foreign graduates admitted to the licensing examinations in various states and 147 licensed by endorsement of credentials.

Many of the foreign graduates are seeking appointments as interns in approved hospitals. In 1937, for

#### Radiology Departments

State	Hospitals Having X Ray Departments		M D Directors	
	1937	1938	1937	1938
Alabama	69	73	58	60
Arizona	42	43	32	34
Arkansas	41	49	38	41
California	279	244	243	238
Colorado	76	75	62	64
Connecticut	53	52	49	48
Delaware	12	12	12	12
District of Columbia	24	23	23	23
Florida	77	70	66	68
Georgia	50	97	70	76
Idaho	35	38	25	30
Illinois	262	265	220	222
Indiana	108	103	77	81
Iowa	122	125	97	103
Kansas	98	97	87	83
Kentucky	61	62	65	61
Louisiana	69	60	52	55
Maine	53	54	39	44
Maryland	57	59	53	56
Massachusetts	158	156	171	182
Michigan	187	197	160	167
Minnesota	176	179	124	135
Mississippi	69	70	53	54
Missouri	92	114	87	102
Montana	43	47	31	32
Nebraska	85	75	69	74
Nevada	11	11	7	7
New Hampshire	37	38	31	32
New Jersey	127	105	122	98
New Mexico	42	45	36	39
New York	450	469	411	432
North Carolina	127	130	105	102
North Dakota	40	39	28	27
Ohio	192	197	165	163
Oklahoma	102	115	78	89
Oregon	59	61	44	43
Pennsylvania	258	255	269	272
Rhode Island	21	20	19	19
South Carolina	49	50	42	42
South Dakota	46	47	39	40
Tennessee	80	81	77	69
Texas	261	269	193	209
Utah	25	27	22	24
Vermont	24	25	20	21
Virginia	96	95	85	81
Washington	95	91	82	75
West Virginia	67	70	54	58
Wisconsin	153	161	115	119
Wyoming	25	23	17	17
Totals	4,594	4,912	4,140	4,216

example, there were 245 employed in 105 hospitals throughout nineteen states. Last year 149 approved hospitals in twenty-nine states reported a total of 312. Reference to table C will show that hospitals in Eastern states are absorbing most of the foreign graduates, especially New York, New Jersey, Pennsylvania and Connecticut. A considerable number are also employed in hospitals in Ohio and Illinois.

The American Medical Association has adopted the following resolution in an effort to solve the perplexing problems associated with graduates of foreign medical schools

*Resolved*, That when suitable graduates of class A schools of the United States and Canada are not available, hospitals

TABLE C—Hospitals Employing Foreign Graduates

	1937		1938	
	No of Hospitals	No of Interns	No of Hospitals	No of Interns
California	3	9	5	9
Colorado			2	2
Connecticut	3	4	8	12
Delaware			1	1
District of Columbia	1	1	1	1
Florida	1	1	1	1
Georgia			1	1
Illinois	7	7	16	24
Indiana	1	2	1	1
Iowa	1	2	2	1
Kansas			1	1
Kentucky			2	2
Maine	1	1	1	2
Maryland	4	5	3	6
Massachusetts	6	9	4	9
Michigan			4	4
Minnesota	1	1	2	2
Missouri	1	1	1	2
New Jersey	12	13	14	11
New York	4	171	4	142
North Carolina			1	1
North Dakota			1	1
Ohio	2	2	7	14
Oregon			1	1
Pennsylvania	8	9	17	18
Texas	2	2		
Virginia			1	1
Washington	2	3	1	1
West Virginia			2	2
Wisconsin	2	2	3	1
	101	240	149	312

approved for intern training may accept graduates of European universities who have passed parts I and II of the examinations of the National Board of Medical Examiners

From the foregoing it is apparent that foreign graduates should not displace senior students of approved medical schools in the United States and Canada

TABLE D—Approved Internship Hospitals with Highest Necropsy Percentages (Includes All Over 70 per Cent, 1937)

	Control	Necropsy Percentage
1 Research and Educational Hospital Chicago	State	88.2
2 Letterman General Hospital San Francisco	Army	87.8
3 University of Nebraska Hospital Omaha	State	84.0
4 Kansas City General Hospital Kansas City Mo	City	80.6
5 United States Naval Hospital San Diego Calif	Navy	84.4
6 Trinity Hospital Minot N D	Church	83.7
7 University of Kansas Hospitals Kansas City Kan	State	81.8
8 Mary Hitchcock Memorial Hosp Hanover N H	NPAssn	80.9
9 United States Marine Hospital Baltimore	USPHS	79.7
10 United States Naval Hospital Washington, D C	Navy	78.9
11 Evanston Hospital Evanston Ill	NPAssn	78.9
12 St Luke's Hospital Kansas City Mo	Church	78.4
13 Montefiore Hosp for Chronic Diseases New York	NPAssn	78.1
14 Station Hospital San Antonio Texas	Army	76.5
15 Santa Fe Coast Lines Hospital Los Angeles	NPAssn	75.3
16 St Luke's Hospital Duluth Minn	NPAssn	74.8
17 Colorado General Hospital Denver	State	74.6
18 Albany Hospital Albany N Y	NPAssn	74.3
19 William Beaumont General Hosp, El Paso Texas	Army	74.1
20 St Joseph Hospital Kansas City Mo	Church	73.4
21 Santa Barbara Gen Hosp Santa Barbara Calif	County	73.0
22 Grasslands Hospital Valhalla N Y	County	73.1
23 United States Naval Hospital Mare Island Calif	Navy	72.0
24 St Mary's Hospital Duluth Minn	Church	71.7
25 United States Marine Hospital Norfolk Va	USPHS	71.5
26 University of Chicago Clinics Chicago	NPAssn	70.5
27 University Hospitals Minneapolis	State	70.2

Furthermore, it devolves on individual hospitals to determine the identity of the candidate, the authenticity of his credentials, and that his professional qualifications are acceptable. Most hospitals are quite unpre-

pared to verify and evaluate foreign credentials, since faculties of medicine abroad have not been inspected and classified as in the case of American and Canadian schools. Applicants should therefore be required to submit translations of medical diplomas and licenses to practice over the signature of the nearest consul representing the country in which the training was obtained. The professional qualifications can be determined by the candidate's ability to pass parts I and II of the National Board. As a matter of fact this serves also as a convenient method of verifying foreign credentials.

In anticipation of taking the foregoing examinations, foreign graduates may be accepted in the capacity of substitutes, but their continued employment should be contingent on the successful passing of parts I and II of the National Board. In other words a permanent appointment should not be made until these requirements have been fulfilled, nor should the internship begin until official notification is received from the National Board that parts I and II have been success-

TABLE E—Approved Internship Hospitals with Highest Necropsy Percentages (Includes All Over 70 per Cent Reported for 1938)

	Control	Necropsy Percentage
1 Trinity Hospital Minot N D	Church	86.4
2 Mary Hitchcock Memorial Hosp Hanover N H	NPAssn	84.6
3 University of Nebraska Hospital Omaha	State	84.2
4 U S Naval Hospital Washington D C	Navy	83.3
5 Ancker Hospital St Paul	City Co	81.7
6 University Hospitals Minneapolis	State	81.3
7 Kansas City General Hospital Kansas City Mo	City	81.2
8 University of Chicago Clinics Chicago	NPAssn	80.8
9 U S Marine Hospital Norfolk Va	USPHS	79.2
10 University of Kansas Hospitals Kansas City Kan	State	78.9
11 Colorado General Hospital Denver	State	76.6
12 Johns Hopkins Hospital Baltimore	NPAssn	76.0
13 St Luke's Hospital Kansas City Mo	Church	75.8
14 Montefiore Hosp for Chronic Diseases New York	NPAssn	75.1
15 University of California Hospital San Francisco	State	74.8
16 St Francis Hosp and Sanit Colorado Springs	Church	74.0
17 Iowa Methodist Hospital Des Moines	Church	73.7
18 Hospital of the Protestant Episcopal Church Philadelphia	Church	70.1
19 Albany Hospital Albany N Y	NPAssn	74.0
20 U S Marine Hospital Baltimore	USPHS	72.0
21 U S Naval Hospital Mare Island Calif	NPAssn	71.4
22 Beverly Hospital Beverly Mass	NPAssn	70.8
23 Presbyterian Hospital Philadelphia	Church	70.8
24 St Joseph Hospital Kansas City Mo	Church	70.1

fully completed. Needless to say a certificate of internship should not be granted until these provisions have been fulfilled.

#### COMPUTATION OF NECROPSY PERCENTAGE

In the computation of necropsy rates in hospitals approved for intern training, all deaths are considered with the exception of still-births. No attempt is made to differentiate between institutional and noninstitutional deaths as based on a twenty-four or forty-eight hour classification, but due allowance is made in accordance with the following resolution of the Council when legal restrictions interfere with the use of pathologic material for teaching purposes.

*Resolved*, That those cases removed from the jurisdiction of a hospital by coroner or medical examiner, and in consequence not available as teaching material for interns, may be deducted from the total hospital deaths in computing autopsy percentages. This provision also extends to bodies legally assigned to qualified educational institutions for dissection.

From this it is apparent that coroner's cases may be excluded from the compilations if the hospital is prevented by regulation from conducting its own examinations. In other words, no penalty attaches to the hospital when bodies are removed from the institution through legal methods and over which the hospital has

no control On the other hand, coroner's cases may be included in the compilation if they serve a genuine educational purpose, that is, they are performed on the premises of the hospital by a qualified pathologist, they may be witnessed by members of the house staff and a complete protocol exists in the hospital record system

TABLE F—Number and Length of Residencies According to Specialties—1938

Specialty	Number of Hospitals							Number of Residencies
	12 Months	16 to 21 Mos	24 Months	25 to 34 Mos	36 Months	Over 36 Mos	No Report	
1 Internal Medicine								
a General medicine	111	17	1	20	5		104	404
b Cardiology	4						4	4
c Communicable diseases	13	1					14	40
d Tuberculosis	48	7		10	1	1	72	221
e Malignant diseases	7	1	2	1			12	44
f Mixed residency	6						6	11
2 Pediatrics	71	9	2	9	5		96	309
3 Psychiatry and Neurology								
a Neurology	7	2	4		3	1	17	49
b Psychiatry	56	1	11		31	2	101	306
c Epilepsy	2						2	2
d Mental deficiencies	1						1	2
4 Dermatology and Syphilology	6	1	5		7		19	39
5 Obstetrics and Gynecology								
a Gynecology	14	1	2		3	1	21	37
b Obstetrics	33	4	6		5	1	50	99
c Obstetrics gynecology	3	3	10	1	12	7	66	215
6 Surgery								
a General surgery	110	2	20	2	26	14	179	670
b Neurosurgery	7		3		3		13	19
c Thoracic surgery	3	1	3		1		8	20
d Industrial surgery	1						1	1
e Fractures	1	1					2	2
f Plastic surgery	2						2	2
g Anesthesia	12		3		4		19	62
7 Orthopedic surgery	34	3	7	1	12	1	58	130
8 Urology	33		8	2	6	3	53	88
9 Ophthalmology	19	6	7	1	7	2	42	120
10 Otolaryngology	26	2	10	1	5	2	51	193
11 Pathology	80		17		13	2	118	188
12 Radiology	39	1	14		19		73	129
Physical therapy	2						2	2
	808	31	179	11	208	47	719	3,499

The following report is employed as an illustration of the present method of computing necropsy percentages

Number of stillbirths	12	Necropsies	5
Coroner's cases	29	Necropsies	16
All other deaths	190	Necropsies	72
Coroner's necropsies performed by hospital pathologist			7

By allowing full credit for seven coroner's cases, a rate of 40.1 per cent is obtained on the basis of  $(72 + 7) - (190 + 7)$

It is permissible, of course, that hospitals exclude from their necropsy statistics the deaths which occur in the ambulance or in the emergency room before admission to the hospital service has actually taken place. Logically it follows that necropsies on deaths occurring outside the institution should not be included in the calculation of hospital rates. Even though official credit is not assigned for postmortem studies of this type, it is nevertheless desirable that outside material be utilized whenever available. Attention is called to tables D and E, showing the highest necropsy rates for 1937 and 1938.

#### REVISION OF NECROPSY REQUIREMENTS

It has long been apparent that necropsy percentage alone is not a satisfactory index of the amount of pathologic material available for house staff instruction

Accordingly the Council has added the requirement of thirty-six necropsies a year, effective in 1940 in hospitals approved for intern training. The minimum rate of 15 per cent will likewise continue in force.

Under ordinary circumstances it would seem that one postmortem examination a week is essential for teaching purposes especially if clinical-pathologic conferences and other educational activities are carried out in accordance with present essentials. Therefore, a minimum of thirty-six necropsies a year cannot be considered an excessive requirement. Admittedly the hospitals which have less than 100 deaths may find it difficult to obtain a rate above 36 per cent, but the problem should not be considered insurmountable since already the average necropsy rate in hospitals for intern training has reached a level of 34.4 per cent.

At present the hospitals with less than thirty-six necropsies offer only 517 internships in a total of 7,354. The majority of these institutions have more than twenty-five postmortem examinations a year and should experience little difficulty in increasing the number to a satisfactory level.

#### Pathology Departments

State	Hospitals Having Clinical Laboratories		M D Directors	
	1937	1938	1937	1938
Alabama	63	66	41	47
Arizona	30	30	24	24
Arkansas	46	50	34	38
California	237	239	199	199
Colorado	67	68	3	51
Connecticut	54	56	46	44
Delaware	11	12	11	11
District of Columbia	26	20	26	20
Florida	67	60	49	45
Georgia	88	94	63	62
Idaho	26	28	18	20
Illinois	238	204	202	194
Indiana	97	102	93	68
Iowa	110	115	80	79
Kansas	81	84	61	61
Kentucky	73	74	48	47
Louisiana	57	60	43	50
Maine	49	48	31	30
Maryland	66	60	60	50
Massachusetts	199	201	170	180
Michigan	108	117	126	140
Minnesota	144	103	98	109
Mississippi	66	69	37	39
Missouri	92	109	80	88
Montana	33	34	24	24
Nebraska	72	73	61	66
Nevada	8	9	6	7
New Hampshire	31	33	26	28
New Jersey	132	133	122	99
New Mexico	36	40	20	33
New York	424	429	387	394
North Carolina	128	130	90	89
North Dakota	35	30	24	21
Ohio	180	196	100	152
Oklahoma	98	103	62	63
Oregon	47	40	37	31
Pennsylvania	282	208	208	263
Rhode Island	19	19	16	15
South Carolina	48	49	34	32
South Dakota	43	41	30	31
Tennessee	79	75	59	50
Texas	223	243	147	157
Utah	21	20	19	17
Vermont	21	20	19	21
Virginia	92	96	64	67
Washington	79	77	60	65
West Virginia	67	68	01	48
Wisconsin	135	145	96	101
Wyoming	18	18	13	13
Totals	4,027	4,673	3,002	3,601

Regardless of the emphasis on quantitative measures, it is understood, of course, that quality of necropsy service is still of paramount importance. Quality is based chiefly on the competence of the hospital pathologist, completeness of anatomic and histologic studies, adequacy of reports, the extent to which pathologic material is utilized for teaching purposes and the degree to which interns and staff members participate in these activities.

## RESIDENCIES AND FELLOWSHIPS

The Council has recently extended the residency classification to include fellowships and henceforth the list of hospitals approved for residencies in specialties will be published under the title of "Approved Residencies and Fellowships." In extending the scope of the residency field it became necessary to formulate new definitions and standards of graduate training as described in the Essentials of Approved Residencies and Fellowships. The new Essentials set forth the general standards applicable to all types of residency and fellowship training and also the specific requirements pertaining to individual specialties. They are purposely of a detailed and comprehensive nature so as to aid in the organization of residency programs especially in institutions that are not familiar with the methods of graduate training.

Residencies and fellowships in the clinical branches of medicine and surgery, pathology and radiology represent advanced training usually in preparation for the practice of a specialty. Residencies in specialties, as defined by the Council, are straight services of one or more years following an approved internship. A fellowship is a form of apprenticeship which in some cases is indistinguishable from a residency although it usually offers greater opportunity for the study of basic sciences and research. Ordinarily a fellowship is a university rather than a hospital appointment. Mixed residencies are general hospital assignments following internship. (They include services classified as general residencies and chief residencies.) In all instances the term of service should be at least twelve months and might well be extended to two or more years when suitable facilities are available.

Approved residencies and fellowships are offered in the following branches of medicine:

- |                               |                                 |
|-------------------------------|---------------------------------|
| 1 Anesthesiology              | 16 Ophthalmology                |
| 2 Cardiology                  | 17 Ophthalmology otolaryngology |
| 3 Communicable diseases       | 18 Orthopedic surgery           |
| 4 Dermatology and syphilology | 19 Otolaryngology               |
| 5 Epilepsy                    | 20 Pathology                    |
| 6 Fractures                   | 21 Pediatrics                   |
| 7 Gynecology                  | 22 Physical therapy             |
| 8 Malignant diseases          | 23 Plastic surgery              |
| 9 Medicine                    | 24 Psychiatry                   |
| 10 Mental deficiencies        | 25 Radiology                    |
| 11 Mixed residency            | 26 Surgery                      |
| 12 Neurology                  | 27 Thoracic surgery             |
| 13 Neurosurgery               | 28 Traumatic surgery            |
| 14 Obstetrics                 | 29 Tuberculosis                 |
| 15 Obstetrics gynecology      | 30 Urology                      |

There is currently a widespread interest in educational activities designed to meet the requirements of the specialty boards. Thus there are constantly increasing demands for specialized training in institutions approved by the Council. As new residencies and fellowships are developed there is usually an immediate request for approval in order that credit may be registered in the files of the American Medical Association. The procedure involved in the evaluation and certification of residencies in specialties has previously been described in the Hospital Number of THE JOURNAL, March 26, 1938, page 978.

On Sept 1, 1938, there were 451 approved hospitals offering training to 3,499 residents and assistant residents. Recent approvals, including the fellowships of the Mayo Foundation, have increased the number of institutions to 503 and individual residencies and fellowships to 3,977. Reference should be made to table F, showing the number and length of residencies according to specialties.

SCHOOLS FOR OCCUPATIONAL  
THERAPY TECHNICIANS

The "Essentials of an Acceptable School of Occupational Therapy" were adopted by the American Medical Association at the Atlantic City session in June 1935. The inspection of occupational therapy schools and the formulation of standards were made following a resolution designed for these purposes and presented to the House of Delegates of the American Medical Association by Dr J Gurney Taylor of Wisconsin at the Milwaukee session in June 1933.

The Board of Trustees recommended that the Council on Medical Education and Hospitals undertake the survey promulgate standards and maintain a list of acceptable schools. The Council on Physical Therapy of the American Medical Association and the American Occupational Therapy Association lent their full cooperation and advice in the study and preparation of standards. The "Essentials of an Acceptable School of Occupational Therapy" were published in THE JOURNAL, May 4, 1935, Aug 31, 1935, and Aug 29, 1936. Changes relating to subjects and hours and a clause permitting the concentration of technical training in one field were proposed and approved by the Council on Feb 12, 1938. The revised "Essentials" were published in THE JOURNAL, March 26, 1938.

The following schools substantially conform to the minimum requirements adopted by the American Medical Association and approved by the Council on Medical Education and Hospitals.

APPROVED SCHOOLS OF OCCUPATIONAL  
THERAPY

**Boston School of Occupational Therapy** Boston—Organized in 1918 as a war time measure. Incorporated in 1921 as a nonprofit institution. Control is under a board of thirty-four trustees. The faculty is composed of thirty-seven regular members, forty-three lecturers and fourteen extramural instructors, ninety-four in all. The educational requirement is one year of college or equivalent. The duration of the course is three academic years. A total of sixteen hospitals and other institutions is used in practice training. The tuition fee is \$300 a year. Thirty students are admitted annually. The next session begins in September 1939. The director is Mrs John A Greene.

**Kalamazoo State Hospital School of Occupational Therapy** Kalamazoo, Mich.—Organized in 1922. Governed by a joint committee of Kalamazoo State Hospital and Western State Teachers College, Kalamazoo. Affiliated with Western State Teachers College in 1936. The faculty includes twenty instructors in the hospital and six in the college, six lecturers and five extramural instructors, a total of thirty-seven. Two courses are offered: the diploma course of twenty-seven months requiring graduation one year of college and a five year course requiring graduation from an accredited high school and leading to a BS degree from Western State Teachers College. The school is affiliated for practice training with five hospitals and other institutions. No tuition is charged for the diploma course; miscellaneous expenses are about \$270. The student pays the regular college fee for courses at Western State Teachers College. Twelve students are admitted each year. The next class begins August 1939. The director is Miss Marion R Spear, BS OT Reg.

**St Louis School of Occupational and Recreational Therapy** St Louis.—Organized in 1918 as a war time measure. Conducted by the Missouri Association for Occupational Therapy and governed by a board of trustees. Affiliated with Washington University School of Medicine and University College. The faculty includes thirty regular instructors, twenty lecturers and twelve extramural instructors, a total of sixty-two. Two courses are offered: the diploma course of three academic years (twenty-seven months) requiring for admission two years of college work or equivalent and a five year course (forty-five months) requiring graduation from an accredited high school and leading to a BS degree from Washington University. Practice training is given in a total of thirteen affiliated hospitals and other institutions. The annual tuition fee for the diploma course is \$320 and for the degree course \$280. Fifteen students are admitted each year. The next session begins in September 1939. The director is Miss Geraldine R Lermitt, AB Ph M OT Reg.

**Philadelphia School of Occupational Therapy** Philadelphia—Organized in 1918. Incorporated in 1923 as a nonprofit organization. Management is vested in a board of directors. An affiliation exists with the University of Pennsylvania. The faculty includes nine instructors in therapeutic occupations, twenty-six in theoretical subjects and seventeen extramural instructors, a total of fifty-two. The entrance requirement is one year

of college or equivalent The course covers three academic years or twenty-eight months Practice training is given in a total of eighteen affiliated hospitals and other institutions including the Graduate Hospital of the University of Pennsylvania The tuition fee is \$650 Approximately forty students are admitted each year The next session begins in September 1939 The director is Miss Helen S Willard B A O T Reg

**Milwaukee Downer College Department of Occupational Therapy**  
Milwaukee—Course in occupational therapy organized in 1913 Management of the college is vested in a board of thirty-two trustees The department's faculty includes fourteen instructors in the college eight lecturers and eight extramural instructors thirty in all Two courses are offered the diploma course of three academic years requiring for admission one year of college or equivalent and a five year course requiring graduation from an accredited high school and leading to a B S degree Practice training is given in nine affiliated hospitals and other institutions The annual tuition fee for the diploma course is \$250 and for the degree course \$230 Approximately fifteen students are admitted each year The next session begins in September 1939 Miss Marjorie Taylor O T Reg is director of occupational therapy

**University of Toronto Department of University Extension Toronto Ont Canada**—Course in occupational therapy organized in 1926 The regular occupational therapy faculty numbers twenty-seven including instructors lecturers and demonstrators and in addition there are nine extramural instructors a total of thirty-six The admission requirement is one year of college The duration of the course is three academic years or twenty-four months Hospitals and other institutions affiliated for practice training number eleven The annual tuition fee is \$150 Twenty-five students are admitted each year The next session begins in September 1939 The supervisor of the course is Miss Helen P LeVesconte

## ESSENTIALS OF AN ACCEPTABLE SCHOOL FOR PHYSICAL THERAPY TECHNICIANS

### I ORGANIZATION

1 Acceptable schools for training physical therapy technicians may be conducted by accredited universities colleges or hospitals

2 The Council has promulgated standards for this type of training to supply physicians hospitals and prospective students with reliable information and for the protection of the public

3 Responsibility for courses in hospitals should be placed on the hospital administration rather than the director of the department In colleges and universities this responsibility is on the controlling board, as for other courses

4 Resources for continued operation of the school should be insured through regular budgets, gifts or endowments but not entirely through students tuition fees Experience has shown that commercial schools operated for profit frequently do not adhere to proper ethical and educational standards and are not acceptable

5 There must be available transcripts of high school, college work and other credentials Attendance and grades of students shall be carefully recorded, by means of which an exact knowledge may be obtained regarding each student's work

6 At least two or more students should be enrolled in each class

### II FACULTY

7 The school should have a competent teaching staff Appointments should be based on thorough education and training and successful teaching experience The staff should include not less than one qualified salaried instructor and in each institution where practical training is carried on not less than one qualified physical therapist The question of full time and part time appointments is not as important as the qualifications of the instructors who should be specialists or exceptionally well trained and well qualified in the lines they are teaching

### III FACILITIES

8 Provision should be made for each student to receive practice training adequate in kind and amount under the supervision of a physician qualified in physical therapy in a hospital or other institution acceptable to the Council on Medical Education and Hospitals of the American Medical Association

9 Adequate equipment should include anatomic charts models and other aids to effective teaching It is suggested that dissecting materials should be provided to enable each student

to dissect or have the benefit of demonstration of dissection of at least the lateral half of the human cadaver Skeletons and disarticulated bones should be supplied

10 A library containing up-to-date references, texts and scientific periodicals pertaining to physical therapy should be maintained

### IV ADMINISTRATION

11 There should be careful and intelligent supervision of the entire school by an executive officer who, by training and experience is fitted to interpret the prevailing standards in physical therapy education and who is clothed with sufficient authority to carry them into effect

12 Except for good cause, such as for illness no credit should be given for any course when the attendance has been less than 90 per cent of the full time

### V REQUIREMENTS FOR ADMISSION

13 Candidates for admission should be able to satisfy one of the following requirements

- (a) Two years or sixty semester hours of college, including courses in physics and biology
- (b) Graduation from an accredited school of nursing
- (c) Graduation from an accredited school of physical education

Courses in general physics, chemistry and biology are highly recommended for all who seek to enter training in physical therapy

14 The admission of students to the physical therapy school must be in the hands of a responsible committee or examiner whose records shall always be open for inspection Documentary evidence of the student's preliminary education should be obtained and kept on file When the physical therapy school is an integral part of the university, this work usually devolves on the university examiner

15 Advanced standing may be granted to students for work done in other acceptable physical therapy schools or hospital departments, provided the entrance requirements and other essentials herein set forth have been complied with Official verification of the student's previous physical therapy work should be obtained by direct correspondence with the schools previously attended, and his preliminary qualifications should also be verified and recorded the same as for first-year students

16 Complete physical examination of each student admitted should be conducted under the auspices of the school

### VI PUBLICATIONS

17 The school should issue at least annually, a bulletin setting forth the character of the work which it offers Such announcement should contain a list of the members of the faculty with their respective qualifications

### VII MINIMUM CURRICULUM

Subjects	Hours	
	Theory	Laboratory and Practice Training
Anatomy (including applied anatomy demonstration on cadaver and lecture)	210	
Clinical practice		400
Electrotherapy	30	45
Ethics and administration	5	
Hydrotherapy	5	15
Massage	15	45
Pathology	30	
Physiology	30	45
Principles of physical therapy as applied to		
Medicine	15	30
Neurology	10	15
Orthopedics	15	30
Surgery (including surgical observation)	15	30
Psychology	15	
Therapeutic exercise	30	75
Electives	45	
Total	470	730
		1 200 hours

Suggested electives asepsis, bandaging, first aid history of physical therapy hygiene joint measurements office routine, occupational therapy records social service

All subjects should be taught by qualified teachers

Length of course Not less than nine months



### SCHOOLS FOR PHYSICAL THERAPY TECHNICIANS

The survey of schools for physical therapy technicians was assigned to the Council on Medical Education and Hospitals in 1934. Following the initial inspection and study of thirty-five schools the "Essentials" were formulated and adopted by the Council and passed by the House of Delegates of the American Medical Association.

#### Nursing Service in Hospitals

State	Registered Nurses	Unregistered Graduate Nurses	Attendants
Alabama	678	21	727
Arizona	441	8	111
Arkansas	419	139	703
California	6 693	290	4 826
Colorado	1 143	114	930
Connecticut	1 786	43	1 786
Delaware	231	10	100
District of Columbia	1 009	1 0	1 936
Florida	917	81	740
Georgia	929	43	1 429
Idaho	264	13	134
Illinois	5 726	436	3 793
Indiana	1 501	93	1 462
Iowa	1 395	81	1 033
Kansas	874	69	68
Kentucky	737	97	836
Louisiana	562	41	1 179
Maine	536	29	407
Maryland	1 139	132	1 237
Massachusetts	5 806	520	4 902
Michigan	4 423	180	4 316
Minnesota	2,578	252	1 492
Mississippi	312	20	567
Missouri	1 677	93	2 073
Montana	513	35	130
Nebraska	700	51	673
Nevada	78		47
New Hampshire	447	13	193
New Jersey	3 076	205	2 856
New Mexico	307	11	326
New York	17 500	2 137	17 809
North Carolina	1 129	101	536
North Dakota	310	44	426
Ohio	4 894	426	3 040
Oklahoma	679	104	910
Oregon	977	36	593
Pennsylvania	6 720	404	4,830
Rhode Island	718	5	500
South Carolina	477	17	766
South Dakota	207	33	247
Tennessee	750	83	736
Texas	2 138	218	2 655
Utah	335	7	132
Vermont	210	22	263
Virginia	1 040	74	1 360
Washington	1 396	30	1 288
West Virginia	694	59	892
Wisconsin	2 441	261	1 696
Wyoming	196	8	173
Totals	90 166	7,240	80 679
Replies to question	5 207	4 828	4 809

tion on May 9, 1936. The first list of approved schools appeared in THE JOURNAL Aug. 29, 1936, and several lists have been published since.

At the November 1937 meeting of the Council, certain changes were made in the "Essentials" for the purpose of clarification of meaning but which did not alter the original considerations in the requirements. The Council on Physical Therapy of the American Medical Association, the American Congress of Physical Therapy and the American Physiotherapy Association lent their full cooperation in the preparation of the original standards and continue to aid the Council in the consideration of new schools and in problems dealing with the "Essentials."

No standards for graduate courses for technicians have as yet been promulgated. The Mayo Clinic now offers organized graduate courses for technicians.

The "Essentials of an Acceptable School for Physical Therapy Technicians" aim to provide more adequate facilities for the training of technicians. The investigations of the various courses during the past few years have revealed in many cases a deplorable lack of requirements, organization, qualified faculty and par-

ticularly clinical material with which students can develop skill in the application of this knowledge. These conditions exist principally in so-called commercial schools. Approval is withheld by the Council for courses where arrangements are such that students are enrolled without the necessary preliminary background and proceed across a well paved short cut in their efforts to enter this highly technical field.

Advertising commercial schools which adhere to no particular standards are turning out each year large numbers of inadequately prepared technicians. Nevertheless recent attention has been drawn to the fact that there is an acute shortage of graduates of approved schools.

The American Registry of Physical Therapy Technicians sponsored by the American Congress of Physical Therapy has now become recognized as a reliable means of identifying those qualified. The Board of Registry accepts for examination graduates of schools approved by the Council on Medical Education and Hospitals. Information concerning registration may be secured

#### Schools of Nursing\*

State	Reported Schools of Nursing				Students Enrolled			
	1926	1932	1936	1938	1926	1932	1936	1938
Alabama	52	42	27	29	1 017	814	660	1 007
Arizona	3	5	4	4	75	152	180	223
Arkansas	28	26	8	10	457	417	400	320
California	50	58	45	40	3 277	3 718	2 694	3,601
Colorado	24	22	17	19	833	1 166	514	631
Connecticut	29	29	20	19	1 869	1 790	1 471	1 416
Delaware	6	7	7	7	148	202	266	310
District of Columbia	13	12	11	10	889	1 106	779	873
Florida	24	19	14	16	438	575	630	729
Georgia	56	39	17	19	1 189	983	977	1 123
Idaho	10	10	8	8	180	228	261	326
Illinois	147	136	112	100	5 916	6 223	5 137	6,210
Indiana	37	31	27	32	1 561	1 711	1 661	1 600
Iowa	64	44	39	38	2 000	1 914	1 471	1 622
Kansas	61	46	36	37	1 169	1,231	1,220	1,300
Kentucky	33	26	19	19	715	833	661	881
Louisiana	21	17	14	15	966	909	1 031	1 114
Maine	34	32	23	22	697	863	649	706
Maryland	31	32	29	32	1 748	1 780	1 889	1,841
Massachusetts	112	114	82	84	4 803	6 163	4 633	4,500
Michigan	73	49	37	38	2 630	2 836	2 444	2 601
Minnesota	59	37	36	39	3 403	3 299	2 064	2,041
Mississippi	43	41	34	39	682	544	500	625
Missouri	48	44	31	33	2 008	2 904	1 677	1,916
Montana	18	16	11	11	493	457	422	494
Nebraska	28	18	14	15	1 006	900	703	800
Nevada								
New Hampshire	23	22	16	15	406	618	541	500
New Jersey	60	59	52	52	2 061	3 381	3 035	3 941
New Mexico	2	2	2	3	34	50	60	73
New York	161	170	133	128	9 010	9 740	7 931	8 329
North Carolina	77	61	44	47	1 461	1 334	1 194	1 383
North Dakota	18	16	16	17	617	541	630	701
Ohio	85	90	76	83	3 903	4,891	4 111	4,310
Oklahoma	42	20	15	14	649	614	568	617
Oregon	17	12	9	11	564	613	588	599
Pennsylvania	190	179	137	132	8 092	9 391	7 642	7,901
Rhode Island	11	11	9	7	520	443	401	470
South Carolina	34	27	21	16	667	622	530	551
South Dakota	20	19	17	16	467	469	430	436
Tennessee	44	33	29	30	1 018	1 220	1 318	1,380
Texas	81	67	49	50	2 172	2 419	2 145	2,570
Utah	6	6	6	6	396	311	400	413
Vermont	13	12	13	12	332	318	400	425
Virginia	48	41	26	30	1 290	1 880	1 114	1,311
Washington	20	29	29	28	1 177	1 780	1 019	1,321
West Virginia	45	43	31	33	790	817	431	1 041
Wisconsin	41	44	32	31	1 837	2 022	1 770	1 900
Wyoming	7	5	2	1	112	103	41	28
Totals	2 100	1 934	1 478	1 512	76 027	86 649	70 114	83 190

\* Including schools approved and those unapproved by state board of nurse examiners as of January 1939. On this date there were 1,230 approved schools.

from Miss Marion G. Smith, registrar of the American Registry of Physical Therapy Technicians, 30 North Michigan Avenue, Chicago.

It is the desire of the Council on Medical Education and Hospitals to cooperate in every way with any hospital or educational institution in an effort to develop more well organized and well administered courses for technicians in the United States.

## SCHOOLS APPROVED FOR TRAINING PHYSICAL THERAPY TECHNICIANS

### By the Council on Medical Education and Hospitals

Name and Location of School	Direction	Entrance Requirement	Duration of Course	Time of Admission	No of Students Admitted Annually	Tuition	Certificate Diploma Degree
California Hospital, Los Angeles <sup>1</sup>	G P Jennings, M D	(a) R N (b) Grad phys ed	18 mos	Jan & July	6	\$200	Certificate
Children's Hospital, Los Angeles	J C Wilson, M D	(a) R N (b) Grad phys ed	12 mos	Sept	12	\$150	Diploma
Stanford University Hospitals, San Francisco	W H Northway, M D	(a) R N (b) Grad phys ed	12 mos	Apr & Oct	12	\$215	Certificate
Walter Reed General Hospital, Washington D C <sup>2</sup>	A A de Lorimier, Capt, M C	Grad phys ed	12 mo <sup>c</sup>	Sept	10	None	Certificate
Northwestern University Medical School, Chicago <sup>4</sup>	J S Coulter, M D	(a) R N (b) Grad phys ed (c) 3 yrs coll	9 mo <sup>c</sup>	Oct	16	\$200	Certificate
Bouré Boston School of Physical Education, Boston <sup>5</sup>	Howard Moore, M D	High sch grad	3 and 4 yrs <sup>a</sup>	Sept	10	\$400 yr	Diploma or B S
Harvard Medical School Course 440, Boston <sup>6</sup>	F R Ober, M D	(a) R N (b) Grad phys ed (c) Coll grad	9 mos	Jan & Sept	18	\$150	Certificate
Boston University Sargent College of Physical Education, Cambridge, Mass	Prof E Hermann, Dean	High sch grad	4 yrs	Oct	12	\$350 yr	B S
Poore School, Kendal, Green, Mass <sup>8</sup>	W F Carlson, President	High sch grad	3 and 4 yrs <sup>b</sup>	Sept	9	\$400 yr	Diploma or B S
Mayo Clinic, Rochester, Minn <sup>9</sup>	F H Krusen, M D	(a) R N (b) Grad phys ed (c) 2 yrs coll	12 mos	Oct	15	None	Certificate
St. Louis University School of Nursing, St. Louis <sup>10</sup>	A J Kotkis, M D	High sch grad	4 yrs	Sept	2	Univ fees	B S
University of Buffalo, Buffalo <sup>11</sup>	G G Martin, M D	R N	18 mos		8	Univ fees	B S
New York Society for the Relief of the Crippled and Crippled, New York City <sup>12</sup>	K G Hansson, M D	(a) R N (b) Grad phys ed	9 mos	Sept	20	\$300	Diploma
D T Watson School of Physiotherapy (affiliated with University of Pittsburgh School of Medicine), Leedsdale, Pa <sup>13</sup>	Jessie Wright, M D	(a) Grad phys ed (b) 2 yrs premed	22 mo <sup>c</sup>	Sept	8	None	Diploma or B S
College of William and Mary, Richmond, Va <sup>14</sup>	H H Hibbs Jr, Ph D, Dean	(a) R N (b) Grad phys ed (c) 3 yrs coll	9 and 12 mo <sup>c</sup>	Sept	10	Coll fees	Certificate
University of Wisconsin, Madison <sup>15</sup>	E A Pohle, M D	(a) R N (b) Grad phys ed	9-12 mos	<sup>a</sup>	20	Univ fees	Certificate

#### AFFILIATED CLINICAL FACILITIES

- Glendale Sanitarium and Hospital, Glendale and Los Angeles
- Cedars of Lebanon Hospital, Los Angeles County Hospital and Presbyterian Hospital—Olmsted Memorial, Los Angeles and others
- Langdon School for Crippled Children, Washington, D C
- Michael Reese Hospital, Passavant Memorial Hospital and St. Luke's Hospital, Chicago and others
- Boston City Hospital, Children's Hospital, Massachusetts General Hospital and Robert Breck Brigham Hospital, Boston and others
- Children's Hospital, Harvard Infantile Paralysis Commission, Clinic Industrial School for Crippled and Deformed Children and Massachusetts General Hospital, Boston and others
- Massachusetts General Hospital, Massachusetts Memorial Hospital and Perkins Institute for the Blind, Boston and Cambridge Hospital, Cambridge and others
- Blind Sanatorium and Hospital, Arlington Heights and Beth Israel Hospital and Industrial School for Crippled and Deformed Children, Boston and others

- Colonial Hospital, Kahler Hospital, St. Mary's Hospital, and Worrall Hospital, Rochester
- Firmen Desloge Hospital, St. Louis
- Buffalo City Hospital, Buffalo
- French Hospital and New York Hospital, New York City
- Allegheny General Hospital, Children's Hospital, Falk Clinic and St. Francis Hospital, Pittsburgh and others
- University of Virginia Hospital, Charlottesville and Crippled Children's Hospital, Stuart Circle Hospital, and Wheelon Clinic, Richmond and others
- State of Wisconsin General Hospital and Wisconsin Orthopedic Hospital for Children, Madison

#### NOTES

- Four year course leads to B S degree from Simmons College
- Four year course leads to B S degree from State Teachers College, Hyannis
- Twelve months course for those with three years of college
- Preferably in summer semester

### SCHOOLS FOR CLINICAL LABORATORY TECHNICIANS

The American Medical Association through its Council on Medical Education and Hospitals adopted requirements for acceptable schools for clinical laboratory technicians in 1936. The report of the original survey of some 200 courses was published in *THE JOURNAL*, Aug 29, 1936.

The American Society of Clinical Pathologists, which maintains the Registry of Medical Technologists, cooperates with the Council in the promulgation of standards for schools, in the consideration of new applications and in the maintenance of the approved lists. The registry has requirements similar to those of the American Medical Association and admits to its examinations the graduates of approved schools. In agreement with the Board of Registry the Council voted in 1937 to increase the admission requirement from one to two years of college work including basic sciences. This ruling became effective in 1938.

Commercial advertising schools are not considered eligible for recognition under the "Essentials of an Acceptable School for Clinical Laboratory Technicians," viz "Acceptable schools for training laboratory technicians may be conducted by universities, colleges, hospitals or public health laboratories." Training in commercial schools alone is not sufficient to permit students to enter the examinations of the Board of Registry.

The Council continues to inspect schools applying for recognition as well as those already approved. Questionnaires giving up-to-date general information concerning courses are requested annually from each school. The list of approved schools is revised each year and published in *THE JOURNAL*.

The "Essentials of an Acceptable School for Clinical Laboratory Technicians" may be obtained by writing to the Council on Medical Education and Hospitals. Information concerning the Registry of Medical Technologists is available through the registrar, Mrs. Anna R. Scott, 234 Metropolitan Building, Denver.

# Schools Approved for Training Clinical Laboratory Technicians By the Council on Medical Education and Hospitals

Under the column headed "Name and Location of School" enclosures in parentheses denote affiliations

The abbreviation *Br fee* under "Tuition," indicates breakage fee

	Name and Location of School	Direction	Entrance Requirement	Duration of Course	Time of Admission	Number of Students Admitted Annually	Tuition	Certificate or Diploma Degree
1	University of Arkansas School of Medicine (Little Rock City Hospital) Little Rock 1	A F DeGroat M D	2 yrs coll	12 mos	Oct	4	\$100	Certificate
2	Children's Hospital Los Angeles	C M Hyland M D	Coll degree	12 mos	Jan	3	None	None
3	College of Medical Evangelists (White Memorial Hospital) Los Angeles	O B Pratt M D	2 yrs coll	12 mos	May	3	None	Certificate
4	Los Angeles County Hospital Los Angeles	N G Evans M D	Coll degree	12 mos	Varies	10	\$80	Certificate
5	Los Angeles General Hospital Huntington Memorial Hospital Pasadena	A G Foord M D	Coll degree	12 mos	July	4	None	Certificate
6	Collins F Hall Hospital San Francisco	Z E Bolin M D	2 yrs coll	12 mos	Varies	3	Br fee	Certificate
7	Marshall Hall Hospital San Francisco	Charles Wells M D	Univ degree	12 mos	Varies	4	None	None
8	University of California Hospital San Francisco	I C Schumacher M D	2 yrs coll	12 mos	Varies	4	None	None
9	Children's Hospital Denver 2	E I Dobos M D	2 yrs coll	12 mos	Sept	2	None	Certificate
10	University of Denver, Denver 1	Philip Hillkowitz M D	High sch grad	4 yrs		20	\$225 yr	B S
11	Grady Hospital Atlanta	W B Matthews M D	Coll degree	12 mos	Quarterly	3	None	Certificate
12	University of Georgia School of Medicine (University Hospital) Augusta 2	E R Pund M D	Coll degree	12 mos	Sept	2	\$100	Certificate
13	Emory University Emory University 1	R R Krucke M D	B S or A B	18 mos	Oct	8	\$250	M S
14	Michael Reese Hospital Chicago	K M Howell M D	2 yrs coll	12 mos	Monthly	12	\$100	Certificate
15	Mt Sinai Hospital Chicago	I Davidson M D	2 yrs coll	12 mos	Varies	4	\$125	Diploma
16	Northwestern University Medical School (Passavant Memorial Hospital) Chicago	H L Alt M D	2 yrs coll or R N a	12 mos	Every 6 wks	8	\$30	Certificate
17	Provident Hospital Chicago 1	F L Lewis M D	2 yrs coll	12 mos	Oct	3	\$100	Certificate
18	Evans Hospital Evanston	J L Benjamin M D	B S	12 mos	Jan & July	4	\$100	Certificate
19	St John's Hospital Springfield	F W Light M D	2 yrs coll	12 mos	Varies	2	\$30	None
20	St Theresa's Hospital Waukegan	J A Pribram M D	2 yrs coll	12 mos	Varies	2	\$100	Diploma
21	Indianapolis City Hospital Indianapolis	H C Thornton M D	2 yrs coll	18 mos	Varies	2	\$30	Certificate
22	Indiana University School of Medicine (Indiana University Hospitals) Indianapolis	C G Culbertson M D	Coll degree	12 mos	July	4	None	Certificate
23	Methodist Episcopal Hospital Indianapolis	H V Banks M D	Coll degree	24 mos	July	4	None	Certificate
24	South Bend Medical Laboratory South Bend 7	A S Giordano M D	2 yrs coll	18 mos	Quarterly	2	\$125	None
25	Bethany Hospital Kansas City	W W Summerville M D	Coll degree	18 mos	Varies	3	None	Certificate
26	University of Kansas Hospitals, Kansas City	C G Letch M D	Coll grad	12 mos	July	7	Univ fees	Diploma
27	St Francis Hospital Wichita	C A Helwig M D	2 yrs coll	12 mos	Sept		\$150	Diploma
28	St Joseph's Hospital Lexington 8	F S Maxwell M D	2 yrs coll	12 mos	Jan & Sept	4	\$100	Certificate
29	University of Kentucky Lexington 9	M Scherago D V M	High sch grad	4 yrs 1	Feb & Sept		Univ fees	B S
30	St Joseph Infirmary Louisville	H M West M D	2 yrs coll	12 mos	Sept	5	\$100	None
31	St Mary and Elizabeth Hospital Louisville	M W West M D	2 yrs coll	12 mos	June & Sept	2	\$120	None
32	State Department of Health Louisville 10	J H South M D	2 yrs coll	12 mos	Sept	12	\$100	Diploma
33	Loyola University New Orleans 11	J G Arnold Jr Ph D	High sch grad	4 yrs	Sept	17	Univ fees	B S
34	Central Maine General Hospital Lewiston 1	Julius Gottlieb M D	B S or A B	18 mos	Jan	3	\$100	Certificate
35	Mercy Hospital Baltimore	H T Collenberg M D	2 yrs coll	18 mos	Sept	10	\$100 & \$10 (Br fee)	Certificate
36	Simmons College Boston 13	C M Hilliard A B	Coll degree	12 mos	Sept	5	\$300	Certificate
37	St Joseph Hospital Springfield	I M Dwyer M D	2 yrs coll	12 mos	Quarterly	5	None	Certificate
38	Worcester City Hospital Worcester	R H Goodale M D	2 yrs coll	12 mos	Every 2 mos	6	None	Diploma
39	Worcester State Hospital Worcester 14	J M Looney M D	Coll degree	12 mos	Varies	2	None	Certificate
40	Leda Y Post Montlery Hospital Battle Creek 15	A A Humphrey M D	Coll degree	12 mos	Jan	3	\$20 (Br fee)	Diploma
41	Mercy Hospital Bay City 16	W G Gammill Jr M D	2 yrs coll	12 mos	Fall & Spring	6	\$170	Certificate
42	City of Detroit Receiving Hospital (Wayne University) Detroit	O A Brack M D	3 yrs coll	12 mos	Jun	6	None	B S
43	Grace Hospital Detroit	C I Owen M D	2 yrs coll	12 mos	Jun	7	\$100	Certificate
44	Henry Ford Hospital (Wayne University) Detroit	F W Hartman M D	2 yrs coll	12 mos	Varies	7	None	M S
45	Providence Hospital Detroit 17	I J Davis M D	B S or A B	12 mos	Feb & Sept	10	Univ fees	Diploma
46	Wayne University Detroit 18	C W Greaser Ph D	High sch grad	4 yrs	July	30	\$100 yr	B S
47	Woman's Hospital Detroit	D C Beaver M D	2 yrs coll	4 yrs	July	30	\$100 yr	B S
48	Michigan State College 1 at Lansing 13	Ward Giltner D V M	High sch grad	4 yrs	July	30	\$100 yr	B S
49	Elmhurst Hospital—Dr Wm J Seymour Hospital Lloke	S L Gould M D	3 yrs coll	12 mos	July	3	None	B S
50	College of St. Scholastica (St. Mary's Hospital) Duluth	G I Bardsley M D	High sch grad	4 yrs	Sept	10	Coll f & n	B S
51	St. Luke's Hospital Duluth	A E Nelson M D	2 yrs coll	12 mos	1 yr & 2 yr	12	\$200	Certificate
52	St. Luke's Hospital Minneapolis	A E Nelson M D	2 yrs coll	12 mos	1 yr & 2 yr	12	\$200	Certificate

53	Minneapolis General Hospital Minneapolis	A H Lufkin M D	Coll grad	12 mos	Monthly	15	None	53
54	Northern Hospital Minneapolis	V J Smith M D	2 yrs coll	12 mos	June & Oct	2	Br fee	54
55	Swedish Hospital Minneapolis	C R Drake M D	High sch grad	4 yrs	Sept	4	\$120 yr	55
56	University of Minnesota Minneapolis	Kano Ikeda M D	2 yrs coll	12 mos	June	50	\$110	56
57	Charles I Miller Hospital St Paul	L S Lippincott M D	2 yrs coll	24 mos	Varies	6	None	57
58	Vicksburg Sanitarium Vicksburg MISSISSIPPI	M P Neal M D	4 yrs coll	12 mos	Sept	3	Univ fees	58
59	University of Wisconsin School of Medicine Columbia	R L Duncan M D	2 yrs coll	12 mos	Quarterly	1	None	59
60	Kansas City Health Department Laboratory Kansas City	R C Karr M D	Coll degree	18 mos	Quarterly	4	None	60
61	Memorial Hospital Kansas City	F C Kerr M D	2 yrs coll	12 mos	1 very 2 mos	0	None	61
62	St Joseph Hospital Kansas City	C G Helwig M D	Coll degree	18 mos	Varies	6	None	62
63	St Luke's Hospital Kansas City	G O Brown M D	Coll grad	12 mos	Every 2 mos	6	None	63
64	St Mary's Hospital Kansas City	R F Peterson M D	High sch grad	4 yrs	Jan & Sept	30	\$10 (Br fee)	64
65	St Louis University School of Nursing St Louis	I F Walker M D	3 yrs coll	12 mos	Sept	5	Univ fees	65
66	Murray Hospital (State University of Missouri) Columbia	D M Heiter Ph D	High sch grad	4 yrs	Sept	5	None	66
67	College of Great Falls Great Falls MONTANA	M J Brewer M D	High sch grad	4 yrs	Sept	5	Coll fees	67
68	State University of Montana Missoula	J P Neely M D	2 yrs coll	12 mos	Feb & June	3	Univ fees	68
69	Bryan Memorial Hospital Lincoln NEBRASKA	J P Tollman M D	2 yrs coll	12 mos	Varies	4	\$10 (Br fee)	69
70	Lincoln General Hospital Lincoln	R E Miller M D	3 yrs coll	12 mos	Quarterly	4	None	70
71	University of Nebraska Hospital Omaha	J J Clemmer M D	1 yrs coll	12 mos	Quarterly	4	Certificate	71
72	Mary Hitchcock Memorial Hospital Troy NEW HAMPSHIRE	M A Lederer M D	2 yrs coll	12 mos	Quarterly	4	Certificate	72
73	Reverend Hygiene Laboratory Albany NEW YORK	I A Thumig M D	Coll grad	18 mos	Varies	4	None	73
74	St John's Hospital Brooklyn	K L Miller M D	2 yrs coll	12 mos	Varies	4	None	74
75	Buffalo City Hospital Buffalo	L F Tierper M D	Coll degree	12 mos	Varies	10	None	75
76	St Joseph General Hospital Buffalo	E B Fiske M D	2 yrs coll	12 mos	Sept	4	None	76
77	Mary Immaculate Hospital Buffalo	I A Gaspard M D	Coll degree	18 mos	Oct	4	None	77
78	Hochester General Hospital Jamaica	V C Jacobson M D	Coll degree	12 mos	Varies	8	None	78
79	Russell College Schenectady	D T Smith M D	2 yrs coll or R N	12 mos	Sept	4	None	79
80	Duke Hospital Durham NORTH CAROLINA	I H Byrnes M D	2 yrs coll	18 mos	Oct	15	Coll fees	80
81	Watts Hospital Durham	H S Goldblatt M D	2 yrs coll	12 mos	Jan & July	4	None	81
82	Institute of Pathology Western Reserve University (University Hospitals) Cleveland	H S Kane M D	2 yrs coll	12 mos	July	15	\$61 (Br fee)	82
83	Starling Loyal University Hospital Columbus OHIO	R S Reichart M D	B S or A B	12 mos	July & Sept	8	Certificate	83
84	White Cross Hospital Columbus	W M German M D	B S or B A	12 mos	Quarterly	5	Certificate	84
85	College of Mt St Joseph on the Ohio Mt St Joseph OHIO	E B Kramer M D	2 yrs coll	12 mos	Jan & July	4	Certificate	85
86	Youngstown Hospital Youngstown	Hugh Jeter M D	High sch grad	4 yrs	Sept	4	Certificate	86
87	St Anthony's Hospital Oklahoma City OKLAHOMA	Hugh Jeter M D	2 yrs coll	12 mos	Oct	2	None	87
88	State University and Crippled Children's Hospitals Oklahoma City	H H Foskett M D	BS or B A	12 mos	Varies	3	None	88
89	Immanuel Hospital Portland OREGON	O H Manlove M D	Coll degree	12 mos	Varies	4	None	89
90	Good Samaritan Hospital Portland	I D Robertson M D	Coll degree	12 mos	Varies	4	None	90
91	University of Oregon Portland	M T Gouley M D	2 yrs coll	12 mos	Varies	4	None	91
92	Washington Memorial Hospital Washington D C	John Flinn M D	2 yrs coll	15 mos	Quarterly	4	None	92
93	St Luke's Hospital Bethlehem PENNSYLVANIA	D R Corcoran	High sch grad	4 yrs	Sept	10	None	93
94	Elizabeth Mercy Hospital Bryn Mawr	H M M Strumia M D	2 yrs coll	12 mos	Sept	3	None	94
95	Harrisburg Hospital Harrisburg	G R Vollett M D	Coll degree	12 mos	Varies	4	None	95
96	Bucknell University Harrisburg	H F Hunt M D	Coll degree	12 mos	Aug	2	None	96
97	Jefferson University Harrisburg	B F Lynch Jr M D	High sch grad	4 yrs	Every 4 mos	6	Certificate	97
98	Jefferson Medical College Philadelphia	F B Crawford M D	2 yrs coll	12 mos	June & Oct	3	None	98
99	Jefferson Medical College Hospital Philadelphia	S P Reimann M D	2 yrs coll	12 mos	Sept	4	None	99
100	Jefferson Medical College Hospital Philadelphia	S P Reimann M D	2 yrs coll	12 mos	Sept	4	None	100

# Schools Approved for Training Clinical Laboratory Technicians—Continued

Name and Location of School	Direction	Entrance Requirement	Duration of Course	Time of Admission	Number of Students Admitted Annually	Tuition	Certificate, Diploma or Degree
PENNSYLVANIA—Continued							
110 Mt Sinai Hospital Philadelphia	D R Morgan M D	2 yrs coll	18 mos	Varies	8	\$150 & \$10 (Br fee)	Certificate 110
111 St Agnes Hospital Philadelphia	J H Smith M D	2 yrs coll	18 mos	May & Nov	8	>0	Certificate 111
112 St Joseph's Hospital Philadelphia	J W Ritz M D	2 yrs coll	18 mos	Sept	4	\$120	Certificate 112
113 Temple University (Temple Hospital) Philadelphia	E S Konzen M D	High sch grad	12 mos	Sept	11	Univ fees	Certificate 113
114 Reading University (Albright College), Reading	E S Funk M D	High sch grad	12 mos	Sept	11	Univ fees	Certificate 114
115 Moses Taylor Hospital Scranton	C L Nuttall M D	Coll grad	12 mos	July & Sept	2	None	Certificate 115
116 Scranton State Hospital Scranton	O L Nuttall M D	Coll grad	12 mos	July & Sept	2	None	Certificate 116
117 Wilkes Barre General Hospital Wilkes Barre	W L Lanyon M D	2 yrs coll	12 mos	July	2	\$500	Certificate 117
TENNESSEE							
118 Knoxville General Hospital Knoxville	R H Monger M D	2 yrs coll	12 mos	Quarterly	4	None	Diploma 118
119 John Gaston Hospital (University of Tennessee) Memphis	H O Schmieser M D	Coll degree	12 mos	Quarterly	4	None	Certificate 119
TEXAS							
120 Hotel Dieu Hospital Beaumont <sup>33</sup>	H B Willford M D	2 yrs coll or R N	18 mos	Varies	3	None	None 120
121 Baylor University Hospital Dallas	J N Hill M D	2 yrs coll	12 mos	Monthly	12	\$100	Certificate 121
122 St Paul's Hospital Dallas	L Coforth M D	B S or A B	12 mos	Jan & July	3	\$100	Certificate 122
123 John Sealy Hospital Galveston <sup>31</sup>	N Bodinsky M D	2 yrs coll	12 mos	Varies	10	\$140	Certificate 123
124 St. Mary's Infirmary Galveston <sup>31</sup>	W L Marr M D	2 yrs coll	12 mos	Varies	3	\$100	Certificate 124
125 Robert B Green Memorial Hospital San Antonio	J D Furey M D	2 yrs coll	12 mos	Jan May, Sept	6	\$500	Certificate 125
VIRGINIA							
126 College of William and Mary (Stuart Circle Hospital) Richmond	H H Hibbs Jr Ph D	High sch grad	4 yrs	Sept	10	Coll fees	B S 126
127 Johnston Willis Hospital Richmond	W A Shepherd M D	2 yrs coll	12 mos	Sept	2	\$100	None 127
128 Medical College of Virginia Hospital Division Richmond	J H Scherer M D	2 yrs coll	12 mos	Sept	3	\$2.50	None 128
129 Stuart Circle Hospital Richmond	R C Beck M D	B S	12 mos				Diploma <sup>32</sup> 129
WASHINGTON							
130 State College of Washington (St Luke's Hospital) Spokane	Victor Burke Ph D	High sch grad	12 yrs	Feb & Sept	8	Coll fees	B S 130
131 Deaconess Hospital Spokane	J M Fingar M D	2 yrs coll	12 mos	July	2	None	None 131
132 Sacred Heart Hospital Spokane	M Patton M D	Coll degree	12 mos	June & Dec	2	\$10 (Br fee)	None 132
133 St Luke's Hospital (State College of Washington Pullman) Spokane <sup>33</sup>	R F Stier M D	3 1/2 yrs coll	12 mos	Feb & Aug	2	\$40	Certificate 133
134 St. Joseph's Hospital (Tacoma College) Tacoma	C R McCall M D	2 yrs coll	18 mos	Aug	2	None	Certificate 134
135 Tacoma General Hospital, Tacoma	B T Ritz M D	Coll degree	12 mos			None	Diploma 135
WISCONSIN							
136 Madison General Hospital Madison	Lester McGary M D	Coll grad	12 mos	Oct	2	None	Certificate 136
137 St. Mary's Hospital Madison	S B Pesin M D	2 yrs coll	18 mos	Jan & July	11	Univ fees	Diploma 137
138 University of Wisconsin (State of Wisconsin General Hospital) Madison	H K B Alkhalil M D	High sch grad	4 yrs	Sept	4	Univ fees	B S 138
139 Milwaukee Hospital The Passavant Milwaukee	H K B Alkhalil M D	2 yrs coll	12 mos	Sept	4	Univ fees	Certificate 139
140 St. Joseph's Hospital (Marquette University) Milwaukee	J C Grill M D	2 yrs coll	24 mos	Sept	4	None	B S 140
141 Milwaukee County General Hospital Wauwatosa	J C Grill M D	2 yrs coll	24 mos	June	4	None	Certificate 141

## NOTES

- Nurses are required to have one year of college
- For Negro students only
- Course includes training in x ray
- A one year course leading to an M S degree is also offered
- A B S degree is required for admission
- A four year course leading to a B S degree is also offered
- Students from other than affiliated colleges must have B S degree
- From Wayne University Detroit or Michigan State College, Lansing
- Students from other than affiliated colleges must have degree
- Students from other than affiliated university must have degree
- Covers lunches laundry breakage and material
- Unives are supplied
- 1 Late summer or fall
- Covers breakage, fee and materials used
- Credit may be applied toward B S degree following three years at College of William and Mary

## ADDITIONAL ALTERNATIONS

- Pokom Chale Little Rock
- Los Angeles City Health Department Laboratories Los Angeles
- St. Joseph's Hospital Denver

- Minneapolis Central Hospital and University Hospitals, Minneapolis
- Anchor Hospital St Paul
- Mississippi State Charity Hospital Vicksburg
- Boone County General Hospital and University Hospitals Columbia
- Kansas City General Hospital Kansas City General Hospital No 2 (col) and Kansas City Tuberculosis Hospital Kansas City
- Fernin De-sage Hospital Mt St Rose Sanatorium and St Mary's Hospital St Louis
- Columbus Hospital Great Falls
- Murray Hospital Butte Montana Deaconess Hospital and Walker Laboratories Great Falls
- Lathrop N Grady Maternity Hospital and Memorial Hospital and Hudson City Hospital Hudson
- Laboratory of the City and County of Schuetteley Schuetteley (col) Dayton
- Clark General Hospital Vancouver Washington
- Deaconess Memorial Hospital for Children and Multnomah Hospital Portland
- Albion Hospital Albion State Hospital and Sacred Heart Hospital Albion
- St Luke's Hospital Albion and Jackson
- City Board of Health and Laboratory Albion
- Whitford Laboratories Beaumont
- Whitford Laboratories Beaumont
- Holbert F and F. L. for code 17 at Boston

The following list contains the names of 6,166 hospitals, sanatoriums and related institutions that are located in the United States and 259 in Alaska, Canal Zone, Guam, Hawaii, Philippine Islands, Puerto Rico and Virgin Islands. It omits the names of 636 hospitals which, after investigation, were not accepted. Registration of hospitals is governed by the Essentials of a Registered Hospital, adopted by the House of Delegates in 1928. Methods of registering and approving hospitals are given on a previous page. The inclusion of the name of any institution may be taken as an indication that evidence concerning irregular or unsafe practices in that institution has not come to the attention of the Council on Medical Education and Hospitals. The list in each state is given in two sections: (1) hospitals and sanatoriums, and (2) related institutions. The related institutions include some general hospitals lacking certain essentials: nursing homes, school infirmaries, prison infirmaries, custodial and other institutions designed to give some medical, nursing or convalescent care in an ethical and acceptable manner, but not strictly hospitals. In the statistics the two classifications are consolidated.

- \* Approved for general internship the fifth year in medicine by the Council on Medical Education and Hospitals
- + Approved for certain residencies in specialties for graduates in medicine who have already had a general internship or its equivalent in private practice

Ca	Cancer	ENT	Eye ear nose and throat	Inst	Institutional	Orth	Orthopedic
Card	Cardiac	Gen	General	Mat	Maternity	SK Ca	Skin and cancer
Chil	Children	G & Or	General and orthopedic	MatCh	Maternity and children	TB	Tuberculosis
Chr	Chronic	G & T B	General and tuberculosis	MeDe	Mentally deficient	TbIsr	Tuberculosis and Isolation
Conv	Convalescence and rest	Inc	Incurable	Ment	Mental	TbOr	Tuberculosis and orthopedic
Drug	Drug and alcoholic	Indus	Industrial	N & M	Nervous and mental	Ven	Veneral
Enfl	Epidemic	Iso	Isolation				

**GOVERNMENTAL**  
Federal  
Indian Affairs  
United States Army  
United States Navy  
United States Public Health Service  
Veterans Administration Facility

**NONPROFIT ORGANIZATIONS**  
Church  
Fraternal  
Nonprofit association

**PROPRIETARY**  
Individual  
Partnership  
Corporation  
(unrestricted as to profit)

## ABBREVIATIONS

CyCo	City and county
Corp	Corporation unrestricted
	as to profit
Fed	Federal

Frat	Fraternal
I A	Office of Indian Affairs, Depart ment of the Interior
Indiv	Individual

NP Assn Nonprofit association  
Part Partnership  
USPHS United States Public Health Service  
Vet Veterans Administration Facility

The accompanying list was corrected by additions and removals of hospitals up to the time of going to press, totals of the list, therefore, may vary from tables 1 and 2, which were necessarily compiled earlier

## ALABAMA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Albertville 2716—Marshall							
Sand Mountain Infirmary	Gen	Indiv	24	2	20	3	193
Alexander City 4510—Tallapoosa							
Russell Hospital	Gen	Indiv	54	4	40	10	500
Anniston 22545—Calhoun							
Garner Hospital	Gen	City	60	8	122	3.5	1351
Station Hospital	Gen	Army	121	2	17	6	1625
Atmore 3023—Escambia							
Attmore General Hospital	Gen	NP Assn	2.5	2	2.5	8	394
Bellamy 317—Sumter							
Bellamy Hospital	Gen	Indiv	18	2	18	5	190
Bessemer 20721—Jefferson							
Bessemer General Hospital	Gen	Corp	72	4	50	20	953
Birmingham 20618—Jefferson							
Birmingham Baptist Hospitals	Gen	Church	164	14	497	10.5	4,681
Children's Hospital	Chil	NP Assn	50			29	1,069
Hill Crest Sanitarium	N&M	Indiv	50			25	963
Hillman Hospital	Gen	County	434	40	1,510	362	11,340
Jefferson Sanatorium	TB	County	100			71	202
Norwood Hospital	Gen	NP Assn	210	16	307	62	5,369
St Vincent's Hospital	Gen	Church	131	6	184	102	3,684
South Highlands Infirmary	Gen	Corp	145	2.5	617	103	4,143
865 Crippled Children's Clinic	Orth	NP Assn	45			3.5	215
Clanton 1547—Chilton							
Central Alabama Hospital	Gen	NP Assn	25	2	12	12	514
Decatur 1533—Morgan							
Benevolent Society Hosp	Gen	NP Assn	50	4	97	20	930
Dunlap 15437—Marengo							
Junetta Coleman Hospital	Gen	Indiv	20		26	6	358
Dothan 16046—Houston							
Fraser Hills Hospital	Gen	Indiv	60	6	68	33	2,192
Moody Hospital	Gen	Indiv	100	6	111	66	2,573
Enterprise 3702—Coffee							
Gibson Hospital	Gen	Indiv	30	3	32	6	415
Fufaula 5298—Barbour							
Brett Infirmary	Gen	Indiv	50	6	25	20	651
Salter Hospital	Gen	Indiv	50	6	23	22	1,050

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Fairfield 11030—Jefferson							
Employees Hospital of the Tennessee Coal Iron and Railroad Company	Gen	NP Assn	261	20	700	170	7,161
Flat (Decatur P O) 134—Morgan							
Morgan County Tuberculosis Sanatorium	TB	County	40			26	120
Florida 2550—Covington							
Young Infirmary and Lakeview Hospital	Gen	Indiv	40	3	26	13	450
Florence 11720—Lauderdale							
Eliza Coffee Memorial Hosp	Gen	City	40	6	116	20	1,083
Gadsden 24042—Etowah							
Forrest General Hospital	Gen	Indiv	85	10	No data supplied		
Holy Name of Jesus Hosp	Gen	Church	85	10	192	50	3,966
Greenville 3985—Butler							
Spir Hospital	Gen	Indiv	26	5	15	6	342
Stabler Infirmary	Gen	Part	42	7	53	12	531
Guntersville Dam —Marshall							
Guntersville Dam Infirmary	Gen	NP Assn	18	2	2	6	422
Huntsville 11534—Madison							
Huntsville Hospital	Gen	NP Assn	50	6	102	29	1,452
Jack on 1,528—Clarke							
South Alabama Infirmary	Gen	Corp	16	1	29	5	104
Jasper 1513—Walker							
Peoples Hospital	Gen	County	5	4	78	22	1,110
Walker County Hospital	Gen	Corp	50	2	43	21	878
Mobile 6802—Mobile							
City Hospital	Gen	City	105	18	457	62	7,717
Mobile County Tuberculosis Sanitarium	TB	County	54			51	40
Mobile Infirmary	Gen	NP Assn	129	10	150	70	2,490
Providence Infirmary	Gen	Church	85	12	294	61	2,267
U S Marine Hospital	Gen	USPHS	1.51			147	1,519
Montgomery 66020—Montgomery							
Fitts Hill Hospital	Gen	Indiv	70	6	105	16	855
Hubbard Hospital	Gen	Indiv	45	12	2.2	25	1,070
Montgomery Tuberculosis Sanatorium	TB	NP Assn	50			40	120

Key to symbols and abbreviations is on page 933



## ALABAMA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
St Margaret's Hospital	Gen	Church	137	15	393	93	4 883
Station Hospital	Gen	Army	59	4	19	25	850
Mt Vernon 810—Mobile							
Searcy Hospital (col)	Ment	State	162			1 63	497
Ophelia 6 156—Lee							
East Alabama Hospital	Gen	NPA'sn	2	3	No data supplied		
Roanoke 4 373—Randolph	Gen	Indiv	34	3	15	25	1 03
Knight Sanatorium							
Russellville 3 146—Franklin	Gen	Indiv	18	2	24	9	481
Russellville Hospital							
Scottsboro 2 304—Jackson	Gen	Indiv	20	2	25	5	264
Hodges Hospital							
Tri Counties Tuberculosis Sanatorium	TB	Counties	30		Destroyed by fire		
Selma 18 012—Dallas							
Burwell Infirmary (col)	Gen	Indiv	27	2	6	21	286
Goldsbey King Mem Hosp	Gen	NPA'sn	6	10	4	44	1 670
Good Samaritan Hosp (col)	Unit of Selma Baptist						
Selma Baptist Hospital	Gen	NPA'sn	90	20	140	44	2 14
Vaughan Memorial Hosp	Gen	Corp	26	6	33	19	681
Sheffield 6 221—Colbert							
Colbert County Hospital	Gen	CyCo	76	12	146	20	1 127
Sylacauga 4 116—Talladega							
Drummond Fraser Hospital	Gen	NPA'sn	30	8	125	10	493
Drummond Infirmary	Gen	Corp	28	6	30	9	493
Talladega 7 596—Talladega							
Citizens Hospital	Gen	Corp	60	5	91	20	1 382
Troy 6 814—Pike							
Beard Memorial Hospital	Gen	Part	3	5	14	12	962
Edge Hospital	Gen	Indiv	27	2	33	1	893
Tuscaloosa 20 63—Tuscaloosa							
Bryce Hospital	Ment	State	3 800			3 773	1 999
Druid City Hospital	Gen	NPA'sn	7	10	381	54	1 5 6
Veterans Admin Facility	Gen	Vet	346			324	2 610
Tuskegee 3 314—Macon							
Veterans Admin Facility (col)	Gen	Vet	1 493			1 283	2 334
Tuskegee Institute 375—Macon							
John Abdon Andrew Memorial Hospital (col)	Gen	NPA'sn	80	0	51	50	916
Wetumpka 2 357—Elmore							
Wetumpka General Hospital	Gen	Part	29	1	62	8	573
York 1 06—Sumter							
Hill Hospital	Gen	Indiv	15	2	10	3	240

## Related Institutions

Alabama City 8 544—Etowah							
Etowah County Tuberculosis Sanatorium	IB	County	18			13	13
Altoona 1 08—Etowah							
Klein Hospital	Gen	Indiv	27	3	34	9	301
Birmingham 2 39 678—Jefferson							
Alabama Boys Industrial School	Inst	State	29			4	614
Children's Home Hosp (col)	Gen	NPA'sn	17	3	18	8	391
Miss Quinn's Nursing Home	Conv	Part	8			6	193
Salvation Army Home and Hospital	Mat	Church	59	12	97	38	112
Dothan 16 046—Houston							
Dr M S Davies Private Hospital	Gen	Indiv	50	4	20	15	618
East Tallahassee 2 198—Tallapoosa							
Community Hospital	Gen	NPA'sn	19	2	24	7	400
Monterevallo 1 24—Shelby							
Peterson Hall	Inst	State	36			5	1 537
Montgomery 66 079—Montgomery							
Fraternal Hospital (col)	Gen	Indiv	4	10	73	17	690
Kilby Prison Hospital	Inst	State	10			72	681
Miriam Jackson Home	Inst	Church	2			6	720
Pell City 835—St Clair							
Pell City Infirmary	Gen	Indiv	19	1	26	4	103
Talladega 7 596—Talladega							
Goodnow Hospital (col)	Inst	NPA'sn	18			1	71
Tuscaloosa 20 63—Tuscaloosa							
Partlow State School	MeDe	State	640			636	24
Wetumpka 2 357—Elmore							
State Convict Tuberculosis Hospital	TB	State	100			No data supplied	

## Summary for Alabama

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	70	11 696	9 530	110 834
Related institutions	16	1 219	911	6 932
Totals	86	13 115	10 497	117 786
Refused registration	3	120		

## ARIZONA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Ajo 1 100—Pima							
Phelps Dodge Hospital	Gen	NPA'sn	28	5	8	9	321
Bisbee 8 023—Cochise							
Copper Queen Hospital	Gen	NPA'sn	4	6	144	19	946
Chin Lee 6—Apache							
Chin Lee General Hospital	Gen	IA	17	4	34	18	820
Douglas 9 828—Cochise							
Cochise County Hospital	Gen	County	4	6	47	36	816

## ARIZONA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Flagstaff, 3 891—Coconino							
Flagstaff Hospital	Gen	Corp	21	6	67	10	435
Ft Defiance 600—Apache							
Ft Defiance Sanatorium	Unit of Southern Navajo General Hospital and Sanatorium						
Southern Navajo General Hospital and Sanatorium	G&TB IA		226	14	161	12	2 137
Ft Huachuca 1 500—Cochise							
Station Hospital	Gen	Army	48	1	8	2	671
Ganado 150—Apache							
Sage Memorial Hospital (Indian)	Gen	Church	100	10	97	97	1 40
Globe 7 157—Gila							
Gila County Hospital	Gen	County	30	6	67	13	693
Jerome 4 932—Yavapai							
United Verde Hospital	Gen	NPA'sn	2	4	50	96	821
Keams Canyon 150—Navajo							
Hopi General Hospital	Gen	IA	33	3	7	29	707
Kingman 2 900—Mohave							
Mohave General Hospital	Gen	County	20		83	20	613
Luppp 200—Coconino							
Lucup Indian Hospital	Gen	IA	23	2	14	1	411
Mesa 3 711—Maricopa							
South Side District Hospital	Gen	NPA'sn	2	8	150	31	1 237
Miami 7 697—Gila							
Miami Inspiration Hospital	Gen	NPA'sn	40	4	116	13	1 640
Morenci 2 900—Greenlee							
Phelps Dodge Hospital	Gen	NPA'sn	15	1	33	6	46
Phoenix 4 118—Maricopa							
Arizona State Hospital	Ment	State	923			800	37
Booker T Washington Memorial Hospital (col)	G&TB Indiv		30	3	1	13	3 1
Good Samaritan Hospital	Gen	Church	13	20	23	10	397
Phoenix Indian Hospital	Gen	IA	64	3	84	44	1 216
Phoenix Indian Sanatorium	TB	IA	120			99	10
St Joseph's Hospital	Gen	Church	153	20	500	132	1 536
St Luke's Home	TB	Church	70			22	6
Prescott 5 517—Yavapai							
Mercy Hospital	Gen	Church	50	7	6	10	579
Panquetgaaf Sanatorium	TB	Indiv	40		No data supplied		
St Luke's in the Mountains	Unit of St Luke's Home Phoenix						
Ray 1 100—Pinal							
Ray Hospital	Gen	NPA'sn	20	4	74	10	94
Sacaton 310—Pinal							
Pima Indian Hospital	Gen	IA	35	6	64	20	710
Safford 1 766—Graham							
Morris Squibb Hospital	Gen	NPA'sn	23	3	26	6	310
San Carlos 100—Gila							
San Carlos Indian Hospital	Gen	IA	40	3	37	3	77
Sells 200—Pima							
Indian Oasis Hospital	Gen	IA	50	5	33	2	70
Tempe 2 490—Maricopa							
State Welfare Sanatorium	TB	State	110			91	123
Tuba City 100—Coconino							
Western Navajo Hospital	Gen	IA	32	6	22	22	19
Tucson 32 06—Pima							
Anson Rest Home	TB	Part	20			11	31
Barfield Sanatorium	TB	Indiv	22				
Desert Sanatorium and Institute of Research	Gen	NPA'sn	59			23	93
Pima County General Hosp	G&TB County		12	10		New building	
St Luke's in the Desert Sanatorium	TB	Church	3			1	45
St Mary's Hospital and Sanatorium	G&TB Church		13	20	3.1	101	3 000
Southern Pacific Sanatorium	TB	NPA'sn	82			51	54
Veterans Admin Facility	G&TB Vet		338			341	53
Whipple—Yavapai							
Veterans Admin Facility	G&TB Vet		503			29	1 477
Whiteriver 300—Navajo							
Ft Apache Agency Hospital	Gen	IA	46	6	30	22	507
Wickenburg 734—Maricopa							
Wickenburg Hospital	Gen	NPA'sn	13	3	34	8	94
Winslow 3 917—Navajo							
Winslow Indian Sanatorium	TB	IA	45			50	9
Yuma 4 892—Yuma							
Ft Yuma Indian Hospital	Gen	IA	29	8	22	10	30
Yuma County General Hosp	Gen	County	48	6	No data supplied		

## Related Institutions

Kayenta 40—Navajo							
Kayenta Sanatorium	TB	IA	02			19	41
McVay 55—Apache							
McVay Hospital	Gen	NPA'sn	8	1	7	0	0
Nogales 6 006—Santa Cruz							
St Joseph's Hospital	Gen	Church	20	7	10	5	221
Oracle 200—Pinal							
La Casa del Encanto	Conv	Indiv	5			5	13
Parker 200—Yuma							
Colorado River Indian Agency Hospital	Gen	IA	40	4	36	11	288
Prescott 5 517—Yavapai							
Yavapai County Hospital	InstGen County		70	4	30	40	1 100
Tucson 32 506—Pima							
Arizona State Elks Association Hospital	TB	Frat	25			15	14
Comstock Children's Hosp	TB	NPA'sn	35			19	25
Means Rest Home	Conv	Indiv	28			9	20
Reardon Sanatorium	TB	Indiv	16				
San Xavier Indian Sanatorium	TB	IA	46			43	62

## ARIZONA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Valentine 110—Mohave	Gen	IA	11	3	14	9	238
Truxton Canon Indian Hosp	Gen	Indiv	10	1	14	2	110
Williams 2106—Coconino	Gen	Indiv	10	1	14	2	110
Williams Hospital	Gen	Indiv	10	1	14	2	110
Summary for Arizona							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related Institutions	47	4 473	3 202	41 46			
Totals	13	368	209	2 710			
Refused registration	60	4 841	3 411	44,171			
	3	60					

## ARKANSAS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Alexander 141—Pulaski	TB	State	32			32	37
McRae Memorial Sanatorium (col)	Gen	Indiv	16	4	22	4	167
Arkadelphia, 3,350—Clark	Gen	Indiv	25	2	10	15	480
Townsend Hospital	Gen	Indiv	12	1	11	4	312
Batesville 4 484—Independence	Gen	Indiv	17	2	13	4	190
Dr Gray's Infirmary	Gen	Indiv	40	6	64	16	676
Johnston and Craig Hosp	Gen	Part	25	4		Estab	1935
Benton 3 445—Saline	Gen	Indiv	30	0	184	14	967
Blackely Hospital	Gen	Indiv	12		23	5	80
Blytheville 10 678—Mississippi	Gen	Indiv	18	1	15	3	165
Blytheville Hospital	Gen	Indiv	45	6	36	4	215
Walls Hospital	Gen	Indiv	50	8	62	10	496
Camden 7 243—Ouachita	Gen	NPAsen	22	2	15	11	471
Camden Hospital	Gen	NPAsen	25	4	90	9	375
Charleston 851—Franklin	Gen	Indiv	25	5	23	5	484
Bollinger Hospital	Gen	Indiv	85	8	204	52	1 850
Clarksburg 3 031—Johnson	Gen	Corp	60	8	118	21	1 184
Johnson County Hospital	Gen	Corp	258		276	2 051	
Conway 5 534—Faulkner	Gen	City	100	15	262	76	3 157
Conway Memorial Hospital	Gen	City	59	12	163	42	2,347
Crossett 2 811—Ashley	Gen	Corp	20	2	49	8	479
Crossett Hospital	Gen	Corp	38	6	87	20	733
De Queen 2 033—Sevier	Gen	Corp	22	5	35	7	323
Archer Hospital	Gen	Indiv	20	4	50	12	400
Dyers 1 000—Mississippi	Gen	Corp	412	3	10	3,2	2 975
Dyers Colony Hospital	Gen	Corp	75	5	46	60	1 199
El Dorado 16 421—Union	Gen	Corp	60	8	21	7	333
Henry C Rosamond Memo	Gen	Indiv	158	6	49	80	2,107
rial Hospital	Gen	Church	100	10	182	72	2 266
Warner Brown Hospital	Gen	Church	45	4	61	17	830
Fayetteville 7 534—Washington	Gen	City	83		56	632	
Fayetteville City Hospital	Gen	City	300	11	336	115	4 514
Veterans Admin Facility	Gen	City	17	2	23	4	153
Ft Smith 31,429—Sebastian	Gen	City	156	12	105	2 27	
Arkansas Tuberculosis Sanat	Unit of Arkansas Tuberculosis Sanatorium						
St Edward's Mercy Hosp	Gen	Church	100	15	262	76	3 157
Sparks Memorial Hosp	Gen	NPAsen	59	12	163	42	2,347
Haskell 180—Saline	Gen	NPAsen	20	2	49	8	479
State Hospital Benton Divi	Unit of State Hospital	Little Rock					
Heber Springs 1 401—Cleburne	Gen	Part	20	2	49	8	479
Estelle Hospital	Gen	Part	38	6	87	20	733
Helena 8 316—Phillips	Gen	NPAsen	22	5	35	7	323
Helena Hospital	Gen	NPAsen	20	4	50	12	400
Hope 6 008—Hempstead	Gen	Part	412	3	10	3,2	2 975
Josephine Hospital	Gen	NPAsen	75	5	46	60	1 199
Julia Chester Hospital	Gen	NPAsen	60	8	21	7	333
Hot Springs National Park 20 238—Garland	Gen	Fed	158	6	49	80	2,107
Army and Navy Gen Hosp	Gen	Fed	100	10	182	72	2 266
Leo N. Levi Memorial Hosp	Gen	Frat	45	4	61	17	830
Ozark Sanatorium	Gen	Corp	83		56	632	
St Joseph's Hospital	Gen	Church	300	11	336	115	4 514
Jonesboro 10 326—Craighead	Gen	Church	17	2	23	4	153
St Bernard's Hospital	Gen	Church	156	6	49	80	2,107
Lake Village 1 582—Chicot	Gen	Part	100	10	182	72	2 266
Lake Village Infirmary	Gen	Part	45	4	61	17	830
Little Rock 81 678—Pulaski	Gen	Part	45	4	61	17	830
Arkansas Children's Home	Chil	NPAsen	83		56	632	
and Hospital	Gen	Church	300	11	336	115	4 514
Baptist State Hospital	Gen	Indiv	17	2	23	4	153
Granite Mountain Hospital	Gen	City	156	12	105	2 27	
Little Rock City Hospital	Gen	City	125		115	4 452	
Missouri Pacific Hospital	Indus	NPAsen	100	10	182	72	2 266
St Vincent's Infirmary	Gen	Church	156	6	49	80	2,107
State Hospital	Gen	State	3 000		8	4 107	1,845
Magnolia 3 000—Columbia	Gen	Corp	10	4	25	3	152
Community Hospital	Gen	Corp	30		36	11	600
Monticello 3 066—Drew	Gen	Indiv	30	4	20	16	442
Mack Wilson Hospital	Gen	Indiv	30	4	20	16	442
Morrilton 4 043—Conway	Gen	Church	30	4	20	16	442
St Anthony's Hospital	Gen	Church	30	4	20	16	442
North Little Rock, 19 418—Pulaski	Gen	Church	30	4	20	16	442
Veterans Admin Facility	Vet	Vet	1 347			1 033	823
Paragould 5 506—Creece	Gen	Corp	25	3	21	10	352
Dickson Memorial Sanatorium	Gen	Corp	25	3	21	10	352
Paris 3 234—Logan	Gen	Indiv	20	2	No data supplied		
Dr Jewell's Infirmary	Gen	Indiv	20	2	No data supplied		
Pine Bluff 20 000—Jefferson	Gen	Church	57	4	54	26	1 207
Davis Hospital	Gen	Church	57	4	54	26	1 207

## ARKANSAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Prescott 3 033—Nevada	Gen	Indiv	30	3	18	12	535
Cora Donnell Hospital	Gen	Indiv	60	12	73	40	1 370
Russellville 5 628—Pope	Gen	Indiv	30	3	35	17	884
St Mary's Hospital	Gen	Indiv	25	4	40	9	551
Searcy 3 387—White	Gen	Indiv	700		685	899	
Wakenight Sanitarium	Gen	NPAsen	50	8	153	35	1 750
Silham Springs 2 378—Benton	Gen	NPAsen	150		68	2 968	
John Brown Univ Hosp	Gen	NPAsen	15	1	16	3	184
State Sanatorium —Logan	Gen	NPAsen	20	1	6	7	410
Arkansas Tuberculosis Sana	TB	State	65	4	20	48	797
torium			41	2	29	2	34
Texarkana, 10 764—Miller	Gen	Church	200	6	121	390	1 142
Michael Meagher Memorial	Gen	Church	8	2	6	4	98
Hospital	Gen	Church	8			2	250
St Louis Southwestern Hos	Indus	NPAsen					
pital							
Summary for Arkansas							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related Institutions	51	9 332	7 671	55 270			
Totals	8	319	268	2 990			
Refused registration	59	9 711	7,939	58 260			
	14	338					

## CALIFORNIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Agnew 300—Santa Clara	Gen	State	3 158			3 468	1 002
Agnes's State Hospital	Gen	State	3 158			3 468	1 002
Ahwannee 50—Madera	Gen	State	3 158			3 468	1 002
Ahwannee Tri County Tuber	TB	County	124			114	122
culosis Sanatorium							
Alameda 3 033—Alameda	Gen	Corp	85	21	222	40	1 747
Alameda Sanatorium on the	Gen	Corp	30	16	400	18	591
South Shore	Gen	Corp	40	12	270	21	1 288
Albany 8 569—Alameda	Gen	Corp	72			33	1,577
Albany Hospital	Gen	Indiv	16	4	121	6	521
Alhambra 20 412—Los Angeles	Gen	Corp	27	5	66	12	556
Alhambra Hospital	Gen	Corp	16	4	121	6	521
Angel Island 418—Marin	Gen	Army	27	5	66	12	556
Station Hospital	Gen	Army	16	4	121	6	521
Antioch 3 563—Contra Costa	Gen	Indiv	27	5	66	12	556
Antioch Hospital	Gen	Indiv	16	4	121	6	521
Arcata 1 769—Humboldt	Gen	Church	27	5	66	12	556
Trinity Hospital	Gen	Church	27	5	66	12	556
Arlington 3 440—Riverside	Gen	Corp	350	15	332	301	3,709
Riverside County Hospital	G&TB	County	24	4	77	10	538
Artesia 3 891—Los Angeles	Gen	Indiv	24	4	77	10	538
Artesia Hospital	Gen	Indiv	24	4	77	10	538
Atwater 917—Merced	Gen	Indiv	24	4	77	10	538
Bloss Memorial Hospital	Gen	Indiv	24	4	77	10	538
Unit of Merced General Hospital	Merced						
Auberry, 100—Fresno	TB	County	66			69	69
Wilfah Sanatorium	TB	County	66			69	69
Auburn 2,661—Placer	Gen	Indiv	25	7	37	10	190
Highland Hospital	Gen	Indiv	25	7	37	10	190
Bakersfield 26 015—Kern	Gen	Church	75	20	366	68	3 696
Merced Hospital	Gen	Church	75	20	366	68	3 696
Banning 7 732—Riverside	Gen	Church	75	20	366	68	3 696
Banning Hospital and Sana	G&TB	Indiv	25	2		7	186
torium	TB	Indiv	35			18	16
Southern Sierras Sanatorium	TB	Indiv	35			18	16
Bell 7 854—Los Angeles	Gen	Corp	30	15	428	20	849
Bell Mission Hospital	Gen	Corp	30	15	428	20	849
Belmont 984—San Mateo	Gen	Corp	75			46	135
Alexander Sanitarium	N&M	Corp	100			55	187
California Sanatorium	TB	Corp	100			55	187
Twin Pines Sanitarium	N&M	Corp	100			55	187
Berkeley 82,109—Alameda	Gen	Corp	100	26	40	69	3 662
Alta Bates Hospital	Gen	Corp	100	26	40	69	3 662
Berkeley General Hospital	Gen	NPAsen	100	13	25	42	1 519
F V Cowell Memorial Hosp	Gen	State	91			56	2 140
Brawley 10 429—Imperial	Gen	Indiv	20	4	100	7	533
Brawley Community Hosp	Gen	Indiv	20	4	100	7	533
Burbank 16 672—Los Angeles	Gen	Indiv	26	7	167	18	63
Burbank Hospital	Gen	Indiv	26	7	167	18	63
Camarillo 300—Ventura	Gen	Indiv	26	7	167	18	63
Camarillo State Hospital	Gen	Indiv	26	7	167	18	63
Carmel 2 000—Monterey	Gen	Indiv	26	7	167	18	63
Peninsula Community Hosp	Gen	NPAsen	25	9	105	15	805

## CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Chico 7961—Butte							
Chico Hospital	Gen	Indiv	15	4	71	0	457
Enloe Hospital	Gen	Indiv	42	12	No data supplied		
Colfax 912—Placer							
Bushnell Sanatorium							
Colfax Hospital							
Colfax School for the Tuberculous							
Housekeeping Cottage Colony							
Colusa 2116—Colusa	FB	Indiv	50			10	53
Colusa Memorial Hospital	Unit of Colfax School for the Tuberculous	Unit of Colfax School for the Tuberculous					
Compton, 12516—Los Angeles	Gen	County	20	8	79	17	588
Compton Sanitarium	N&M	Corp	170			50	316
Las Campanas Hospital	Gen	Corp	40	9	216	17	660
Covina 2714—Los Angeles							
Covina Hospital	Gen	Part	40	10	100	27	1104
Crescent City 1720—Del Norte							
Knapp Hospital	Gen	NPA'ssn	20	5	28	10	432
Culver City 5669—Los Angeles							
University Hospital	Gen	Corp	50	17	60	7	300
Dinuba 2968—Tulare							
Alta District Hospital	Gen	Part	16	4		1 stab	1038
Duarte 1600—Los Angeles							
Los Angeles Sanatorium	TB	NPA'ssn	170			106	103
Dunsmuir 2610—Siskiyou							
Dunsmuir Hospital and Sanatorium	Gen	Part	17	4	24	6	370
El Centro 8431—Imperial							
Imperial County Farm and Hospital	Gen	County	115	10	160	60	2167
El Monte 3470—Los Angeles							
Ruth Home	Ven	NPA'ssn	140	15	23	111	169
Eureka 15752—Humboldt							
General Hospital	Gen	Part	53	8	130	22	1063
Humboldt County Hospital	Gen	County	114	12	157	118	1,900
Humboldt County School for the Tuberculous	TB	County Church	60			21	91
St. Joseph Hospital	Gen	Church	62	13	187	32	1,396
Ft. Bidwell 402—Modoc							
Ft. Bidwell Hospital	G&TB	IA	38	1	4	32	57
Ft. Bragg 3022—Mendocino							
Redwood Coast Hospital	Gen	Corp	26	5	94	13	439
French Camp 248—San Joaquin							
San Joaquin General Hospital	Gen	County	570	20	724	504	9,230
Fresno 52518—Fresno							
Burnett Sanitarium	Gen	Corp	120	18	511	71	3,161
Fresno County General Hospital	Gen	County	500	18	970	462	8,196
St. Agnes Hospital	Gen	Church	72	18	381	40	2,113
Fullerton 10800—Orange							
Fullerton Hospital (St. Joseph Hospital)	Gen	Church	32	6	120	14	500
Gilroy 3402—Santa Clara							
Wheeler Hospital	Gen	NPA'ssn	30	8	74	11	974
Glendale 62736—Los Angeles							
Glendale Sanitarium and Hospital	Gen	Church	200	12	340	137	3,091
Physicians and Surgeons Hospital	Gen	Corp	60	16	507	51	1,669
Grass Valley 3817—Nevada							
W. C. Jones Memorial Hospital	Gen	Indiv	24	4	22	15	587
Hanford 7028—Kings							
Hanford Sanitarium	Gen	Corp	20	6	120	10	724
Kings County Hospital	Gen	County	100	11	162	115	1,831
Sacred Heart Hospital	Gen	Church	20	5	71	10	897
Hawthorne 6550—Los Angeles							
Hawthorne Hospital	Gen	Indiv	15	5	215	14	578
Hayward 5530—Alameda							
Hayward Hospital	Gen	Indiv	16	5	100	9	411
Healdsburg 2296—Sonoma							
Healdsburg General Hospital	Gen	NPA'ssn	14	6		5	210
Hermosa Beach 4706—Los Angeles							
South Bay Community Hospital	Gen	NPA'ssn	10	7	21	6	273
Hollister 3757—San Benito							
Hazel Hawkins Memorial Hospital	Gen	NPA'ssn	18	4	55	7	610
Hoopa 20—Humboldt							
Hoopa Valley Indian Hospital	Gen	IA	38	5	36	15	476
Huntington Park 24591—Los Angeles							
Mission Hospital	Gen	Corp	31	10	219	25	1,183
Imola 20—Napa							
Napa State Hospital	Ment	State	3,746			3,620	970
Indio 2000—Riverside							
Casita Hospital	Gen	Indiv	20	6	No data supplied		
Coachella Valley Hospital	Gen	Indiv	16	4	No data supplied		
Inglewood 19480—Los Angeles							
Centinela Hospital	Gen	Indiv	34	10	148	11	675
Keene 164—Kern							
Stony Brook Retreat	TB	County	103			101	98
King City 1483—Monterey							
Community Hospital	Gen	Indiv	16	2	20	5	193
La Crescenta 6000—Los Angeles							
Hillcrest Sanatorium	TB	Corp	45			19	148
La Vina 70—Los Angeles							
La Vina Sanatorium	TB	NPA'ssn	51			42	80
Lindsay 3788—Tulare							
Lindsay Hospital	Gen	Part	12	2	57	5	210
Livermore 3119—Alameda							
Arroyo Del Valle Sanatorium	TbChll	County	270			220	349
Livermore Sanitarium	N&M	Corp	112			84	160
St. Paul's Hospital	Gen	Indiv	21	3	48	7	219
Veterans Admin Facility	TB	Vet	312			284	420

## CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Lodi, 6788—San Joaquin	Gen	Indiv	23	6	71	9	441
Dr. Buchanan's Sanatorium	Gen	Indiv	10	3	33	6	251
Mason Hospital	Gen	Indiv	10	3	33	6	251
Loma Linda 2560—San Bernardino	Gen	Church	112	12	971	81	2,900
Loma Linda Sanatorium and Hospital	Gen	Church	112	12	971	81	2,900
Long Beach 1420.2—Los Angeles	Gen	Church	48	8	99	16	709
Harriman Jones Clinic and Hospital	Gen	Church	100	20	400	14	1,210
Long Beach Community Hospital	Gen	Church	70	10	277	10	1,175
St. Mary's Long Beach Hos	Gen	Church	200	33	890	117	3,000
Seaside Memorial Hospital	Gen	Church	100				69
Los Angeles 1238015—Los Angeles	Gen	Church	28	20	90	9	681
Barlow Sanatorium	Gen	Church	30	10	90	9	681
Barry's Maternity Cottage Mat	Gen	Church	261	31	1,916	972	8,294
California Babies Hospital	Gen	Church	28	40	937	213	1,131
California Hospital	Gen	Church	185				113
Cedars of Lebanon Hosp	Gen	Church	70				66
Children's Hospital	Gen	Church	21				140
Ex-Patients Home of the Jewish Consumptive Relief Association	Gen	Church	100	20	300	29	1,514
Eye and Ear Hospital	Gen	Church	70				66
French Hospital	Gen	Church	100	20	300	29	1,514
Golden State Hospital	Gen	Church	70				66
Hospital of the Good Samaritan	Gen	Church	400	40	694	32	9,430
Japanese Hospital	Gen	Church	42	6	174	91	7,481
Lincoln Hospital	Gen	Church	20	0	110	0	873
Los Angeles County Hos	Gen	County	3154	144	3560	936	30,001
Los Angeles County Psychopathic Hospital	Gen	County	37				11
Los Angeles Sanatorium	Gen	County	180	40	1103	107	4,500
Methodist Hospital of Southern California	Gen	County	70				66
Orthopaedic Hospital	Gen	County	10	3	71	8	46
Pahl Hospital	Gen	County	210	60	1794	100	6,000
Presbyterian Hospital Olmsted Memorial	Gen	County	220	39	912	191	6,400
Queen of Angels Hospital	Gen	County	220	40	807	100	6,400
St. Vincent's Hospital	Gen	County	100				69
Santa Fe Coast Lines Hos	Gen	County	100				69
Southwest General Hospital	Gen	County	24	8	206	18	500
White Memorial Hospital	Gen	County	174	24	1030	128	6,000
Los Catos 3168—Santa Clara	Gen	County	60				20
Oak Sanatorium	Gen	County	13	4	50	11	500
Madera 4660—Madera	Gen	County	132	8	100	97	1,400
Dearborn Hospital	Gen	County	21	6	57	11	400
Madera County Hospital	Gen	County	46				40
Madera Sanatorium	Gen	County	70	6	04	30	1,000
Manor—Marlin	Gen	County	500	7	62	90	6,000
Arequipa Sanatorium	Gen	County	230	12	200	107	2,300
March Field—Riverside	Gen	County	32	6	140	10	500
Station Hospital	Gen	County	500	7	62	90	6,000
Mare Island 500—Solano	Gen	County	230	12	200	107	2,300
U. S. Naval Hospital	Gen	County	32	6	140	10	500
Martinez 6569—Contra Costa	Gen	County	30	6	80	20	800
Contra Costa County Hosp	Gen	County	53	12	300	30	1,000
Martinez Community Hosp	Gen	County	30	6	80	20	800
Marysville 5763—Yuba	Gen	County	53	12	300	30	1,000
Rideout Memorial Hospital	Gen	County	30	6	80	20	800
Merced 7066—Merced	Gen	County	30	6	80	20	800
Merced Hospital	Gen	County	30	6	80	20	800
Modesto 13842—Stanislaus	Gen	County	30	6	80	20	800
McPherson Hospital	Gen	County	30	6	80	20	800
Robertson Hospital	Gen	County	30	6	80	20	800
St. Mary's Hospital	Gen	County	30	6	80	20	800
Stanislaus County Hospital	Gen	County	30	6	80	20	800
Monrovia 10890—Los Angeles	Gen	County	20				11
Norumbeka Sanatorium	Gen	County	120				60
Pottenger Sanatorium and Clinic	Gen	County	100	6	48	11	400
Monterey 9141—Monterey	Gen	County	50	2	5	51	1,411
Monterey Hospital	Gen	County	30	8	040	22	977
Station Hospital	Gen	County	100	6	48	11	400
Monterey Park 6406—Los Angeles	Gen	County	28	6	140	13	600
Garfield Hospital	Gen	County	12	2	20	5	193
Murphy's 600—Calaveras	Gen	County	133	16	200	6	1,410
Bret Harte Sanatorium	Gen	County	100	6	48	11	400
Napa 6437—Napa	Gen	County	100	6	48	11	400
Victory Hospital	Gen	County	100	6	48	11	400
National City 7301—San Diego	Gen	County	100	6	48	11	400
Elwyn Hospital	Gen	County	100	6	48	11	400
Paradise Valley Sanatorium and Hospital	Gen	County	100	6	48	11	400
Newhall 1104—Los Angeles	Gen	County	100	6	48	11	400
Wildwood Sanatorium	Gen	County	100	6	48	11	400
Newman 1269—Stanislaus	Gen	County	100	6	48	11	400
West Side Hospital	Gen	County	100	6	48	11	400
Norwalk 5111—Los Angeles	Gen	County	100	6	48	11	400
Norwalk State Hospital	Gen	County	100	6	48	11	400
Oakland 284063—Alameda	Gen	County	100	6	48	11	400
Alameda County Hosp	Gen	County	100	6	48	11	400
Children's Hospital of the East Bay	Gen	County	100	6	48	11	400
East Bay	Gen	County	100	6	48	11	400
Fast Oakland Hospital	Gen	County	100	6	48	11	400
Peralta Hospital	Gen	County	100	6	48	11	400
Providence Hospital	Gen	County	100	6	48	11	400
Samuel Merritt Hospital	Gen	County	100	6	48	11	400

Key to symbols and abbreviations is on page 933

CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Olive View —Los Angeles	TB	County	1 017			98.5	756
Olive View Sanatorium*							
Orange 8 006—Orange	Gen	County	352	13	347	281	3 336
Orange County Hospital*	Gen	County	100	25	611	76	2 357
St Joseph Hospital*	Gen	Church	34	9	150	11	701
Onward 6 285—Ventura	Gen	Church	80	20	363	64	2 995
St John's Hospital	Gen	Church	1 026			1 101	322
Palo Alto 18 632—Santa Clara	Gen	NPA'ssn					
Palo Alto Hospital	Gen	NPA'ssn					
Veterans Admin Facility	Gen	NPA'ssn					
Pasadena 16 086—Los Angeles	Gen	NPA'ssn	174	24	530	131	5 385
Collins P and Howard Hunt	Gen	NPA'ssn	50			88	1 001
Ington Memorial Hosp**	Gen	NPA'ssn					
Las Encinas Sanitarium	Gen	NPA'ssn					
Lutheran Good Samaritan Hospital	Gen	Church	30	18	53	14	497
St Luke's Hospital	Gen	Church	23	20	386	57	2 044
Southern California Sanitarium for Nervous and Gen	Gen	Church					
eral Diseases	Gen	Church					
Woman's Hospital	Gen	Church					
Patton 4 100—San Bernardino	Gen	Church					
Patton State Hospital	Gen	Church					
Placerville 2 322—Eldorado	Gen	Church					
Placerville Sanitarium	Gen	Church					
Pomona 26 804—Los Angeles	Gen	Church					
Pomona Valley Community Hospital	Gen	Church					
Portola 1 400—Plumas	Gen	Church					
Western Pacific Railway Hos	Gen	Church					
ital	Gen	Church					
Red Bluff 3 517—Tehama	Gen	Church					
St Elizabeth's Mercy Hosp	Gen	Church					
Tehama County Hospital	Gen	Church					
Redwood City 5 902—San Mateo	Gen	Church					
Canyon Sanitarium	Gen	Church					
Hawley Health Home	Gen	Church					
Richmond 10 063—Contra Costa	Gen	Church					
Richmond Cottage Hospital	Gen	Church					
Riverside 29 696—Riverside	Gen	Church					
Riverside Community Hosp	Gen	Church					
Rosemead 4 300—Los Angeles	Gen	Church					
Alhambra Sanatorium	Gen	Church					
Lovell Sanat for Children	Gen	Church					
Ross 1 500—Marin	Gen	Church					
Ross General Hospital	Gen	Church					
Sacramento 23 100—Sacramento	Gen	Church					
Sacramento County Hosp**	Gen	Church					
Sutter General Hospital	Gen	Church					
Sutter Maternity Hospital	Gen	Church					
Salinas 10 267—Monterey	Gen	Church					
St Paul's Sanitarium	Gen	Church					
Monterey County Hospital	Gen	Church					
Park Lane Hospital	Gen	Church					
Salinas Valley Hospital	Gen	Church					
San Bernardino 37 481—San Bernardino	Gen	Church					
St Bernardino's Hospital	Gen	Church					
San Bernardino County Charity	Gen	Church					
Hospital**	Gen	Church					
San Diego 14 995—San Diego	Gen	Church					
Good Samaritan Hospital	Gen	Church					
Mersey Hospital	Gen	Church					
San Diego County General	Gen	Church					
Hospital**	Gen	Church					
Scripps Memorial Hospital	Gen	Church					
Scripps Metabolic Clinic	Gen	Church					
U S Naval Hospital*	Gen	Church					
Vaulain Home	Gen	Church					
San Fernando 7 67—Los Angeles	Gen	Church					
Veterans Admin Facility	Gen	Church					
San Francisco 634 394—San Francisco	Gen	Church					
Chinese Hospital	Gen	Church					
Dante Hospital	Gen	Church					
Franklin Hospital**	Gen	Church					
French Hospital**	Gen	Church					
Greens Eye Hospital*	Gen	Church					
Hospital for Children**	Gen	Church					
Letterman General Hospital	Gen	Church					
Mary's Help Hospital**	Gen	Church					
Mt Zion Hospital**	Gen	Church					
Park Sanitarium	Gen	Church					
St Elizabeth's Infant Hosp	Gen	Church					
St Francis Hospital*	Gen	Church					
St Joseph's Hospital**	Gen	Church					
St Luke's Hospital**	Gen	Church					
St Mary's Hospital**	Gen	Church					
San Francisco Hospital**	Gen	Church					
Shriners Hospital for Crip	Gen	Church					
pled Children**	Gen	Church					
Southern Pacific Cen Hosp*	Gen	Church					
Stanford Univ Hospitals (in	Gen	Church					
cluding Lane Hosp)**	Gen	Church					
Sutter Hospital	Gen	Church					
U S Marine Hospital*	Gen	Church					
University of California Hos	Gen	Church					
pital**	Gen	Church					
Veterans Admin Facility	Gen	Church					
Sanger 2 000—Fresno	Gen	Church					
Sanger Sanitarium	Gen	Church					
Sanitarium 500—Napa	Gen	Church					
St Helena Sanitarium and	Gen	Church					
Hospital*	Gen	Church					

CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
San Jacinto 1 346—Riverside	Gen	IA	34	3	32	23	229
Soboba Indian Hospital	Gen	IA					
San Jose 57 631—Santa Clara	TB	Corp	40			35	135
Alum Rock Sanatorium	Gen	Church	103	25	500	78	3 539
O Connor Sanitarium*	Gen	NPA'ssn	131	30	603	80	3 674
San Jose Hospital	Gen	NPA'ssn					
Santa Clara County Hos	Gen	NPA'ssn					
pital**	Gen	NPA'ssn					
Santa Clara County Sana	Gen	NPA'ssn					
torium	Gen	NPA'ssn					
San Leandro 11 455—Alameda	Gen	NPA'ssn					
Fairmont Hospital of Ala	Gen	NPA'ssn					
ameda County**	Gen	NPA'ssn					
San Luis Obispo 8 256—San Luis Obispo	Gen	NPA'ssn					
Mountain View Hospital	Gen	NPA'ssn					
San Luis Obispo General	Gen	NPA'ssn					
Hospital	Gen	NPA'ssn					
San Luis Sanitarium	Gen	NPA'ssn					
San Mateo 13 444—San Mateo	Gen	NPA'ssn					
Community Hospital of San	Gen	NPA'ssn					
Mateo County	Gen	NPA'ssn					
Mills Memorial Hospital	Gen	NPA'ssn					
San Pedro —Los Angeles	Gen	NPA'ssn					
San Pedro Hospital	Gen	NPA'ssn					
Station Hospital	Gen	NPA'ssn					
U S Ship Relief	Gen	NPA'ssn					
San Rafael 8 022—Marin	Gen	NPA'ssn					
San Rafael Cottage Hosp	Gen	NPA'ssn					
Station Hospital	Gen	NPA'ssn					
Santa Barbara 33 613—Santa Barbara	Gen	NPA'ssn					
St Francis Hospital*	Gen	NPA'ssn					
Santa Barbara Cottage Hos	Gen	NPA'ssn					
pital**	Gen	NPA'ssn					
Santa Barbara General Hos	Gen	NPA'ssn					
pital*	Gen	NPA'ssn					
Santa Cruz 14 335—Santa Cruz	Gen	NPA'ssn					
Hanly Hospital	Gen	NPA'ssn					
Santa Cruz County Hospital	Gen	NPA'ssn					
Santa Cruz Hospital	Gen	NPA'ssn					
Santa Monica 37 140—Los Angeles	Gen	NPA'ssn					
St Catherine's Hospital	Gen	NPA'ssn					
Santa Monica Hospital	Gen	NPA'ssn					
Santa Rosa 10 636—Sonoma	Gen	NPA'ssn					
Lila Tanner Hospital	Gen	NPA'ssn					
General Hospital	Gen	NPA'ssn					
Scottia 1 000—Humboldt	Gen	NPA'ssn					
Scottia Hospital	Gen	NPA'ssn					
Selma 3 047—Fresno	Gen	NPA'ssn					
Selma Sanitarium	Gen	NPA'ssn					
Sonoma 2 248—Tuolumne	Gen	NPA'ssn					
Sonoma Hospital	Gen	NPA'ssn					
South Gate 19 632—Los Angeles	Gen	NPA'ssn					
Suburban Hospital	Gen	NPA'ssn					
South Pasadena 13 300—Los Angeles	Gen	NPA'ssn					
Pasadena Sanitarium	Gen	NPA'ssn					
South San Francisco 6 190—San Mateo	Gen	NPA'ssn					
South San Francisco Hosp	Gen	NPA'ssn					
Spadra 250—Los Angeles	Gen	NPA'ssn					
Pacific Colony—State Nar	Gen	NPA'ssn					
cotic Hospital	Gen	NPA'ssn					
Springville 665—Tulare	Gen	NPA'ssn					
Tulare Kings Counties Joint	Gen	NPA'ssn					
Tuberculosis Hospital	Gen	NPA'ssn					
Stockton 47 063—San Joaquin	Gen	NPA'ssn					
Dameron Hospital	Gen	NPA'ssn					
St Joseph's Home and Hos	Gen	NPA'ssn					
pital	Gen	NPA'ssn					
Stockton State Hospital	Gen	NPA'ssn					
Susannahville 1 338—Lassen	Gen	NPA'ssn					
Riverside Hospital	Gen	NPA'ssn					
Tamagoe 330—Mendocino	Gen	NPA'ssn					
Mendocino State Hospital*	Gen	NPA'ssn					
Tehachapi 736—Kern	Gen	NPA'ssn					
Tehachapi Valley Hospital	Gen	NPA'ssn					
Torrance 7 271—Los Angeles	Gen	NPA'ssn					
Jared Sidney Torrance Me	Gen	NPA'ssn					
morial Hospital	Gen	NPA'ssn					
Trona 755—San Bernardino	Gen	NPA'ssn					
Trona Hospital	Gen	NPA'ssn					
Tulare 6 207—Tulare	Gen	NPA'ssn					
Bellevue Hospital	Gen	NPA'ssn					
Tulare County General Hosp	Gen	NPA'ssn					
Tulare Hospital	Gen	NPA'ssn					
Turlock 4 256—Stanislaus	Gen	NPA'ssn					
Emanuel Hospital	Gen	NPA'ssn					
Lillian Collins Hospital	Gen	NPA'ssn					
Upland 4 717—San Bernardino	Gen	NPA'ssn					
San Antonio Community Hos	Gen	NPA'ssn					
pital	Gen	NPA'ssn					
Ventura 11 603—Ventura	Gen	NPA'ssn					
Poster Memorial Hospital	Gen	NPA'ssn					
Ventura County Hospital	Gen	NPA'ssn					
Vineburg 164—Sonoma	Gen	NPA'ssn					
Burndale Ho pital	Gen	NPA'ssn					
Vicalia 7 063—Tulare	Gen	NPA'ssn					
Vicalia Municipal Hospital	Gen	NPA'ssn					
Watsonville 5 344—Santa Cruz	Gen	NPA'ssn					
Wat onville Hospital	Gen	NPA'ssn					
Weed 4 000—Siskiyou	Gen	NPA'ssn					
Weed Hospital	Gen	NPA'ssn					
Welman 50—Ince	Gen	NPA'ssn					
Welman Joint Sanitarium	Gen	NPA'ssn					
West Los Angeles —Los Angeles	Gen	NPA'ssn					
Veterans Admin Facility	Gen	NPA'ssn					

Key to symbols and abbreviations is on page 933

## CALIFORNIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Westwood 3,500—Lassen	Gen	Indiv	30	9	172	13	855
Westwood Hospital	Gen	Indiv	30	9	172	13	855
Willits 1 424—Mendocino	Gen	NPA'ssn	23	5	68	17	635
Frank R Howard Memorial Hospital	Gen	NPA'ssn	23	5	68	17	635
Woodland 5 542—Yolo	Gen	Part	65	10	121	38	1 614
Woodland Clinic Hospital	Gen	Part	65	10	121	38	1 614
Yosemite National Park 1 000—Mariposa	Gen	Indiv	14	2	15	8	412
Lewis Memorial Hospital	Gen	Indiv	14	2	15	8	412
Yreka 2 126—Siskiyou	Gen	County	110	7	181	130	1,534
Siskiyou County Gen Hosp	Gen	County	110	7	181	130	1,534
Yuba City 3 605—Sutter	Gen	Indiv	20	6	190	15	971
Yuba City General Hospital	Gen	Indiv	20	6	190	15	971
Related Institutions							
Alcatraz—San Francisco	Inst	Fed	23		15	15	15
U S Penitentiary Hosp	Inst	Fed	23		15	15	15
Alta Loma 1 500—San Bernardino	Inst	Indiv	25		12	15	15
Our Lady of Lourdes Sanat	Inst	Indiv	25		12	15	15
Artesia 3 891—Los Angeles	Inst	Part	35		No data supplied		
Pioneer Sanitarium	Inst	Part	35		No data supplied		
Auburn 2 661—Placer	Inst	Gen County	156	66	77	96	893
Placer County Hospital	Inst	Gen County	156	66	77	96	893
Azusa 4 808—Los Angeles	Conv	NPA'ssn	50		44	133	
Rural Rest Home and Sanit	Conv	NPA'ssn	50		44	133	
Belmont 984—San Mateo	Inst	Chil	20		18	67	
Chas S Howard Foundation	Inst	NPA'ssn	20		18	67	
Bishop 1 159—Inyo	Inst	City	13		3	154	
Mono Basin Hospital	Inst	City	13		3	154	
Blythe 1 020—Riverside	Gen	County	20	5	74	5	288
Blythe Hospital	Gen	County	20	5	74	5	288
Claremont 2 719—Los Angeles	Inst	NPA'ssn	24		4	256	
Claremont Colleges Infirm	Inst	NPA'ssn	24		4	256	
Coronado 5 425—San Diego	Gen	Indiv	20	5	52	6	351
Coronado Hospital	Gen	Indiv	20	5	52	6	351
Culver City 5 669—Los Angeles	Gen	Indiv	12	4	107	7	400
Community Hospital	Gen	Indiv	12	4	107	7	400
Delano 2 632—Kern	Gen	Indiv	11	4	37	5	253
Delano Hospital	Gen	Indiv	11	4	37	5	253
Dos Palos 1 000—Merced	Gen	Indiv	12	3	102	6	317
Dos Palos Community Hosp	Gen	Indiv	12	3	102	6	317
Duarte, 1 500—Los Angeles	TB	Part	24		14	21	
Mulrose Sanatorium	TB	Part	24		14	21	
Santa Teresita Sanatorium	TB	Church	100		95	35	
Eldridge 16—Sonoma	MeDe	State	2 863		2 804	354	
Sonoma State Home	MeDe	State	2 863		2 804	354	
Eureka 15 752—Humboldt	Iso	County	16		6	157	
Humboldt County Isolation Hospital	Iso	County	16		6	157	
Fowler 1 171—Fresno	Gen	Indiv	6	3	18	3	112
Fowler Sanitarium	Gen	Indiv	6	3	18	3	112
Glendale 62 736—Los Angeles	N & M	Indiv	24		23	11	
Villa Shaw Rest Home	N & M	Indiv	24		23	11	
Hollister 3 757—San Benito	Inst	Gen County	11	3	New building		
San Benito County Hosp	Inst	Gen County	11	3	New building		
Hondo 3 150—Los Angeles	Ment	Gen County	1 691		1 609	2 134	
Rancho Los Amigos	Ment	Gen County	1 691		1 609	2 134	
Inglewood 19 480—Los Angeles	N & M	Indiv	140		135	255	
St Erne Sanitarium	N & M	Indiv	140		135	255	
Keene 164—Kern	TbChil	County	44		40	57	
Kern County Preventorium	TbChil	County	44		40	57	
Kingsburg 1 322—Fresno	Gen	Indiv	12	2	40	6	292
Kingsburg Sanitarium	Gen	Indiv	12	2	40	6	292
La Crescenta 6 000—Los Angeles	N & M	Part	25		19	38	
Kimball Sanitarium	N & M	Part	25		19	38	
Lancaster 1 000—Los Angeles	TB	Part	118		113	110	
Antelope Valley Sanatorium and Hospital	TB	Part	118		113	110	
Lincoln 2 694—Placer	N & M	Indiv	15		9	15	
Joslin's Sanatorium	N & M	Indiv	15		9	15	
Livermore 3 119—Alameda	Unit of	Arroyo Del Valle Sanat	Livermore				
Del Valle Preventorium	Unit of	Arroyo Del Valle Sanat	Livermore				
Los Angeles 1 238 048—Los Angeles	Conv	Indiv	22		11	151	
Chase Diet Sanitarium	Conv	Indiv	22		11	151	
Doughty Sanitarium	TB	Indiv	14		30	83	
Florence Crittenton Home	Mat	NPA'ssn	44	6	78	30	83
Junior League Convalescent Home for Children	Conv	NPA'ssn	24		20	65	
Juvenile Hall Hospital	GenVen	County	121		84	4 957	
Las Palmas Rest Home	Nerv	Indiv	20		20	18	
Resthaven	N & M	NPA'ssn	40		24	133	
St Barnabas Rest Home for Men	Conv	Church	15		12	120	
Salvation Army Women's Home and Hospital	Mat	Church	92	8	152	74	239
Twentieth Century Sanit	N & M	Indiv	45		35	80	
Los Banos 185—Merced	Gen	Indiv	14	4	62	3	228
Los Banos Hospital	Gen	Indiv	14	4	62	3	228
Loyalton 837—Sierra	Gen	Indiv	9	1	2	36	
Sierra Valley Hospital	Gen	Indiv	9	1	2	36	
Vanteca 1 614—San Joaquin	Gen	Part	8	4	24	3	104
Manteca Hospital	Gen	Part	8	4	24	3	104
Marysville 5 763—Yuba	Inst	Gen County	90	6	119	72	764
Yuba County Hospital	Inst	Gen County	90	6	119	72	764
Merced 7 066—Merced	Inst	Gen County	250	11	385	257	3 506
Merced General Hospital	Inst	Gen County	250	11	385	257	3 506
Monrovia 10 590—Los Angeles	TB	Church	40		50	35	
Maryknoll Sanatorium	TB	Church	40		50	35	
Monrovia Health Camp	TB	NPA'ssn	90		64	61	
Palm Grove Sanatorium	N & M	Part	40		No data supplied		
Montebello 5 498—Los Angeles	Conv	NPA'ssn	42		50	451	
Los Angeles Convalecent Home	Conv	NPA'ssn	42		50	451	

## CALIFORNIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Nevada City, 1 701—Nevada							
Nevada City Sanitarium	Gen	Indiv	12	8	159	5	34
Nevada County Hospital	Inst	County	160		10	17	
Oakland 284 063—Alameda							
Salvation Army Women's Home and Hospital	Mat	Church	65	20	150	45	15
Pacific Grove 5 558—Monterey							
Pine Grove Sanitarium	Gen	Indiv	18	4	23	3	115
Picochima—Los Angeles							
Independent Order of Foresters California Tuberculosis Sanitarium	TB	Frnt	100		90	15	
Pasadena 76 656—Los Angeles							
Pasadena Preventorium	Conv	NPA'ssn	40		40	4	
Placerville 2 322—Fidorado							
Fidorado County Hospital	Inst	Gen County	50	2	No data supplied		
Porterville 5 307—Fulare							
Mt Whitney Hospital	Gen	Indiv	8	2	10	1	2
Randsburg 442—Kern							
Rand District Hospital	Gen	Indiv	10	4	39	7	109
Redding 4 158—Shasta							
Shasta County Hospital	Inst	Gen County	17	7	4	51	94
Represa 30—Sacramento							
Folsom Prison Hospital	Inst	State	84		65		
Riverside 29 606—Riverside							
Sherman Institute Hosp	Inst	IA	58		9	522	
Rosemead, 4 00—Los Angeles							
Rosemead Lodge	N & M	Indiv	40		20	111	
Ross 1 35—Marin							
The Cedars School for Nervous and Retarded Children	MeDe	Indiv	37		4	1	
San Andreas 1 062—Calaveras							
San Andreas Hospital	Gen	Indiv	8	2	12	5	85
San Diego 147 995—San Diego							
Fraser Hall	Conv	Part	21		14	135	
Hillcrest Home	Conv	Indiv	39		7	41	
Home Sanitarium	Conv	Indiv	10		7	41	
San Fernando 7 567—Los Angeles							
Pauling Rest Home	TB	County	50		50	66	
San Fernando Hospital	Gen	Indiv	18	4	97	8	415
San Francisco 6 24 704—San Francisco							
Garden Nursing Home	Inc	NPA'ssn	67		55	5	
Greer Home	Conv	Corp	25		16	71	
Laguna Honda Home Infirmary	Inst	CyCo	900		91	1 164	
San Francisco Polyclinic	Gen	NPA'ssn	12		8	857	
San Gabriel 7 224—Los Angeles							
Baldy View Sanitarium	N & M	Part	85		85	105	
Mission Lodge Sanitarium	N & M	Indiv	60		59	5	
San Jose 57 651—Santa Clara							
Beale Conv Home	N & M	Indiv	12		10	70	
Sunnyholme Preventorium							
Unit of Santa Clara County Hospital							
San Luis Obispo 8 276—San Luis Obispo							
San Luis Obispo County Tuberculosis Sanatorium	TB	County	23		17	5	
San Mateo 13 444—San Mateo							
San Mateo Preventorium	TB	NPA'ssn	25		15	15	
San Quentin 328—Marin							
Charles L Neumiller Hosp	Inst	State	200		120	1 224	
San Rafael 8 022—Marin							
Marin County Hospital	G & TB	County	95		83	90	
Santa Barbara 33 613—Santa Barbara							
La Loma Feliz	CardCh	NPA'ssn	18		16	20	
Santa Maria 7 057—Santa Barbara							
Alpport Hospital	Gen	Indiv	16	5	86	13	5
Santa Monica 37 146—Los Angeles							
Loamshire Convalescent Hospital and Rest Home	Conv	Corp	21		10	1	
Santa Monica Diet Home	Conv	Indiv	6		5	1	
Santa Rosa 10 636—Sonoma							
Sonoma County Hospital	Inst	Gen County	319	29	No data supplied		
Sonoma 2 278—Tulolumne							
Tulolumne County Hospital	Inst	Gen County	36	4	45	94	465
Stanford University 720—Santa Clara							
Stanford Convalescent Home	Chil	NPA'ssn	80		55	50	
Sul on City 905—Solano							
Solano County Hospital	Inst	Gen County	110	6	119	94	54
Sunland—Los Angeles							
Sunland Sanatorium	TB	Corp	60		57	7	
Verdugo City 1 500—Los Angeles							
Rockhaven Sanitarium	N & M	Indiv	100		98	75	
Veterans Home 800—Napa							
Veterans Home Hospital	Inst	State	260		200	1 12	
Waterman—Amador							
Preston School of Industry Hospital	Inst	State	3		4	1 119	
Weaverville 650—Trinity							
Trinity County Hospital	Inst	Gen County	25		No data supplied		
Willows 2 024—Glenn							
Glenn County Hospital	Inst	Gen County	38	3	55	23	97
Yuba City 3 605—Sutter							
Sutter County Hospital	Inst	Gen County	55	10	192	4	575
Summary for California							
Hospitals and sanatoriums	Number	Beds	Average Census		Admissions		
Related Institutions	267	60 201	50 858		574,351		
	91	10 054	8 630		25,190		
Totals	358	70 255	59 528		600,541		
Referred registration	79	3 059					

Key to symbols and abbreviations is on page 933

## COLORADO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Alamosa 5 107—Alamosa Lutheran Hospital	Gen	Church	47	7	106	19	86
Aspen 703—Pitkin Citizens Hospital	Gen	NPAssn	20	2	5	6	54
Boulder 11 223—Boulder Boulder Colorado Sanitarium and Hospital*	Gen	Church	101	6	63	34	1 136
Community Hospital	Gen	NPAssn	53	8	12	24	1 04
Brush 2 312—Morgan Eben Ezer Hospital	Gen	Church	24	8	44	12	390
Canon City 5 938—Fremont Colorado Hospital	Gen	Indiv	28	5	35	9	486
Thomas More Hospital	Gen	Church	22	5	9	11	13
Cheyenne Wells 595—Cheyenne Cheyenne County Hospital	Gen	Indiv	10	5	2	4	415
Climax 200—Lake Chimax Molybdenum Company Hospital	Gen	Corp	10			5	197
Colorado Springs 33 237—El Paso Beth El General Hospital and Sanatorium*	G&TB	Church	202	15	38	1	2 378
Colorado Springs Psycho pathic Hospital	N&M	Part	150			125	154
Cragmor Sanatorium	TB	NPAssn	150		No data supplied		
Crestone Heights Sanitarium and Hospital	Gen	Indiv	3	7	23	11	239
Glockner Sanatorium and Hospital	G&TB	Church	150	13	190	100	1 536
National Methodist Episcopal Sanat for Tuberculosis Observation Hospital	Unit of Beth El Gen Hosp and Sanatorium	Unit of Beth El Gen Hosp and Sanatorium					
St Francis Hospital and Sanatorium*	G&TB	Church	150	11	182	80	1 086
Union Printers Home and Tuberculosis Sanatorium	G&TB	NPAssn	172			16	2
Cortez 921—Montezuma Johnson Hospital	Gen	Indiv	12	2	32	7	313
Cripple Creek 1 427—Teller Cripple Creek Hospital	Gen	NPAssn	25	6	43	5	313
Del Norte 1 410—Rio Grande St Joseph's Hospital and Sanatorium	Gen	Church	3	11	116	21	679
Delta 2 938—Delta Western Slope Memorial Hospital	Gen	NPAssn	11	3	14	5	199
Denver 251 861—Denver Bethesda Sanatorium	TB	Church	68			26	51
Beth Israel Hospital	Gen	NPAssn	5	10	44	39	1 194
Childrens Hospital*	Chil	NPAssn	200			134	3 067
Colorado General Hosp**	Gen	State	160	20	48	137	3 436
Colorado Psychopathic Hospital*	Ment	State	78			78	836
Denver General Hospital**	Gen	CyCo	556	51	5	336	20 219
Ex Patients Tubercular Home	TB	NPAssn	76			50	15
Fitzsimons General Hosp	G&TB	Army	1 18	8	73	87	4 100
Mersey Hospital*	Gen	Church	200	2	572	157	6 093
Mt Airy Sanitarium	N&M	Corp	66			43	407
National Jewish Hospital*	TB	NPAssn	246			242	162
Porter Sanitarium & Hosp	Gen	Church	100	20	212	46	1 170
Presbyterian Hospital*	Gen	Church	150	2	597	94	4 461
St Anthony Hospital*	Gen	Church	154	30	6	101	3 580
St Joseph's Hospital*	Gen	Church	240	30	618	168	4 760
St Luke's Hospital*	Gen	Church	219	40	750	169	6 717
Sands House	TB	NPAssn	48			38	19
Steele Memorial Hospital	Gen	CyCo	86			21	5
Durango 5 400—La Plata Mercy Hospital	Gen	Church	51	8	146	33	1 744
Edgewater 1 478—Jefferson Craig Colony	TB	NPAssn	51			4	21
Englewood 7 980—Arapahoe Swedish National Sanatorium	TB	NPAssn	80			59	9
Fairplay 221—Park Fairplay Hospital	Gen	Part	14	2	50	8	398
Ft Logan 500—Arapahoe Station Hospital	Gen	Army	4			42	1 0
Ft Lyon 1 159—Bent Veterans Admin Facility	Ment	Vet	80			568	296
Ft Morgan 4 423—Morgan Ft Morgan Hospital	Gen	Indiv	2	6	153	11	663
Clenwood Springs 1 587—Garfield Dr Porter's Hospital	Gen	Part	21	3	40	10	404
Grand Junction 10 217—Mesa St Mary's Hospital	Gen	Church	6	12	1	3	920
Creeley 12 000—Weld Greeley Hospital	Gen	County	100	15	434	64	2 726
Hayden 304—Routt Solandt Memorial Hospital	Gen	NPAssn	15	3	27	8	173
Holyoke 1 266—Phillips Holyoke Hospital	Gen	Indiv	8	2	10	5	263
Ignacio 464—La Plata Edward T. Taylor Hospital	Gen	IA	37	4	23	16	421
La Junta 7 193—Otero A T C S F Railroad Hosp	Indus	NPAssn	36			17	407
Mennonite Hospital and Sanitarium	G&TB	Church	70	10	183	31	1 10
Lamar 4 253—Prowers Charles Maxwell Hospital	Gen	Corp	50	6	62	12	47
Leadville 3 771—Lake St Vincent Hospital	Gen	Church	56	10	12	1	400
Longmont 6 629—Boulder Longmont Hospital	Gen	Indiv	33	7	76	18	2

## COLORADO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Montrose 3 566—Montrose Montrose Hospital	Gen	Indiv	20	5	28	5	257
St Luke's Hospital	Gen	Indiv	16	3	69	9	351
Oak Creek 1 211—Routt Oak Creek Hospital	Gen	Indiv	11	2	24	7	320
Red Cross Hospital	Gen	Indiv	12	2	19	6	179
Ouray 707—Ouray Bates Hospital and Sanit	Gen	Corp	16	3	8	8	440
Pueblo 50 096—Pueblo Colorado State Hospital	Ment	State	3 821			3 650	61
Corwin Hospital	Gen	NPAssn	247	22	189	121	2 269
Parkview Hospital	Gen	NPAssn	96	11	182	36	1 360
St Mary Hospital*	Gen	Church	150	20	360	91	2 427
Woodcroft Hospital	N&M	Corp	95			56	163
Rocky Ford 3 420—Otero Physicians Hospital	Gen	NPAssn	10	2	58	8	324
Salida 5 066—Chaffee Denver & Rio Grande Western Railroad Hospital	Gen	NPAssn	80	4	75	31	1 312
Red Cross Hospital	Gen	Corp	40	3	16	16	592
Spivak 300—Jefferson Sanatorium of the Jewish Consumptives Relief Society*	TB	NPAssn	300			215	134
Steamboat Springs 1 198—Routt Steamboat Springs Hosp	Gen	Indiv	10	3	53	8	296
Strling 7 190—Logan Good Samaritan Hospital	Gen	Church	30	10	118	16	876
St Benedict Hospital	Gen	Church	31	6	134	11	942
Towaoc 50—Montezuma Ute Mountain Indian Hosp	Gen	IA	26	4	15	10	220
Trinidad 11 732—Las Animas Mt San Rafael Hospital	Gen	Church	12	12	13	48	1 21
Walsenburg 5 508—Huerfano Lamma Brothers Hospital	Gen	Part	20	2	23	9	372
Wheat Ridge 500—Jefferson Evangelical Lutheran Sanit	TB	Church	110			88	61
Woodmen 400—El Paso Modern Woodmen of America Sanatorium	TB	Frat	155			83	123
Related Institutions							
Alamosa 5 107—Alamosa Cornum Hospital	Gen	Indiv	12	7	72	1	300
Boulder 11 223—Boulder Boulder County Hospital	Gen	County	40	4	41	30	600
Mesa Vista Sanatorium	TB	Part	4			28	31
Burlington 1 220—Kit Carson Burlington Hospital	Gen	Part	8	3	34	4	248
Canon City 5 938—Fremont Colorado State Penitentiary Hospital	Inst	State	40			34	1 741
Collbran 341—Mesa Plateau Valley Congregation Hospital	Gen	Church	8	2	26	5	249
Denver 257 861—Denver Costello Home	TB	Frat	16			10	4
Florence Crittenton Home (Mary H Donaldson Woman's Hospital)	Mat	NPAssn	11	9	85	5	101
Oakes Home Sanitarium	TB	Church	100			51	122
St Francis Sanatorium	TB	Church	16			14	34
Salvation Army Woman's Home and Hospital	Mat	Church	40	20	90	31	196
Englewood 7 980—Arapahoe Temple Sanatorium	TbConv	Indiv	3			35	150
Flagler 540—Kit Carson Flagler Hospital	Gen	Indiv	9	4	20	4	183
Fruita 1 033—Mesa Fruita Community Hospital	Gen	Indiv	8	2	14	4	161
Golden 2 426—Jefferson Hospital—State Industrial School for Boys	Inst	State	25			7	518
Grand Junction 10 247—Mesa State Home and Training School for Mental Defectives	McDe	State	400			261	38
Greeley 12 200—Weld Island Grove Hospital	Inst	Iso County	62			54	234
Homelake 220—Rio Grande Colorado State Soldiers and Sailors Home	Inst	State	3			10	6
Longmont 6 629—Boulder St Vrain Hospital	Gen	Indiv	2	5	34	9	343
Loveland 5 506—Larimer Loveland Hospital and Clinic	Gen	Part	10	4	27	6	213
Monte Vista 2 610—Rio Grande Monte Vista Hospital	Gen	Indiv	9	5	41	6	22
Ridge 200—Jefferson State Home and Training School for Mental Defectives	McDe	State	32			60	14
Yuma 1 360—Yuma Yuma Community Hospital	Gen	NPAssn	10	3	47	4	291
Summary for Colorado							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	23	12 144	81.9	100 000			
Total	101	12 144	10 100	106 100			
Refused registration	24	4 1					

Key to symbols and abbreviations is on page 933



## CONNECTICUT

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Bridgeport 146 716—Fairfield	Gen	NPA'ssn	326	74	1 420	312	10 220
Bridgeport Hospital*o	Tbliso	City	150			54	634
Englewood Hospital	Gen	Church	204	50	988	168	6 330
St Vincent's Hospital*o	Gen	NPA'ssn	100	20	490	78	2,780
Bristol Hospital	Gen	NPA'ssn	26	6	50	10	343
Canaan, 560—Litchfield	Gen	NPA'ssn	33			20	84
Robert C Geer Memorial Hospital	Gen	NPA'ssn	138	23	417	88	3 243
Cromwell 2 814—Middlesex	Nerv	Corp	82	10	417	63	2 100
Cromwell Hall	Gen	NPA'ssn	70			36	110
Danbury 22 261—Fairfield	Gen	NPA'ssn	90	20	400	92	3 070
Danbury Hospital*o	Gen	NPA'ssn	223			220	100
Derby 10 788—New Haven	Gen	NPA'ssn	687	105	2 250	546	17 107
Griffin Hospital	Gen	NPA'ssn	60	10	227	51	1 790
Greens Farms 270—Fairfield	N & M	Corp	310	20	308	164	6 462
Hall Brooke Sanitarium	N & M	Corp	270			213	653
Greenwich 5 981—Fairfield	N & M	Corp	412	80	1,202	310	13 003
Blytheville	N & M	Corp	55	11	200	59	1 947
Greenwich Hospital	Gen	NPA'ssn	116	24	489	77	2 324
Hartford 164 072—Hartford	Unit of Hartford Hospital		200			186	109
Avery Convalescent Hosp	Unit of Hartford Hospital		200			218	1,081
Cedarcrest Sanatorium	Unit of Hartford Hospital		200			218	1,081
Hartford Hospital*o	Unit of Hartford Hospital		200			218	1,081
Mt Sinai Hospital	Unit of Hartford Hospital		200			218	1,081
Municipal Hospital*o	Unit of Hartford Hospital		200			218	1,081
Neuro Psychiatric Institute of the Hartford Retreat	Unit of Hartford Hospital		200			218	1,081
St Francis Hospital*o	Unit of Hartford Hospital		200			218	1,081
Wildwood Sanatorium	Unit of Hartford Hospital		200			218	1,081
Manchester 21 913—Hartford	Gen	NPA'ssn	60	12	122	30	714
Manchester Memorial Hosp	Gen	NPA'ssn	203	36	621	123	3 324
Meriden 38 481—New Haven	Gen	NPA'ssn	27			16	719
Meriden Hospital*o	Gen	NPA'ssn	30	6	70	13	547
Undercliff Meriden State Tuberculosis Sanatorium	TbChil	State	935			921	1 187
Middletown 24 001—Middlesex	Ment	State	100	23	771	123	4 780
Connecticut State Hosp *o	Gen	NPA'ssn	3182			3 040	1 191
Middlesex Hospital*o	Gen	NPA'ssn	404			392	272
Millford 12 600—New Haven	Gen	NPA'ssn	105	27	490	83	3 096
Millford Hospital	Gen	NPA'ssn	20			20	86
New Britain 68 128—Hartford	Gen	NPA'ssn	70	16	207	56	1 677
New Britain General Hosp *o	Gen	NPA'ssn	35	10	103	16	499
New Haven 162 600—New Haven	Gen	NPA'ssn	40	12	189	20	787
Dr J H Lyons Private Hospital	Gen	NPA'ssn	40	12	189	20	787
Grace Hospital*o	Gen	NPA'ssn	40	12	189	20	787
Hospital of St Raphael*o	Gen	NPA'ssn	40	12	189	20	787
New Haven Hospital*o	Gen	NPA'ssn	40	12	189	20	787
Newington 4 572—Hartford	Orth	NPA'ssn	200			186	109
Newington Home for Crippled Children	Gen	NPA'ssn	200			186	109
Veterans Admin Facility	Gen	NPA'ssn	200			186	109
New London 29 640—New London	Gen	NPA'ssn	60	12	122	30	714
Home Memorial Hospital	Gen	NPA'ssn	203	36	621	123	3 324
Lawrence and Memorial Associated Hospitals*o	Gen	NPA'ssn	27			16	719
Dr Lena's Surgical Hosp	Surg	Indiv	30	6	70	13	547
New Milford 3 000—Litchfield	Gen	NPA'ssn	30	6	70	13	547
New Milford Hospital	Gen	NPA'ssn	30	6	70	13	547
Newton 482—Fairfield	Ment	State	935			921	1 187
Fairfield State Hospital	Gen	NPA'ssn	100	23	771	123	4 780
Norwalk 36 010—Fairfield	Gen	NPA'ssn	3182			3 040	1 191
Norwalk General Hospital*o	Gen	NPA'ssn	404			392	272
Norwich 23 021—New London	Ment	State	100	23	771	123	4 780
Norwich State Hospital	Gen	NPA'ssn	105	27	490	83	3 096
Norwalk State Tuberculosis Sanat (Unens On Thames)*o	TB	State	20			20	86
William W Backus Hosp *o	Gen	NPA'ssn	70	16	207	56	1 677
Portland 2 500—Middlesex	N & M	Indiv	35	10	103	16	499
Elmerest Manor	N & M	Indiv	40	12	189	20	787
Putnam 7 316—Wadham	Gen	NPA'ssn	40	12	189	20	787
Day Kimball Hospital	Gen	NPA'ssn	40	12	189	20	787
Rockville 7 445—Tolland	Gen	NPA'ssn	40	12	189	20	787
Rockville City Hospital	Gen	NPA'ssn	40	12	189	20	787
Sharon 500—Litchfield	Gen	NPA'ssn	40	12	189	20	787
Sharon Hospital	Gen	NPA'ssn	40	12	189	20	787
Shelton 10 113—Fairfield	TB	State	30			12	15
Laurel Heights State Tuberculosis Sanatorium	TB	State	30			12	15
South Norwalk —Fairfield	N & M	Indiv	30			12	15
Dr Wadsworth's Sanitarium	N & M	Indiv	30			12	15
Stafford Springs 3 492—Tolland	Gen	NPA'ssn	50	12	185	26	617
Cyril and Julia C Johnson Memorial Hospital	Gen	NPA'ssn	60			35	91
Stamford 46 346—Fairfield	N & M	Corp	100			125	183
Dr Barnes Sanitarium	N & M	Corp	219	39	700	140	4 700
Stamford Hall	Gen	NPA'ssn	26			13	5
Stamford Hospital*o	Gen	NPA'ssn	20			No data supplied	
Thompsonville 9 642—Hartford	N & M	Corp	130	20	433	79	2 649
Flmcoff Dr Van's Sanat	N & M	Corp	145			140	212
Torrington 26 040—Litchfield	Gen	NPA'ssn	220	44	1 185	170	9 003
Charlotte Hungerford Hosp	Gen	NPA'ssn	283	45	770	187	6 130
Wallingford 11 170—New Haven	Gen	NPA'ssn	175			140	22
Gaylord Farm Sanatorium*o	TbChil	State	175			140	22
Waterbury 99 902—New Haven	Gen	NPA'ssn	62			56	180
St Mary's Hospital*o	Gen	NPA'ssn	62			56	180
Waterbury Hospital*o	Gen	NPA'ssn	62			56	180
Waterford 100—New London	TbChil	State	62			56	180
The Seaside	Tb	NPA'ssn	62			56	180
West Haven 25 808—New Haven	Tb	NPA'ssn	62			56	180
William Wirt Winchester Hospital	Tb	NPA'ssn	62			56	180

## CONNECTICUT—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Westport 6 073—Fairfield	N & M	Corp	100			76	210
Westport Sanitarium	N & M	Corp	100			76	210
Willimantic 12 102—Wadham	Gen	NPA'ssn	91	15	216	41	1 067
Windham Community Memorial Hospital	Gen	NPA'ssn	64	11	146	29	697
Winsted 7 803—Litchfield	Gen	NPA'ssn	64	11	146	29	697
Litchfield County Hosp	Gen	NPA'ssn	64	11	146	29	697
Related Institutions							
Avon 1 738—Hartford	Inst	Corp	14			9	20
Avon Old Farms Infirmary	Inst	Corp	14			9	20
Bridgeport 146 716—Fairfield	ChrConv	City	270			20	682
Hillside Home and Hosp	ChrConv	City	270			20	682
Cheshire 2963—New Haven	Inst	State	23			5	10
Connecticut Reformatory	Inst	State	23			5	10
Greenwich 5 981—Fairfield	N & M	Corp	22			17	30
Crest View Sanitarium	N & M	Corp	22			17	30
Municipal Hospital	Tbliso	City	73	2		47	90
Gulford 1 850—New Haven	Gen	Corp	14	4	33	8	100
Gulford Sanatorium	Gen	Corp	14	4	33	8	100
Manchester Depot 200—Tolland	MeDe	State	1 200			115	51
Manchester State Training School and Hospital	MeDe	State	1 200			115	51
Meriden 38 481—New Haven	Inst	State	34			8	47
Connecticut School for Boys	Inst	State	34			8	47
New Canaan 2 772—Fairfield	Nerv	Corp	23			10	10
Silver Hill	Nerv	Corp	23			10	10
New Haven 162 600—New Haven	NPA'ssn	93				90	31
Jewish Home for the Aged	NPA'ssn	30				9	50
Yale Infirmary	Inst	NPA'ssn	30			9	50
Niantic 1 312—New London	Inst	State	60			50	10
Connecticut State Farm for Women	Inst	State	60			50	10
Noroton Heights 1 600—Fairfield	Inst	State	135			107	1 429
Fitch's Home and Hospital	Inst	State	135			107	1 429
Nestledown Convalescent Hospital	Unit of Nestledown Home	Springdale					
Springdale 4 500—Fairfield	Conv	N & M Indiv	33			63	
Nestledown Home	Conv	N & M Indiv	33			63	
Stamford 46 346—Fairfield	Conv	N & M Indiv	12			6	10
Glenhurst Convalescent Home	Conv	N & M Indiv	12			6	10
West Hartford 24 941—Hartford	Mat	Church	9	11	80	3	51
St Agnes Home	Mat	Church	9	11	80	3	51
Wethersfield 7 312—Hartford	Inst	State	50			14	219
Connecticut State Prison Hospital	Inst	State	50			14	219
Woodmont 531—New Haven	Conv	Indiv	12			6	31
Woodmont Hall	Conv	Indiv	12			6	31
Summary for Connecticut							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	60	16 269	13 909	157 146			
Totals	18	2 123	1 849	4 000			
Refused registration	78	18 392	15 188	1,603			
	2	45					

## DELAWARE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Dover 4 800—Kent	Gen	NPA'ssn	50	10	160	33	1 166
Kent General Hospital	Gen	NPA'ssn	50	10	160	33	1 166
Farmhurst 200—New Castle	Ment	State	1 169			1 143	41
Delaware State Hospital*o	Ment	State	1 169			1 143	41
Ft Dupont (Delaware City P O)	Gen	Army	23			17	51
Station Hospital	Gen	Army	23			17	51
Leves 1 993—Sussex	Gen	NPA'ssn	99	8	80	36	1 011
Beebe Hospital*o	Gen	NPA'ssn	99	8	80	36	1 011
Marshallton 1 500—New Castle	TB	State	160			140	50
Brandywine Sanatorium	TB	State	160			140	50
Edgewood Sanatorium (col)	TB	State	40			30	25
Millford 3 718—Sussex	Gen	NPA'ssn	100	18	100	44	1 000
Millford Memorial Hospital*o	Gen	NPA'ssn	100	18	100	44	1 000
Wilmington 106 597—New Castle	Gen	NPA'ssn	201	24	499	143	4 101
Delaware Hospital*o	Gen	NPA'ssn	201	24	499	143	4 101
Gross Private Hospital	Gen	Corp	15	6	55	197	4 000
Homeopathic Hospital*o	Gen	NPA'ssn	172	30	666	58	1 120
St Francis Hospital*o	Gen	Church	106	18	328	7	3 611
Wilmington General Hosp *o	Gen	NPA'ssn	170	45	696	7	3 611
Related Institutions							
Marshallton 1 500—New Castle	TB	NPA'ssn	24			20	15
Sunnybrook Cottage	TB	NPA'ssn	24			20	15
Smyrna 1 908—Kent	InstGen	StateCo	86	4	91	51	721
Delaware State Welfare Home	InstGen	StateCo	86	4	91	51	721
Stockley 138—Sussex	MeDe	State	404			2	414
Delaware Colony	MeDe	State	404			2	414
Summary for Delaware							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	12	2 311	1900	19,000			
Totals	3	674	450	900			
Refused registration	15	2 880	2 340	90 000			
	0						

## DISTRICT OF COLUMBIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Washington 623 000							
Central Dispensary and Emergency Hospital**	Gen	NP Assn	250			233	7 628
Chevy Chase Sanatorium	N&M	Indiv	23			38	
Children's Hospital**	Gen	NP Assn	200			123	6 589
Columbia Hosp for Women and Lying in Asylum*	GynMat	NP Assn	203	83	2 093	103	3 834
Eastern Dispensary and Casualty Hospital	Gen	NP Assn	130	12	7	63	2 292
Episcopal Eye Ear & Throat Hospital*	ENT	Church	103			61	5 953
Freedmen's Hosp (col)**	Gen	Fed	322	54	931	244	3 069
Gallinger Municipal Hospital**	Gen	City	1 119	117	1 764	843	14 698
Garfield Memorial Hosp**	Gen	NP Assn	316	80	1 423	240	7 000
Georgetown University Hospital**	Gen	NP Assn	210	31	1 042	151	6 337
George Washington University Hospital*	Gen	NP Assn	92	22	611	73	2 634
National Homeopathic Hosp	Gen	NP Assn	84	15	253	45	1 533
Providence Hospital**	Gen	Church	260	30	921	194	7 333
St Elizabeths Hospital**	Gen	Fed	430	4	6	390	1 543
St Elizabeths Hospital**	Gen	Fed	5 630			5 390	9 31
Sibley Memorial Hospital**	Gen	Church	330	102	2 043	208	8 974
Tuberculosis Sanatorium (Glenn Dale Md P O)	TB	City	700			622	6 32
U S Naval Hospital*	Gen	Navy	202			173	1 609
Veterans Admin Facility	Gen	Vet	327			317	4 743
Walter Reed General Hosp	Gen	Army	1 042	15	176	935	7 469
Washington Sanitarium and Hospital**	Gen	Church	170	13	390	141	3 105

## Related Institutions

Washington 623 000							
District of Columbia Reformatory Hospital (Lorton Va P O)	Inst	City	80			40	833
District Training School (Laurel Md P O)	McDe	City	576			33	47
Florence Crittenton Home for the Aged and Infirm	Mnt	NP Assn	50	50	70	42	160
Kendall House Sanitarium	Inst	City	120			120	321
National Training School for Boys Hospital	Conv	Indiv	22			10	90
U S Soldiers Home Hosp	Inst	Fed	30			10	1 062
Washington Home for Incurables	Inc	NP Assn	163			266	1 623

## Summary for District of Columbia

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	21	12 249	10 824	99 963
Related institutions	8	1 309	1 201	4 181
Totals	29	13 558	12 025	104 144
Refused registration	0			

## FLORIDA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Arcadia 4 682—De Soto							
Arcadia General Hospital	Gen	Corp	21	3	No data supplied		
Bartow 3 269—Polk							
Bartow General Hospital	Gen	Indiv	23	4	65	6	530
Polk County Hospital	Gen	County	58	5	52	51	1 439
Bay Pines—Pinellas							
Veterans Admin Facility	Gen	Vet	193			193	1 009
Bradenton 5 986—Manatee							
Bradenton General Hospital	Gen	Indiv	13	5	32	6	287
Century 1 230—Escambia							
Turberville Hospital	Gen	Part	40	4	16	13	544
Chattahoochee 450—Gadsden							
Florida State Hospital	Ment	State	4 297			4 293	811
Clearwater 7 607—Pinellas							
Morton F Plant Hospital	Gen	NP Assn	43	10	99	22	798
Coral Gables 5 639—Dade							
University Hospital	Gen	Corp	35	12	173	23	938
Dade City 1 811—Pasco							
Tackson Memorial Hospital	Gen	County	20	3	18	4	219
Daytona Beach 16 598—Volusia							
Halifax District Hospital	Gen	NP Assn	143	13	143	47	1 405
De Land 5 346—Volusia							
De Land Memorial Hospital	Gen	NP Assn	22	11	6	8	436
Fuertes 2 333—Lake							
Lake County Medical Center	Gen	NP Assn	30	6	104	24	896
Fl Barrancas 130—Escambia							
Station Hospital	Gen	Army	33	1	1	33	870
Fl Lauderdale 8 666—Broward							
Broward General Hospital	Gen	CyCo	48	5	104	20	1 102
Fl Myers 9 933—Lee							
Lee Memorial Hospital	Gen	NP Assn	30	4	127	10	553
Gainesville 10 463—Alachua							
Alachua County Hospital	Gen	County	33	10	168	32	1 224
Jacksonville 129 549—Duval							
Brewster Hospital (col) 39	Gen	Church	63	10	116	33	925
Duval County Hospital**	Gen	County	216	24	646	134	4 510
Negro Tuberculosis Hosp	TB	CyCo	40			43	140
D Randolph Sanitarium	N&M	Indiv	12			6	43

## FLORIDA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Riverside Hospital**	Gen	NP Assn	50	6	77	28	1 230
St Luke's Hospital**	Gen	NP Assn	176	24	693	99	3 764
St Vincent's Hospital**	Gen	Church	200	40	733	140	5 216
Key West 12 831—Monroe							
U S Marine Hospital	Gen	USPHS	65			45	603
Kissimmee 3 163—Osceola							
Osceola Hospital	Gen	Indiv	35	5	24	14	706
Lake City 4 416—Columbia							
Lake Shore Hospital	Gen	Corp	15	2	27	9	447
Veterans Admin Facility	Gen	Vet	333			283	2 13
Lakeland 18 334—Polk							
Morrell Memorial Hospital	Gen	City	100	8	177	50	1 633
Lake Wales 3 401—Polk							
Lake Wales Hospital	Gen	NP Assn	25	6	29	6	215
Leesburg 4 113—Lake							
Theresa Holland Hospital	Gen	Indiv	24	4	65	11	680
Manatee 3 219—Manatee							
Riverside Hospital	Gen	Indiv	20	4	20	8	383
Marianna 3 372—Jackson							
Baltzell Hospital	Gen	Indiv	12	2	4	4	287
Melbourne 2 677—Brevard							
Brevard Hospital	Gen	City	30	5	43	9	446
Miami 110 637—Dade							
Dade County Hospital	G&TB	County	173	13	281	112	2 019
James M Jackson Memorial Hospital**	Gen	City	460	40	1 965	335	13 532
Miami Retreat	N&M	Indiv	73			27	339
Miami Riverside Hospital	Gen	Indiv	54	8	107	13	612
Sun Ray Park Health Resort	N&M	Indiv	63			11	192
Victoria Hospital	Gen	Indiv	63	17	309	26	1 572
Miami Beach 6 494—Dade							
Alton Road Hospital	Gen	Corp	50	5	21	20	830
St Francis Hospital	Gen	Church	123	15	111	60	2 129
Miami Springs 402—Dade							
Miami Battle Creek Sanit	Gen	NP Assn	105			23	335
Ocala 7 281—Marion							
Munroe Memorial Hospital	Gen	CyCo	83	11	111	30	1 290
Orlando 27 330—Orange							
Florida Sanitarium and Hospital	Gen	Church	100	12	119	33	1 348
Florida State Sanatorium	TB	State	318			312	468
Orange General Hospital	Gen	NP Assn	135	12	273	70	2 716
Panama City 5 402—Bay							
Lisenby Hospital	Gen	Indiv	26	3	62	7	397
Panama City Hospital	Gen	NP Assn	16	4	62	4	299
Pensacola 31 549—Escambia							
Escambia County Tuberculo	TB	CyCo	56			52	88
is Sanatorium	Gen	Church	127	17	476	70	3 694
Pensacola Hospital	Gen	Navy	142			66	930
U S Naval Hospital	Gen	Navy	142			66	930
Quincy 3 788—Gadsden							
Gadsden County Hospital	Gen	NP Assn	33	2	60	13	370
St Augustine 12 111—St Johns							
East Coast Hospital	Gen	Corp	55	5	88	39	1 812
Flagler Hospital	Gen	NP Assn	66	5	87	30	632
St Petersburg 40 423—Pinellas							
Mercy Hospital (col)	Gen	City	44	4	13	18	418
Mound Park Hospital	Gen	City	172	16	347	83	4 900
St Anthony's Hospital	Gen	Church	31	10	94	30	1 172
Sanford 10 100—Seminole							
Fernald Laughton Memorial Hospital	Gen	NP Assn	21	6	86	9	570
Sarasota 8 398—Sarasota							
Joseph Halton Hospital	Gen	Indiv	14	5	10	10	323
Sarasota Hospital	Gen	City	32	8	82	10	835
Sebring 2 912—Highlands							
Sebring General Hospital	Gen	Indiv	19	7	25	5	237
Dr Weems Hospital	Gen	Indiv	16	3	67	6	428
Tallahassee 10 700—Leon							
Johnston's Sanitarium	Gen	Indiv	31	8	121	12	603
Tampa 101 161—Hillborough							
Centro Asturiano Hospital	Gen	Frat	33	4	104	33	833
Clara Frye Tampa Municipal							
Negro Hospital	Gen	City	47	6	37	18	669
Dr H M Cook's Hospital	Gen	Indiv	23	8	No data supplied		
St Joseph's Hospital	Gen	Church	33	30	11	20	1 030
Tampa Municipal Hosp**	Gen	City	236	23	787	148	6 004
Umatilla 90—Lake							
Harry Anna Crippled Children's Home	Orth	Frat	73			54	222
West Palm Beach 26 610—Palm Beach							
Good Samaritan Hospital	Gen	NP Assn	113	13	322	67	2 796
Pine Ridge Hospital (col)	Gen	NP Assn	27	4	10	20	326

## Related Institutions

Daytona Beach 16 598—Volusia							
Daytona Beach Sanitarium	Gen	Indiv	10	2	9	5	100
Cainesville 10 463—Alachua							
Florida Farm Colony	McDe	State	373			510	124
University of Florida Infirmary	Inst	State	43			7	732
Jacksonville 129 549—Duval							
Dr Miller's Sanitarium	Drugs	Indiv	20			4	135
Idalgo 1 429—Pinellas							
Pinellas County Home	TB	County	70			32	
Leesburg 4 113—Lake							
Community Hospital	Gen	Indiv	10	2	16	4	160
Miami 110 637—Dade							
Christian Hospital (col)	Gen	NP Assn	23	4	73	11	475
Edgewater Hospital	Gen	Part	2	5		Reopened	
Orange Park 671—Clay							
Moorehaven Hospital	Inst	Frat	23			17	107

Key to symbols and abbreviations is on page 933

## FLORIDA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Palatka 6500—Putnam							
Glendale Hospital	Gen	Indiv	27	4	60	1	600
Mary Lawson Sanatorium (col)	Gen	Indiv	50	6	15	8	276
Ralford 460—Union							
Florida State Farm Hosp	Inst	State	90			30	977
St Petersburg, 40 425—Pinellas							
American Legion Hospital for Crippled Children	Orth	NPA'ssn	40			18	153
Carle Restorium	Conv	Indiv	20			8	102
Florence Crittenton Home	Mat	NPA'ssn	16	4	32	12	36
Stuart 1924—Martin							
St Lucie Hospital	Gen	County	10	3	15	5	230
Tallahassee 10700—Leon							
Florida Agricultural and Mechanical College Hospital (col)	Inst	Gen State	43	2	13	21	509
Tampa 101 161—Hillsborough							
Hillsboro County Tuberculosis Sanatorium	TB	County	80			70	140
Vero Beach 2263—Indian River							
Indian River Hospital	Gen	Indiv	21	5	30	0	305

## Summary for Florida

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	72	10 012	7 764	97 274
Related institutions	19	1 227	819	5 972
Totals	91	11 239	8 583	103 246
Refused registration	15	553		

## GEORGIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Albany 14 507—Dougherty							
Phoebe Putney Memorial Hospital	Gen	NPA'ssn	60	12	137	29	1 082
Alto 219—Habersham							
State Tuberculosis Sanat	TB	State	328			260	580
Americus 8760—Sumter							
Americus and Sumter County Hospital	Gen	NPA'ssn	35	5	54	16	650
Athens 18 192—Clarke							
Athens General Hospital	Gen	County	70	10	114	30	1 619
St Mary's Hospital	Gen	Church	52	10	31	22	208
Atlanta 360 691—Fulton							
Albert Steiner Clinic for Cancer and Allied Diseases	Ca	City	30			19	3 614
Battle Hill Sanatorium	TB	CyCo	206			221	140
Blackman Sanatorium	Gen	Indiv	25			10	203
Crawford W Long Memorial Hospital	Gen	NPA'ssn	150	30	803	91	4 799
Georgia Baptist Hospital	Gen	Church	154	30	709	145	6 790
Grady Hospital	Gen	City	560	81	3 604	467	22 078
Grady Hospital Emory University Division (col)							
Henrietta Eggleston Hospital for Children	Chil	NPA'ssn	40	2		33	1 060
Piedmont Hospital	Corp	Corp	144	20	385	88	3 781
Ponce de Leon Eye and Ear							
Throat Infirmary	FNT	Indiv	12			6	564
St Joseph Infirmary	Gen	Church	10	22	380	110	3 225
Veterans Admin Facility	Gen	Vet	265			239	2 753
Augusta 60 342—Richmond							
University Hospital	Gen	City	373	46	837	248	8 744
Veterans Admin Facility	Ment	Vet	1 061			1 000	616
Wilkenford Hospital for Women and Children	Gen	NPA'ssn	46	4	17	14	871
Bainbridge 6 141—Decatur							
Bainbridge Hospital	Surg	Indiv	32	1	No data supplied		
Riverside Hospital	Gen	Part	24	4	59	14	450
Brunswick 14 022—Glynn							
Brunswick City Hospital	Gen	CyCo	50	6	137	20	830
Caro 3 169—Grady							
Cairo Hospital	Gen	Indiv	20	4	76		392
Canton 2 892—Cherokee							
Cokers Hospital	Gen	Corp	30	3	33	19	610
Cedartown 8 124—Polk							
Hall Chaudron Hospital	Gen	Indiv	8	2	20	3	120
Columbus 43 131—Muscogee							
Columbus City Hospital	Gen	City	145	20	380	92	3 764
Cuthbert 3 235—Randolph							
Patterson Hospital	Gen	Indiv	30	3	37	13	612
Dalton 8 160—Whitfield							
Hamilton Memorial Hosp	Gen	NPA'ssn	30	5	123	13	640
Decatur 13 276—De Kalb							
Scottish Rite Hospital for Crippled Children	Orth	Frat	64			59	313
Donalsonville 1 183—Seminole							
Chason's Hospital	Gen	NPA'ssn	20	6	191	10	308
Douglas 4 206—Coffee							
Douglas Hospital	Gen	City	25	3	43	10	601
Dublin 6 681—Laurens							
Claxton Sanitarium	Gen	Indiv	58	5	75	30	1 190
Hicks Hospital	Gen	Indiv	20	1	4	9	648
Eastman 3 022—Dodge							
Coleman Sanatorium	Gen	Indiv	38	4	10	8	453

## GEORGIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Liberton 4,600—Libert							
Libert County Hospital	Gen	CyCo	12	2	26	4	97
Thompson Johnson Hospital	Gen	Part	10	5	50	4	200
Morey University—De Kalb							
Morey University Hosp	Gen	NPA'ssn	232	28	640	149	6 081
St Bennet—Chattahoochee							
St Bennet Hospital	Gen	Army	310	8	130	109	4 434
St McPherson (Atlanta P O)	—Fulton						
St Paul Hospital	Gen	Army	226	4	27	160	1 512
St Oglethorpe 1 186—Catoosa							
St Oglethorpe Hospital	Gen	Army	262	6	10	17	2 297
St Sereen—Chatham							
St Paul Hospital	Gen	Army	0		7	3	1 033
Galnesville 3 624—Hall							
Downey Hospital	Gen	Corp	2	6	70	94	1 191
Hall County Memorial Hosp	Gen	County	25	4	90	10	56
Griffin 10 321—Spalding							
R 1 Strickland and Son							
Memorial Hospital	Gen	Indiv	41	5	66	24	1 019
Hawkinsville 2 484—Pulaski							
R 1 Taylor Memorial Hosp	Gen	NPA'ssn	40	6			Estab 1900
Homerville 1,150—Clinch							
Iluey Hospital	Gen	Indiv	10	1			Reopened
Hosenton 427—Jackson							
Allen Clinic and Hospital	Gen	Part	14	2	14	8	284
Jesup 2 300—Wayne							
Drs Colvin Ritch Hospital	Gen	Part	27	4	100	13	649
La Grange 20 131—Troup							
City County Hospital	Gen	CyCo	60	6	116	94	1 651
Macon 64,041—Bibb							
Clinic Hospital	Gen	Corp	26	6	57	12	830
Hopewell Sanatorium	TB	CyCo	27		No data supplied		
Macon Hospital	Gen	CyCo	182	25	640	101	5 190
Middle Georgia Hospital	Gen	Corp	48	12	118	30	1 541
Oglethorpe Private Infirmary	Gen	Corp	35	6	78	19	900
St Luke Hospital (col)	Gen	Indiv	12	1	No data supplied		
Marletta 7 638—Cobb							
Marletta Hospital	Gen	Corp	50	3	66	10	500
Metter 1 424—Candler							
Kennedy Memorial Hospital	Gen	Part	20	3	10	11	227
Millidgeville 5 534—Baldwin							
Allen's Invalid Home	N CM	Indiv	150			100	313
Baldwin Memorial Hospital	Gen	Indiv	50	6	34	20	1 397
Millidgeville State Hosp	Gen	State	7 250			187	1 206
Scott Hospital	Gen	Indiv	20	4	10	20	300
Willen 2 27—Jenkins							
Millen Hospital	Gen	Indiv	21	5	20	7	603
Mulkey Hospital	Gen	Indiv	20	4	30	10	590
Monroe 3 706—Walton							
Walton County Hospital	Gen	NPA'ssn	17	3	24	3	197
Montezuma 2 24—Macon							
Macon County Clinic	Gen	Part	12	2	20	4	200
Quitman 4 139—Brooks							
Brooks County Hospital	Gen	CyCo	32	4	16	10	524
Rome 21 843—Floyd							
Harbin Hospital	Gen	Part	50	6	100	90	1 400
McCall Hospital	Gen	Part	60	10	90	23	604
Sandersville 3 011—Washington							
Rawlings Sanitarium	Gen	Corp	50	6	70	25	1 000
Savannah 8 024—Chatham							
Central of Georgia Railway Hospital	Indus	NPA'ssn	67			54	1 906
Charity Hospital (col)	Gen	NPA'ssn	44	14	318	40	2 200
Oglethorpe Infirmary (col)	Gen	NPA'ssn	60	7	257	50	1 190
Oglethorpe Sanatorium	Gen	Indiv	60	5	90	35	1 191
St Joseph Hospital	Gen	Church	100	10	239	62	900
Telfair Hospital	Gen	NPA'ssn	60	20	477	60	4 411
U S Marine Hospital	Gen	USPHS	108			160	1 533
Warren A Candler Hosp	Gen	Church	80	11	310	60	3 500
Smyrna 1 178—Cobb							
Dr Brawner's Sanitarium	N CM	Indiv	40			34	319
Statesboro 3 996—Bulloch							
Bulloch County Hospital	Gen	County	50	6	50	13	500
Van Buren's Sanitarium (col)	Gen	Indiv	20	4	10	7	50
Swainsboro 2 442— Emanuel							
Franklin Hospital	Gen	Indiv	20	2	14	6	300
Tate 1 548—Pleikens							
Robinson Hospital	Gen	Indiv	12	2	90	8	410
Thomasville 11 733—Thomas							
John D Arehbold Memorial Hospital	Gen	NPA'ssn	100	12	197	60	2 200
Tifton 3 390—Tift							
Coastal Plain Hospital	Gen	Corp	20	2	19	6	450
Locoia 4 602—Stephens							
Stephens County Hospital	Gen	CyCo	30	3	60	1	619
Trion 3 259—Chattooga							
Riegel Hospital	Gen	Indiv	25	5	133	15	1 416
Valdosta 13 482—Lowndes							
Frank Bird Hospital	Gen	Indiv	22	3	30	2	411
Little Griffin Owens Saunders Private Hospital	Gen	Corp	70	6	14	90	1 400
Vidalia 3 580—Toombs							
Bethany Home Hospital	Gen	Church	30			10	200
Washington 3 158—Wilkes							
Washington General Hosp	Gen	City	28	2	64	10	1 125
Waycross 15 510—Ware							
Atlantic Coast Line Hosp	Indus	NPA'ssn	70	8	142	41	1 125
Ware County Hospital	Gen	County	68	8	142	41	1 125
West Point 2 146—Troup							
Valley Hospital	Gen	NPA'ssn	20	4	50	6	200

Key to symbols and abbreviations is on page 933

## GEORGIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Atlanta 360 691—Fulton							
Dwelle's Infirmary (col)	Gen	Indiv	15	2	12	10	153
Florence Crittenton Home	Mat	NP Assn	25	15	67	25	69
Georgia Sanitarium	Gen	Indiv	8	2	6	2	29
Joseph B. Whitehead Memorial Hospital	Inst	State	24				222
U. S. Penitentiary Hosp	Inst	Fed	187			115	1 791
Venerable Hosp and Clinic	Ven	City	68			34	368
William A. Harris Memorial Hospital (col)	Gen	Indiv	26	2	9	15	457
Barwick 499—Brooks							
Sanchez Private Sanitarium	Gen	Indiv	14	2	15	2	450
Cedartown 8 124—Polk							
Cedartown Hospital	Gen	Indiv	12	4	50	6	240
Whitely Hospital	Gen	Indiv	12	2	8	1	116
Columbus 43 131—Muscookee							
Muscookee County Tuberculo is Sanatorium	TB	County	43			20	34
Cordele 6 880—Crisp							
Gillespie Hospital (col)	Gen	Church	34	4	10	14	500
Deatur 13 276—De Kalb							
Georgia Psychoanalytical Health Farm	N&M	Indiv	15		No data supplied		
Gracewood 500—Richmond							
Georgia Training School for Mental Defectives	MeDe	State	334			325	25
Moultrie 8 097—Colquitt							
Daniel Emergency Sanit	Gen	Indiv	16	2	10	6	250
Edmondson Brannen Hosp	Gen	Part	20	2	No data supplied		
Summersville 933—Chattooga							
Summersville Trion Hospital	Gen	Corp	22	3	No data supplied		
Warm Springs 400—Meriwether							
Georgia Warm Springs Foundation	Orth	NP Assn	113			93	321

## Summary for Georgia

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	92	15 082	12 772	141 077
Related institutions	18	992	690	5 619
Totals	110	16 074	13 412	146 696
Refused registration	3	61		

## IDAHO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
American Falls 1 980—Power							
Schultz Memorial Hospital	Gen	County	22	8	113	13	704
Boise 21 544—Ada							
St. Alphonsus Hospital	Gen	Church	135	20	251	96	2 608
St. Luke's Hospital	Gen	Church	115	16	572	107	5 057
Veterans Admin. Facility	Gen	Vet	194			147	1 249
Bonniers Ferry 1 418—Boundary							
Bonniers Ferry Hospital	Gen	Corp	25	8	60	9	208
Burley 3 826—Cassia							
Cottage Hospital	Gen	Corp	15	4	43	10	504
Coeur d'Alene 8 297—Kootenai							
Coeur d'Alene Hospital	Gen	NP Assn	30	3	2	15	67
Lakeside Hospital	Gen	Indiv	22	4	No data supplied		
Cottonwood 519—Idaho							
Our Lady of Consolation Hospital	Gen	Church	14	4	33	9	426
Ft. Hall 100—Bingham							
Ft. Hall Indian Agency Hosp	Gen	IA	14	4	48	7	203
Gooding 1 597—Gooding							
Gooding County Hospital	Gen	CyCo	24	6	110	7	628
Halley 953—Blaine							
Halley Clinical Hospital	Gen	Indiv	20	6	45	9	493
Idaho Falls 9 490—Bonneville							
Idaho Falls Latter Day Saints Hospital	Gen	Church	90	25	511	67	3 223
Spencer Hospital	Gen	Indiv	25	6	62	12	502
Kellogg 4 124—Shoshone							
Wardner Hospital	Gen	Part	30	6	107	21	1 173
Idaho Falls 416—Nez Perce							
Ft. Lapwai Sanatorium	TB	IA	132			125	293
Lewiston 9 405—Nez Perce							
St. Joseph's Hospital	Gen	Church	90	18	501	71	2 072
White Hospital	Gen	NP Assn	30	4	63	19	403
McDow 4 476—Latah							
Gritman Private Hospital	Gen	Indiv	28	9	146	17	694
Nampa 8 906—Canyon							
Mersey Hospital	Gen	Church	60	15	229	35	1 499
Nazarene Missionary Sanitarium and Institute (Samaritan Hospital)	Gen	Church	52	6	97	37	1 022
Orofino 10 85—Clearwater							
Orofino Hospital	Gen	Part	35	4	41	19	445
Pocatello 16 471—Bannock							
Pocatello General Hospital	Gen	County	59	16	219	57	2 154
St. Anthony Mercy Hosp	Gen	Church	42	15	302	25	1 213

## IDAHO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Potlatch 800—Latah							
Potlatch Hospital	Gen	Part	21	3	32	10	379
Preston 3 381—Franklin							
General Memorial Hospital	Gen	NP Assn	17	9	111	10	379
Rexburg 3 048—Madison							
Rexburg General Hospital	Gen	Indiv	70	5	53	7	509
Rupert 2 250—Minidoka							
Rupert General Hospital	Gen	Indiv	15	2	36	6	346
St. Maries 1 956—Benewah							
St. Maries Hospital	Gen	Part	30	3	23	10	263
Sandpoint 3 790—Bonner							
Graham Hospital	Gen	Indiv	21	5	75	10	600
Page Hospital	Gen	Indiv	30	6	38	8	286
Soda Springs 631—Caribou							
Caribou County Hospital	Gen	County	38	2	42	33	1 823
Twin Falls 8 787—Twin Falls							
Twin Falls County General Hospital	Gen	County	65	15	385	63	2 651
Wallace 3 634—Shoshone							
Providence Hospital	Gen	Church	50	10	146	23	1 071
Wallace Hospital	Gen	Part	50	5	46	22	756
Wendell 725—Gooding							
St. Valentine's Hospital	Gen	Church	24	9	74	9	352
Related Institutions							
Blackfoot 3 199—Bingham							
State Hospital South	Meat	State	565			550	152
Boise 21 544—Ada							
Salvation Army Women's Home and Hospital	Mat	Church	15	8	159	13	221
Coeur d'Alene 8 297—Kootenai							
Community Hospital	Gen	Indiv	16	1		Estab 1938	
Moscow 4 476—Latah							
Univ. of Idaho Infirmary	Inst	State	30			12	931
Nampa 8 206—Canyon							
Stato School and Colony	MeDe	State	553			530	47
Orofino 1 075—Clearwater							
State Hospital North	Meat	State	405			384	93
Priest River 940—Bonner							
Priest River Hospital	Gen	Indiv	10	2	8	2	48

## Summary for Idaho

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	38	1 717	1 156	35 649
Related institutions	7	1 590	1 496	1 573
Totals	45	3 307	2 652	37 222
Refused registration	3	67		

## ILLINOIS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Alton 30 151—Madison							
Alton Memorial Hospital	Gen	Church	95	15	287	55	1 653
Alton State Hospital	Meat	State	1 535			1 498	493
St. Anthony's Infirmary and Sanitarium	Gen	Church	70			40	589
St. Joseph's Hospital	Gen	Church	125	22	206	53	2 436
Amboy 1 912—Lee							
Amboy Public Hospital	Gen	NP Assn	17	4	61	6	210
Anna 3 436—Union							
Anna State Hospital	Meat	State	2 350			2 197	709
Hale Willard Memorial Hosp	Gen	City	15	4	No data supplied		
Aurora 46 589—Kane							
Copley Hospital	Gen	NP Assn	89	18	432	79	3 344
Kane County Springbrook Sanitarium	TB	County	70			77	70
Mercyville Sanitarium	N&M	Church	150			126	192
St. Charles Hospital	Gen	Church	120	20	364	76	1 714
St. Joseph Mercy Hospital	Gen	Church	136	30	544	87	2 929
Batavia 5 045—Kane							
Bellerue Place Sanitarium	N&M	Corp	33			20	7
Fox River Sanitarium	TB	NP Assn	85			60	100
Belleville 25 425—St. Clair							
St. Elizabeth's Hospital	Gen	Church	137	17	429	69	2 741
Belvidere 8 123—Boone							
Highland Hospital	Gen	NP Assn	28	10	89	12	477
St. Joseph's Hospital	Gen	Church	25	9	110	9	675
Benton 8 219—Franklin							
Moore Hospital	Gen	Indiv	25	1	36	10	467
Berwyn 47 021—Cook							
Berwyn Hospital	Gen	NP Assn	75	18	550	51	2 690
Bloomington 39 970—McLean							
Vernonville Hospital	Gen	Church	72	13	299	61	1 916
St. Joseph's Hospital	Gen	Church	200	22	356	133	3 709
Blue Island 16 534—Cook							
St. Francis Hospital	Gen	Church	100	15	475	54	2 352
Breese 1 957—Clinton							
St. Joseph Hospital	Gen	Church	20	7	73	17	563
Bushnell 2 850—McDonough							
Elmhurst Sanatorium	TB	County	40			31	41
Cairo 13 522—Alexander							
St. Mary Infirmary	Gen	Church	100	12	105	45	1 713
Canton 11 718—Fulton							
Graham Hospital	Gen	NP Assn	56	14	352	43	1 774
Carbondale 7 525—Jackson							
Holden Hospital	Gen	Church	60	10	117	22	85

## ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Examinations	Number of Births	Average Census	Admissions
Carlinville 4144—Macoupin Macoupin Hospital	Gen	Indiv	20	6	68	18	780
Centra 12583—Marion St Mary's Hospital	Gen	Church	61	12	180	34	1,613
Champaign, 2034—Champaign Burnham City Hospital	Gen	City	125	18	398	78	5,731
Charleston 8012—Coles M A Montgomery Memorial Sanatorium	Gen	NPA'sn	24	4	34	11	401
Oakwood Hospital	Gen	Indiv	21	3	18	6	190
Chicago 3677—Cook Albert Merritt Billings Hospital	Unit of University of Chicago Clinics						
Alexian Brothers Hosp *o	Gen	Church	24			148	3,020
American Hospital *o	Gen	NPA'sn	150	20	191	68	2,801
Augustana Hospital *o	Gen	Church	275	25	469	141	4,883
Belmont Community Hosp *o	Gen	NPA'sn	100	25	47	60	2,266
Bethany Home Hospital	Gen	Church	17	3	41	9	273
Bethany Sanitarium and Hospital	Gen	Church	50	16	222	21	1,125
Boys Roberts Memorial Hospital for Children	Unit of University of Chicago Clinics						
Burrows Hospital	Gen	Indiv	40	6	No data supplied		
Chicago Eye Ear Nose and Throat Hospital	ENT	Corp	75			12	1,413
Chicago Lying in Hospital of the Univ of Chicago *o	Unit of University of Chicago Clinics						
Chicago Memorial Hospital *o	Gen	NPA'sn	88	20	337	36	2,487
Chicago State Hospital *o	Ment	State	4,288			4,699	1,417
Children's Memorial Hospital *o	Chil	NPA'sn	252			165	4,110
City of Chicago Municipal Tuberculosis Sanitarium *o	TB	City	1,201	1	8	1,178	1,403
Columbus Hospital *o	Gen	Church	165	15	325	73	3,238
Cook County Children's Hospital	Unit of Cook County Hospital						
Cook County Hospital *o	Gen	County	3,300	174	4,122	2,027	75,223
Cook County Psychopathic Hospital	Unit of Cook County Hospital						
Edgewater Hospital *o	Gen	NPA'sn	111	29	516	70	3,093
Englewood Hospital *o	Gen	NPA'sn	101	25	539	78	3,288
Evangelical Deaconess Hospital	Gen	Church	65	20	141	24	877
Evangelical Hospital *o	Gen	Church	175	60	1,482	137	6,885
Franklin Boulevard Hosp *o	Gen	Corp	60	16	285	43	1,940
Garfield Park Community Hospital *o	Gen	NPA'sn	150	32	572	91	4,231
Grant Hospital *o	Gen	NPA'sn	213	40	969	155	6,502
Henrotin Hospital *o	Gen	NPA'sn	120	20	276	60	2,784
Holy Cross Hospital *o	Gen	Church	135	36	749	87	3,934
Home for Destitute Crippled Children	Unit of University of Chicago Clinics						
Hospital of St Anthony de Padua *o	Gen	Church	200	40	1,035	144	5,673
Illinois Central Hospital *o	Gen	NPA'sn	250	40	634	144	5,150
Illinois Eye and Ear Infirmary *o	FAI	State	200			199	5,487
Illinois Masonic Hospital *o	Gen	Trat	159	21	395	80	2,992
Jackson Park Hospital *o	Gen	Corp	182	40	501	9	3,624
John B Murphy Hospital	Gen	Church	129	29	232	37	1,342
Kenner Hospital	Gen	NPA'sn	40	6	44	21	510
Lake View Community Hospital	Gen	Corp	130	20	123	36	1,509
La Rabida Jackson Park Sanitarium	CardChil	NPA'sn	100			47	116
Lewis Memorial Maternity Hospital	Mat	Church	117	117	2,110	65	2,369
Loretto Hospital *o (Formerly Willard Hospital)	Gen	Church	175	20		Opened 1939	
Lutheran Deaconess Home and Hospital *o	Gen	Church	176	42	896	97	5,109
Lutheran Memorial Hosp *o	Gen	Church	211	36	995	72	3,615
Martha Washington Hosp	Gen	NPA'sn	60	10	172	25	1,262
Mercy Hospital *o	Gen	Church	310	24	498	204	6,094
Michael Reese Hospital *o	Gen	NPA'sn	669	71	1,627	462	16,943
Misericordia Hospital and Home for Infants *o	Mat	Church	17	20	337	8	383
Mother Cabrini Memorial Hospital *o	Gen	Church	120	20	426	74	3,623
Mt Sinai Hospital *o	Gen	NPA'sn	176	44	825	146	6,395
Municipal Contagious Disease Hospital *o	Iso	City	428			269	4,612
Nancy Adele McElwee Memorial and Gertrude Dunn Hicks Memorial Hospital	Unit of University of Chicago Clinics						
Norwegian American Hospital *o	Gen	NPA'sn	130	35	713	70	3,256
Parkey Sanitarium	N&M	NPA'sn	50		No data supplied		
Passavant Memorial Hospital *o	Gen	NPA'sn	185	35	481	145	4,686
Pinel Sanitarium	N&M	NPA'sn	50			23	202
Post Graduate Hospital and Medical School	Gen	NPA'sn	65	4	No data supplied		
Presbyterian Hospital *o	Gen	Church	378	34	883	287	10,614
Provident Hosp (col) *o	Gen	NPA'sn	142	18	590	100	3,804
Ravenswood Hospital *o	Gen	NPA'sn	184	30	1,613	112	5,916
Research and Educational Hospital *o	Gen	State	415	26	648	348	5,911
Roseland Community Hospital *o	Gen	Corp	101	28	517	70	2,779
St Anne's Hospital *o	Gen	Church	325	60	1,585	190	7,469
St Anthony de Padua Hosp	Sec	Hospital of St Anthony de Padua	200	33	621	110	6,290
St Bernard's Hospital *o	Gen	Church	289	44	790	190	4,358
St Elizabeth's Hospital *o	Gen	Church					

## ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Examinations	Number of Births	Average Census	Admissions
St George's Hospital	Gen	Church	135			Opened 1919	
St Joseph Hospital *o	Gen	Church	250	40	633	123	5,111
St Luke's Hospital *o	Gen	NPA'sn	563	49	937	250	7,521
St Mary of Nazareth Hospital *o	Gen	Church	212	35	1,202	150	6,575
St Vincent's Infant and Maternity Hospital *o	Mat	Church	40	15	215	19	520
Sarah Morris Hospital for Children	Unit of Michael Reese Hospital						
Shriners Hospital for Crippled Children *o	Orth	Frat	60			69	53
South Chicago Community Hospital *o	Gen	NPA'sn	85	17	425	95	1,575
South Shore Hospital *o	Gen	Corp	100	25	477	104	1,575
Streeter Memorial Hospital	Gen	Corp	55	10			250
Surgeal Institute for Crippled Children	Unit of Research and Educational Hospital						
Swedish Covenant Hosp *o	Gen	Church	160	42	1,058	101	4,231
U S Marine Hospital *o	Gen	USPHS	201			155	3,345
University Hospital *o	Gen	NPA'sn	100	21	201	95	551
University of Chicago Clinics *o	Gen	NPA'sn	520	162	2,691	410	19,722
Washington Boulevard Hospital *o	Gen	NPA'sn	100	10	124	55	1,874
Westley Memorial Hospital *o	Gen	Church	241	15	961	83	3,110
West Side Hospital *o	Gen	Corp	222	8	115		14
Women and Children's Hospital *o	Gen	NPA'sn	125	25	451	6	2,275
Woodlawn Hospital *o	Gen	NPA'sn	86	25	345	9	965
Chicago Heights 22521—Cook St James Hospital	Gen	Church	100	20	260	50	2,475
Clinton 5920—De Witt Dr John Warner Hospital	Gen	City	28	4	82	15	641
Compton 277—Lee Compton Hospital	Gen	Indiv	12	2	12	4	155
Danville 26765—Vernifson Lake View Hospital *o	Gen	NPA'sn	170	25	307	165	8,755
St Elizabeth Hospital *o	Gen	Church	150	21	345	120	3,251
Veterans Admin Facility	Ment	Vet	1,785			1,621	1,111
Decatur 57510—Macon Decatur and Macon County Hospital	Gen	NPA'sn	140	25	621	105	3,415
Macon County Tuberculosis Sanitarium *o	TB	County	80			63	6
St Mary's Hospital	Gen	Church	195	28	573	120	4,255
Walsh's Employment Hospital Indus	NPA'sn		75			49	1,129
De Kalb 5545—De Kalb De Kalb County Tuberculosis Sanitarium	TB	County	32			25	57
De Kalb Public Hospital	Gen	City	30	6	160	19	579
St Mary's Hospital	Gen	Church	30	10	85		
Des Plaines 8798—Cook Northwestern Hospital	Gen	NPA'sn	14	5	95	6	95
Dixon 9995—Lee Dixon Public Hospital *o	Gen	NPA'sn	60	17	571	41	1,875
Du Quoin 7533—Perry Du Quoin Public Hospital *o	Gen	NPA'sn	47	8	115	25	1,074
Marshall Browning Hosp	Gen	NPA'sn					
Dwight 2334—Livingston Veterans Admin Facility	Gen	Vet	225			204	1,471
East Moline 10107—Rock Island East Moline State Hosp	Ment	State	2,240			2,133	925
East St Louis 74347—St Clair Christian Welfare Hosp *o	Gen	NPA'sn	62	10	905	121	1,611
St Mary's Hospital *o	Gen	Church	260	35	684	122	3,259
Edwardsville 6235—Madison Madison County Tuberculosis Sanitarium	TB	County	93			83	40
Effingham 4978—Effingham St Anthony's Hospital	Gen	Church	88	8	114	60	1,644
Elgin 35929—Kane Elgin State Hospital *o	Ment	State	4,614			4,529	16,771
Resthaven Sanitarium	N&M	Indiv	100			61	1,262
St Joseph Hospital *o	Gen	Church	100	15	302	81	3,140
Sherman Hospital *o	Gen	NPA'sn	116	24	537		
Elmhurst 14055—Du Page Elmhurst Community Hosp	Gen	NPA'sn	110	20	391	50	2,519
Evans 63338—Cook Evanston Community Hospital (col)	Gen	NPA'sn	251	4	29	11	579
Evansville Hospital *o	Gen	NPA'sn	228	32	909	139	5,216
St Francis Hospital *o	Gen	Church	303	50	683	130	1,731
Evergreen Park, 1594—Cook Little Company of Mary Hospital *o	Gen	Church	156	45	1,100	109	4,477
Freeport 22000—Lake Station Hospital	Gen	Army	180	6	39	154	9,999
Freeport 22045—Stephenson Deaconess Hospital *o	Gen	Church	68	16	293	43	1,471
St Francis Hospital *o	Gen	Church	100	19	291	60	2,255
Galesburg 28530—Knock Galesburg Cottage Hosp *o	Gen	NPA'sn	82	19	331	54	1,071
St Mary's Hospital	Gen	Church	100	16	251		
Geneseo 3406—Henry J C Hammond City Hosp	Gen	City	25	5	65	9	420
Geneva 4607—Kane Community Hospital	Gen	NPA'sn	65	20	227	34	1,115
Granite City 25130—Madison St Elizabeth Hospital *o	Gen	Church	103	22	395	14	9,622
Great Lakes—Lake U S Naval Hospital	Gen	Navy	331			80	1,450
Harrisburg 11625—Saline Harrisburg Hospital	Gen	Corp	25	1	No data supplied	15	1,777
Lightner Hospital	Gen	Indiv	40	5	54		

Key to symbols and abbreviations is on page 933

## ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Harvard 2,688—McHenry	Gen	Part	21	5	88	14	320
Harvard Community Hosp	Gen	NP Assn	90	20	463	33	1,540
Harvey 16,374—Cook	Gen	NP Assn	40	6	84	24	840
Ingalls Memorial Hospital	Gen	NP Assn	80	8	188	56	1,632
Herrin 9,008—Williamson	Gen	Indiv	47	17	215	26	1,414
Herrin Hospital	Gen	NP Assn	32	5	44	18	403
Highland 3,319—Madison	Gen	Church	1760		1,663	8,673	
St Joseph's Hospital	Gen	Church	100	10	173	51	1,534
Highland Park 12,203—Lake	Gen	NP Assn	40				
Highland Park Hospital	Gen	NP Assn	40				
Hillsboro, 4,430—Montgomery	Gen	NP Assn	40				
Hillsboro Hospital	Gen	NP Assn	40				
Hines, —Cook	Gen	Vet	1,760		1,663	8,673	
Veterans Admin Facility	Gen	Vet	1,760		1,663	8,673	
Hinsdale 6,970—Du Page	Gen	NP Assn	100	10	173	51	1,534
Hinsdale Sanitarium and Hos	Gen	NP Assn	100	10	173	51	1,534
Jacksonville 17,747—Morgan	Ment	State	3,403		3,221	890	
Jacksonville State Hosp	Ment	State	3,403		3,221	890	
Morgan County Tuberculosis	TB	County	40		41	40	
Sanatorium Oaklawn	N&M	Corp	120		78	147	
Norbury Sanatorium	Gen	Church	81	12	144	43	1,558
Our Saviour's Hospital	Gen	Church	73	12	107	41	1,397
Passavant Memorial Hosp	Gen	Church	220	44	930	154	5,981
Joliet 42,903—Will	Gen	NP Assn	107	18	344	58	2,149
St Joseph's Hospital	Gen	Church	220	44	930	154	5,981
Silver Cross Hospital	Gen	NP Assn	107	18	344	58	2,149
Will County Tuberculosis	TB	County	96		84	67	
Sanatorium	TB	County	96		84	67	
Kankakee 20,620—Kankakee	Ment	State	4,111		3,997	749	
Kankakee State Hosp	Ment	State	4,111		3,997	749	
St Mary Hospital	Gen	Church	125	22	287	61	2,330
Kenilworth 2,501—Cook	N&M	Indiv	30		10	62	
Kenilworth Sanitarium	N&M	Indiv	30		10	62	
Kewanee 17,093—Henry	Gen	NP Assn	04	12	100	38	973
Kewanee Public Hospital	Gen	Church	07	11	196	40	930
St Francis Hospital	Gen	Church	07	11	196	40	930
Lake Forest 6,554—Lake	Gen	NP Assn	42	9	80	13	621
Alice Home Hospital	Gen	NP Assn	42	9	80	13	621
La Salle 13,149—La Salle	Gen	Church	80	10	340	60	1,600
St Mary Hospital	Gen	Church	80	10	340	60	1,600
Libertyville 3,701—Lake	Gen	NP Assn	20	6	81	11	436
Condell Memorial Hospital	Gen	NP Assn	20	6	81	11	436
Lincoln 12,803—Logan	Gen	Church	52	8	100	38	1,537
Evangelical Deaconess Hos	Gen	Church	06	10	96	44	1,008
St Clara's Hospital	Gen	Church	06	10	96	44	1,008
Litchfield 6,612—Montgomery	Gen	Church	130	11	278	101	2,973
St Francis Hospital	Gen	Church	130	11	278	101	2,973
Mackinaw 760—Tazewell	TB	County	40		36	42	
Oak Knoll Sanatorium	TB	County	40		36	42	
Macomb 8,509—McDonough	Gen	Corp	40	6	123	20	709
Marquette Phelps Hospital	Gen	Church	100	10	181	47	1,009
St Francis Hospital	Gen	Church	100	10	181	47	1,009
Manteno 1,149—Kankakee	Ment	State	5,093		3,610	1,479	
Manteno State Hospital	Ment	State	5,093		3,610	1,479	
Mattoon 14,631—Coles	Gen	Church	43	10	103	26	1,039
Memorial Methodist Hosp	Gen	Church	43	10	103	26	1,039
Melrose Park 10,741—Cook	Gen	Corp	71	16	309	36	1,680
Westlake Hospital	Gen	Corp	71	16	309	36	1,680
Mendota 4,008—La Salle	Gen	Indiv	16	4	78	4	428
Harris Hospital	Gen	Indiv	16	4	78	4	428
Moline 32,236—Rock Island	Gen	Church	130	16	420	59	2,161
Lutheran Hospital	Gen	City	133	31	750	90	3,064
Moline Public Hospital	Gen	City	133	31	750	90	3,064
Monmouth 8,666—Warren	Gen	City	30	10	161	26	781
Monmouth Hospital	Gen	City	30	10	161	26	781
Morris 5,568—Grundy	Gen	NP Assn	37	14	161	25	677
Morris Hospital	Gen	NP Assn	37	14	161	25	677
Moweaqua 1,418—Shelby	Gen	Indiv	20	8	44	10	137
Moweaqua Hospital	Gen	Indiv	20	8	44	10	137
Murphysboro 8,182—Jackson	Gen	Church	35	6	73	25	875
St Andrew's Hospital	Gen	Church	35	6	73	25	875
Naperville 5,118—Du Page	TB	NP Assn	97		73	201	
Edward Sanatorium	TB	NP Assn	97		73	201	
Normal 6,768—McLean	Gen	Church	90	15	233	60	2,780
Brokaw Hospital	Gen	Church	90	15	233	60	2,780
Fairview Sanatorium	TB	County	50		41	30	
North Chicago 8,466—Lake	Ment	Vet	1,747		1,153	240	
Veterans Admin Facility	Ment	Vet	1,747		1,153	240	
North Riverside (Riverside P O)	TB	City	200		215	211	
Municipal Tuberculosis Home	TB	City	200		215	211	
Oak Forest 820—Cook	Gen	County	1,004		1,016	1,728	
Cook County Infirmary	Gen	County	1,004		1,016	1,728	
Cook County Tuberculosis	TB	County	634		459	112	
Hospital	TB	County	634		459	112	
Oak Park 19,082—Cook	Gen	Church	130	40	721	92	4,492
Oak Park Hospital	Gen	Church	130	40	721	92	4,492
West Suburban Hospital	Gen	NP Assn	377	100	1,417	153	5,097
Olney 1,140—Richland	Gen	Corp	70	8	No data supplied		
Olney Sanitarium	Gen	Corp	70	8	No data supplied		
Ottawa 1,094—La Salle	TB	County	40		41	31	
Highland	TB	County	40		41	31	
Ottawa Tuberculosis Sanat	TB	Corp	170		119	167	
Ryburn Memorial Hospital	Gen	City	63	12	303	43	1,676
Pana 5,030—Christian	Gen	Church	30	10	78	20	800
Huber Memorial Hospital	Gen	Church	30	10	78	20	800
Paris 871—Edgar	Gen	Corp	40	6	71		
Paris Hospital	Gen	Corp	40	6	71		
Pekin 16,120—Tazewell	Gen	NP Assn	50	12	250	40	1,631
Pekin Public Hospital	Gen	NP Assn	50	12	250	40	1,631

## ILLINOIS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Peoria 104 969—Peoria							
John O Proctor Hosp	Gen	NP Assn	100	17	297	73	2,042
Methodist Hospital of Central Illinois**	Gen	Church	200	40	1 020	160	6 328
Michell Farm	N&M	Indiv	26			17	39
Peoria Municipal Tubercu- losis Sanitarium+	TB	City	93			68	167
Peoria Sanitarium	N&M	Indiv	22			10	89
Peoria State Hospital	Ment	State	2 570			2 000	883
St Francis Hospital**	Gen	Church	300	47	1 308	200	12 930
Peru 9 121—La Salle							
Peoples Hospital	Gen	NP Assn	42	10	122	35	800
Pontiac 8 272—Livingston							
Livingston County Sanat	TB	County	38			29	49
St James' Hospital	Gen	Church	40	12	175	21	627
Princeton 4 762—Bureau							
Julia Rackley Perry Memorial Hospital	Gen	City	52	10	182	29	1 154
Quincy 39 241—Adams							
Blessing Hospital	Gen	NP Assn	120	20	308	80	3 080
Hillcrest	TB	County	50			45	33
St Mary Hospital	Gen	Church	190	20	469	140	3 912
Rantoul 1 555—Champaign							
Station Hospital	Gen	Army	50	1	5	30	938
Red Bud 1 208—Randolph							
St Clement's Hospital	Gen	Church	14	3	29	9	260
Robinson 3 668—Crawford							
Robinson Hospital	Gen	Part	18	4	26	3	144
Rockford 80 864—Winnebago							
Flmlawn (Willgus Sanit)	N&M	Indiv	30			23	78
Rockford Hospital	Gen	NP Assn	84	18	209	57	2 231
Rockford Municipal Tubercu- losis Sanatorium+	TB	City	120			103	154
St Anthony's Hospital	Gen	Church	191	34	790	120	4 993
Swedish American Hosp	Gen	NP Assn	70	12	409	40	1 816
Winnebago County Hospital	Gen	County	72	6	56	00	1 163
Rock Island 37 003—Rock Island							
Rock Island County Tuber- culosis Sanatorium	TB	County	76			63	70
St Anthony's Hospital	Gen	Church	200	24	346	74	2 679
Rosiclare 1 784—Hardin							
Rosiclare Hospital	Gen	Indiv	17	2	19	5	213
Rushville 2 388—Schuyler							
Culbertson Hospital	Gen	Indiv	27	3	19	6	206
St Charles 5 377—Kane							
St Charles City Hospital	Gen	NP Assn	20	6	52	6	240
Savanna 5 086—Carroll							
Savanna City Hospital	Gen	City	15	5	03	5	201
Shelbyville 3 491—Shelby							
Shelby County Memorial Hos- pital	Gen	NP Assn	15	5	03	5	201
Springfield 71 864—Sangamon							
Palmer Sanatorium	TB	Corp	74			63	56
St John's Crippled Children's Home	Unit of St John's Sanitarium	Gen	600	40	1 123	380	11 439
St John's Hospital	Gen	Church	300			190	341
St John's Sanitarium	TB	Church	300			190	341
Springfield Hospital	Gen	NP Assn	100	10	428	100	3 601
Spring Valley 5 270—Bureau							
St Margaret's Hospital	Gen	Church	60	7	240	07	1 520
Sterling 10 012—Whiteside							
Home Hospital	Gen	NP Assn	20	6	40	16	541
Public Hospital	Gen	City	70	14	306	24	1 209
Stearns 14 728—La Salle							
St Mary's Hospital	Gen	Church	120	16	432	80	3 007
Sublette 261—Lee							
Angear Maternity Hospital	Mat	Indiv	10	10	42	3	297
Sycamore 4 021—De Kalb							
Sycamore Municipal Hosp	Gen	City	28	12	02	10	033
Taylorville 7 316—Christian							
St Vincent Hospital	Gen	Church	62	12	237	03	1 644
Tuscola 2 569—Douglas							
Douglas County Jarman Hos- pital	Gen	County	33	5	128	23	974
Urbana 13 000—Champaign							
Carle Memorial Hospital	Gen	Corp	46	10	77	20	1 341
Champaign County Hospital	Gen	County	62	10	115	30	776
Mercy Hospital	Gen	Church	60	12	224	47	1 880
The Outlook	TB	County	48			36	35
Vandalla 4 342—Fayette							
Mark Greer Hospital	Gen	Indiv	30	9	66	22	720
Waterman 570—De Kalb							
East Side Hospital	Gen	Indiv	22	7	68	13	407
Watsika 3 144—Iroquois							
Iroquois Hospital	Gen	NP Assn	41	11	201	29	1 265
Waukegan 33 499—Lake							
Lake County General Hosp	Gen	County	90	15	243	84	1 777
St Therese Hospital	Gen	Church	150	21	425	66	2 780
Victory Memorial Hosp	Gen	NP Assn	76	14	330	37	1 600
Winfield 4							
Winfield Sanatorium	TB	NP Assn	110			60	130
Zace Sanatorium	TB	NP Assn	00			20	00
Woodstock 5 471—McHenry							
Woodstock Public Ho p	Gen	NP Assn	40	12	104	13	644
Zeigler 3 816—Franklin							
Zeigler Hospital	Gen	NP Assn	13	2	4	3	70
Related Institutions							
Arrowsmith 297—McLean							
L M John on Ho pital	Gen	Indiv	10	2	6	2	20
Avon 700—Fulton							
Saunders Ho pital	Gen	NP Assn	13	4	39	6	140



## ILLINOIS—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Chicago 3 677 700—Cook	Conv	Indiv	10			7	28
Beverly Hills Rest Home	Conv	Indiv	41			76	242
Chicago Home for Convalescent Women and Children	Conv	NPA'ssn	283			280	70
Chicago Home for Incurables	Conv	Indiv	15			10	60
Dora Levine Gordon Rest Home	Conv	Indiv	75			30	1 452
House of Correction Hosp	Inst	City	3				26
Isolation Hospital	SmPos	City	24			11	43
Long & Convalescent Home	N&M	Indiv	10			8	23
North Side Rest Home	N&M	Part	270			206	1 080
Parkway Lodge Convalescent Home for Men and Women	Conv	FedCy	21	12	216	76	263
Salvation Army Booth Memorial Hospital	Mat	Church	21	12	216	76	263
Washington and Jane Smith Home	InstGen	NPA'ssn	21			9	78
Danvers 510—McLean	Alcoh	Corp	8			4	35
Parkhurst Willow Bark Hospital	Alcoh	Corp	26			8	120
Decatur 57 510—Macon	MeDe	State	3 746		4	3 967	666
City Public Hospital	MeDe	State	12	2	9	4	200
Dixon 9 008—Lee	Gen	Indiv	26			20	100
Dixon State Hospital	Chll	NPA'ssn	30			26	222
Eldorado 4 482—Saline	Gen	Indiv	11	5	95	5	391
Errell Hospital	Inst	State	25	15	22	17	186
Evanston 63 338—Cook	MeDe	Corp	70			65	12
Grove House for Convalescents	Cen	Part	8	6	25	3	155
The Cradle	Mat	NPA'ssn	20	16	42	15	44
Fairbury 2 810—Livingston	MeDe	State	4 474	7	7	3 884	410
Fairbury Hospital	Inst	Frat	55			35	149
Geneva 4 607—Kane	MeDe	State	475			440	85
State Training School for Girls	Inst	State	33			30	696
Godfrey 150—Madison	Gen	Indiv	10	2	21	6	407
Beverly Farm	TB	County	10			8	15
Henry 1 658—Marshall	InstChll	Inst	65			37	
Drs Coggeshall and Dygart Hospital	Gen	Indiv	10	4		3	
Hinsdale 6 923—Du Page	Inst	State	18			10	1 500
West Suburban Home for Girls	Inst	State	40			18	983
Lincoln 12 853—Logan	Gen	NPA'ssn	17	4	87	8	520
Lincoln State School and Colony	Inst	State	14			7	69
Mattoon 14 631—Coles	Inst	State	20			21	1 045
I O O F Old Folks Home	Inst	State	115			28	2 500
Menard 22—Randolph	Conv	Church	75			45	1 020
Illinois Security Hospital	MeDe	Indiv	50			45	7
Prison Hospital of Illinois	Cen	Indiv	10	5	75	6	200
State Penitentiary	Conv	Corp	75			No data supplied	
Metropolis 5 578—Macomb	Inst	State	14	4	34	7	69
Fisher Hospital	Inst	State	40			18	983
Minonk 1 910—Woodford	Inst	State	14	4	34	7	69
Woodford County Tuberculosis Sanatorium	Inst	State	14	4	34	7	69
Mooheart 1 400—Kane	Inst	State	14	4	34	7	69
Philadelphia Memorial Hospital	Inst	State	14	4	34	7	69
Mount Prospect 1 220—Cook	Inst	State	14	4	34	7	69
Mount Prospect General Hospital	Inst	State	14	4	34	7	69
Normal 6 768—McLean	Inst	State	14	4	34	7	69
Soldiers and Sailors Children's School	Inst	State	14	4	34	7	69
Payton 2 892—Ford	Inst	State	14	4	34	7	69
Payton Community Hospital	Inst	State	14	4	34	7	69
Pontiac 8 272—Livingston	Inst	State	14	4	34	7	69
Illinois State Penitentiary	Inst	State	14	4	34	7	69
Princeville 994—Peoria	Inst	State	14	4	34	7	69
Seven Oaks Rest Home and Hospital	Inst	State	14	4	34	7	69
Quincy 39 241—Adams	Inst	State	14	4	34	7	69
Quincy Memorial Sanitarium	Inst	State	14	4	34	7	69
St Charles 5 377—Kane	Inst	State	14	4	34	7	69
St Charles School for Boys	Inst	State	14	4	34	7	69
Urbana 13 060—Champaign	Inst	State	14	4	34	7	69
McKinley University Hosp	Inst	State	14	4	34	7	69
Wedron 262—La Salle	Inst	State	14	4	34	7	69
St Joseph's Health Resort	Inst	State	14	4	34	7	69
West Chicago 3 417—Du Page	Inst	State	14	4	34	7	69
Country Home for Convalescent Crippled Children	Inst	State	14	4	34	7	69
Wheaton 7 258—Du Page	Inst	State	14	4	34	7	69
Mary E Pogue School	Inst	State	14	4	34	7	69
Wheeling 467—Cook	Inst	State	14	4	34	7	69
Wheeling Hospital	Inst	State	14	4	34	7	69
White Hall 2 928—Greene	Inst	State	14	4	34	7	69
White Hall Hospital	Inst	State	14	4	34	7	69
Winnetka 12 166—Cook	Inst	State	14	4	34	7	69
North Shore Health Resort	Inst	State	14	4	34	7	69

## Summary for Illinois

Hospitals and sanatoriums	Number	Beds	Average Census	Admissions
Related institution	260	71 877	5 495	675 921
	45	10 528	5 885	17 929
Totals	305	82 405	64 380	693 850
Refused registration	43	1 488		

## INDIANA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Anderson 39 801—Madison	Gen	Church	105	15	483	75	265
St John's Hickey Memorial Hospital	Gen	Church	20	4	65	10	47
Angola 2 66—Steuben	Gen	NPA'ssn	10	4	No data supplied		
Cameron Hospitals	Gen	NPA'ssn	10	4	No data supplied		
Argos 1 211—Marshall	Gen	NPA'ssn	10	4	No data supplied		
Kelly Hospital	Gen	NPA'ssn	10	4	No data supplied		
Auburn 5 088—De Kalb	Gen	Indiv	20	12	41	4	12
Dr Bonnell M Souder Hosp	Gen	Indiv	20	12	41	4	12
Batesville 2 628—Ripley	Gen	Church	50	10	148	90	65
Margaret Mary Hospital	Gen	Church	25	4	64	14	42
Bedford 13 208—Lawrence	Gen	Corp	25	4	64	14	42
Dunn Hospital	Gen	Corp	25	4	64	14	42
Beech Grove 3 552—Marion	Gen	Church	140	30	657	60	915
St Francis Hospital	Gen	Church	140	30	657	60	915
Bloomington 18 227—Monroe	Gen	NPA'ssn	40	6	87	20	114
Bloomington Hospital	Gen	NPA'ssn	40	6	87	20	114
Bluffton 5 074—Wells	Gen	County	24	6	175	15	61
Wells County Hospital	Gen	County	24	6	175	15	61
Clinton 7 036—Vermillion	Gen	County	43	6	105	30	175
Vermillion County Hospital	Gen	County	43	6	105	30	175
Columbus 9 915—Bartholomew	Gen	County	50	6	113	22	92
Bartholomew County Hosp	Gen	County	50	6	113	22	92
Connersville 12 795—Fayette	Gen	NPA'ssn	40	10	110	25	95
Fayette Memorial Hospital	Gen	NPA'ssn	40	10	110	25	95
Crawfordsville 10 355—Montgomery	Gen	County	57	12	165	40	120
Culver Hospital	Gen	County	57	12	165	40	120
Crown Point 4 046—Lake	TB	County	900			901	15
Lake County Tuberculosis Sanatorium	TB	County	900			901	15
Decatur 5 156—Adams	Gen	County	29	6	111	25	120
Adams County Memorial Hospital	Gen	County	29	6	111	25	120
East Chicago, 54 754—Lake	Gen	Church	252	60	955	912	617
St Catherine's Hospital	Gen	Church	252	60	955	912	617
Elkhart 12 949—Elkhart	Gen	NPA'ssn	75	10	555	37	125
Elkhart General Hospital	Gen	NPA'ssn	75	10	555	37	125
Floyd 10 685—Madison	Gen	Church	33	14	996	91	991
Mercy Hospital	Gen	Church	33	14	996	91	991
Evansville 102 249—Vanderburgh	County	State	1 500			1 525	25
Boehne Tuberculosis Hosp + TB	County	State	1 500			1 525	25
Evansville State Hospital	Ment	State	155	20	555	122	450
Protestant Deaconess Hosp	Gen	Church	155	20	555	122	450
St Mary's Hospital	Cen	Church	155	20	555	122	450
U S Marine Hospital	USPHS	Corp	111	6	124	55	255
Welborn Walker Hospital	Gen	Corp	111	6	124	55	255
Ft Benjamin Harrison—Marion	Gen	Army	166	4	31	120	947
Station Hospital	Gen	Army	166	4	31	120	947
It Wayne 114 946—Allen	TB	County	227			931	91
Irene Byron Sanatorium	TB	County	227			931	91
Lutheran Hospital	Gen	Church	160	25	555	91	311
Methodist Episcopal Hosp	Cen	Church	160	25	555	91	311
St Joseph Hospital	Gen	Church	225	57	145	155	455
Frankfort 12 195—Clinton	Gen	County	45	7	155	23	95
Clinton County Hospital	Gen	County	45	7	155	23	95
Carret 4 428—De Kalb	Gen	Church	45	6	54	23	65
Sacred Heart Hospital	Gen	Church	45	6	54	23	65
Gary 100 426—Lake	Gen	Church	555	15	655	55	515
Methodist Episcopal Hosp	Cen	Church	555	15	655	55	515
St Antonio Hospital	Cen	NPA'ssn	55	10	30	19	45
St John Hospital (col)	Gen	Indiv	15	6	55	5	45
St Mary's Mercy Hospital	Gen	Church	250	45	155	155	655
Greencastle 4 613—Putnam	Gen	County	30			16	
Putnam County Hospital	Gen	County	30			16	
Greensburg 5 702—Decatur	Gen	County	55	5	No data supplied		
Decatur County Memorial Hospital	Gen	County	55	5	No data supplied		
Hammond 64 560—Lake	N&M	Church	34			20	20
Mount Mercy Sanitarium	N&M	Church	215	50	1 918	136	515
St Margaret Hospital	N&M	Church	215	50	1 918	136	515
Hartford City 6 613—Blackford	Gen	County	30	5	141	10	45
Blackford County Hospital	Gen	County	30	5	141	10	45
Huntington 13 420—Huntington	Gen	County	26	6	125	15	75
Huntington County Hosp	Gen	County	26	6	125	15	75
Indianapolis 364 161—Marion	Ment	State	1 962			1 962	94
Central State Hospital	Ment	State	1 962			1 962	94
Community Hospital (col)	Gen	NPA'ssn	25	6	No data supplied		
Dr W B Fletcher's Sanatorium (Neuronhurst)	N&M	Corp	50			23	10
Flower Mission Memorial Hospital	Unit of Indianapolis City Hospital	Gen	67	40	655	45	95
Indianapolis City Hosp	Gen	City	67	40	655	45	95
Indiana University Hospital	Gen	State	466	33	1 094	450	955
James Whitecomb Riley Hospital for Children	Unit of Indiana University Hospital	Gen	466	33	1 094	450	955
Kiwanis Home	Unit of Indiana University Hospital	Gen	466	33	1 094	450	955
Methodist Episcopal Hospital	Gen	Church	570	59	1 555	423	2 555
Norways Sterne Memorial Hospital	N&M	Corp	30			15	15
Robert W Long Hospital	Unit of Indiana University Hospital	Gen	466	33	1 094	450	955
Rotary Convalescent Home	Unit of Indiana University Hospital	Gen	466	33	1 094	450	955
St Vincent's Hospital	Gen	Church	260	35	1 107	175	678
Veterans Admin Facility	Gen	Vet	152			164	155
William H C. Leman Hospital for Women	Unit of Indiana University Hospital	Gen	466	33	1 094	450	955
Jeffersonville 11 946—Clark	Gen	County	35	6	No data supplied		
Clark County Memorial Hospital	Gen	County	35	6	No data supplied		

Key to symbols and abbreviations is on page 933

## INDIANA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Kendallville 5439—Noble Lakeside Hospital	Gen	City	23	12	113	16	609
Kokomo 37843—Howard Good Samaritan Hospital	Gen	Church	50			17	327
St Joseph Memorial Hosp	Gen	Church	62	12	183	38	1277
La Fayette 26240—Tippecanoe La Fayette Home Hospital	Gen	NPA'sn	120	20	325	60	2363
St Elizabeth Hospital*	Gen	Church	228	26	690	136	4830
William Ross Sanatorium	TB	County	41			34	57
La Porte 10700—La Porte Fairview Hospital	Gen	NPA'sn	34	8	81	22	651
Holy Family Hospital	Gen	Church	90	10	302	76	2033
Lebanon, 6445—Boone Witham Memorial Hospital	Gen	County	58	8	129	30	740
Logansport 13508—Cass Cass County Hospital	Gen	County	40	8	103	37	1670
Logansport State Hospital*	Ment	State	1840			1728	421
St Joseph's Hospital	Gen	Church	50	10	117	23	844
Madison 6300—Jefferson Kings Daughters Hospital	Gen	NPA'sn	56	6	61	20	638
Marion 24496—Grant Marion General Hospital	Gen	NPA'sn	50	7	240	32	1184
Marionville 4962—Morgan Morgan County Memorial Hospital	Gen	County	18	5	70	9	427
Michigan City 26730—La Porte Clinic Hospital	Gen	Corp	50	12	43	25	968
St Anthony's Hospital	Gen	Church	110	15	392	41	1076
Michawaka 28630—St Joseph St Joseph Hospital	Gen	Church	100	18	494	61	2911
Muncie 46545—Delaware Ball Memorial Hospital**	Gen	NPA'sn	217	20	734	136	4919
New Albany 20819—Floyd St Edward's Hospital	Gen	Church	114	14	219	48	1663
Newcastle 14027—Henry Clinic Hospital	Gen	Part	10	5		9	
Henry County Hospital	Gen	County	70	9			
North Madison 573—Jefferson Madison State Hospital	Ment	State	1580			1673	300
Oaklandon 300—Marion Sunnyside Sanatorium	TB	County	200			207	219
Peru 12700—Miami Duke's Miami County Memorial Hospital	Gen	County	48	12	160	30	1202
Wabash Railroad Employees Hospital	Indus	NPA'sn	50			27	493
Plymouth 5290—Marshall Parkview Hospital	Gen	NPA'sn	30	8	191	23	910
Portland 5706—Jay Jay County Hospital	Gen	County	14	6	70	10	221
Princeton 7500—Gibson Methodist Episcopal Hosp	Gen	Church	30	6	94	19	636
Rensselaer 2708—Jasper Jasper County Hospital	Gen	County	38	10	214	20	991
Richmond 30493—Wayne Reid Memorial Hospital	Gen	NPA'sn	130	22	430	63	3667
Richmond State Hospital	Ment	State	1001			1392	300
Smith Esteb Memorial Hosp	TB	County	51			30	40
Rochester 3518—Fulton Woodlawn Hospital	Gen	Indiv	31	6	08	23	808
Rockville 1832—Parke Indiana State Sanatorium	TB	State	250			214	223
Rushville 5709—Rush City Hospital	Gen	City	11	3	56	3	931
Seymour 7508—Jackson Schneck Memorial Hospital	Gen	NPA'sn	23	8	144	22	806
Shelbyville 10618—Shelby W S Major Hospital	Gen	City	42	12	98	18	683
South Bend 104193—St Joseph Epworth Hospital*	Gen	NPA'sn	105	37	773	107	4187
Healthwin Hospital	TB	County	210			108	203
St Joseph Hospital*	Gen	Church	126	22	590	70	2600
Sullivan 3006—Sullivan Mary Sherman Memorial Hospital	Gen	County	60	7	108	26	860
Tell City 4033—Perry Parkview Hospital	Gen	Indiv	12	3	18	8	408
Terre Haute 62010—Vigo St Anthony's Hospital*	Gen	Church	171	26	292	90	3014
Union Hospital	Gen	NPA'sn	168	21	392	118	3941
Union City 7054—Randolph Union City Hospital	Gen	Indiv	10	3	64	9	422
Veterans Administration Hospital 2000—Grant Veterans Admin Facility	Ment	Vet	1006			1523	306
Vincennes 17564—Knox Good Samaritan Hospital	Gen	County	92	8	166	21	1600
Hillcrest Tuberculosis Hosp	TB	County	66			30	64
Wabash 6010—Wabash Wabash County Hospital	Gen	County	40	8	148	20	600
Warsaw 5700—Kosciusko McDonald Hospital	Gen	Indiv	70	8	190	24	807
Murphy Hospital	Gen	Indiv	12	6	46	6	9
Washington 9070—Davies Davies County Hospital	Gen	County	70	10	100	39	1477
Williamsport 1003—Warren Winchester Hospital	Gen	Indiv	14	4	12	7	190
Winchester 448—Randolph Randolph County Hospital	Gen	County	34	4	100	18	679
Wolf Lake 200—Noble Luckey Hospital	Gen	Part	20	6	10	7	182

## INDIANA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Anderson 39804—Madison Flia B Keller Hospital	TB	County	75			35	60
Hopkes Lying In Hospital	Mat	Indiv	12	9	197	4	214
Butler 286—Jennings Muscatatuck Colony	McDe	State	624			610	306
Dillsboro, 502—Dearborn Dillsboro Sanatorium	Conv	Corp	110			60	
Evansville 102249—Vanderburgh French Hospital	Proct	NPA'sn	6			4	232
Ft Wayne 114946—Allen Ft Wayne State School	McDe	State	1898			1800	148
Grace Convalescent Hosp	Conv	Indiv	21			10	27
Medical Center Hospital	Gen	Part	15	7	147	8	481
Greencastle 4613—Putnam Indiana State Farm Hosp	Inst	State	30			11	737
Greensburg 5702—Decatur Odd Fellows Home Hospital	Inst	Frat	80			No data supplied	
Indianapolis 364161—Marion Indianapolis Orphan Asylum	Inst	NPA'sn	12			4	250
Suemama Coleman Home	Inst	NPA'sn	40	18	51	10	01
Knightstown 2309—Henry Indiana Sailors and Soldiers Children's Home	Inst	State	20			10	1467
Kramer 1200—Warren Mudlavin Springs Hotel and Sanatorium	Conv	Corp	60			20	400
La Fayette 26240—Tippecanoe Indiana State Soldiers Home Hospital	Inst	State	140			60	322
Michigan City 26730—La Porte Indiana Hospital for Insane Criminals	Ment	State	270			270	20
Indiana State Prison Hosp	Inst	State	80			No data supplied	
Michigan City Sanitarium	Conv	Corp	31			16	700
Moore'sville 1910—Morgan Corner Sanitarium	Proct	Indiv	15			8	270
Newcastle 14027—Henry Indiana Village for Epileptics	Epil	State	915			No data supplied	
Pendleton 1538—Madison Indiana State Reformatory	Inst	State	120			40	2023
Plainfield 1617—Hendricks Indiana Boys School Hosp	Inst	State	31			5	
Valparaiso, 8070—Porter Christian Hospital	Gen	Church	22	10	103	16	610
Wilkinson 316—Hancock Dr Charles Titus Hospital	ENT	Indiv	7			3	415

## Summary for Indiana

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	107	19782	16289	187603
Related institutions	24	4661	4103	13003
Totals	131	24043	20392	200606
Refused registration	19	798		

## IOWA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Akron 1304—Plymouth Akron Hospital	Gen	Indiv	14	3	33	4	194
Albia 442—Monroe Miner's Hospital	Gen	Indiv	20	5	20	6	432
Alkona 3080—Kossuth Kossuth Hospital	Gen	Indiv	31	0	114	13	03
Alta 1207—Buena Vista Alta Community Hospital	Gen	NPA'sn	10	5	24	8	198
Anamosa 3079—Jones Mercy Hospital	Gen	Church	30	5	60	15	000
Atlantic 558—Case Atlantic Hospital	Gen	Corp	31	10	60	20	679
Battle Creek 004—Ida New Battle Creek Hosp	Gen	Indiv	17	4	27	10	290
Boone 11006—Boone Boone County Hospital	Gen	County	38	10	20	10	774
Burlington 2600—Des Moines Burlington Protestant Hospital	Gen	NPA'sn	120	20	215	78	1981
Mercy Hospital	Gen	Church	120	20	187	54	100
St Francis Hospital	Gen	Church	10	10	119	30	84
Carroll 401—Carroll St Anthony Hospital	Gen	Church	100	22	350	70	2007
Cedar Falls 202—Blair Hawk Sartori Memorial Hospital	Gen	City	37	8	146	17	090
Cedar Rapids 56097—Linn Mercy Hospital*	Gen	Church	147	20	316	90	3012
St Luke & Methodist Hosp*	Gen	Church	120	20	549	92	3012
Centerville 8147—Appanoose St Joseph's Mercy Hosp	Gen	Church	33	6	101	27	1000
Chariton 5300—Lucas Vocom Hospital	Gen	Indiv	16	0	60	13	460
Charles City 002—Ford Cedar Valley Hospital	Gen	City	40	8	149	20	1100
Cherokee 6400—Cherokee Cherokee State Hospital	Ment	State	1007			107	300
Shoof Valley Hospital	Gen	NPA'sn	30	6	100	24	100
Clarinda 400—Page Clarinda State Hospital	Ment	State	1000			1672	013

Key to symbols and abbreviations is on page 933

## IOWA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
McGregor, 1,200—Clayton McGregor Hospital	Gen	Indiv	10	2	21	5	159
Manticello, 2,200—Jones John McDonald Hospital	Gen	NPAasn	30	7	194	16	610
Mt Pleasant 771—Henry Mt Pleasant State Hosp	Ment	State	1,570			1,487	502
Muscatine 16,778—Muscatine Bellevue Hospital	Gen	NPAasn	92	7	100	18	775
Benjamin Hershey Memorial Hospital	Gen	NPAasn	50	6	132	22	1,912
Nevada, 3113—Story Iowa Sanitarium and Hosp	Gen	Church	30	4	61	10	471
New Hampton, 2,458—Chickasaw St Joseph's Hospital	Gen	Church	51	0	102	24	969
Newton 11,500—Inspr Mary Frances Skiff Memorial Hospital	Gen	City	43	9	217	34	897
Oakdale —Johnson State Sanatorium	TB	State	420			390	291
Oelwein 7,701—Fayette Mercy Hospital	Gen	Church	20	5	137	15	663
Onawa, 2,538—Monona Onawa Hospital	Gen	Indiv	10	2		3	
Osceola 2,871—Clarke Harker Hospital	Gen	Indiv	20	6	20	9	371
Osceola Hospital	Gen	Part	20	3	51	7	216
Osceola Sanitarium	Gen	Indiv	10	3		4	60
Oskaloosa, 10,121—Mahaska Mercy Hospital	Gen	Part	30	5	50	14	573
Ottumwa 28,075—Wapello Ottumwa Hospital	Gen	NPAasn	62	16	215	41	1,563
St Joseph Hospital	Gen	Church	75	12	200	48	1,411
Sunny Slope Sanatorium	TB	County	100			100	96
Perry 5,881—Dallas Kings Daughters Hospital	Gen	NPAasn	23	5	59	13	530
Pleasantville, 707—Marion Community Hospital	Gen	Indiv	10	2			New
Red Oak 5,748—Montgomery Murphy Memorial Hospital	Gen	City	22	8	102	10	490
Sheldon 3,420—O'Brien Sheldon Good Samaritan Hospital	Gen	Church	10	4	30	7	500
Shebandowah 6,602—Page Hand Memorial Hospital	Gen	NPAasn	38	7	114	22	813
Sibley 1,870—Osceola Osceola Hospital	Gen	Part	18	6	30	7	300
Sibley Hospital	Gen	Indiv	18	4	No data supplied		
Sigourney 2,762—Keokuk Sigourney Hospital	Gen	Indiv	11	2	18	3	174
Sioux City 79,183—Woodbury Lutheran Hospital	Gen	Church	76	15	203	70	2,900
Methodist Hospital	Gen	Church	120	18	327	64	2,183
St Joseph Mercy Hosp *0	Gen	Church	200	20	357	114	4,700
St Vincent's Hospital	Gen	Church	120	14	217	85	3,681
Spencer 5,010—Clay Spencer Municipal Hospital	Gen	City	26	6	136	12	749
Spirit Lake 1,778—Dickinson Spirit Lake Hospital	Gen	Part	10	3	27	6	337
Storm Lake 4,167—Buena Vista Porath Hospital	Gen	Indiv	12	5			Established 1938
Toledo, 1,820—Lama Sac and Fox Sanatorium	G & TB LA		62	3	23	68	119
Vinton 1,372—Benton Virginia Gny Hospital	Gen	City	20	6	90	12	412
Washington 4,814—Washington Washington County Hosp	Gen	County	30	10	200	10	910
Waterloo, 46,191—Black Hawk Allen Memorial Hospital	Gen	Church	120	15	306	59	1,841
Presbyterian Hospital	Gen	NPAasn	100	10	220	10	1,300
St Francis Hospital	Gen	Church	72	10	310	37	2,700
Waverly 3,602—Bremer St Joseph Mercy Hospital	Gen	Church	50	10	173	23	1,000
West Union, 2,000—Tayette West Union Community Hospital	Gen	City	15	3	30	8	170
Williamsburg, 1,210—Iowa Miller Hospital	Gen	Indiv	10	2	10	2	100
<b>Related Institutions</b>							
Ames 10,761—Story Iowa State College Hosp	Inst	State	75			10	810
Anamosa 3,679—Jensen Men's Reformatory Hosp	Inst	State	115			91	622
Belmond 1,733—Wright Belmond Hospital	Gen	Part	10	5	18	5	901
Dettendorf, 2,768—Scott Masonic Sanitarium	Conv	Frat	50			48	18
Burlington 26,700—Des Moines Des Moines County Asylum	Ment	County	70		No data supplied		
Council Bluffs, 4,018—Pottawattamie Christian Home Hospital	Inst	NPAasn	34			0	501
Iowa School for the Deaf Infirmary	Inst	State	54			8	577
Davenport 60,751—Scott Iowa Soldiers Orphans Home Hospital	Inst	State	57			40	1,469
Des Moines, 142,500—Polk Benedict Home	Mat	NPAasn	40	5	20	23	37
Booth Memorial Hospital	Mat	Church	50	10	80	23	111
Junior League Convalescent Home for Children	Conv	Corp	20			18	91
Fidora, 3,200—Hardin Iowa Training School for Boys Hospital	Inst	State	20			14	1,110

*Key to symbols and abbreviations is on page 933*

## IOWA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Ft Madison 13 770—Lee Iowa State Penitentiary Hospital	Inst	State	25			17	332
Glenwood 4 269—Mills Iowa Institution for Feeble minded Children	MeDe	State	1,890			1,799	51
Harlan 3,145—Shelby Harlan Hospital	Gen	Indiv	14	6	60	6	309
Manchester 3 413—Delaware Jones and Garling Hosp	Gen	Part	10	2	22	6	2.6
Marshalltown 17 373—Marshall Iowa Soldiers Home Hosp	Inst	State	180			109	120
Odebolt, 1 888—Sae Odebolt Hospital	Gen	Indiv	9	3		2	27
Orange City 1 727—Sloux De Bey Hospital	Gen	Part	6	1		2	
Doornink Hospital	Gen	Indiv	6	1	10	2	140
Postville 1 060—Allamakee Postville Community Hosp	Gen	Corp	15	3	43	9	22a
Red Oak 5,778—Montgomery Powell School for Backward and Nervous Children	MeDe	Part	55			50	52
Sac City 2 864—Sae Sac City Hospital	Gen	Indiv	10	3	16	3	87
Sloux City 79 185—Woodbury Florence Crittenton Home	Mat	NPA'ssn	39	3a	57	28	90
Toledo 1 825—Tama State Juvenile Home Hosp	Inst	State	40			10	200
Waukon 2 526—Allamakee Hall Hospital	Mat	Indiv	5	4	3a	1	3a
Rominger and Jeffries Emergency Hospital	Gen	Part	8			2	100
Winterset 2 991—Madison Winterset Hospital	Gen	Indiv	14	5	2a	7	300
Woodward 901—Dallas Hospital for Epileptics and School for Feebleminded	MeDe	State	1 469			1 420	1.6
Summary for Iowa							
Hospitals and sanatoriums			Number 122	Beds 16 237	Average Census 13 239		Admissions 1a8 060
Related institutions			29	4 335	3,820		7 797
Totals			151	20 572	17 059		16a 857
Refused registration			27	623			

## KANSAS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Abilene 5 638—Dickinson Dickinson County Memorial Hospital	Gen	NPA'ssn	30	7	100	14	822
Anthony 2 947—Harper Community Hospital	Gen	Indiv	11	4	44	7	400
Galloway Hospital	Gen	Indiv	3a	7	No data supplied		
Arkansas City 13 946—Cowley Mercy Hospital	Gen	NPA'ssn	2a	12		11	
Stricklen Hospital	Gen	NPA'ssn	23	5	13	4	169
Atchison 13 024—Atchison Atchison Hospital	Gen	NPA'ssn	32	8	298	19	1 094
Axtell 604—Marshall Axtell Hospital	Gen	Indiv	12	5	4a	6	2.1
Belleville, 2 353—Republic R G Patterson Memorial Hospital	Gen	Church	20	4	19	6	246
Beloit 3 502—Mitchell Community Hospital	Gen	NPA'ssn	49	6	156	18	804
Chanute 10 277—Neosho Johnson Hospital	Gen	Corp	56	6	70	22	837
Coffeyville 16 198—Montgomery Coffeyville General Hosp	Gen	Indiv	10	4	12	5	190
Medical Center	Gen	NPA'ssn	18	6	72	9	5.0
Southeast Kansas Hospital	Gen	NPA'ssn	21	5	75	10	50a
Columbus 3 235—Cherokee Maude Norton Memorial City Hospital	Gen	City	17	2	4	6	371
Concordia 5 792—Cloud St Joseph's Hospital	Gen	Church	7a	10	106	62	1 442
Dodge City 10 039—Ford St Anthony Hospital	Gen	Church	70	12	2.0	47	1 950
Eldorado 10 311—Butler Susan B Allen Memorial Hospital	Gen	NPA'ssn	47	8	234	31	1 173
Fikhart 1 435—Norton Tucker Hospital	Gen	Indiv	13	2	11	5	8a
Fil-worth 2,0,2—Ellsworth Fil-worth Hospital	Gen	NPA'ssn	37	7	101	26	892
Emporia 14 067—Lyon Newman Memorial County Hospital	Gen	County	69	14	222	42	1 3.6
St Mary's Hospital	Gen	Church	79	10	94	30	
Ft Leavenworth 4 252—Leavenworth Station Hospital	Gen	Army	152	10	46	117	2.4a
Ft Riley 3 400—Geary Station Hospital	Gen	Army	201	8	98	11a	2.3a
Ft Scott 10 763—Bourbon Mercy Hospital	Gen	Church	110	12	193	66	2.45

## KANSAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Garden City 6 121—Finney St Catherine's Hospital	Gen	Church	43	7	14a	23	1 156
Girard 2 442—Crawford Girard General Hospital	Gen	City	14	4	36	6	245
Coessel 2,0—Marion Mennonite Bethesda Hosp	Gen	Church	16	6	60	12	265
Goodland 3 626—Sherman Boothroy Memorial Hosp	Gen	Church	21	3	64	8	398
Great Bend 5 548—Barton St Rose Hospital	Gen	Church	97	19	442	62	2 636
Halstead, 1 373—Harvey Halstead Hospital	Gen	Church	1a0	8	57	103	3 026
Harper 1 485—Harper Joslin Hospital	Gen	Indiv	10	4	47	5	217
Hays 4 618—Lilla Hays Protestant Hospital	Gen	Church	3a	5	53	15	431
St Anthony's Hospital	Gen	Church	100	22	3a8	91	2 722
Herlington 4 519—Dickinson Mercy Hospital	Gen	Corp	15	5	31	7	260
Hillsboro 1 647—Marion Salem Deaconess Hospital	Gen	Church	20	5	125	10	400
Holingsworth, 3 001—Barton Atkin Hospital	Gen	Indiv	15	2	22	5	300
Horton 4 049—Brown Horton Hospital	Gen	Corp	25	6	130	15	833
Hutchinson 27 085—Reno Grace Hospital	Gen	Church	123	18	477	52	2 473
St Elizabeth Mercy Hosp	Gen	Church	60	12	3a5	33	1,632
Independence 12 782—Montgomery Mercy Hospital	Gen	Church	60	10	86	31	794
Iola 7 160—Allen St John's Hospital	Gen	Church	2a	6	84	0	9a9
Junction City 7 407—Geary Junction City Municipal Hospital	Gen	City	32	8		20	
Kansas City 121 8a7—Wyandotte Bell Memorial Hospital	Unit of University of Kansas Hospitals						
Bethany Hospital	Gen	Church	130	22	348	80	2 540
Douglass Hospital (col)	Gen	Church	25	2	16	9	2.40
Grandview Sanitarium	N M	Indiv	35			14	158
Providence Hospital	Gen	Church	85	15	337	77	2 648
St Margaret's Hospital	Gen	Church	274	26	386	137	4 093
University of Kansas Hospitals	Gen	State	300	25	373	235	5 719
Larned 3 532—Pawnee Larned City Hospital	Gen	NPA'ssn	18	3	71	7	472
Larned State Hospital	Ment	State	1 049			1 118	237
Lawrence 13 726—Douglas Lawrence Memorial Hosp	Gen	City	6a	10	237	19	1 209
Leavenworth 17 466—Leavenworth Cushing Memorial Hospital	Gen	NPA'ssn	55	10	154	23	1 031
St John's Hospital	Gen	Church	6a	10	98	50	8.1
Liberal 5 294—Seward Epworth Hospital	Gen	Church	42	9	49	10	437
Lyons 2 939—Rice Lyons Hospital	Gen	NPA'ssn	20	6	192	11	630
Manhattan 10 136—Riley St Mary Hospital	Gen	Church	50	8	120	22	1 064
Marysville 4 013—Marshall Randell Hospital	Gen	Indiv	12	3	36	4	213
Mulvane 1 042—Sumner A T & S F Railway Hosp	Indus	NPA'ssn	50			24	303
Newton 11 034—Harvey Axtell Christian Hospital	Gen	Church	6a	12	168	34	1 008
Bethel Deaconess Hospital	Gen	Church	45	12	168	a6	1 263
Norton 2 767—Norton Norton Hospital	Gen	City	23	6	50	7	407
State Sanatorium for Tuberculosis	TB	State	290			282	228
Oberlin 1 629—Decatur Benton Memorial Hospital	Gen	Indiv	14	3	26	7	2.50
Osawatimie 4 440—Miami Osawatimie State Hosp	Ment	State	1 67a			1 662	363
Ottawa 9 563—Franklin Ransom Memorial Hospital	Gen	County	35	11	176	13	592
Parsons 14 903—Labette Mercy Hospital	Gen	Church	25	10	67	10	a41
M K T Railroad Employees Hospital	Indus	NPA'ssn	a			30	600
State Hospital for Epileptics	Epil	State	947			860	208
Pittsburg 18 145—Crawford Mt Carmel Hospital	Gen	Church	7a	5	162	40	1 490
Pratt 6 322—Pratt Wanesca Hospital	Gen	Corp	20	5	45	14	346
Quinter 570—Gove Quinter Hospital	Gen	Church	12	6		6	
Ransom 431—Ne s Griell Memorial Hospital	Gen	Part	24	4	36	4	143
Sabetha 2,332—Nebraska St Anthony Murdock Memorial Hospital	Gen	Church	100	12	50	42	1 043
Salina 20 155—Saline Isbury Protestant Hosp	Gen	Church	50	15	176	46	1 471
St John's Hospital	Gen	Church	63	12	214	50	1 321
Spargville 703—Ford Perkins Hospital	Gen	NPA'ssn	16	3	11	7	214
Stafford 1 614—Stafford Foldhut Memorial Hospital	Gen	Part	25	5	80	12	3.1
Sterling 1 825—Rice Sterling Hospital	Gen	NPA'ssn	20	4	70	11	577
Syracuse 1 335—Hamilton Donohue Memorial Hospital	Gen	County	19	6	40	6	203

Key to symbols and abbreviations is on page 933

## KANSAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Topeka, 64 120—Shawnee	Indus	NPA'ssn	140			86	1 689
A T & S F Railway Hosp	Gen	Church	100	20	232	57	2 233
Christ's Hospital	TB	Cy Co	70			60	211
Hillcrest Sanatorium	Gen	NPA'ssn	100	20	3.0	65	2 006
Jane C Stormont Hospital	Gen	NPA'ssn	60			44	144
Meuninger Sanitarium	Gen	Church	94	12	256	61	1 894
St Francis Hospital	Gen	State	189			186	373
Topeka State Hospital	Gen	Vet	734			579	4 517
Wadsworth—Leavenworth	Gen	City	16	6	68	8	390
Veterans Admin Facility	Gen	NPA'ssn	30	6	47	10	498
Wamego 1 647—Pottawatomie	Gen	NPA'ssn	20	8	69	7	467
Gena Hospital	Gen	Indiv	15	2		5	
Wellington 7 40—Sumner	Gen	Church	275	25	659	179	6 028
Hatcher Hospital	Gen	County	70	1	33	65	1 275
St Luke's Hospital	Gen	Vet	180			107	1 588
Wichita 111 110—Sedgwick	Gen	Church	225	26	592	150	5 347
Collman Hospital	Gen	Church	100	15	310	85	2 454
St Francis Hospital	Gen	Church	50	6	13	33	882
Sedgwick County Hospital	Gen	City	47	10	161	32	1 159
Veterans Admin Facility	Gen	City	47	10	161	32	1 159
Wichita Hospital	Gen	City	47	10	161	32	1 159
Winfield 9 395—Covley	Gen	Church	50	6	13	33	882
St Mary's Hospital	Gen	Church	50	6	13	33	882
William Newton Memorial Hospital	Gen	City	47	10	161	32	1 159

## Related Institutions

Ashland 1 232—Clark	Gen	NPA'ssn	11	4	57	4	262
Ashland Hospital	Gen	NPA'ssn	11	4	57	4	262
Caldwell 2 046—Sumner	Gen	Indiv	20	5	42	6	280
Caldwell General Hospital	Gen	Indiv	20	5	42	6	280
Ellsworth, 2 072—Ellsworth	Inst	State	32			22	84
Mother Bickerdike Home and Hospital	Inst	State	32			22	84
Ft Dodge 515—Ford	Inst	State	31			15	297
Kansas State Soldiers Home	Inst	State	31			15	297
Ft Leavenworth 4 982—Leavenworth	Inst	Fed	175			103	1 371
U S Penitentiary Annex	Inst	Fed	175			103	1 371
Lansing 98—Leavenworth	Inst	State	55			No data supplied	
Kansas State Penitentiary	Inst	State	55			No data supplied	
Lawrence 13 720—Douglas	Inst	IA	40			5	277
Hasell Institute Hospital	Inst	State	62			15	1 310
Watkins Memorial Hospital	Inst	State	62			15	1 310
Leavenworth 17 466—Leavenworth	Inst	Fed	180			118	2 615
U S Penitentiary Hospital	Inst	Fed	180			118	2 615
Little River 618—Rice	Gen	City	20	2	27	6	185
Hoffman Memorial Hospital	Gen	City	20	2	27	6	185
Manhattan 10 136—Riley	Inst	State	50			10	972
Kansas State College Hosp	Inst	State	50			10	972
Medicine Lodge 1 655—Barber	Gen	Indiv	9			4	135
Medicine Lodge Hospital	Gen	Indiv	9			4	135
Norwich 477—Kingman	Gen	Indiv	9	2	16	4	200
Norwich Hospital	Gen	Indiv	9	2	16	4	200
St Francis 944—Cheyenne	Gen	Indiv	12	1	13	4	172
St Francis Hospital	Gen	Indiv	12	1	13	4	172
Scott City 1 544—Scott	Gen	NPA'ssn	11	4	44	6	329
Scott City Hospital	Gen	NPA'ssn	11	4	44	6	329
Topeka 64 120—Shawnee	Mat	NPA'ssn	10	12	23	15	35
Florence Crittenton Home	Mat	NPA'ssn	10	12	23	15	35
State Industrial School for Boys	Inst	State	24			4	160
Wichita 111 110—Sedgwick	Mat	Church	69	19	86	42	100
Salvation Army Home and Hospital	Mat	Church	69	19	86	42	100
Sedgwick County Tuberculosis Sanitarium	Conv	County	60			45	47
Suburban Rest Sanitarium	Conv	Indiv	30			10	
Winfield 9 395—Covley	MeDe	State	1 304			1 066	105
State Training School	MeDe	State	1 304			1 066	105

## Summary for Kansas

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	97	12 115	9 770	112 815
Related institutions	21	2 117	1 689	10 038
Totals	118	14 232	11 459	122 853
Refused registration	31	938		

## KENTUCKY

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Anchorage 664—Jefferson	N & M	Indiv	55			39	115
Hord's Sanitarium	N & M	Indiv	55			39	115
Ashland 29 074—Boyd	Gen	NPA'ssn	73	12	305	55	1 788
Kings Daughters Hospital	Gen	NPA'ssn	73	12	305	55	1 788
Berea 1 827—Madison	Gen	NPA'ssn	125	5	36	28	2 000
Berea College Hospital	Gen	NPA'ssn	125	5	36	28	2 000
Beverly 69—Bell	Gen	Church	9	4	32	4	165
Red Bird Evangelical Hosp	Gen	Church	9	4	32	4	165
Bowling Green 12 348—Warren	Gen	City	44	8	72	17	1 052
City Hospital	Gen	City	44	8	72	17	1 052
Campbellsville 1 923—Taylor	Gen	NPA'ssn	8	2	11	3	140
Campbellsville Hospital	Gen	NPA'ssn	8	2	11	3	140
Carlisle 1 469—Nicholas	Gen	County	11	2	20	4	129
John on Memorial Ho pital	Gen	County	11	2	20	4	129

## KENTUCKY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Corbin 8 636—Whitley	Gen	Indiv	25	3	15	11	399
Smith Hospital	Gen	Indiv	25	3	15	11	399
Covington, 65 252—Kenton	Gen	Church	386	30	813	225	5 351
St Elizabeth Hospital	Gen	Church	386	30	813	225	5 351
Win Booth Memorial Hosp	Gen	Church	94	18	304	45	1 317
Cynthiana 4 386—Harrison	Gen	NPA'ssn	40	6	48	15	295
Harrison Memorial Hospital	Gen	NPA'ssn	40	6	48	15	295
Danville 6 729—Boyle	Gen	NPA'ssn	50	6	No data supplied		
Danville and Boyle County Hospital	Gen	NPA'ssn	50	6	No data supplied		
Dayton 9 071—Campbell	Gen	County	110	15	305	61	2 316
Speer's Memorial Hospital	Gen	County	110	15	305	61	2 316
Ft Knox 500—Hardin	Gen	Army	161	4	47	97	2 155
Station Hospital	Gen	Army	161	4	47	97	2 155
Ft Thomas 10 008—Campbell	Gen	Army	142	2	7	67	1 942
Station Hospital	Gen	Army	142	2	7	67	1 942
Frankfort 11 626—Franklin	Gen	NPA'ssn	75	17	141	25	1 117
Kings Daughters Hospital	Gen	NPA'ssn	75	17	141	25	1 117
Georgetown 4 220—Scott	Gen	Church	30	6	73	17	551
John Graves Ford Memorial Hospital	Gen	Church	30	6	73	17	551
Glasgow 5 042—Barren	Gen	NPA'ssn	51	9	73	40	2 214
1 Samson Community Hospital	Gen	NPA'ssn	51	9	73	40	2 214
Greenville 2 451—Muhlenberg	Gen	NPA'ssn	35	5	Etab 1835		
Muhlenberg Community Hos pital	Gen	NPA'ssn	35	5	Etab 1835		
Harlan 4 327—Harlan	Gen	Corp	75	6	80	43	1 847
Harlan Hospital	Gen	Corp	75	6	80	43	1 847
Harrodsburg 4 629—Mercer	Gen	NPA'ssn	20	4	30	8	561
A D Price Memorial Hosp	Gen	NPA'ssn	20	4	30	8	561
Hazard 7 021—Perry	Gen	Corp	78	8	62	34	1 944
Hazard Hospital	Gen	Corp	78	8	62	34	1 944
Hurst Snyder Hospital	Gen	Corp	25	4	19	12	512
Henderson 11 668—Henderson	Gen	NPA'ssn	48	8	84	21	1 940
Henderson Hospital	Gen	NPA'ssn	48	8	84	21	1 940
Hopkinsville 10 746—Christian	Gen	NPA'ssn	32	3	46	19	917
Jennie Stuart Memorial Hos pital	Gen	NPA'ssn	32	3	46	19	917
Hyden 1 471—Leslie	Gen	NPA'ssn	15	5	35	8	319
Frontier Nursing Service Hos pital	Gen	NPA'ssn	15	5	35	8	319
Jackson 2 109—Breathitt	Gen	Indiv	20	3	Reopened		
Buch Memorial Hospital	Gen	Indiv	20	3	Reopened		
Jenkins 8 465—Letcher	Gen	NPA'ssn	65	6	No data supplied		
Jenkins Hospital	Gen	NPA'ssn	65	6	No data supplied		
Lebanon 3 248—Marion	Gen	Indiv	15	3	47	7	397
Baute Infirmary	Gen	Indiv	15	3	47	7	397
Lexington 4 736—Fayette	Gen	Church	230	16	417	174	6 432
Good Samaritan Hospital	Gen	Church	230	16	417	174	6 432
High Oaks Sanatorium	N & M	Indiv	35			19	231
Julius Marks Sanatorium	TB	County	94			93	143
St Joseph Hospital	Gen	Church	228	22	315	143	7 311
Shriners Hospital for Crip pled Children	Orth	Frat	20			20	83
U S Public Health Service Hospital	Drug	Fed	1 000			939	1 149
Veterans Admin Facility	Ment	Vet	559			375	615
London 1 950—Laurel	Gen	Corp	35	3	10	13	363
Pennington General Hosp	Gen	Corp	35	3	10	13	363
Louis 1 961—Lawrence	Gen	Indiv	21	6	9	4	133
Louis General Hospital	Gen	Indiv	21	6	9	4	133
Riverview Hospital	Gen	Indiv	10	2	No data supplied		
Louisville 307 745—Jefferson	Chil	NPA'ssn	75			45	1 100
Children's Free Hospital	Chil	NPA'ssn	75			45	1 100
Jewish Hospital	Gen	NPA'ssn	56	14	182	45	1 605
Kentucky Baptist Hosp	Gen	Church	150	20	425	123	4 733
Kosair Crippled Children Hos pital	Orth	NPA'ssn	70			62	367
Louisville City Hospital	Gen	City	525	58	1 135	418	10 553
Louisville Neuropathic Sanat	N & M	Corp	24			23	351
Methodist Episcopal Deaconess Hospital	Gen	Church	67	8	230	50	1 572
Norton Memorial Infmr	Gen	NPA'ssn	120	30	294	74	3 045
Pope Sanatorium	Nerv	Corp	17			6	40
Red Cross Hospital (col)	Gen	NPA'ssn	68	8	16	30	295
St Anthony's Hospital	Gen	Church	138	25	580	121	3 193
St Joseph Infirmary	Gen	Church	297	25	508	153	6 663
SS Mary and Elizabeth Hos pital	Gen	Church	150	30	710	86	4 037
State Tuberculosis Sanat	TB	State	130			91	225
Stokes Hospital	N & M	Indiv	40		No data supplied		
U S Marine Hospital	Gen	USPHS	164			84	1 112
Lynch 7 000—Harlan	Gen	Corp	50		No data supplied		
Lynch Hospital	Gen	Corp	50		No data supplied		
Madisonville 6 908—Hopkins	Gen	NPA'ssn	62	6	Etab 1839		
Hopkins County Hospital	Gen	NPA'ssn	62	6	Etab 1839		
Martin 799—Floyd	Gen	Part	50	3	23		
Beaver Valley Hospital	Gen	Part	50	3	23		
Mayfield 8 177—Graves	Gen	Corp	25	4	61	12	596
Fuller Gilliam Hospital	Gen	Corp	25	4	61	12	596
Mayfield Hospital	Gen	NPA'ssn	40	2	53	14	555
Maysville 6 557—Mason	Gen	NPA'ssn	42	6	74	20	1 070
Hayswood Ho pital	Gen	NPA'ssn	42	6	74	20	1 070
Middlesboro 10 350—Bell	Gen	Part	50	8	75	32	1 200
Middleboro Hospital	Gen	Part	50	8	75	32	1 200
Murray 2 591—Calloway	Gen	Part	20	3	30	8	410
Keys Houston Clinic Hosp	Gen	Part	20	3	30	8	410
Wm Mason Memorial Hosp	Gen	NPA'ssn	152	5	41	37	947
Outwood—Christian	Gen	Part	35			312	1 393
Veterans Admin Facility	Gen	Part	35			312	1 393
Owensboro 22 765—Davies	Gen	City	68	12	258	50	2 515
Owensboro City Ho pital	Gen	City	68	12	258	50	2 515

Key to symbols and abbreviations is on page 933

## KENTUCKY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Paducah 33 541—McCracken	Unit of Indus Gen	Riverside NP Assn City	Hospital 127	8	284	32	1 800
Ewart Purcell Isolation Hos pital						31	1 833
Illinois Central Hospital						35	1 423
Riverside Hospital	Gen	Corp	60	6	104	35	1 423
Paintsville 2 411—Johnson	Gen	City	50	5	71	28	808
Paintsville Hospital							
Paris 6 904—Bourbon							
W W Massie Memorial Hos pital	Gen	City	50	5	71	28	808
Pewee Valley 582—Oldham	Gen	NP Assn	35	3	20	30	330
Pewee Valley Sanitarium and Hospital							
Pikeville 3 306—Pike							
Methodist Hospital	Gen	Church	55	5	48	33	1 245
Pineville 3 567—Bell	Gen	Corp	25	2	14	10	200
Pineville Community Hosp							
Richmond 6 493—Madison							
Gibson Hospital	Gen	Indiv	15	3	10	10	200
Pattie A Clay Infirmary	Gen	NP Assn	47	6	64	29	1 211
State Trachoma Hospital	Trach	State	35			30	303
Shelbyville 4 033—Shelby	Gen	NP Assn	35	9	88	21	652
Kings Daughters Hospital							
Somerset 5 506—Pulaski							
Somerset General Hospital	Gen	Corp	20	2	28	8	429
Versailles 2 244—Woodford	Gen	C3 Co	20	4	84	10	583
Woodford Memorial Hosp							
Waverly Hills —Jefferson							
Waverly Hills Sanatorium	TB	C3 Co	520			495	461
Winchester 8 233—Clark	Gen	NP Assn	30	4	56	13	622
Clark County Hospital							
Guerrant Clinic and Hosp							
Related Institutions							
Barbourville 2 380—Knox	Gen	Corp	21	2	8	5	441
Logan Hospital							
Fleming 1 389—Letcher							
Fleming Hospital	Indus	Corp	25		6	3	198
Florence 450—Boone	Gen	Indiv	20	2	No data supplied		
Highway Medical Hospital							
Frankfort 11 626—Franklin							
State Institution for the Feeble-minded	MeDe	State	794			780	36
Fulton 3 022—Fulton	Gen	Part	10	2		5	
Fulton Hospital							
Grayson 1 022—Carter							
J Q Stovall Memorial Hosp	Gen	Corp	20	3	40	8	332
Hopkinsville 10 746—Christian	Ment	State	1 020			1 999	533
Western State Hospital							
La Grange 1 121—Oldham							
State Prison Hospital	Inst	State	65			30	810
Lakeland 55—Jefferson	Ment	State	2 469			2 372	564
Central State Hospital							
Lexington 45 736—Fayette							
Eastern State Hospital	Ment	State	1 873			1 888	761
Louisville 307 74—Jefferson	Inc	NP Assn	96			83	15
Kings Daughters Home for Incurables							
Susan Speed Davis Home and Hospital							
Princeton 4 764—Caldwell	Gen	NP Assn	12	2	No data supplied		
Princeton Hospital							
Summary for Kentucky							
Hospitals and sanatoriums			Number 87	Beds 8 355	Average Census 6 223	Admissions 113 247	
Related institutions			13	7 368	7 228	4 484	
Totals			95	15 723	12 851	117 741	
Refused registration			13	251			

## LOUISIANA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Abbeville 4 356—Vermilion	Gen	Part	12	3	65	6	413
Abbeville Clinic							
Alexandria 23 022—Rapides							
Baptist Hospital	Gen	Church	77	10	247	35	2 183
Veterans Admin Facility	Gen	Vet	599			397	2 223
Barksdale Field—Boesler	Gen	Army	125	5	46	94	1 815
Station Hospital							
Bastrop 5 121—Morehouse							
Bastrop General Hospital	Gen	Indiv	22	4			
Baton Rouge 30 779—East Baton Rouge	Gen	NP Assn	69	6	314	40	2 253
Baton Rouge General Hosp							
Our Lady of the Lake Sani tarium							
Bogalusa 14 079—Washington	Gen	Corp	96	12	258	70	2 655
Elizabeth Sullivan Memorial Hospital							
Carville 508—Iberville							
U S Marine Hospital	Lepro	USPHS	454			363	51
Converse 901—Sabine	Gen	Indiv	26	8	75	11	1 500
Allen Sanitarium							
Covington 3 206—St Tammany							
New Fenwick Sanitarium	N&M	Indiv	64			18	1 22

## LOUISIANA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Crowley 7 656—Acadia	Gen	NP Assn	16	2	53	7	667
Crowley Sanitarium (Legion Memorial Hospital)							
Delhi 1 043—Richland							
Delhi Clinic and Sanitarium	Gen	Part	12	3	21	2	178
De Ridder 3 747—Beauregard	Gen	NP Assn	16	2	27	2	172
De Ridder Sanitarium							
Ferriday 2 902—Concordia							
Ferriday Hospital	Gen	Part	22	4	41	11	602
Greenwell Springs 130—East Baton Rouge	TB	State	111				91
Greenwell Springs Sanat							
Haynesville 2 541—Claiborne							
Haynesville Hospital	Gen	NP Assn	25	3	32	7	454
Houma 6 331—Terrebonne	Gen	Part	18	4	96	12	724
Ellender Memorial Hospital							
Lafayette Sanitarium							
Jackson 3 966—East Feliciana	Ment	State	4 000			3 480	876
East Louisiana State Hosp							
Parker Hospital							
Lafayette 14 635—Lafayette	Gen	State	220	14	65	230	New 575
Lafayette Charity Hospital							
Lafayette Sanitarium							
Lake Charles 15 791—Calcasieu	Gen	Church	75	10	249	45	2 642
St Patrick's Hospital							
Lecompte 1 247—Rapides							
Lecompte Sanitarium	Gen	Part	25	2	82	5	1 500
Mansfield 3 837—De Soto	Gen	Corp	32	2	22	10	382
Mansfield Sanitarium							
Marksville 1 527—Avovelles							
Marksville Hospital	Gen	Indiv	10	3		Estab	1638
Minden 5 623—Webster	Gen	Corp	32	4	103	12	584
Minden Sanitarium							
Monroe 26 025—Ouachita							
Riverside Sanitarium	Gen	Indiv	25	4	57	7	508
St Francis Sanitarium	Gen	Church	140	15	287	66	2 891
Vaughan Wright Bendel Clinic	Gen	Part	25	6	49	18	823
New Iberia 8 003—Iberia	Gen	Indiv	25	5	244	8	825
Dauterive Hospital							
Iberia General Hospital							
New Orleans 458 702—Orleans	Gen	State	1 735	68	4 125	1 644	55 850
Charity Hospital**							
City Hospital for Mental Diseases							
Delgado Memorial Hospital	Ment	City	100			65	471
De Paul Sanitarium	N&M	Church	260			260	420
Eye Ear Nose and Throat Hospital	FVT	NP Assn	70			36	9 602
Flint Goodridge Hospital of Dillard University (col)*	Gen	NP Assn	88	12	204	44	1 617
French Hospital	Gen	Frat	75	12	119	21	942
Hotel Dieu Sisters Hosp**	Gen	Church	249	26	772	219	9 978
Illinois Central Hospital	Indus	NP Assn	60			27	1 174
John Dibert Memorial Tuber culosis Hospital	Unit of Charity Hospital						
Mercy Hospital Soniat Memorial**	Gen	Church	125	25	499	85	3 177
New Orleans Hospital and Dispensary for Women and Children	Gen	NP Assn	34	12	407	20	908
Richard Milliken Memorial Hospital	Unit of Charity Hospital						
Southern Baptist Hosp**	Gen	Church	198	24	680	157	11 939
Touro Infirmary**	Gen	NP Assn	400	40	1 063	290	11 286
U S Marine Hospital*	Gen	USPHS	572			419	4 701
Opelousas 6 990—St Landry	Gen	Part	30		50	15	600
St Rita's Infirmary							
Pineville 3 612—Rapides							
Central Louisiana State Hospital	Ment	State	2 069			2 069	666
Plaquemine 5 124—Iberville	Gen	Corp	25	6	96	8	825
Plaquemine Sanitarium							
Port Sulphur 25—Plaquemines							
Port Sulphur Hospital	Gen	NP Assn	14	2		Estab	1038
Ruston 4 400—Lincoln	Gen	Corp	25	6		6	
Ruston Lincoln Sanitarium							
Shreveport 76 650—Caddo							
Gowen Sanitarium	TB	NP Assn	22			18	57
Highland Sanatorium*	Gen	Corp	190	8	302	67	3 600
North Louisiana Sanit**	Gen	Corp	100	10	218	70	2 440
Pines Sanitarium	TB	NP Assn	104			60	138
T E Schumpert Memorial Sanitarium*	Gen	Church	136	12	370	73	3 400
Shreveport Charity Hosp**	Gen	State	800	40	2 276	706	23 400
Shriners Hospital for Crippled Children*	Orth	Frat	60			59	212
Tri State Hospital**	Gen	Corp	160	10	328	73	3 100
Tallulah 3 332—Madison	Gen	Indiv	15	3	12	6	258
Tallulah Hosp and Clinic							
Thibodaux 4 442—La Fourche							
St Joseph Hospital	Gen	Church	40	4	72	12	1 090
Winnboro 1 965—Franklin	Gen	Indiv	12	2	41	5	409
Rogers Clinic and Hospital							
Related Institutions							
Alexandria 23 025—Rapides	MeDe	State	825			815	875
State Colony and Training School							
Angola 18—West Feliciana							
Louisiana State Penitentiary	Inst	State	21		2	12	287
Hospital							
Breaux Bridge 1 399—St Martin							
St Paul Hospital	Gen	Indiv	10	1	4	2	100



## LOUISIANA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bathrooms	Number of Births	Average Census	Admissions
Elizabeth 3 000—Allen Industrial Lumber Company Hospital	Indus	NPAasn	22	2		2	30
Hodge 1 367—Jackson Hodge Clinic	Gen	Indiv	8	2	52	3	284
New Orleans 458 762—Orleans New Orleans Convalescent Home	Conv	NPAasn	30			19	254
Orleans Tuberculosis Hosp	TB	NPAasn	100			54	117
Opelousas 6 209—St Landry St Landry Clinic	Gen	Corp	25	4	96	15	770
Winnaboro 1 065—Franklin Winnaboro Sanitarium	Gen	Corp	30	3	50	10	870

## Summary for Louisiana

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	59	14 111	11 914	190 816
Related institutions	9	1 071	937	2 821
Totals	68	15 182	12 851	193 637
Refused registration	3	32		

## MAINE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bathrooms	Number of Births	Average Census	Admissions
Augusta 17 198—Kennebec Augusta General Hospital	Gen	NPAasn	65	15		3	289
Augusta State Hospital	Ment	State	1 354			1 403	289
Bangor 28 749—Penobscot Bangor Sanatorium	TB	NPAasn	30			10	24
Bangor State Hospital	Ment	State	1 106			1 140	322
Eastern Maine Gen Hosp	Gen	NPAasn	150	14	121	164	4 303
Palme Private Hospital	Gen	Indiv	30	3	19	14	343
Bar Harbor 4 486—Hancock Mount Desert Island Hosp	Gen	NPAasn	37	6	45	21	914
Bath 9 110—Sagadahoc Bath Memorial Hospital	Gen	NPAasn	50	10	114	29	805
Belfast 4 993—Waldo Bradbury Memorial Hospital	Gen	NPAasn	1	5	9	6	90
Waldo County Gen Hosp	Gen	NPAasn	33	5	52	23	542
Biddeford 17 633—York Trull Hospital	Gen	Corp	50	10	114	30	825
Webber Hospital	Gen	NPAasn	54	13	25	53	1 790
Blue Hill 1 439—Hancock Blue Hill Memorial Hosp	Gen	NPAasn	25	6	39	14	251
Boothbay Harbor 2 070—Lincoln St Andrews Hospital	Gen	Corp	20	4	15	5	170
Brunswick 6 144—Cumberland Brunswick Hospital	Gen	Indiv	46	6		19	572
Calais 5 470—Washington Calais Hospital	Gen	Indiv	52	5	103	30	1 004
Cape Cottage 50—Cumberland Station Hospital	Gen	Army	42			36	880
Caribou 7 248—Aroostook Cary Memorial Hospital	Gen	City	40	10	69	23	650
Castine 736—Hancock Castine Community Hosp	Gen	NPAasn	10	6	37	8	304
Ellsworth 3 537—Hancock Hurley Private Hospital	Gen	Corp	12	5	33	7	275
Fairfield 3 825—Somerset Central Maine Sanatorium	TB	State	186			189	113
Farmington 1 737—Franklin Franklin County Memorial Hospital	Gen	NPAasn	40	9	98	21	845
Ft Fairfield 2 616—Aroostook Ft Fairfield Clinic	Gen	Corp	17	6	43	9	348
Gardiner 5 009—Kennebec Cardiner General Hospital	Gen	NPAasn	48	12	218	29	1 034
Greenville Junction 345—Piscataquis Charles A Dean Hospital	Gen	NPAasn	24	4	37	7	463
Greenwood Mountain—Oxford Western Maine Sanatorium	TB	State	150			140	174
Houlton 6 865—Aroostook Aroostook Hospital	Gen	NPAasn	42	10	113	25	990
Madigan Memorial Hosp	Gen	Church	40	7	73	26	806
Island Falls 1 455—Aroostook Emma V Milliken Memorial Hospital	Gen	NPAasn	12	5	32	8	301
Lewiston 34 948—Androscoggin Central Maine General Hospital	Gen	NPAasn	193	28	536	170	8,558
St Mary's General Hosp	Gen	Church	150	12	245	103	2 893
Portland 70 810—Cumberland Children's Hospital	Chil	NPAasn	100			76	481
Farrington Hospital	Gen	City	180	16	188	139	1 851
Dr Leighton's Private Hosp	GynOb	Indiv	14	14	78	10	411
Maine Eye and Ear Infirmary	Gen	NPAasn	100	20	406	96	2 588
Maine General Hospital	Gen	NPAasn	284	21	551	270	6 019
Queen's Hospital	Gen	Church	60	12	105	35	934
State Street Hospital	Gen	Corp	50	12	74	44	1 003
U S Marine Hospital	Gen	USPHS	72			52	430
Presque Isle 4 662—Aroostook Northern Maine Sanatorium	TB	State	119			113	124
Presque Isle General Hosp	Gen	NPAasn	50	10	91	30	1 122
Rockland 9 075—Knox Knox County Gen Hosp	Gen	NPAasn	66	7	83	23	816

## MAINE—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bathrooms	Number of Births	Average Census	Admissions
Rumford 10 340—Oxford Rumford Community Hosp	Gen	Corp	75	8	199	42	1 455
Sanford 13 392—York Henrietta D Goodall Hosp	Gen	NPAasn	50	8	92	27	955
Skowhegan 6 433—Somerset Redington Memorial Hosp	Gen	NPAasn	30	5	48	16	480
Togus—Kennebec Veterans Admin Facility	Gen	Vet	294			229	1,946
Winterville 15 454—Kennebec 11th City Hospital	Gen	Indiv	5	6	67	24	717
Sisters Hospital	Gen	Church	100	10	154	50	2,856
Thayer Hospital	Gen	Corp	34	5	83	24	946
Westbrook 10 897—Cumberland Westbrook Hospital	Gen	NPAasn	22	8	86	11	562
York Village 800—York York Hospital	Gen	NPAasn	21	7	74	6	240

## Related Institutions

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bathrooms	Number of Births	Average Census	Admissions
Auburn 18 571—Androscoggin Auburn Private Hospital	Gen	Indiv	11	6	51	3	150
Bangor 28 749—Penobscot Friendship Hospital	Gen	Indiv	12	2	6	6	265
Gay Private Hospital	N&M	Indiv	18			13	
Stinson Private Hospital	Gen	Indiv	18	12	No data supplied		
Bar Mills 500—York Burton Hollis Hospital	Gen	Indiv	12	2	No data supplied		
Bridgton 2 639—Cumberland Northern Cumberland Memorial Hospital	Gen	NPAasn	10	4	25	1	94
Eagle Lake 1 780—Aroostook Northern Maine General Hospital	Gen	Church	42			33	603
East Parsonfield 306—York Restland	Conv	Indiv	25			15	25
Lubec 2 994—Washington Lubec Hospital	Gen	NPAasn	12	5	98	6	157
Portland 70 810—Cumberland Dr C P Westcott Sanatorium	Conv	Indiv	14			8	39
Pownall 462—Cumberland Pownall State School	McDe	State	1 120			871	260
Union 1 060—Knox Jones Sanitarium	N&M	Corp	30			12	6

## Summary for Maine

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	50	6 075	5 158	53 606
Related institution	12	1 394	931	2 917
Totals	62	7 399	6 089	56 523
Refused registration	6	116		

## MARYLAND

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bathrooms	Number of Births	Average Census	Admissions
Aberdeen Proving Ground—Harford Station Hospital	Gen	Army	12			3	153
Annapolis 12 531—Anne Arundel Annapolis Emergency Hosp	Gen	NPAasn	85	15	258	34	1 637
U S Naval Hospital	Gen	Navy	224			63	1 844
Baltimore 504 874—Baltimore City Baltimore City Hospitals	Gen	City	1 285	60	2 016	1,030	8 912
Baltimore City Psychopathic Hospital	Unit of Baltimore City Hospitals						
Baltimore City Tuberculosis Hospital	Unit of Baltimore City Hospitals						
Baltimore Fye Far and Throat Charity Hospital	ENT	NPAasn	60			31	2 521
Beck Diagnostic Clinic	Gen	Indiv	12			10	107
Bon Secours Hospital	Gen	Church	150	25	626	25	3 088
Children's Hospital School	Orth	NPAasn	120			88	574
Church Home and Infirmary	Gen	Church	164	22	347	113	3 307
Franklin Square Hosp	Gen	NPAasn	175	37	353	100	3 048
Good Shepherd General Hospital (col)	Gen	Corp	50	5	13	13	9
Gundry Sanitarium	N&M	Indiv	45			40	41
Hospital for Women	Gen	NPAasn	135	35	370	77	2 946
James Lawrence Kernan Hospital and Industrial School for Crippled Children	Orth	NPAasn	80			67	177
Johns Hopkins Hospital	Gen	NPAasn	873	72	1 514	730	17 644
Johnston Memorial Children's Hospital	Unit of Johns Hopkins Hospital						
Maryland General Hosp	Gen	Church	260	21	365	187	4 487
Mercy Hospital	Gen	Church	310	32	431	269	8 569
Mount Hope Retreat	N&M	Church	600			510	107
Phipps Psychiatric Clinic	Unit of Johns Hopkins Hospital						
Presbyterian Eye Ear and Throat Charity Hospital	ENT	Church	40			9	2 110
Provident Hospital and Free Dispensary (col)	Gen	NPAasn	170	9	167	86	1 127
St Agnes Hospital	Gen	Church	212	23	371	137	3 894
St Joseph's Hospital	Gen	Church	248	33	425	150	5 770
St Paul Hospital	Gen	NPAasn	243	40	743	190	5 591
South Baltimore General Hospital	Gen	NPAasn	115	10	257	94	2 691

## MARYLAND—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Sydenham Hospital	Gen	City	110			72	1,389
Union Memorial Hospital**	Gen	NPA'ssn	321	24	513	224	6,592
U. S. Marine Hospital*	Gen	USPHS	440			342	4,086
University Hospital**	Gen	State	396	50	1,184	350	9,270
Volunteers of America Hosp	Gen	NPA'ssn	34	14	462	31	1,526
West Baltimore General Hos- pital**	Gen	Corp	165	35	618	108	3,605
Brunswick 3671—Frederick Schnauffer Hospital	Gen	Indiv	30	5	13	8	224
Cambridge 844—Dorchester	Gen	NPA'ssn	70	15	219	33	1,253
Cambridge Maryland Hosp	Gen	Corp	40	20	171	13	459
Chester Hospital	Ment	State	445			380	156
Eastern Shore State Hosp							
Catonsville 7647—Baltimore	N&M	Indiv	35			15	20
Harlem Lodge	Ment	State	1,890			1,881	604
Spring Grove State Hosp +							
Chestertown 2809—Kent	Gen	NPA'ssn	25	6	62	10	345
Kent and Upper Queen Anne's General Hospital	Gen	NPA'ssn	25	6	62	10	345
Crisfield 3850—Somerset	Gen	County	35	5	54	15	303
Edward W. McCready Memo- rial Hospital	Gen	County	35	5	54	15	303
Crownsville (Waterbury P O)	—Anne Arundel						
Crownsville State Hospital (col)	Ment	State	1,450			1,375	493
Hospital for Colored Feeble- minded Children	Unit of Crownsville State Hospital						
Cumberland 3,747—Allegany	Gen	Church	105	30	513	76	2,440
Allegany Hospital of the Sisters of Charity	Gen	CyCo	166	26	340	123	3,340
Memorial Hospital	Gen						
Easton 4,092—Talbot	Gen	NPA'ssn	95	19	133	61	2,069
Emergency Hospital	Gen	NPA'ssn	95	19	133	61	2,069
Edgewood 300—Harford	Gen	Army	56		2	26	619
Station Hospital	Gen	Army	56		2	26	619
Elkton 3,331—Cecil	Gen	NPA'ssn	45	8	194	30	1,162
Union Hosp of Cecil County	Gen	NPA'ssn	45	8	194	30	1,162
Fillicott City 1,216—Howard	Gen	Corp	20			No data	supplied
Patapsco Manor Sanitarium N&M	Gen	Corp	20			No data	supplied
Ft George G. Meade—Anne Arundel	Gen	Army	107	2	28	79	1,716
Station Hospital	Gen	Army	107	2	28	79	1,716
Ft Howard 588—Baltimore	Gen	Army	27	1	7	24	516
Station Hospital	Gen	Army	27	1	7	24	516
Ft Washington 415—Prince Georges	Gen	Army	28		1	4	297
Station Hospital	Gen	Army	28		1	4	297
Frederick 14,434—Frederick	Gen	County	50	10	187	36	551
Emergency Hospital	Gen	NPA'ssn	112	13	166	54	1,925
Frederick City Hospital	Gen	NPA'ssn	112	13	166	54	1,925
Frostburg 5,583—Allegany	Gen	State	39	10	132	22	782
Miners Hospital	Gen	State	39	10	132	22	782
Hagerstown 30,561—Washington	Gen	NPA'ssn	150	18	278	84	3,094
Washington County Hosp	Gen	NPA'ssn	150	18	278	84	3,094
Havre de Grace 3,985—Harford	Gen	NPA'ssn	42	10	82	30	877
Harford Memorial Hospital	Gen	NPA'ssn	42	10	82	30	877
Henrytown 15—Carroll	Gen	State					
Maryland Tuberculosis Sana- torium (col)	TB	State	2,0			225	307
Ijamsville 72—Frederick	N&M	Indiv	30			26	23
Riggs Cottage Sanitarium	N&M	Indiv	75			67	333
Laurel 2,532—Prince Georges	N&M	Indiv	75			67	333
Laurel Sanitarium	N&M	Indiv	75			67	333
Mt Wilson 22—Baltimore	TB	State	177			176	196
Mt Wilson Branch Maryland Tuberculosis Sanat	TB	State	177			176	196
Olney 100—Montgomery	Gen	NPA'ssn	40	8	149	34	1,199
Montgomery County General Hospital	Gen	NPA'ssn	40	8	149	34	1,199
Perry Point 80—Cecil	Ment	Vet	1,391			1,271	360
Veterans Admin Facility	Ment	Vet	1,391			1,271	360
Prince Frederick 200—Calvert	Gen	County	23	5		10	3,3
Calvert County Hospital	Gen	County	23	5		10	3,3
Reisterstown 1,635—Baltimore	TB	NPA'ssn	60			57	42
Mt Pleasant	TB	NPA'ssn	60			57	42
Relay 2,016—Baltimore	N&M	Part	35			18	100
Relay Sanitarium	N&M	Part	35			18	100
Rockville 1,422—Montgomery	N&M	Indiv	45			40	115
Chestnut Lodge Sanitarium	N&M	Indiv	45			40	115
Salisbury 10,99—Wicomico	TB	State	75			57	108
Maryland Tuberculosis Sana- torium	TB	State	75			57	108
Peninsula General Hosp	Gen	NPA'ssn	93	16	289	78	2,749
State Sanatorium 200—Frederick	Gen	NPA'ssn	93	16	289	78	2,749
Maryland Tuberculosis Sana- torium	TB	State	510			503	677
Sykesville 661—Carroll	Ment	State	2,747			2,733	522
Springfield State Hospital*	Ment	State	2,747			2,733	522
Towson 2,044—Baltimore	Conv	Indiv	23			13	70
Albion Manor	Conv	Indiv	23			13	70
Hospital for Consumptives (Ludowood Sanatorium)	TB	NPA'ssn	190			190	187
Sheppard and Enoch Pratt Hospital*	N&M	NPA'ssn	285			282	339
Related Institutions							
Baltimore 804,844—Baltimore City	Inst	City	24			8	550
Baltimore City Jail Hosp	Inst	City	24			8	550
Happy Hills Convalescent	Conv	NPA'ssn	85			51	107
Home for Children	Conv	NPA'ssn	119			119	30
Home for Incubables	Conv	NPA'ssn	119			119	30
Maryland Penitentiary Hosp	Inst	State	50			24	318
Cumberland 37,747—Allegany	TB	NPA'ssn	24			9	16
Allegany County Tuberculo- sis Sanatorium	TB	NPA'ssn	24			9	16

## MARYLAND—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Jessups 161—Anne Arundel	Inst	State	47			16	52
Maryland House of Corre- ction Hospital	Inst	State	47			16	52
Leonardtown 697—St Marys	Gen	NPA'ssn	32	6	57	9	345
St Marys Hospital	Gen	NPA'ssn	32	6	57	9	345
Owings Mill 130—Baltimore	McDe	State	1,200			1,119	1,638
Rosewood State Training School	McDe	State	1,200			1,119	1,638
Rockville 1,422—Montgomery	Conv	NP Assn	34			33	120
Christ Child Farm for Con- valescent Children	Conv	NP Assn	34			33	120
Sparrows Point—Baltimore	Indus	Corp	20			5	52
Sparrows Point Hospital	Indus	Corp	20			5	52
Summary for Maryland							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	69	18,004	15,407	139,040			
Totals	70	19,732	16,794	142,332			
Refused registration	4	76					

## MASSACHUSETTS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Acushnet (New Bedford P O)	3,000—Bristol						
Acushnet Hospital	Gen	NPA'ssn	35	6	92	23	620
Adams 12,697—Berkshire	Gen	NPA'ssn	35	6	92	23	620
W. B. Plunkett Memorial Hospital	Gen	City	50	15	190	27	790
Aldenville (Chicopee Falls P O)	—Hampden						
Chicopee Hospital	Gen	Indiv	25	6	66	23	
Amesbury 11,890—Essex	Gen	City	30	6	87	15	1,097
Amesbury Hospital	Gen	City	30	6	87	15	1,097
Arlington 36,094—Middlesex	N&M	Corp	60			42	320
Ring Sanatorium and Hosp	Gen	NPA'ssn	80	20	229	59	2,317
Symmes Arlington Hosp	Gen	NPA'ssn	80	20	229	59	2,317
Attleboro 21,769—Bristol	TB	County	60			63	140
Bristol County Tuberculosis Hospital	TB	County	60			63	140
Sturdy Memorial Hospital	Gen	NPA'ssn	125	24	507	61	2,293
Ayer 3,060—Middlesex	Gen	NPA'ssn	22	7	87	11	207
Community Memorial Hosp	Gen	NPA'ssn	22	7	87	11	207
Bedford 2,603—Middlesex	Ment	Vet	1,177			1,000	3,7
Veterans Admin Facility	Ment	Vet	1,177			1,000	3,7
Belmont 21,748—Middlesex	N&M	NPA'ssn	232			212	239
McLean Hospital*	N&M	NPA'ssn	232			212	239
Beverly 2,086—Essex	Gen	NPA'ssn	121	20	394	110	4,245
Beverly Hospital*	Gen	NPA'ssn	121	20	394	110	4,245
Boston 781,188—Suffolk	Nerv	NPA'ssn	36			21	60
Adams House (Nervine)	Nerv	NPA'ssn	36			21	60
Beth Israel Hospital**	Gen	NPA'ssn	220			176	6,300
Boston City Hospital**	Gen	City	2,349	159	3,254	1,430	42,750
Boston Floating Hospital*	Chil	NPA'ssn	50			32	1,083
Boston Lying in Hospital*	Mat	NPA'ssn	150	150	2,456	110	2,972
Boston Psychopathic Hosp +	Ment	State	110			74	2,185
Boston State Hospital*	Ment	State	2,500			2,422	946
Carney Hospital**	Gen	Church	186	24	412	143	4,148
Channing Home	TB	NPA'ssn	27			26	26
Children's Hospital*	Chil	NPA'ssn	283			183	5,270
Collis P. Huntington Memo- rial Hospital*	SkCa	NPA'ssn	25			15	1,678
Emerson Hospital	Gen	Corp	30	10	89	14	431
Evangeline Booth Maternity Hospital and Home	Mat	Church	75	65	467	86	781
Faulkner Hospital*	Gen	NPA'ssn	140	25	521	127	3,801
Glenside Hospital	N&M	Corp	87			87	227
Harley Private Hospital	Gen	Corp	80	21	184	16	766
House of the Good Samaritan	Card	NPA'ssn	80			71	155
Infants Hospital	Chil	NPA'ssn	45			No data	supplied
Jewish Memorial Hospital	Chr	NPA'ssn	79			66	145
Joseph H. Pratt Diagnostic Hospital*	IntMed	NPA'ssn	63			15	790
Long Island Hospital*	Gen	City	625	4	37	567	1,760
Massachusetts Eye and Ear Infirmary*	ENT	NPA'ssn	219	12		146	7,337
Massachusetts General Hos- pital**	Gen	NPA'ssn	392			363	7,490
Massachusetts General Hos- pital The Baker Memorial	Gen	NPA'ssn	242	46	612	206	3,439
Massachusetts General Hos- pital Phillips House	Gen	NPA'ssn	101	25	226	81	2,487
Massachusetts Memorial Hos- pital**	Gen	NPA'ssn	392	45	613	217	7,569
Massachusetts Women's Hos- pital*	Gen	NPA'ssn	62	20	275	35	1,085
New England Baptist Hosp	Gen	NPA'ssn	240	25	177	162	5,745
New England Deaconess Hos- pital*	Gen	Church	314			274	7,506
New England Hospital for Women and Children*	Gen	NPA'ssn	185	75	1,563	130	5,706
Palmer Memorial Hospital	Unit of New England Deaconess Hospital						
Peter Bent Brigham Hos- pital**	Gen	NPA'ssn	247			192	4,884
Robert Breck Brigham Hos- pital*	Chr	NPA'ssn	115			82	943
Robert Dawson Evans Memo- rial*	Unit of Massachusetts Memorial Hospitals						

## MASSACHUSETTS—Continued

## MASSACHUSETTS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
St Elizabeth's Hospital*	Gen	Church	240	30	749	185	4 530
St Margaret's Hospital	Gen	Church	60	30	499	42	1 212
St Mary's Maternity Hosp	MatCh	Church	50	12	119	28	135
Sanatorium Division of Boston City Hospital*	TB	City	616			547	529
Vincent Memorial Hospital	Gen	NPA'ssn	21			10	304
Bridgewater 963—Plymouth							
Bridgewater State Hospital	Ment	State	900			800	151
Brockton 6379—Plymouth							
Brockton Hospital*	Gen	NPA'ssn	120	29	410	96	2 879
Goddard Hospital	Gen	Corp	60	20	397	47	1 740
Moore Hospital	Gen	Indiv	20	8	60	14	431
Brookline 47490—Norfolk							
Bellevue Hospital	Gen	Corp	30	6	22	12	210
Bournwood Hospital	Nerv	Indiv	18			7	
Brooks Hospital	Gen	Corp	53			42	1 200
Free Hospital for Women*	Gyn	NPA'ssn	101			73	2 300
Trumbull Hospital	Gen	NPA'ssn	50	11	93	33	1 162
Cambridge 113643—Middlesex							
Cambridge City Hospital*	Gen	City	232	32	682	177	6 021
Cambridge Hospital*	Gen	NPA'ssn	214	60	924	150	4 842
Cambridge Sanatorium	TB	City	50			50	96
Charlesgate Hospital	Gen	Corp	80	10	142	30	1 081
Canton 5816—Norfolk							
Massachusetts Hosp School	Orth	State	300			208	399
Chelsea 40816—Suffolk							
Captain John Adams Hospital at Soldiers Home*	Gen	State	282			270	2 221
Chelsea Memorial Hosp *	Gen	Corp	80	20	348	67	1 927
U S Marine Hospital	Gen	USPHS	170			160	2 010
U S Naval Hospital*	Gen	Navy	330	3	34	214	2 069
Clinton 12817—Worcester							
Clinton Hospital	Gen	NPA'ssn	60	20	207	31	1 110
Concord, 7477—Middlesex							
Emerson Hospital	Gen	Corp	30	12	215	20	809
Valleyhead	Nerv	Indiv	20			12	136
Danvers 12907—Essex							
Hunt Memorial Hospital	Gen	City	20	6	56	9	282
Iverett 48424—Middlesex							
Whidden Memorial Hosp *	Gen	NPA'ssn	110	20	496	97	3 017
Fall River 11024—Bristol							
Fall River General Hospital	Gen	City	216			192	1 984
St Anne's Hospital*	Gen	Church	100	26	269	60	1 967
Truesdale Hospital*	Gen	NPA'ssn	134	16	336	83	2 640
Union Hospital*	Gen	NPA'ssn	172	30	442	100	3 110
Fitchburg 40662—Worcester							
Burbank Hospital*	Gen	Corp	203	33	577	147	4 190
Lucy Helen Memorial Hosp	Unit of	Burbank Hospital					
Forest Hills (Boston F O )—Suffolk							
Forest Hills General Hosp	Gen	NPA'ssn	150	36	No data supplied		
Ft Devens (Ayer F O )—Middlesex							
Station Hospital	Gen	Army	117			66	1 836
Foxboro 5347—Norfolk							
Foxboro State Hospital*	Ment	State	1 426			1 360	339
Frammingham 22210—Middlesex							
Frammingham Union Hosp *	Gen	NPA'ssn	130	30	400	64	2 431
Gardner 19099—Worcester							
Gardner State Hospital*	Ment	State	1 443			1 400	197
Henry Heywood Memorial Hospital*	Gen	NPA'ssn	81	19	394	70	2 406
Clouester 24204—Essex							
Addison Gilbert Hospital	Gen	NPA'ssn	80	10	206	61	1 028
Great Barrington 5934—Berkshire							
Fairview Hospital	Gen	NPA'ssn	60	8	110	23	709
Greenfield 15500—Franklin							
Franklin County Public Hospital	Gen	NPA'ssn	86	20	266	60	1 869
Croton 2434—Middlesex							
Groton Hospital	Gen	Indiv	15	4	31	7	244
Hathorne 171—Essex							
Danvers State Hospital*	Men	State	2 423			2 324	961
Haverhill 45710—Essex							
Benson Hospital	Gen	Indiv	26	2	13	17	306
Haverhill Municipal Hospital (Hale)*	Gen	City	161	38	444	122	4 797
Haydenville 1300—Hampshire							
Hampshire County Sanat	TB	County	100			82	87
Holbrook 3333—Norfolk							
Elmhurst Hosp and Sanit	Gen	Indiv	15			8	62
Holden 3871—Worcester							
Holden District Hospital	Gen	NPA'ssn	38	6	82	27	988
Holyoke 66037—Hampden							
Holyoke Hospital*	Gen	NPA'ssn	144	20	287	70	1 911
Providence Hospital*	Gen	Church	168	32	590	90	5 447
Hyannis 1000—Barnstable							
Cape Cod Hospital	Gen	NPA'ssn	65	15	201	49	1 348
Ipswich 5599—Essex							
Benjamin Stickney Cable Memorial Hospital	Gen	NPA'ssn	30	7	99		447
Lawrence 8068—Essex							
Bessie Burke Memorial Hospital	Gen	City	120	12	274	112	2 705
Clover Hill Hospital	Gen	Corp	42	9	24	26	1 070
Lawrence General Hosp *	Gen	NPA'ssn	122	20	333	87	3 490
Loominster 21810—Worcester							
Loominster Hospital	Gen	NPA'ssn	61	12	192	41	1 644
Ipswich 100234—Middlesex							
Lowell General Hospital*	Gen	NPA'ssn	160	30	410	86	3 177
St John's Hospital*	Gen	Church	162	20	428	120	3 900
St Joseph's Hospital*	Gen	Church	123	17	261	92	3 094
Shaw Hospital	Gen	Indiv	20	5	60	6	160
Ludlow 8876—Hampden							
Ludlow Hospital	Gen	NPA'ssn	30	14	170	16	722

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Lynn 102320—Essex							
Lynn Hospital*	Gen	NPA'ssn	178	46	524	133	5 770
Union Hospital	Gen	NPA'ssn	61	22	363	20	1 470
Malden 58036—Middlesex							
Malden Hospital*	Gen	Corp	239	32	701	120	5 000
Marblehead 8608—Essex							
Mary A Alley Emergency Hospital	Gen	City	10	8	66	9	403
Marlboro 15587—Middlesex							
Marlboro Hospital	Gen	NPA'ssn	63	22	200	37	1 007
Medfield 4066—Norfolk							
Medfield State Hospital*	Ment	State	1 800				
Medford, 50714—Middlesex							
Lawrence Memorial Hosp *	Gen	NPA'ssn	70	34	459	50	2 200
Melrose 23170—Middlesex							
Melrose Hospital	Gen	NPA'ssn	102	20	402	86	2 670
New England Sanitarium and Hospital	Gen	Church	135	17	296	90	2 100
Middleboro 8608—Plymouth							
Lakeville State Sanatorium*	TB	State	302			281	900
St Luke's Hospital	Gen	Corp	33	14	127	7	401
Middleton 1712—Essex							
Essex Sanatorium	TB	County	360			339	310
Milford 14741—Worcester							
Milford Hospital	Gen	NPA'ssn	60	15	304	39	1 618
Milton 16434—Norfolk							
Milton Hospital and Convalescent Home	Gen	NPA'ssn	27	12	79	14	503
Montague City 761—Franklin							
Armen Hospital*	Gen	Church	74	12	167	51	1 068
Nantucket 7668—Nantucket							
Nantucket Cottage Hospital	Gen	Corp	22	0	48	12	400
Natick 13089—Middlesex							
Leonard Morse Hospital	Gen	City	61	14	180	37	1 000
Needham 10845—Norfolk							
Glover Memorial Hospital	Gen	City	22	10	83	14	699
New Bedford 112097—Bristol							
St Luke's Hospital*	Gen	NPA'ssn	294	40	897	190	6 700
Sassaquin Sanatorium	TB	NPA'ssn	116			107	101
Union Hospital	Gen	Corp	34	3	28	20	900
Newburyport 10084—Essex							
Anna Jaques Hospital	Gen	NPA'ssn	52	10	101	40	1 220
Newburyport Homeopathic Hospital	Gen	NPA'ssn	20	5	51	11	302
Newton 60276—Middlesex							
New England Peabody Home for Crippled Children	TbOr	NPA'ssn	100			82	12
Newton Hospital*	Gen	NPA'ssn	202	52	607	147	5 504
North Adams 21621—Berkshire							
North Adams Hospital	Gen	NPA'ssn	110	19	264	50	1 648
Northampton 24081—Hampshire							
Cooley Dickinson Hospital	Gen	NPA'ssn	140	24	347	100	2 603
Northampton State Hosp *	Ment	State	2 096			1 900	649
Veterans Admin Facility	Ment	Vet	703			649	100
North Grafton 2340—Worcester							
Grafton State Hospital*	Ment	State	1 349			1 460	207
North Wilmington 412—Middlesex							
North Reading State Sanatorium*	TbChil	State	297			242	181
Norwood 10049—Norfolk							
Norwood Hospital	Gen	NPA'ssn	80	20	470	79	2 427
Oak Bluffs 1933—Dukes							
Martha's Vineyard Hosp	Gen	NPA'ssn	27	10	67	13	400
Palmer 9577—Hampden							
Monson State Hospital*	Fphl	State	1 642			1 509	106
Wing Memorial Hospital	Gen	NPA'ssn	30	28	94	14	813
Peabody 21340—Essex							
Isiah B Thomas Hospital*	Gen	City	60	15	204	42	1 748
Pittsfield 40617—Berkshire							
Hillcrest Hospital	Gen	NPA'ssn	42	10	107	91	70
House of Mercy Hospital*	Gen	NPA'ssn	200	33	500	103	3 197
St Luke's Hospital*	Gen	Church	156	33	502	100	4 749
Plymouth 13042—Plymouth							
Jordan Hospital	Gen	NPA'ssn	56	10	104	27	940
Pocasset 360—Barnstable							
Barnstable County Sanat	FbIso	County	48			53	00
Quincy 71953—Norfolk							
Quincy City Hospital*	Gen	City	240	50	582	183	6 096
Rutland 2442—Worcester							
Central New England Sanat	TB	NPA'ssn	70			23	8
Jewish Tuberculosis Sanat	TB	NPA'ssn	30			27	09
Rutland State Sanatorium*	TB	State	370			340	246
Rutland Heights—Worcester							
Veterans Admin Facility	GCTB	Vet	460			414	1 005
Salem 43303—Essex							
North Shore Babies Hosp	Chil	NPA'ssn	50			31	415
Salem Hospital*	Chil	NPA'ssn	100	30	02	197	4 163
Sharon 3301—Norfolk							
Sharon Sanatorium	TB	NPA'ssn	50			30	40
Somerville 103908—Middlesex							
Central Hospital	Gen	Indiv	54	20	108	39	1 400
Somerville Hospital	Gen	NPA'ssn	110	30	600	100	3 411
South Braintree—Norfolk							
Norfolk County Hospital	TB	County	100			140	150
Southbridge 14264—Worcester							
Harrington Memorial Hosp	Gen	NPA'ssn	40	12	100	20	810
South Dartmouth 1810—Bristol							
Sole & Mar Orthopedic Hospital for Children	Orth	NPA'ssn	80			50	32
South Hanson 831—Plymouth							
Plymouth County Hospital*	TB	County	140			101	66
Springfield 14900—Hampden							
Health Dept Hospital*	TbIso	City	100	4		63	304

Key to symbols and abbreviations is on page 933

## MASSACHUSETTS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Mercy Hospital*	Gen	Church	310	50	890	220	6 374
Shriners Hospital for Crippled Children*	Orth	Frat	60			62	304
Springfield Hospital*	Gen	NP Assn	261	4	2	214	5 939
Wesson Maternity Hosp	Mat	NP Assn	62	66	1,761	40	1 574
Wesson Memorial Hosp *	Gen	NP Assn	120		2	70	2,554
Stockbridge 1,662—Berksh							
Austen Riggs Foundation	Nerv	NP Assn	50			41	260
Taunton 3,355—Bristol							
Morton Hospital	Gen	Corp	12	12	31	47	2 432
Taunton State Hospital*	Ment	State	1,730			1 692	557
Tisbury 5,585—Middlesex							
State Infirmary	Gen	State	3,100	40	126	2 890	3 136
Vinyard Haven 1,500—Dukes							
U S Marine Hospital	Gen	USPHS	37			19	107
Waltham 30,741—Middlesex							
Metropolitan State Hospital	Ment	State	1,906			1 790	196
Middlesex County Sanat	IB	County	400			570	328
Waltham Contagious Hosp	Unit of	Waltham Hospital					
Waltham Hospital*	Gen	NP Assn	210	53	511	76	3 074
Ware 7,285—Hampshire							
Mary Jane Hospital	Gen	NP Assn	33	13	312	30	691
Webster 12,902—Worcester							
Webster District Hospital	Gen	NP Assn	30	7	200	30	1 219
Wellesley 11,439—Norfolk							
Channing Sanitarium	N&M	Corp	70			30	66
Wiswall Sanitarium	N&M	Indiv	10			20	31
Woburn 6,409—Worcester							
Woburn State Hospital*	Ment	State	1,673			1 091	597
Westfield 19,775—Hampden							
Nobis Hospital	Gen	NP Assn	90	13	272	40	1 637
Westfield State Sanat	TBC	State	230			223	740
Westwood 2,097—Norfolk							
Westwood Lodge	N&M	Corp	21			15	40
Weymouth, 20,882—Norfolk							
Weymouth Hospital	Gen	NP Assn	70	24	529	77	2 764
Whitinsville 6,060—Worcester							
Whitinsville Hospital	Gen	NP Assn	20	7	160	13	708
Winchendon, 6,202—Worcester							
Milks River Hospital	Gen	Corp	25	8	74	20	682
Winchester 12,719—Middlesex							
Winchester Hospital	Gen	NP Assn	62	20	260	36	1 243
Winthrop 16,825—Suffolk							
Station Hospital	Gen	Army	100	6	84	1 021	
Winthrop Community Hosp	Gen	NP Assn	64	20	32	30	1 119
Woburn 19,434—Middlesex							
Charles Choate Memorial Hospital*	Gen	NP Assn	42	19	246	30	1 064
Worcester 19,311—Worcester							
Belmont Hospital*	IB	City	200			150	742
Fairlawn Hospital	Gen	NP Assn	47	18	181	29	1 076
Harvard Private Hospital	Gen	Corp	20		0	5	
Memorial Hospital*	Gen	NP Assn	180	30	624	174	6 138
St Vincent Hospital*	Gen	Church	220	20	643	167	6 280
Worcester City Hosp *	Gen	City	400	60	1 230	238	10 477
Worcester County Sanat	TB	County	130			122	90
Worcester Hahnemann Hospital*	Gen	NP Assn	111	29	500	70	2 626
Worcester State Hospital*	Ment	State	2,440	8	10	2 306	761
Wrentham 3,584—Norfolk							
Pondville Hosp at Norfolk + Ca	State		147			133	1,378

## Related Institutions

Baldwinsville 2,300—Worcester							
Hosp Cottages for Children	Chil	NP Assn	130			124	44
Belchertown 3,139—Hampshire							
Belchertown State School	MeDe	State	1,240			1 292	77
Boston 181,188—Suffolk							
Audubon Hospital	Gen	Indiv	22	3		15	
Bay State Hospital	Gen	Part	19	6	28	10	396
Boston Home for Incurables	Inc	NP Assn	57			57	14
Deer Island Hospital	Inst	Cy Co	20			15	290
Fenway Hospital	Gen	Corp	40	3	No data supplied		
Florence Crittenton Home and Hospital	Mat	NP Assn	27	30	100	11	106
MacLeod Hospital	Gen	Corp	20	3	80	14	476
Massachusetts State Prison Hospital	Inst	State	26			4	173
New England Home for Little Wanderers	Inst	NP Assn	44	6		15	390
Prendergast Preventorium	TB	NP Assn	130				402
Riverbank Hospital	Gen	Indiv	32	6	5	4	202
Salisbury Union Home	Mat	NP Assn	32	17	64	20	72
Dr Taylor's Private Hosp	Drug	Indiv	18			6	195
Washingtonian Home	Alcoh	NP Assn	30			7	504
Brookton 63,797—Plymouth							
Harris Convalescent Home	Conv	Indiv	14			12	36
Sunshine Private Hospital	Conv	Indiv	10			6	60
Brookline 47,490—Norfolk							
Board of Health Hospital	Tb Iso	City	50			27	98
Cambridge 113,643—Middlesex							
Holy Ghost Hospital for Incurables	Inc	Church	210			207	161
Fgypt 340—Plymouth							
Children's Sunlight Hosp	Orth	NP Assn	60			43	110
Framingham 22,210—Middlesex							
Woodside Cottages	Conv	Corp	21			13	34
Greenfield 15,000—Franklin							
Greenfield Isolation Hosp	Tb Iso	City	20			4	102
Haverhill 18,710—Essex							
Haverhill City Infirmary	Inst	City	145			120	118
Haverhill Municipal Hospital	Iso	City	40		1	13	287

## MASSACHUSETTS—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Lowell, 100,234—Middlesex							
Lowell Tuberculosis Hosp	Tb Iso	City	94			67	109
Lynn 102,320—Essex							
Lynn Isolation Hospital	Iso	City	75			20	343
Malden, 58,036—Middlesex							
Malden Contagious Hospital	Tb Iso	City	50			16	165
Marblehead 8,668—Essex							
Children's Island Sanit	Conv	NP Assn	94			94	101
Methuen, 21,669—Essex							
Mary F. McGowan Memorial Hospital	Gen	Indiv	28	8	141	11	437
Newton 63,246—Middlesex							
Woodlawn Sanitarium	Epil	Indiv	9			4	1
Norfolk 1,429—Norfolk							
Hospital of Norfolk State Prison Colony	Inst	State	70			37	511
Pittsfield 49,677—Berkshire							
Frederic S. Coolidge Memorial Home	TB	NP Assn	8			5	4
Pittsfield Anti Tuberculosis Hospital	TB	NP Assn	14			11	12
Quincy 71,983—Norfolk							
Wellington Hospital Home	Conv	Corp	30			22	73
Rutland 2,442—Worcester							
Rutland Cottage Sanatoria	TB	Indiv	34			9	11
Salem 43,303—Essex							
Health Department Hospital for Contagious Diseases	Iso	City	60		1	8	106
Somerville 104,908—Middlesex							
Somerville Contagious Disease Hospital	Iso	City	40			13	146
Springfield 149,000—Hampden							
Busell Nursing Home	Conv	Indiv	25			10	46
City of Springfield Infirmary	Inst	City	124			102	544
Renear Wilson Private Hosp	Gen	Part	9	5	33	4	46
Waltham 39,247—Middlesex							
Peresian Lying in Hospital	Mat	Indiv	10	10	189	8	188
Walter E. Fernald State School	MeDe	State	1,700			1 923	91
Waltham Baby Hospital	Chil	NP Assn	22			5	
Wellesley 11,439—Norfolk							
Convalescent Home of the Children's Hospital	Conv	NP Assn	79			71	578
Simpson Infirmary of Wellesley College	Inst	NP Assn	20			9	598
West Concord 1,801—Middlesex							
Massachusetts Reformatory Hospital	Inst	State	46		No data supplied		
Whitman, 7,638—Plymouth							
Whitman Hospital	Gen	Indiv	12	7	30	5	67
Williamstown 3,900—Berkshire							
Williams College Infirmary	Inst	NP Assn	21			6	356
Wrentham 3,841—Norfolk							
Wrentham State School	MeDe	State	2,057			1 942	120

## Summary for Massachusetts

Hospitals and Sanatoriums	Number	Beds	Average Census	Admissions
Related institutions	201	53 635	40 360	403 179
	60	7,273	6 644	10 788
Totals	261	60 908	52 004	413 967
Refugee registration	18	460		

## MICHIGAN

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Adrian 13,064—Lenawee							
Emma L. Bliby Hospital	Gen	City	44	10	333	30	1 280
Albion 8,324—Calhoun							
James W. Sheldon Memorial Hospital	Gen	City	40	10	102	21	1 112
Alma 6,734—Gratiot							
Carney Wilson Hospital	Gen	Part	30	4	60	17	577
R B Smith Memorial Hosp	Gen	NP Assn	20	6	105	19	835
Ann Arbor 26,944—Washtenaw							
Mercywood Sanitarium	N&M	Church	40			20	200
St Joseph's Mercy Hosp *	Gen	Church	130	20	378	114	3 924
State Psychopathic Hospital	Unit of	University Hospital					
University Hospital*	Gen	State	1 280	30	618	1 120	23 665
Bad Ave 2,332—Huron							
Hubbard Memorial Hosp	Gen	County	20	6	92	22	576
Battle Creek 43,073—Calhoun							
American Legion Hospital	TB	State	300			217	421
Battle Creek Sanitarium	Gen	NP Assn	500			336	4 939
Calhoun County Public Hospital	TB	County	75			0	68
Community Hospital	Gen	NP Assn	100	24		Estab 1934	
Lela V. Post Montgomery Hospital*	Gen	Church	140	17	402	82	3 739
Bay City, 47,300—Bay							
Bay City General Hospital	Gen	City	73	10	146	33	1 166
Bay City Samaritan Hosp	Gen	NP Assn	43	4	37	2	1 148
Mercy Hospital*	Gen	Church	119	21	423	68	4 494
Benton Harbor 10,434—Berrien							
Mercy Hospital	Gen	NP Assn	80	20	226	40	1 621

## MICHIGAN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bathrooms	Number of Births	Average Census	Admissions
Big Rapids 4 671—Mecosta Community Hospital	Gen	City	33	9	50	6	506
Brighton, 1 287—Livingston Mellus Hospital	Gen	Part	12	4	17	7	216
Cadillac 9 570—Wexford Mercy Hospital	Gen	Church	65	8	115	38	1 938
Wexford County Hospital	Gen	County	17			10	35
Calumet, 1 537—Houghton Calumet and Hecla Hosp	Indus	Corp	21		No data supplied		
Camp Custer—Kalamazoo Station Hospital	Gen	Army	45			20	581
Veterans Admin Facility	Ment	Vet	1 010			928	403
Caro 2 534—Tuscola Caro Community Hospital	Gen	City	18	5	01	6	302
Cassopolis 1 448—Cass McCutcheon Hospital	Gen	Indiv	8	2	20	4	180
Charlevoix 2 247—Charlevoix Charlevoix Hospital	Gen	NPAasn	28	8	76	16	596
Charlotte, 5 307—Eaton Hays Green Memorial Hosp	Gen	County	17	5	102	10	542
Clare 1 491—Clare Clare County General Hosp	Gen	Indiv	17	3	50	11	432
Dearborn 50 308—Wayne St Joseph's Retreat	N&M	Church	300			320	516
Detroit 1 568 662—Wayne Alexander Blain Hospital*	Gen	NPAasn	60	5	32	39	1 521
Bethesda Hospital (col)	TB	NPAasn	83			76	163
Charles Godwin Jennings Hospital	Gen	NPAasn	66	9	81	20	1 313
Chenik Hospital	TB	NPAasn	54			45	101
Children's Hospital*	Chil	NPAasn	230			218	7 631
City of Detroit Receiving Hospital**	Gen	City	646	4	12	666	20 773
City of Detroit Receiving Hospital (Redford Branch)	Gen	City	50			37	1 945
Cottage Hospital	Gen	NPAasn	4	13	33	34	1 860
Delray General Hospital	Gen	NPAasn	90	10	470	46	2 100
Detroit Tuberculosis Sanat	TB	NPAasn	150			136	206
Fast Side General Hosp	Gen	NPAasn	80	30	914	59	2 040
Edyth K. Thomas Memorial Hospital (col)	Gen	NPAasn	170	30	200	76	1 088
Evangelical Deaconess Hospital*	Gen	Church	175	30	908	110	4 699
Fairview Sanatorium (col)	TB	NPAasn	66			63	70
Florence Crittenton Hosp	Gen	NPAasn	140	100	1 900	88	3 633
Good Samaritan Hosp (col)	TB	Indiv	29			25	60
Grace Hospital**	Gen	NPAasn	468	77	2 068	437	15 864
Grosse Pointe Hospital	Gen	Indiv	30	10	93	10	
Harper Hospital**	Gen	NPAasn	600	50	1 339	318	16 794
Henry Ford Hospital**	Gen	NPAasn	672	50	1 732	466	11 098
Herman Kiefer Hosp**	Contag	City	1 330	60	1 887	1 120	11 158
Lincoln Hospital	Gen	Corp	90	11	170	52	947
Marr General Hospital	Gen	NPAasn	30	10	147	17	500
Michigan Mutual Hospital	Indus	NPAasn	40			17	500
Miram Memorial Hospital	Unit of Grace Hospital						
Mt Carmel Mercy Hospital	Gen	Church	300	60		Estab	1939
Parkside Hospital (col)*	Gen	NPAasn	53	12	168	44	1 477
Pingree General Hospital	Gen	Corp	22	11	182	10	413
Providence Hospital**	Gen	Church	322	100	2 094	301	12 691
St Aubin Gen Hosp (col)	Gen	Indiv	48		6	30	361
St Joseph's Mercy Hosp**	Gen	Church	180	30	1 106	133	6 131
St Mary's Hospital**	Gen	Church	320	50	1 374	236	7 407
Saratoga General Hospital	Gen	NPAasn	40	10	160	28	2 010
Shurly Hospital*	Gen	Indiv	80	1	2	68	2 800
Station Hospital	Gen	Army	60			42	404
Trinity Hospital (col)	Gen	NPAasn	115	22		34	2 436
U S Marine Hospital	Gen	USPHS	291			239	2 300
Warren Avenue Diagnostic Hospital	Gen	Indiv	18	3	18	12	232
West Fort Hospital	Gen	Indiv	36			20	144
Woman's Hospital**	Gen	NPAasn	220	100	2 534	100	6 377
Dowagiac 5 530—Cass Leo Memorial Hospital	Gen	Church	25	4		12	501
Durand 3 081—Shiawassee Durand Hospital	Gen	NPAasn	13	4	60	5	268
Eaton Rapids 2 822—Eaton Harriet Chapman Memorial Hospital	Gen	Part	13	3	23	8	248
Eloise 710—Wayne Eloise Hospital for Mental Diseases*	Ment	County	3 683			3 639	496
Eloise Hospital—Dr William J Seymour Hospital**	Gen	County	1 437			1 410	6 996
Escanaba 14 524—Delta St Francis Hospital	Gen	Church	90	20	387	50	1 918
Flint 156 492—Genesee Hurley Hospital**	Gen	City	417	50	1 090	260	7 929
St Joseph's Hospital	Gen	Church	110	30	834	72	3 313
Women's Hospital	Gen	NPAasn	67	25	744	57	1 127
Fremont 2 157—Newaygo Gerber Memorial Hospital	Gen	City	19	5	102	12	402
Gaylord 1 627—Otsego Northern Michigan Tuberculosis Sanatorium	TB	State	90			72	128
Goodrich 324—Genesee Goodrich General Hospital	Gen	NPAasn	26	5	61	15	904
Grand Haven 8 840—Ottawa Elizabeth Hutton Memorial Hospital	Gen	City	26	6	80	10	410
Grand Rapids 168 592—Kent Blodgett Memorial Hosp**	Gen	NPAasn	132	18	518	92	3 409

## MICHIGAN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bathrooms	Number of Births	Average Census	Admissions
Butterworth Hospital**	Gen	NPAasn	212	48	814	191	5 004
Christian Psychopathic Hospital	Gen	N&M	260			203	197
City General Hospital	Gen	City	30			20	264
Ferguson Droste Ferguson Sanatorium	Proct	Corp	33			18	696
St Mary's Hospital**	Gen	Church	220	30	754	164	7 325
Sunshine Sanatorium	TB	City	140			122	1 100
Grayling 1 973—Crawford Grayling Mercy Hospital	Gen	Church	40		50	22	9 9
Greenville 4 730—Montcalm United Memorial Hospital	Gen	NPAasn	19	6	59	11	561
Hamtramck 56 968—Wayne St Francis Hospital	Gen	Church	170	42	313	53	1 897
Hancock 5 790—Houghton St Joseph's Hospital	Gen	Church	90	12	143	52	1 340
Hart 1 690—Oceana Oceana Hospital	Gen	NPAasn	18	4	69	14	891
Hastings 5 227—Barry Pennock Hospital	Gen	NPAasn	39	6	140	16	790
Highland Park 2 900—Wayne Highland Park General Hospital	Gen	City	106	34	919	116	4 146
Hillsdale 5 890—Hillsdale Hillsdale Hospital	Gen	City	26	6	162	29	1 070
Holland 14 346—Ottawa Holland City Hospital	Gen	City	48	15	270	24	881
Houghton 3 707—Houghton Copper Country Sanatorium	TB	County	53			53	30
Howell 3 610—Livingston McPherson Memorial Hosp	Gen	City	20	7	No data supplied	425	291
Michigan State Sanat*	TB	State	490				
Ionla 6 062—Ionla Ionla State Hospital	Ment	State	982			912	120
Iron Mountain 11 652—Dickinson Iron Mountain General Hosp	Gen	City	28	8	163	18	840
Ironwood 14 290—Gogebic Grand View Hospital	G&TB	County	62	10	141	59	1 709
Newport Hospital	Gen	NPAasn	12	4	116		300
Twin City Hospital	Gen	Indiv	21	3	No data supplied		
Ishpeming 9 238—Marquette Ishpeming Hospital	Gen	Corp	40	10	244	43	1 704
Jackson 50 187—Jackson W A Foote Memorial Hospital	Gen	City	170	20	644	108	4 760
Jackson County Sanatorium	TB	County	64			60	64
Mercy Hospital**	Gen	Church	110	20	418	74	3 697
Kalamazoo 54 786—Kalamazoo Borgess Hospital	Gen	Church	214	27	694	112	3 633
Bronson Methodist Hosp	Gen	Church	120	27	602	12	3 498
Fairmount Hospital	TB	County	140			71	994
Kalamazoo State Hospital	Ment	State	2 160			2 700	463
Lakeview 800—Montcalm Kelsey Hospital	Gen	Part	20	4	37	9	410
Lansing 78 397—Ingham Edward W Sparrow Hosp	Gen	NPAasn	150	29	892	104	4 210
Ingham Sanatorium	TB	County	110			84	706
St Lawrence Hospital	Gen	Church	100	28	731	93	6 458
Laurium 4 916—Houghton Calumet Memorial Hosp	Gen	NPAasn	30	6	100	20	1 002
Ludington 8 898—Mason Paulina Stearns Hospital	Gen	NPAasn	23	3	108	10	540
Manistee 8 008—Manistee Mercy Hosp and Sanatorium	Gen	Church	50	6	76	21	980
Manistee 5 198—Scholarcraft Shaw General Hospital	Gen	Indiv	20	4	29	10	332
Marquette 14 789—Marquette Morgan Heights Sanat*	TB	County	90			79	100
St Luke's Hospital	Gen	NPAasn	120	10	139	103	2 513
St Mary's Hospital	Gen	Church	60	9	217	50	1 227
Marshall 5 019—Calhoun Oak Lawn Hospital	Gen	NPAasn	17	7	106	11	571
Menominee 10 320—Menominee St Joseph's Hospital	Gen	Church	73	13	309	34	1 367
Monroe 18 110—Monroe Mercy Hospital	Gen	Church	56	10	319	44	1 416
Monroe Hospital	Gen	NPAasn	68	12	233	64	2 420
Morenci 1 773—Lenawee Blanchard Hospital	Gen	Part	14	6	46	7	463
Mt Clemens 13 497—Macomb St Joseph Sanatorium and Hospital	Gen	Church	120	10	303	100	2 257
Station Hospital	Gen	Army	58	4	9	27	700
Mt Pleasant 5 211—Isabella McArthur Strange Hospital	Gen	Part	20	5	51	21	1 171
Mt Pleasant Community Hospital	Gen	NPAasn	23	5		15	
Munising 3 906—Alger Munising Hospital	Gen	NPAasn	24	4	77	11	1 061
Muskegon 41 390—Muskegon Hackley Hospital**	Gen	NPAasn	108	17	309	67	2 601
Mercy Hospital**	Gen	Church	100	20	707	82	3 087
Muskegon County Sanat	TB	County	70			68	00
Newberry 2 460—Luce Newberry State Hospital	Ment	State	1 328			1 316	203
Perry Spinks Hospital	Part	Part	14	6	82	7	300
Niles 11 376—Berrien Pawating Hospital	Gen	NPAasn	27	9	163	19	676
Northville 2 066—Wayne East Lawn Sanatorium	TB	Corp	55			90	69

Key to symbols and abbreviations is on page 933

MICHIGAN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Sessions Private Hospital	Gen	Indiv	21	6	70	9	1 096
Wm H Maybury Sanat +	TB	City	843			709	673
Norway 4 016—Dickinson							
Penn Iron Mining Company Hospital	Gen	Corp	10	5	87	6	200
Ontonagon 1 937—Ontonagon	Gen	Indiv	18	4	51	12	493
Ontonagon Hospital							
Oshemo 1 670—Kalamazoo	TB	Corp	130			124	91
Pine Crest Sanatorium							
Owosso 14 496—Shiawassee	Gen	NP Assn	70	10	378	57	2 089
Memorial Hospital							
Petoskey 5 740—Emmet	Gen	City	50	8	136	40	1 101
Lockwood General Hospital	Gen	NP Assn	42	6	137	29	1 271
Petoskey Hospital							
Plainwell 2 909—Allegan	Gen	City	21	6	110	12	530
Wm Crispe Hospital							
Pontiac 64 978—Oakland	Gen	County	80			22	993
Oakland County Contagious Hospital							
Oakland County Tuberculosis Sanatorium*	TB	County	103			188	230
Pontiac General Hospital*	Gen	City	112	20	520	90	3 016
Pontiac State Hospital*	Ment	State	1 200			1 823	302
St Joseph Mercy Hosp *	Gen	Church	100	30	816	110	4 032
Port Huron 31 361—St Clair	Gen	NP Assn	130	10	261	67	2 223
Port Huron Hospital							
Powers 360—Menominee	TB	County	140			106	130
Pinecrest Sanatorium							
Reed City 1 692—Oscoda	Gen	City	10	3	39	14	448
Reed City Hospital							
River Rouge 17 314—Wayne	Gen	Indiv	33	6	39	45	243
Sidney A Sumbly Memorial Hospital (col)							
Royal Oak 22 904—Oakland	Gen	Indiv	19	4	40	10	507
Royal Oak Hospital							
Saginaw 80 710—Saginaw	Gen	City	26	5	40	19	351
Saginaw City Hospital							
Saginaw County Hospital	TB Iso	County	170			116	438
Saginaw General Hospital*	Gen	NP Assn	129	23	516	96	3 440
St Luke's Hospital	Gen	Church	54	12	472	40	1 888
St Mary's Hospital*	Gen	Church	106	20	646	121	3 712
St Johns 3 929—Clinton	Gen	NP Assn	40	11	184	28	1 408
Clinton Memorial Hospital							
St Joseph 8 349—Berrien	Gen	NP Assn	40	8	132	13	714
St Joseph Sanitarium							
Sault Ste Marie 13 705—Chippewa	Gen	County	92	10	281	64	1 914
Chippewa County War Memorial Hospital							
Station Hospital	Gen	Army	46			40	772
South Haven 4 804—Van Buren	Gen	Indiv	12	6	21	4	187
Penoyar Memorial Hospital							
Stambaugh 2 400—Iron	Gen	NP Assn	27	6	128	14	700
General Hospital Company of Iron River District							
Sturgis 6 900—St Joseph	Gen	City	40	10	266	24	1 013
Sturgis Memorial Hospital							
Tecumseh 2 406—Lenawee	Gen	City	29	8		Estab	1935
Tecumseh Hospital							
Three Rivers 6 863—St Joseph	Gen	City	33	6	129	19	818
Three Rivers Hospital							
Traverse City 12 539—Grand Traverse	Gen	State	26			15	508
Central Michigan Children's Clinic	Chil	State	120	14	280	69	1 951
James Decker Munson Hosp *	Gen	State	2 340			2 346	384
Traverse City State Hosp *	Ment	State					
Trimountain 2 511—Houghton	Gen	NP Assn	20	5	46	10	301
Copper Range Hospital							
Wayne 3 423—Wayne	Gen	Indiv	20	4	54	6	284
Wayne General Hospital							
West Branch 1 164—Ogemaw	Gen	City	10	4	46	11	460
Tolfree Memorial Hospital							
Wyandotte 28 908—Wayne	Gen	City	100	30	668	96	3 490
Wyandotte General Hosp							
Xpsilanti 10 143—Washtenaw	Gen	City	30	9	242	21	828
Beyer Memorial Hospital	Gen	Unit of Beyer Memorial Hospital					
Hull Memorial City Hosp	TB	NP Assn	190			80	96
Leland Sanatorium	Ment	State	2 370			2 082	1 744
Xpsilanti State Hospital*							
Zeland 2 500—Ottawa	Gen	NP Assn	14	3	52	6	291
Thomas G Huizinga Memorial Hospital							
Related Institutions							
Addison 402—Lenawee	Gen	County	0	2	31	4	161
Addison Community Hosp							
Adrian 13 064—Lenawee	TB	County	95			20	11
Lenawee County Tuberculosis Sanatorium							
Allegan 0 941—Allegan	Gen	Part	18	4	38	7	215
Allegan General Hospital							
Alma 6 734—Gratiot	Inst	Frat	40			27	123
Michigan Masonic Home and Hospital							
Ann Arbor 9 644—Washtenaw	Gen	Indiv	9			2	88
Cowle Hospital							
Coldwater 6 730—Lanich	MeDe	State	200			237	2
Michigan Children's Village							
Crystal Falls 2 900—Iron	Gen	County	14			7	190
Iron County Infirmary							
Detroit 1 068 662—Wayne	TB	Indiv	83			78	145
Burns Home Sanitarium							

MICHIGAN—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
De Nike Sanitarium	Alcoh	Corp	20			11	05
Doctor's Hospital	Conv	Indiv	30		No data supplied	1	100
Memorial Hospital	Sk Ca	Part	6			20	440
Mercy Hospital (col)	Gen	Indiv	47	5	32	20	440
St Luke's Convalescent Home	Conv	Church	20			18	201
William Booth Memorial Hospital	Mat	Church	84	10	361	31	379
Douglas 363—Allegan	Gen	Indiv	12	3	36	5	195
Community Hospital							
Edmore 897—Montcalm	Gen	Indiv	18	3	52	6	207
Edmore Hospital							
Farmington 1 243—Oakland	Conv	NP Assn	210			143	381
Children's Hospital Convalescent Home							
Ferndale 20 800—Oakland	Gen	Indiv	14	8	196	8	319
Ardmore Hospital							
Flint 156 492—Genesee	Inst	County	220		No data supplied		
Genesee County Infirmary							
Grand Rapids 108 592—Kent	Ment	County	32			18	381
Kent County Receiving Hosp							
Michigan Soldiers Home Hospital	Inst	State	240			180	1 044
Municipal Isolation Hosp	Iso	City	25			10	
Salvation Army Evangeline Booth Home and Hospital	Mat	Church	80	6	118	54	180
Harbor Beach 1 892—Huron	Gen	Corp	15	4	42	10	406
Harbor Beach Hospital							
Hazel Park—Oakland	Gen	Indiv	13	8	40	5	262
Helene Menke Hospital							
Ionia 6 562—Ionia	Inst	State	22			11	671
Michigan State Reformatory							
Jackson 0 187—Jackson	Mat	NP Assn	25	12	37	18	51
Florence Crittenton Home and Hospital							
Jackson County Isolation Hospital	Iso	County	31			17	285
Michigan State Prison Hosp	Inst	State	200			97	3 855
Lansing 78 397—Ingham	Inst	State	50			9	560
Boys Vocational School Hospital							
Lansing City Hospital	Iso	CyCo	45		1	16	321
Lapeer 5 068—Lapeer	Gen	Part	18	4	41	6	334
Lapeer City Hospital							
Lapeer State Home and Training School*	MeDe	State	3 938			3 714	417
Marquette 14 789—Marquette	Inst	State	24			4	157
Hospital of the State House of Correction and Branch Prison							
Mt Clemens 18 497—Macomb	Orth	NP Assn	50			40	107
Sigma Gamma Hosp School for Crippled Children							
Mt Pleasant 5 211—Isabella	MeDe	State	324			312	24
Mt Pleasant State Home and Training School							
Negaunee 6 502—Marquette	Gen	Indiv	20	3	No data supplied		
Twin City Hospital							
Northville 2 066—Wayne	MeDe	County	830			648	142
Wayne County Training School							
Otter Lake 336—Lapeer	TB	Frat	114			114	260
American Legion Children's Billet							
Plymouth 4 484—Wayne	Gen	Part	10	3	50	3	202
Plymouth Hospital							
Pontiac 64 928—Oakland	Inst	County	241			200	787
Oakland County Infirmary							
Port Huron 31 361—St Clair	Iso	City	24			3	42
Port Huron Eme gency Hosp							
Rochester 3 504—Oakland	N&M	Corp	40			28	143
Haven Sanitarium							
Rockland 700—Ontonagon	TB	County	20			15	21
Ontonagon County Sanat							
Rogers City 3 278—Presque Isle	Gen	Indiv	6	1		3	50
Rogers City Hospital							
Romeo 2 283—Macomb	TB	Indiv	40			36	92
Wehenkel Convalescent Home							
Royal Oak 22 904—Oakland	Gen	Indiv	23	7	91	8	354
Sunnybrook Hospital							
St Clair 3 389—St Clair	Gen	City	12	5	84	7	374
St Clair Community Hosp							
Shelby 1 152—Oceana	Gen	City	15	4		Reopened	
Shelby Hospital							
Stockbridge 715—Ingham	Gen	Part	10	3	61	5	1 815
Rowe Memorial Hospital							
Traverse City 12 539—Grand Traverse	Gen	County	20	2	30	15	301
Grand Traverse County Hospital							
Wahjamega 111—Tuscola	Epil	State	1 078			1 001	59
Michigan State Hospital for Epileptics							
Summary for Michigan							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	150 02	38 087	32 392	377 278			
		8 736	7 411	18 165			
Totals	237	46 823	39 803	390 443			
Refused registration	24	581					

Key to symbols and abbreviations is on page 933



## MINNESOTA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Ada 1285—Norman Norman County Memorial Hospital	Gen	Corp	11	3	50	2	218
Adrian 1,000—Nobles Adrian Hospital	Gen	Part	10	3	45	4	198
Ah gwa ching 45—Cass Minnesota State Sanat	T B	State	480			352	468
Albert Lea 10 169—Freeborn Naeve Hospital	Gen	NPA's'n	86	14	46	60	2 731
Alexandria 3 876—Douglas Douglas County Hospital	Gen	NPA's'n	30	6	50	13	766
St Luke's Hospital	Gen	Indiv	17	6	37	7	300
Appleton 1 625—Swift Kaufman Hospital	Gen	Indiv	20	5	30	10	548
Austin 12 276—Mower St Olaf Lutheran Hosp	Gen	Church	59	12	323	43	1 642
Bagley 885—Clearwater Clearwater Hospital	Gen	Indiv	14	5		6	
Battle Lake 552—Otter Tail Otter Tail County Sanat	T B	County	42			34	40
Benidji 7 202—Beltrami Lutheran Hospital	Gen	NPA's'n	50	8	109	30	1 089
Benson 2 000—Swift Swift County Hospital	Gen	NPA's'n	10	5	71	12	544
Blue Earth 2 884—Faribault Blue Earth Hospital	Gen	Indiv	10	4	46	5	284
Blwabik 1 353—St Louis Blwabik Hospital	Gen	Indiv	12	5	40	5	297
Brainerd 10 221—Crow Wing St Joseph's Hospital	Gen	Church	75	15	267	20	1 710
Breckenridge 2 264—Will in St Francis Hospital	Gen	Church	70	9	162	40	1 503
Buffalo 1 409—Wright Catlin Hospital	Gen	Part	12	3	21	4	91
Canby 1 738—Yellow Medicine John Swenson Memorial Hos	Gen	City	20	5	54	7	300
Cannon Falls 1 358—Goodhue Mineral Springs Sanat	T B	County	100			90	58
Cass Lake 1 409—Cass Consolidated Chippewa Indian Hospital	Gen	IA	30	4	86	19	590
Chisholm 8 908—St Louis Rood Hospital	Gen	Indiv	12	3		1 250	1938
Clarkfield 802—Yellow Medicine Clarkfield Community Hosp	Gen	Indiv	10	4	51	5	263
Cloquet 6 782—Carlton Fppard Hospital	Gen	Indiv	6	4	41	2	71
Fond du Lac Indian Hosp	Gen	IA	21	4	57	18	371
Rafter Hospital	Gen	Part	42	8	108	15	696
Crookston 6 321—olk Bethesda Hospital	Gen	Church	50	10	173	31	1 140
St Vincent's Hospital	Gen	Church	46	10	150	41	1 060
Sunnyrest Sanatorium	T B	County	72			62	50
Crosby 3 401—Crow Wing Miner's Hospital	Gen	Indiv	22	6	77	5	191
Dawson 1 386—Lac qui Parle Dawson Surgical Hospital	Gen	Corp	25	4	53	14	416
Deerwood 652—Crow Wing Deerwood Sanatorium	T B	County	26			20	20
Detroit Lakes 3 670—Becker St Mary's Hospital	Gen	Church	21	5	103	14	607
Duluth 101 403—St Louis Miller Memorial Hospital	Gen	City	50			19	480
St Luke's Hospital	Gen	NPA's'n	277	73	874	189	5 301
St Mary's Hospital	Gen	Church	260	30	770	226	6 050
Webber Hospital	Gen	Indiv	50	10	108	23	1 364
Fly 6 156—St Louis Shipman Hospital	Gen	Part	15	6	58	7	294
Fyleth 7 484—St Louis More Hospital	Gen	Corp	30	8	92	16	706
Fairmont 5 521—Martin Bailey Hospital	Gen	Indiv	13	5	40	5	220
Fairmont Clinic and Hosp	Gen	Corp	30	12	52	11	520
Gardner Hospital	Gen	Indiv	10	2	20	3	161
Hunt Hospital	Gen	Indiv	13	5	30	6	250
Faribault 12 767—Rice St Lucas Evangelical Deacon	Gen	Church	64	15	238	43	1 177
ess Hospital							
Fergus Falls 9 380—Otter Tail Fergus Falls State Hosp	Gen	State	200			2 028	607
George B Wright Memorial Hospital	Gen	NPA's'n	50	12	150	29	1 028
St Luke's Hospital	Gen	NPA's'n	52	5	157	24	830
Ft Snelling 1 327—Hennepin Station Hospital	Gen	Army	168	5	42	120	1 701
Foston 978—Polk Foston Hospital	Gen	Part	12	4	80	9	417
Graceville 969—Big Stone West Central Minnesota Hos	Gen	NPA's'n	29	5	107	16	733
Grand Rapids 3 206—Itasca Itasca Hospital	Gen	County	60	15	263	41	1 547
Granite Falls 1 701—Yellow Medicine Granite Falls Hospital	Gen	Indiv	10	5	57	8	298
Riverside Sanatorium	T B	County	48			44	26
Hallock 860—Rittson Klitson War Veterans Memo	Gen	NPA's'n	32	7	106	27	883
rial Hospital							
Hendricks 702—Lincoln Hendricks Hospital	Gen	NPA's'n	15	4	39	9	760

## MINNESOTA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Heron Lake 786—Jackson Southwestern Minnesota Hos	Gen	Indiv	12	2	30	5	166
Hibbing 1 666—St Louis Adams Hospital	Gen	Indiv	25	6	No data supplied		
Rood Hospital	Gen	Indiv	50	10	240	25	1 003
Hutchinson 3 406—McLeod Hutchinson Community Hos	Gen	NPA's'n	29	7	102	15	500
International Falls, 5 036—Koochiching Crut, Hospital	Gen	Indiv	27	6	48	23	81
Northern Minnesota Hosp	Gen	Corp	50	6	No data supplied		
Jackson, 2 206—Jackson Halloran Hospital	Gen	Part	15	4	No data supplied		
Lake City 3 210—Wabasha Lake City Hospital	Gen	NPA's'n	24	5	78	10	481
Lake Park 694—Becker Sand Beach Sanatorium	T B	County	46			41	17
Litchfield 2 880—Meeker Litchfield Hospital	Gen	NPA's'n	29	6	110	21	47
Little Falls 5 014—Morrison St Gabriel's Hospital	Gen	Church	43	9	144	20	847
Luverne 2 614—Rock Luverne Hospital	Gen	Part	10	6	97	7	310
Madison, 1 916—Lac qui Parle Ebenezer Lutheran Hosp	Gen	Church	20	7	71	10	401
Mankato 14 038—Blue Earth Immanuel Hospital	Gen	Church	70	10	243	42	1 769
St Joseph's Hospital	Gen	Church	126	18	332	47	1 861
Marshall 3 200—Lyon Marshall Hospital	Gen	NPA's'n	30	5	33	11	320
McLose 1 801—Stearns McLose Hospital	Gen	Indiv	13	4	19	3	901
Minneapolis 464 300—Hennepin Abbott Hospital	Gen	Church	100	18	314	79	3 333
Ashbury Hospital	Gen	Church	122	16	404	80	3 686
Fitel Hospital	Gen	NPA's'n	120	20	423	100	5 449
Unit of University Hospitals							
Fairview Hospital	Gen	G & TB Church	200	20	506	90	4 414
Harriet Walker Hospital	Gen	NPA's'n	50	30	90	31	100
Lutheran Deaconess Home and Hospital	Gen	Church	100	30	504	116	4 076
Maternity Hospital	Gen	Mat Ch NPA's'n	90	30	826	77	1 393
Minneapolis General Hospi	Gen	City	616	50	1 469	610	13 003
Minnesota General Hospital	Gen	See Univer ity Hospitals					
Northwestern Hospital	Gen	NPA's'n	160	20	573	142	7 929
Ripley Memorial Hospital	Gen	Unit of Maternity Hospital					
St Andrew's Hospital	Gen	Church	100	20	290	44	1 900
St Barnabas Hospital	Gen	NPA's'n	147	25	601	99	6 209
St Mary's Hospital	Gen	Church	200	30	780	112	7 403
Shriners Hospital for Crip	Ortho	Frat	60			61	230
pled Children	Gen	NPA's'n	220	42	962	181	6 400
Swedish Hospital	Gen	NPA's'n	220	42	962	181	6 400
Podd Memorial Eye Ear	Gen	Unit of University Hospitals					
Nose and Throat Hospital	Gen	State	450	20	487	301	9 317
Univer ity Hospitals	Gen	G & TB Vet	642			502	3 888
Veterans Admin Facility							
William Henry Lustis Chil							
dren's Hospital							
Montevideo, 4 310—Chippewa Montevideo Hospital	Gen	NPA's'n	40	10	270	30	1 510
Moorhead 7 601—Clay St Ansgars Hospital	Gen	Church	60	10	169	32	937
Mooe Lake 742—Carlton Moose Lake Community Hos	Gen	Indiv	12	3	71	6	274
pital							
Moose Lake State Hospital	Gen	State	1 000				Opened 1933
Morris 2 474—Stevens Morris Hospital	Gen	Indiv	10	5	58	9	315
Mountain Lake 1 388—Cottonwood Bethel Hospital	Gen	Church	23	7	114	9	500
Clinic Hospital	Gen	Indiv	20			12	316
New Prague 1 643—La Sueur New Prague Community Hos	Gen	NPA's'n	21	3	77	9	500
pital							
New Ulm 7 208—Brown Joretto Hospital	Gen	Church	40	8	160	39	1 121
Unlon Hospital	Gen	NPA's'n	50	12	170	50	1 740
Nopeming 384—St Louis Nopeming Sanatorium	T B	County	230			207	161
Northfield 4 100—Rice Northfield City Hospital	Gen	City	13	4	50	7	200
Oak Terrace 50—Hennepin Glen Lake Sanatorium	T B	County	700	6	7	607	572
Ortonville 2 017—Big Stone Ortonville Evangelical Hosp	Gen	Church	20	4	61	8	302
Owatonna 7 604—Steele Owatonna City Hospital	Gen	City	46	9	150	23	1 711
Paynesville 1 121—Stearns Paynesville Hospital	Gen	Indiv	15	3	6	1	125
Perham 1 411—Otter Tail St James Hospital	Gen	Church	33	6	120	19	916
Pine City 1 34—Pine Lakeside Memorial Hospital	Gen	Indiv	20	6	38	15	496
Pine River 422—Cass St Matthew Hospital	Gen	Indiv	32	5	No data supplied		
Pipestone 7 489—Pipestone Ashton Memorial Hos pital	Gen	CyCo	50	8	123	20	1 012
Pokegama 50—Pine Pokegama Sanatorium	T B	NPA's'n	47	3	3	20	76
Princeton 1 636—Mille Lacs Northwestern Hos pital	Gen	Indiv	20	3	20	8	292

Key to symbols and abbreviations is on page 933

## MINNESOTA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Puposky 6—Beltrami							
Lake Julia Tuberculosis Sanatorium	IB	County	57			54	57
Redlake 214—Beltrami							
Redlake Indian Hospital	Gen	IA	24	6	90	14	686
Red Wing 969—Goodhue							
Red Wing Hospital	Gen	City	40	6	83	28	796
St John's Hospital	Gen	NPA'sn	90	15	245	51	1 662
Redwood Falls 252—Redwood							
Redwood Falls Hospital	Gen	Part	15	4	54	6	723
Richmond 603—Stearns							
Richmond Hospital	Gen	NPA'sn	10		28	4	267
Rochester 2067—Olmsted							
Colonial Hospital	Gen	Corp	20			216	9 151
Kahler Hospital	Gen	Corp	129			86	3 090
Rochester State Hospital	Ment	State	1 538			1,567	688
St Mary's Hospital	Gen	Church	568	23	533	472	11 515
Worral Hospital	SKC&NT	Corp	190			123	7 582
Roseau 1028—Roseau							
Budd Hospital	Gen	Indiv	23	4	33	9	422
St Cloud 21 000—Stearns							
St Cloud Hospital	Gen	Church	107	21	540	144	3 297
Veterans Admin Facility	Ment	Vet	1 046			857	313
St Paul 271 606—Ramsey							
Ancker Hospital	Gen	CyCo	830	36	1 095	593	9 150
Bethesda Hospital	Gen	Church	120	23	799	118	5 013
Charles T. Miller Hosp	Gen	NPA'sn	230	30	726	163	6 093
Children's Hospital	Chil	NPA'sn	63			28	1 293
Gillette State Hospital for Crippled Children	Orth	State	230			233	642
Midway Hospital	Gen	Church	103	23	362	75	2 892
Mounds Park Hospital	Gen	Church	122	12	213	88	1 706
Northern Pacific Beneficial Association Hospital	Gen	NPA'sn	139	11	144	82	2 408
Ramsey County Tuberculosis Pavilion							
Unit of Ancker Hospital							
St John's Hospital	Gen	Church	90	15	224	43	1 634
St Joseph's Hospital	Gen	Church	250	32	675	200	7 836
St Luke's Hospital	Gen	NPA'sn	130	23	230	64	
West Side General Hospital	Gen	Church	82	16	280	38	1 392
St Peter 4811—Nicollet							
Corvill Hospital	Gen	Corp	30	10	61	11	532
St Peter State Hospital	Ment	State	2 233			2 104	692
Shakopee 2 023—Scott							
Shakopee Hospital	Gen	Indiv	17	6	33	6	213
Stayton 1 102—Murray							
Home Hospital	Gen	Part	23	6	73	12	474
Springfield 2 049—Brown							
St John's Hospital	Gen	Church	19	5	102	10	436
Spring Grove 867—Houston							
Spring Grove Hospital	Gen	Corp	13	7	79	9	279
Staples 2 667—Todd							
Municipal Hospital	Gen	City	22	5	53	9	470
Starbuck 781—Pope							
Minnewaska Hospital	Gen	NPA'sn	15	5	71	9	338
Stillwater 7 133—Washington							
Lakeview Memorial Hospital	Gen	CyCo	38	6	157	27	890
Thief River Falls 4 208—Pennington							
Mercy Hospital	Gen	NPA'sn	23	6	172	15	564
Oakland Park Sanatorium	TB	County	53			57	23
St Luke's Hospital	Gen	NPA'sn	41	6	61	20	902
Tracy 2 530—Lyon							
Clinic Hospital	Gen	Part	13	5	53	6	241
Tracy Hospital	Gen	Indiv	18	4	74	10	593
Two Harbors 4 425—Lake							
Two Harbors Hospital	Gen	Part	32	6	84	15	642
Tyler 903—Lincoln							
Tyler Hospital	Gen	NPA'sn	22	7	110	17	783
Virginia 11 963—St Louis							
Virginia Municipal Hospital	Gen	City	56	10	267	30	1 721
Wabasha 2 212—Wabasha							
Buena Vista Sanatorium	TB	County	30			25	23
St Elizabeth's Hospital	Gen	Church	42	6	73	29	609
Waconia 1 201—Carver							
Nager Hospital	Gen	Indiv	10	2	14	5	206
Wadena 2 312—Wadena							
Fair Oaks Lodge Sanatorium	TB	County	34			24	8
Wesley Hospital	Gen	Church	51	11	168	22	1 082
Walker 615—Case							
Walker Hospital	Gen	Indiv	20	4	47	7	213
Warren 1 442—Marshall							
Warren Hospital	Gen	Church	30	6	73	14	523
Warroad 1 164—Roseau							
Warroad Hospital	Gen	City	16	4	54	10	387
Waseca 3 313—Waseca							
Waseca Memorial Hospital	Gen	CyCo	26	8	133	12	570
White Earth 415—Becker							
White Earth Indian Hosp	Gen	IA	20	8	121	16	703
Willmar 6 113—Kandiyohi							
Willmar Hospital	Gen	Corp	33	3	46	14	486
Windom 2 121—Cottonwood							
Windom Hospital	Gen	NPA'sn	18	3	67	8	333
Winnebago 1 361—Faribault							
Winnebago Community Hospital	Gen	Part	11	4	58	5	241
Winona 20 830—Winona							
Winona General Hospital	Gen	NPA'sn	129	17	338	57	1 623
Worthington 3 533—Nobles							
Southwestern Minnesota Sanatorium	TB	County	54			51	40
Worthington Clinic Hosp	Gen	Part	23	8	138	17	636
Worthington Hospital	Gen	Indiv	10	3	29	2	108

## MINNESOTA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Anoka, 4 861—Anoka							
Anoka State Hospital	Ment	State	1 490			1 439	77
Barrett 368—Grant							
Powers Hospital	Surg	Indiv	10			1	70
Bertha 490—Todd							
Thiel Hospital	Gen	Indiv	24	8	97	10	431
Braham 579—Isanti							
Braham Hospital	Gen	Indiv	14	4	62	7	387
Buhl 1 634—St Louis							
Range Hospital	Gen	County	46			34	341
Caledonia 1 534—Houston							
Caledonia Hospital	Gen	Indiv	15	8	56	8	330
Cambridge 1 183—Isanti							
Minnesota Colony for Epileptics	McDe	State	1 103			1 101	98
Cokato 1 123—Wright							
Cokato Hospital	Gen	Indiv	12	3	35	5	221
Detroit Lakes 3 673—Becker							
Detroit Hospital	Gen	Indiv	11	3	9	3	90
Duluth 101 463—St Louis							
Hearing Hospital	Inst	County	63			39	1 598
Ellsworth 644—Nobles							
Ellsworth Hospital	Gen	Indiv	10	3	13	3	63
Elly 6 136—St Louis							
Detention Hospital	Iso	City	19			3	54
Faribault 12 767—Rice							
Minnesota School for Feeble minded	McDe	State	2 342	16	23	2 302	435
Glenwood 2 220—Pope							
Glenwood Hospital	Gen	Part	13	3	52	8	400
Greenbush 387—Roseau							
General Hospital	Gen	Indiv	9	3	63	7	239
Hastings 5 686—Dakota							
Hastings State Hospital	Ment	State	1 118			1 090	82
Iatto Hospital	Gen	Indiv	20	5	No data supplied		
St Francis Hospital	Gen	Part	18	3	31	10	268
Hibbing 15 666—St Louis							
Hibbing Detention Hospital	Iso	City	23			3	55
Long Prairie 1 634—Todd							
Long Prairie Hospital	Gen	Part	13	3	13	4	170
Madelia 1 397—Watsonwan							
Madelia Hospital	Gen	Indiv	13	4	81	5	705
Minneapolis 464 356—Hennepin							
Franklin Hospital	ChrConv	NPA'sn	60			47	572
Glenwood Hills Hospitals	N&M	NPA'sn	46			31	239
Homewood Hospital	Unit of Glenwood Hills Hospitals						
Minneapolis Sanitarium	N&M	Indiv	23			23	48
Minnesota Sanitarium	N&M	Indiv	19			16	
Minnesota Soldiers Home							
Hospital	Inst	State	85			60	242
Parkview Sanatorium	Chr	City	177			162	231
Portland Resthome	N&M	Indiv	10			3	3
R st Hospital	N&M	Part	18			13	130
Vocational Hospital	Conv	NPA'sn	41			37	79
Women's Welfare League							
Home for Convalescents	Conv	NPA'sn	23			17	190
Morris 2 474—Stevens							
Stevens County Hospital	Gen	NPA'sn	23	6	89	11	403
Mudbaden 23—Scott							
Mudbaden Sulphur Springs	Conv	Corp	100			20	1 648
Nicollet 434—Nicollet							
Nicollet Hospital	Gen	Indiv	12	2	19	3	129
Owatonna 7 634—Steele							
Minnesota State Public School Hospital	Inst	State	130			130	645
Pelican Rapids 1 363—Otter Tail							
Dr. Boyens's Hospital	Gen	Indiv	12	3	29	2	87
Pelican Rapids Hospital	Gen	Indiv	8	3	34	3	118
Pipestone 3 430—Pipestone							
Pipestone Indian Hospital	Gen	IA	42	6	10	21	239
Red Wing 9 629—Goodhue							
Minnesota State Training School for Boys	Inst	State	23			13	120
St Cloud 21 000—Stearns							
Minnesota State Reformatory Hospital	Inst	State	30			23	403
St Paul 271 606—Ramsey							
Children's Preventorium of Ramsey County	TB	CyCo	80			73	68
Mrs. Robbins Rest Home	N&M	Indiv	12			8	19
Salvation Army Booth Memorial Hospital	Vat	Church	73	11	127	48	163
Samaritan Hospital	Gen	NPA'sn	26	7	87	9	334
Sauk Centre 2 716—Stearns							
Home School for Girls (Higbee Hospital)	Inst	State	10	5	17	4	113
Long Hospital	Gen	Indiv	8	3	14	1	94
Shakopee 2 073—Scott							
Vudeura Sanitarium	Conv	Corp	73			21	1 036
Stillwater 7 173—Washington							
Minnesota State Prison Hospital	Inst	State	60			33	704
Watertown 504—Carver							
Shrader and Lee Hospital	Gen	Indiv	6	4	28	5	170
Wayzata 1 100—Hennepin							
Minnetonka Hospital	Gen	NPA'sn	13	3	20	6	164
Wheaton 1 230—Traverse							
Wheaton Hospital	Gen	Indiv	12	1	62	3	186

Key to symbols and abbreviations is on page 933

## MINNESOTA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Willmar 6 173—Kandiyohi	Ment	State	1 400			1 450	344
Willmar State Hospital							
Worthington 3 878—Nobles	Gen	Part	8	5	No data supplied		
General Hospital							
Summary for Minnesota							
Hospitals and sanatoriums	168	Beds 21 344	Average Census 16 707	Admissions 241 700			
Related institutions	93	Beds 9 246	Average Census 8 334	Admissions 15 728			
Totals	221	Beds 30 590	Average Census 20 091	Admissions 257 428			
Refused registration	8	Beds 147					

## MISSISSIPPI

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Aberdeen 3 925—Monroe	Gen	NPAsn	20	3	20	5	358
Aberdeen Hospital							
Amory 3 214—Monroe	Gen	NPAsn	30	6	27	16	627
Gilmore Sanitarium							
Biloxi 14 800—Harrison	Gen	NPAsn	50	9	143	21	906
Biloxi Hospital							
Veterans Admin Facility	Gen	Vet	207			185	2 442
Booneville 1 703—Prentiss	Gen	NPAsn	40	2	28	17	817
North East Mississippi Hos- pital							
Brookhaven 5 288—Lincoln	Gen	NPAsn	32	6	60	13	822
Kings Daughters Hospital							
Canton 4 720—Madison	Gen	NPAsn	20	5	24	11	600
Madison County Kings Daugh- ters Hospital							
Centerville 1 344—Wilkinson	Gen	Part	23	4	47	12	610
Field Memorial Hospital							
Charleston 2 014—Tallahatchie	Gen	Indiv	20	2	20	8	230
Tallahatchie Hospital							
Clarksdale 10 043—Coahoma	Gen	NPAsn	24	5	66	5	520
Clarksdale Hospital							
Cleveland 3 240—Bolivar	Gen	City	22	3		Estab 1038	
City Hospital							
Columbia 4 833—Marion	Gen	NPAsn	30	3	49	20	1 238
Columbia Clinic Hospital							
Columbus 10 743—Lowndes	Gen	Indiv	25	5	28	4	268
Columbus Hospital							
Fite Hospital	Gen	Indiv	30	6	43	9	441
Corinth 6 220—Alcorn	Gen	Indiv	12	3	45	5	400
Corinth Hospital							
McRae Hospital	Gen	NPAsn	30	6	29	9	1 481
Electric Mills 1 034—Kemper	Gen	NPAsn	30	4	49	13	581
George C. Hixon Memorial Hospital							
Greenville 14 807—Washington	Gen	NPAsn	100	14	157	55	2 564
Kings Daughters Hospital							
Greenwood 11 123—Leflore	Gen	CyCo	50	8	106	32	1 163
Greenwood Leflore Hospital							
Victoria Butler Hospital	Gen	Indiv	20		8	6	189
Grenada 4 349—Grenada	Gen	Part	30	5	89	20	1 400
Grenada General Hospital							
Gulport 12 547—Harrison	Gen	NPAsn	85	6	244	29	1 716
Kings Daughters Hospital							
Veterans Admin Facility	Gen	Vet	788			779	728
Hattiesburg 18 601—Forrest	Gen	Church	70	12	206	34	1 866
Methodist Hospital							
South Mississippi Infirmary	Gen	Indiv	60	15	36	14	641
Houston 1 477—Chickasaw	Gen	NPAsn	30	3	27	17	857
Houston Hospital							
Jackson 48 282—Hinds	Gen	NPAsn	67	13	235	36	2 669
Jackson Infirmary							
Mississippi Baptist Hosp	Gen	Church	110	10	No data supplied		
Mississippi State Charity Hospital	Gen	State	72	25	60	3 403	
Welch's Sanitarium	Gen	N&M	16		9	150	
Dr. Willis Walley Hosp	Gen	Indiv	70	5	19	16	480
Kosciusko 3 237—Attala	Gen	CyCo	22	2		Estab 1938	
Montfort Jones Hospital							
Laurel 18 017—Jones	Gen	Indiv	50	6	207	20	1 632
Laurel General Hospital							
South Mississippi Charity Hospital	Gen	State	60	10	163	40	1 839
Lexington 2 590—Holmes	Gen	County	20	2	60	12	780
Holmes County Community Hospital							
Macon 2 198—Noxubee	Gen	Indiv	20	4	30	11	640
Macon Hospital							
McComb 10 057—Pike	Gen	Part	27	4	70	13	873
McComb City Hospital							
McComb Infirmary	Gen	Indiv	25	4	76	14	868
Meridian 31 904—Lauderdale	Gen	NPAsn	45	5	101	12	791
Anderson Infirmary							
East Mississippi State Hosp	Gen	State	80		789	320	
Hoye's Sanitarium	Gen	N&M	26		11	184	
Matty Hersee Hospital	Gen	State	60	10	86	55	2 083
Meridian Sanitarium and Clinic							
Dr. F. G. Riley's Hospital and Clinic	Gen	NPAsn	20	4	23	8	600
Rush's Infirmary	Gen	NPAsn	56	6	90	27	1 067

## MISSISSIPPI—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Morton 900—Scott	Gen	Part	17	2	20	6	402
Scott County Hospital							
Natchez 13 422—Adams	Gen	State	70	12	280	58	2 237
Natchez Charity Hospital							
Natchez Sanatorium	Gen	Corp	50	0	No data supplied		
New Albany 3 187—Union	Gen	Indiv	20	2	64	10	30
Mayes Hospital							
New Albany Hospital and Clinic	Gen	NPAsn	10	2	30	6	322
Newton 2 011—Newton	Gen	NPAsn	20	4	22	11	381
Newton Infirmary							
Oxford 2 890—Lafayette	Gen	Corp	30	5	40	14	1 011
Bramlett Hospital							
Oxford Hospital	Gen	Indiv	30	5	53	23	1 304
Pascagoula 4 330—Jackson	Gen	County	20	5	63	12	406
Jackson County Hospital							
Philadelphia 2 060—Neshoba	Gen	IA	30	7	40	20	603
Choctaw Mississippi Hosp							
Picayune 4 698—Pearl River	Gen	Indiv	20	2	47	9	
Martin Sanatorium							
Sanatorium 200—Simpson							
Mississippi State Tuberculosis Sanatorium	TB	State	400			204	266
Starkville 3 612—Oktibbeha	Gen	Indiv	21	2	31	8	409
Oktibbeha Hospital							
Tupelo 6 361—Lee	Gen	NPAsn	49	8	112	24	1 330
North Mississippi Community Hospital							
Tylertown 1 102—Walthall	Gen	NPAsn	15	2	30	8	449
Tylertown Hospital							
Vicksburg 22 943—Warren	Gen	State	60	6	246	56	2 479
Mississippi State Charity Hos- pital							
Vicksburg Hospital	Gen	NPAsn	50	8	64	36	1 576
Vicksburg Infirmary	Gen	NPAsn	50	4	30	40	1 476
Vicksburg Sanitarium	Gen	NPAsn	70	10	119	53	2 290
Water Valley 3 730—Yalobusha	Gen	Part	25	4	17	6	411
Water Valley Hospital							
West Point 4 677—Clay	Gen	Indiv	20	4	30	10	230
Ivy Hospital							
Whitfield—Rankin	Ment	State	3 000			3 246	1 637
Mississippi State Hospital							
Winona 2 607—Montgomery	Gen	NPAsn	30	2	33	12	392
Winona Infirmary							
Yazoo City 0 079—Yazoo	Gen	Corp	30	3	37	9	600
Kings Daughters Hospital							
Related Institutions							
Baldwyn 1 106—Lee	Gen	Indiv	10	1	16	5	206
Baldwyn Hospital							
Biloxi 14 800—Harrison	Inst	State	65			30	20
Jefferson Davis Soldiers Home							
Ellisville 2 127—Jones	MeDe	State	400		No data supplied		
Ellisville State School							
Greenville 14 807—Washington	Gen	Indiv	50	2	20	30	700
Colored Kings Daughters Hospital							
Greenwood 11 123—Leflore	Gen	Indiv	15	5	2	8	242
Greenwood Colored Hospital							
Meridian 31 904—Lauderdale	TB	NPAsn	45			20	26
Kings Daughters Tuberculosis Hospital							
Okolona 2 230—Chickasaw	Gen	Indiv	10	2	6	2	60
Wicks Hospital							
University 15—Lafayette	Inst	State	30			5	409
University of Mississippi Hospital							
Summary for Mississippi							
Hospitals and sanatoriums	Number 67	Beds 8 297	Average Census 6 514	Admissions 71 493			
Related institutions	8	620	414	1 418			
Totals	75	8 922	6 928	73 301			
Refused registration	2	72					

## MISSOURI

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Bonne Terre 4 021—St. Francois	Gen	NPAsn	32	5	84	15	406
Bonne Terre Hospital							
Boonville 6 430—Cooper	Gen	Church	80	14	96	00	801
St. Joseph's Hospital							
Butler 2 706—Bates	Gen	Indiv	22	3	85	7	567
Butler Memorial Hospital							
California 2 334—Monteau	Gen	Indiv	33	2	2	15	1 137
Latham Sanitarium							
Canton 2 044—Lewis	Gen	Indiv	14	3	15	5	270
Canton Community Hosp							
Cape Girardeau 16 227—Cape Girardeau	Gen	Church	70	15	277	50	2 106
St. Francis Hospital							
Southeast Missouri Hosp	Gen	NPAsn	70	12	No data supplied		
Carthage 9 780—Jasper	Gen	City	44	6	94	17	971
McCune Brooks Hospital							
Clayton 9 613—St. Louis	Gen	County	175	23	316	103	4 297
St. Louis County Hosp **							

Key to symbols and abbreviations is on page 933

MISSOURI—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Columbia 14 067—Boone	Gen	County	46	4	77	23	1,070
Boone County General Hosp	Gen	County	46	4	77	23	1,070
Noyes Hospital	Unit of University Hospitals	Unit of University Hospitals					
Parker Memorial Hospital	Unit of University Hospitals	Unit of University Hospitals					
State Hospital for Crippled Children	Unit of University Hospitals	Unit of University Hospitals					
University Hospitals+0	Gen	State	150	10	41	64	2,603
Excelsior Springs 4 065—Clay	Gen	Corp	40	1	No data supplied		
Excelsior Springs Sanitarium and Hospital	Gen	Corp	40	1	No data supplied		
Veterans Admin Facility	Gen	Vet	202			202	1,007
Farmington 3 001—St Francois	Gen	State	1,000			1,401	594
State Hospital No 4	Ment	State					
Fayette 2 630—Howard	Gen	Part	70	5	10	7	310
Lee Hospital	Gen	Part	70	5	10	7	310
Fulton 6 100—Callaway	Ment	State	2,385			2,175	713
State Hospital No 14	Ment	State					
Glendale (Kirkwood P O) 1 431—St Louis	N&M	Corp	12			9	12
Oakland Park Hospital	N&M	Corp	12			9	12
Hannibal 22 761—Marion	Gen	City	90	15	189	43	1,520
Levering Hospital	Gen	City	70	10	182	55	1,068
St Elizabeth's Hospital	Gen	Church	70	10	182	55	1,068
Independence 15 296—Jackson	Gen	Church	67	13	270	36	1,598
Independence Sanitarium and Hospital	Gen	Church	67	13	270	36	1,598
Ironton 0 4—Iron	Gen	Church	31	6	60	24	550
Aradia Valley Hospital—St Mary's of the Ozarks	Gen	Church	31	6	60	24	550
Jefferson Barracks (St Louis P O) 832—St Louis	Gen	Army	143	6	28	132	1,904
Station Hospital	Gen	Army	143	6	28	132	1,904
Veterans Admin Facility	Gen	Vet	415			370	2,542
Jefferson City 21 596—Cole	Gen	Church	100	15	195	59	2,070
St Mary's Hospital	Gen	Church	100	15	195	59	2,070
Joplin 33 454—Jasper	Gen	Church	87	12	143	39	1,607
Freeman Hospital	Gen	Church	87	12	143	39	1,607
St John's Hospital	Gen	Church	110	10	211	50	2,018
Kansas City 399 746—Jackson	Chil	NPAasn	145	24	147	30	180
Children's Mercy Hospital+0	Chil	NPAasn	145	24	147	30	180
Fairmount Maternity Hosp	Mat	Corp	460	40	901	402	11,242
Kansas City Gen Hosp +0	Gen	City	200	24	300	163	3,626
Kansas City General Hospital No 2 (col) +0	Gen	City	200	24	300	163	3,626
Kansas City Tuberculosis Hospital	TB	City	260			192	406
Major Clinic	N&M	Indiv	30			13	143
Menorah Hospital	Gen	NPAasn	143	23	343	92	3,179
Neurological Hospital	N&M	NPAasn	50			33	328
Ralph Sanitarium	Drug	Indiv	20			8	108
Research Hospital+0	Gen	NPAasn	200	20	478	163	5,703
St Joseph Hospital+0	Gen	Church	222	36	809	162	5,327
St Luke's Hospital+0	Gen	Church	193	20	491	155	4,709
St Mary's Hospital+0	Gen	Church	175	20	820	122	4,278
St Vincent's Maternity Hospital	Mat	Church	42	35	420	21	487
Trinity Lutheran Hosp +0	Gen	Church	112	24	344	67	2,408
Vineyard Park Hospital	Gen	Indiv	32			6	287
Wesley Hospital	Gen	NPAasn	50	10	53	21	713
Wheatley Provident Hospital (col) +0	Gen	NPAasn	67	2	32	21	631
Willows Maternity Sanit	Mat	Indiv	70	75	104	33	184
Kirksville 6 293—Adair	Gen	Corp	34	6	42	25	1,010
Grinn Smith Hospital and Clinic	Gen	Corp	20	5	20	10	373
Stickler Hospital	Gen	Corp	20	5	20	10	373
Lamar 2 351—Barton	Gen	Indiv	9	3	102	3	207
Bickel Hospital	Gen	Indiv	9	3	102	3	207
Lebanon 3 562—Laclede	Gen	NPAasn	29	5	48	21	800
Louise G Wallace Hospital	Gen	NPAasn	29	5	48	21	800
Louisiana 3 549—Pike	Gen	County	54	11	61	16	548
Pike County Hospital	Gen	County	54	11	61	16	548
Macon 3 801—Macon	Gen	NPAasn	20	6	No data supplied		
Samaritan Hospital	Gen	NPAasn	20	6	No data supplied		
Marcelline 3 565—Linn	Gen	Indiv	12	3	22	3	168
B B Putman Memorial Hospital	Gen	Indiv	12	3	22	3	168
Marshall 6 103—Saline	Gen	Indiv	12	3	22	3	168
Georgia Brown Blosser Home for Crippled Children	Orth	NPAasn	60			20	181
John Fitzgibbon Memorial Hospital	Gen	NPAasn	32	5	43	11	572
Maryville 5 217—Nodaway	Gen	Church	75	6	159	27	1,503
St Francis Hospital	Gen	Church	75	6	159	27	1,503
Moberly 13 712—Randolph	Gen	Indiv	40	5	32	16	503
McCormick Hospital	Gen	Indiv	40	5	32	16	503
Wabash Employes Hospital	Indus	NPAasn	30			12	339
Woodland Hospital	Gen	Corp	30	5	45	20	712
Monett 4 099—Barry	Gen	Indiv	18	3	20	6	192
Dr William M West's Hosp	Gen	Indiv	18	3	20	6	192
Mt Vernon 1 342—Lawrence	TB	State	691			626	858
Missouri State Sanatorium	TB	State	691			626	858
Neosho 4 480—Newton	Gen	Part	31	4	67	10	760
Sak Bowman Hospital	Gen	Part	31	4	67	10	760
Nevada 7 448—Vernon	Gen	City	27	6	20	11	277
Nevada Hospital	Gen	City	27	6	20	11	277
State Hospital No 3	Ment	State	1,330			1,814	496
Pine Lawn (St Louis P O) —St Louis	Gen	Indiv	29	4	10	12	122
Tiernon Hospital and Clinic	Gen	Indiv	29	4	10	12	122
Poplar Bluff 7 551—Butler	Gen	Indiv	45	5	38	20	660
Brandon Hospital	Gen	Indiv	45	5	38	20	660
Lucy Lee Hospital	Gen	Indiv	40	5	48	30	800
Poplar Bluff Hospital	Gen	Indiv	40	5	48	30	800
Robertson 600—St Louis	TB	NPAasn	105			60	70
Jewish Sanatorium	TB	NPAasn	105			60	70

MISSOURI—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Rolla 3 670—Phelps	Trach	State	34			26	312
Missouri Trachoma Hospital	Trach	State	34			26	312
Rolla Hospital	Gen	Indiv	46	10	40	20	679
St Charles 10 401—St Charles	Gen	Church	50	10	148	40	1,519
St Joseph's Hospital	Gen	Church	50	10	148	40	1,519
St James 1 204—Phelps	Gen	Indiv	15	7	39	8	112
St James Hospital	Gen	Indiv	15	7	39	8	112
St Joseph 80 930—Buchanan	N&M	Indiv	35		No data supplied		
Dr Byrd's Sanitarium	N&M	Indiv	35		No data supplied		
Missouri Methodist Hosp +0	Gen	Church	150	20	276	87	3,701
St Joseph's Hospital+0	Gen	Church	160	20	429	93	2,037
State Hospital No 2+	Ment	State	2,774			2,500	675
St Louis, 821 060—St Louis City	Gen	Church	160			90	1,201
Alexian Brothers Hosp +0	Gen	Church	160			90	1,201
Barnard Free Skin and Cancer Hospital+	SkCa	NPAasn	44			30	903
Barnes Hospital+0	Gen	Church	300	20	247	301	10,167
Bethesda General Hospital	Gen	NPAasn	100	20	247	64	1,486
Central Hospital	Gen	NPAasn	32	11	137	21	824
Christian Hospital+	Gen	NPAasn	90	20	300	56	1,609
City Isolation Hospital+0	Tbiso	City	220			183	2,509
City Sanitarium+0	Ment	City	3,600			3,560	557
De Paul Hospital+0	Gen	Church	250	30	1,015	185	7,229
Evangelical Deaconess Home and Hospital+0	Gen	Church	170	30	679	133	5,825
Faith Hospital	Gen	NPAasn	35	6	32	11	343
Farmen Desloge Hospital+0	Gen	Church	223	23	700	217	5,206
Frisco Employes Hospital	Indus	NPAasn	100			50	1,484
Homerg G Phillips Hospital for Colored+0	Gen	City	681	57	1,281	576	10,021
Jewish Hospital+0	Gen	NPAasn	200	33	472	176	6,043
Josephine Keithamp Memorial Hospital	Gen	Church	35	10	201	23	1,125
Lutheran Hospital+0	Gen	Church	150	30	549	91	4,200
Missouri Baptist Hospital+0	Gen	Church	400	30	307	215	5,250
Missouri Pacific Hospital	Indus	NPAasn	300			119	3,804
Mt St Rose Sanatorium+0	TB	Church	135			120	329
Peoples Hospital (col)	Gen	NPAasn	50	5	52	26	723
Robert Koch Hospital+	TB	City	647			518	278
St Ann's Maternity Hosp	Mat	Church	95	40	521	22	683
St Anthony's Hospital+	Gen	Church	212	50	1,062	137	4,326
St John's Hospital+0	Gen	Church	286	34	632	215	5,900
St Louis Children's Hosp +0	Chil	NPAasn	207			128	3,425
St Louis City Hospital+0	Gen	City	750	50	1,821	728	19,027
St Louis Maternity Hosp +0	Mat	NPAasn	98	95	1,751	57	2,049
St Luke's Hospital+0	Gen	Church	207	32	409	132	4,820
St Mary's Hospital+0	Gen	Church	310	45	506	219	6,218
St Mary's Infirmary (col) +0	Gen	Church	130	20	167	60	1,128
St Vincent's Sanitarium	N&M	Church	250			218	144
Shriners Hospital for Crippled Children+	Orth	Frat	100			100	473
U S Marine Hospital	Gen	USPHS	120			99	1,007
Sedalia 20 866—Pettis	Gen	City	120	12	142	27	1,013
John H Bothwell Memorial Hospital	Gen	City	120	12	142	27	1,013
Smithville 902—Clay	Gen	NPAasn	15	4			Estab 1933
Smithville Community Hosp	Gen	NPAasn	15	4			Estab 1933
Springfield 57 577—Greene	Gen	Church	80	10	175	35	1,495
Burge Hospital	Gen	Church	100	14	281	64	2,322
St John's Hospital	Gen	Church	90	10	174	46	1,993
Springfield Baptist Hosp +0	Gen	NPAasn	90	10	174	46	1,993
U S Hospital for Defective Delinquents	Ment	Fed	549			443	400
Stella 226—Newton	Gen	Indiv	50	10	54	9	408
O Cardwell Hospital	Gen	Indiv	50	10	54	9	408
Trenton 6 992—Grundy	Gen	Indiv	14	2	16	7	282
Cullers Hospital	Gen	Indiv	14	2	16	7	282
Wright Memorial Hospital	Gen	NPAasn	17	4	20	8	300
Washington 5 918—Franklin	Gen	Church	50	10	114	24	760
St Francis Hospital	Gen	Church	50	10	114	24	760
Webb City 6 876—Jasper	TB	County	115			115	166
Jasper County Tuberculosis Hospital	TB	County	115			115	166
Webster Groves 16 487—St Louis	N&M	Corp	60			34	70
Glenwood Sanatorium	N&M	Corp	60			34	70
West Plains 3 335—Howell	Gen	Indiv	18	1	16	8	220
Christa Hogan Hospital	Gen	Indiv	18	1	16	8	220
Related Institutions							
Independence 15 296—Jackson	N&M	Corp	25			18	12
Vale Sanitarium	N&M	Corp	25			18	12
Jefferson City 21 596—Cole	Inst	State	230			120	
Missouri State Penitentiary	Inst	State	230			120	
Kansas City 399 746—Jackson	Conv	Indiv	20			15	60
Oresthaven Convalescent Home	Conv	Indiv	20			15	60
Florence Crittenton Home	Mat	NPAasn	22	16	21	16	27
Florence Home for Colored Girls	Mat	NPAasn	55	6	72	30	80
Trowbridge Training School for Nervous and Backward Children	MeDe	Indiv	25			20	20
Liberty 3 516—Clay	Inst	Frat	85			59	867
Missouri Odd Fellows Home	Inst	Frat	85			59	867
Marshall 8 103—Saline	MeDe	State	1,524			1,324	264
Missouri State School—Epilepsy and Feeble-minded	MeDe	State	1,524			1,324	264
Marthasville 394—Warren	MeDe	Church	125			93	7
Evangelical Emmaus Home for Epileptics and Feeble-minded	MeDe	Church	125			93	7

## MISSOURI—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Mountain Grove 2 229—Wright Ryan Hospital	Gen	Indiv	11	3	21	4	10
Rolla 3 670—Phelps Missouri School of Mines Hospital	Inst	State	14			2	20
St Charles 10 491—St Charles Evangelical Emmaus Home for Epileptics and Feeble minded	McDe	Church	142			135	24
St James 1 294—Phelps State Federal Soldiers Home Hospital	Inst	State	52			35	134
St Louis 821 960—St Louis City Booth Memorial Hospital	Mat	Church	10	10	98	40	167
City Infirmary	Inst	City	9			92	400
Hospital of Masonic Home	Inst	Frat	123			78	372
Mother of Good Counsel Home for Incurables	Cn	Church	40			40	30
Night and Day Camp for Children	Chil	NP Assn	80			7	136
St Louis Training School	McDe	City	494			481	46
Sedalia 20 806—Pettis City Hospital No 2 (col)	Gen	City	12	2	6	4	8
Springfield 37 527—Greene City Hospital	Gen	City	26	2	28	11	835
Valley Park 1 772—St Louis Ridge Farm	Unit of St Louis Children's Hospital						
Warrensburg 5 146—Johnson Warrensburg Clinic	Gen	Part	10	1	2	1	88
Webster Groves 16 487—St Louis Mirlam Convalescent Home	Conv	Frat	30			24	339
West Plains 3 34—Howell Cottage Hospital	Gen	Indiv	8	4	39	4	115

## Summary for Missouri

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	122	27 377	22 309	233 648
Related institutions	24	3 358	2 726	5 064
Totals	146	30 735	23 035	238 712
Refused registration	32	1 308		

## MONTANA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Anaconda 12 494—Deerlodge St Ann's Hospital	Gen	Church	90	15	224	51	1 230
Billings 16 340—Yellowstone Billings Deaconess Hosp	Gen	Church	58	12	348	50	1 810
St Vincent Hospital	GA Or	Church	150	16	353	99	2,293
Bozeman 6 85—Gallatin Bozeman Deaconess Hosp	Gen	Church	61	12	201	39	1 600
Browning 1 172—Glaeder Blackfeet Hospital	Gen	IA	45	8	120	37	908
Butte 39 032—Silver Bow Murray Hospital	Gen	Corp	120	12	190	63	2 392
St James Hospital	Gen	Church	175	26	449	93	2 030
Choteau 926—Teton Choteau Hospital	Gen	Indiv	20	4	100	8	374
Conrad 1 490—Pondera St Mary's Hospital	Gen	Church	58	10	123	24	900
Crow Agency 036—Big Horn Crow Indian Hospital	Gen	IA	34	4	71	18	600
Deer Lodge 3 510—Powell Montana State Tuberculosis Sanitarium	IB	State	208			203	208
St Joseph Hospital	Cen	Church	30	5	70	30	431
Dillon 2 422—Beaverhead Barrett Hospital	Cen	Corp	22	4	78	8	494
Ft Benton 1 109—Chouteau St Clare Hospital	Gen	Church	48	6	64	22	421
Ft Harrison 000—Lewis and Clark Veterans Admin Facility	Vet		140			124	864
Ft Missoula (Missoula P O) 400—Missoula Station Hospital	Gen	Army	36			31	508
Ft Peck 4 000—Valley Ft Peck Hospital	Cen	Army	35			16	861
Glasgow 2 216—Valley Frances Mahon Deaconess Hospital	Gen	Church	60	12	297	27	1 084
Valley County Hospital	Gen	County	20	6		New	
Glendive 4 629—Dawson Dawson County Hospital	Gen	County	20	5	69	13	208
Northern Pacific Hospital	Gen	NP Assn	60	4	43	34	1 442
Great Falls 28 822—Cascade Columbus Hospital	Cen	Church	340	50	410	147	3 814
Montana Deaconess Hosp	Gen	Church	190	27	399	97	2 665
Hamilton 1 839—Ravalli Marcus Daly Memorial Hosp	Gen	NP Assn	36	7	132	20	706
Hardin 1 169—Big Horn Hardin General Hospital	Gen	Corp	30	4	74	9	322
Harlem 70—Blaine Ft Belknap Indian Hospital and Sanitarium	Gen	IA	49	8	97	24	630
Have 6 372—Hill Kennedy Deaconess Hospital	Gen	Church	43	12	114	20	1 068
Sacred Heart Hospital	Gen	Church	75	13	225	34	1 745

## MONTANA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Helena 11 803—Lewis and Clark St John Hospital	Gen	Church	40	12	227	32	980
St Peter's Hospital	Gen	NP Assn	54	10	133	36	1 063
Jordan 600—Garfield Good Samaritan Hospital	Gen	Church	20	4	42	10	164
Kalspell 6 094—Flathead Kalspell General Hospital	Gen	Church	50	10	138	26	1 311
Lame Deer 89—Rosebud Tongue River Agency Hosp	Gen	IA	42	4	21	21	409
Lewistown 5 358—Fergus St Joseph's Hospital	Gen	Church	133	16	203	70	2 330
Libby 1 702—Lincoln Libby General Hospital	Gen	Indiv	19	4	60	10	360
Livingston 6 391—Park Park Hospital	Gen	Indiv	22	6	30	12	463
Miles City 7 175—Custer Miles City Hospital (Holy Rosary Hospital)	Gen	Church	80	8	110	60	1 046
Missoula 14 637—Missoula Northern Pacific Beneficial Association Hospital	Indus	NP Assn	75			40	1 638
St Patrick Hospital	Cen	Part	102	18	333	10	2 483
Thornton Hospital	Gen		31	8	131	26	974
Plentywood 1 226—Sheridan Sheridan Memorial Hospital	Gen	NP Assn	22	5	60	9	448
Poplar 1 046—Roosevelt Ft Peck Indian Agency Hospital	Gen	IA	28	5	98	19	634
Roundup 2 577—Musselshell Musselshell Valley Hospital	Gen	Indiv	20	6	25	7	710
St Ignace 727—Lake Holy Family Hospital	Gen	Church	31	7	101	23	930
Sidney 2 010—Richland Sidney Deaconess Hospital	Gen	Church	31	6	121	19	853
Warm Springs 1 900—Deerlodge Montana State Hospital	Ment	State	1 712			1 800	560

## Related Institutions

Billings 16 340—Yellowstone Yellowstone County Hospital	Gen	County	16	6	64	11	307
Butte 39 532—Silver Bow Silver Bow County Hospital	Inst Gen	County	129	4	32	190	540
Great Falls 28 822—Cascade Detention Hospital	IA	Co	20			6	100
Helena 11 803—Lewis and Clark Florence Crittenton Home	Mat	NP Assn	17	17	90	6	
Lewis and Clark County Hospital	Inst Gen	County	90	4	20		370
Lewistown 5 358—Fergus Fergus County Hospital	Gen	County	16	4	41	12	302
Polson 1 400—Lake Hotel Dieu Hospital	Gen	Church	20	6	58	6	200
Scobey 1 200—Daniels Scobey Clinic Hospital	Gen	Indiv	20	4	43	6	100
Shelby 2 004—Toole New Shelby Hospital	Gen	Indiv	20	6	32	5	194
Terry 7 00—Prairie Lutheran Good Samaritan Hospital	Gen	Church	18	6	23	8	183
White Sulphur Springs 575—Meagher McKay Hospital	Gen	Indiv	12	3	10	2	70
Wolf Point 1 539—Roosevelt St Margaret's Hospital	Gen	Indiv	25	5	20	9	

## Summary for Montana

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	46	4 780	3 610	51 666
Related institutions	12	441	275	3 466
Totals	58	5 221	3 885	55 132
Refused registration	6	106		

## NEBRASKA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Albany 1 378—Brown Albany Hospital	Gen	Part	18	5	142	10	698
Allamore 6 660—Box Butte St Joseph's Hospital	Gen	Church	80	12	146	58	1 907
Arnold 899—Custer Arnold Hospital	Gen	Indiv	15	2	23	3	98
Auburn 3 065—Nemaha Auburn Hospital	Gen	Indiv	15	4	48	6	320
Aurora 2 715—Hamilton Aurora Hospital	Gen	Indiv	10	4	52	0	260
Beatrice 10 297—Gage Beatrice Sanitarium	Gen	Indiv	20	4		6	
Lutheran Hospital	Gen	Church	40	8	146	18	780
Mennonite Deaconess Home and Hospital	Gen	Church	30	10	158	24	809
Blair 2 791—Washington Court View Hospital	Gen	Indiv	20	4	31	5	228
Broken Bow 2 710—Custer Broken Bow Hospital	Gen	Indiv	35	4		7	318
Burwell 1 106—Carlisle Dr Roy C Cram's Hospital	Gen	Indiv	14	3	29	3	110

## NEBRASKA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Cambridge 1,203—Furnas	Gen	Indiv	25	2	11	4	104
Republican Valley Hospital	Gen	Indiv	25	2	11	4	104
Chadron 4,606—Dawson	Gen	City	23	7	30	10	504
Chadron Municipal Hospital	Gen	City	23	7	30	10	504
Columbus 6,086—Platte	Gen	Church	30	5	51	13	544
Lutheran Good Samaritan Hospital	Gen	Church	120	12	158	26	814
St. Mary's Hospital	Gen	Church	14	4	31	4	160
David City 2,333—Butler	Gen	NP Assn	15	4	60	0	320
David City Hospital	Gen	Indiv	30	10	20	10	300
Fairbury 6,191—Jefferson	Gen	Indiv	30	10	20	10	300
Fairbury Hospital	Gen	Indiv	30	10	20	10	300
Falls City 5,787—Richardson	Gen	Indiv	30	10	20	10	300
Falls City Hospital	Gen	Indiv	30	10	20	10	300
Ft. Crook 1,000—Bartley	Gen	Army	50			35	883
Station Hospital	Gen	Army	50			35	883
Grand Island 16,041—Hall	Gen	Church	70	6		Estab 1038	
Lutheran Hospital	Gen	Church	140	10	194	58	1,701
St. Francis Hospital	Gen	Church	140	10	194	58	1,701
Hartington 1,000—Cedar	Gen	Indiv	16			No data supplied	
St. John's Hospital	Gen	Indiv	16			No data supplied	
Hastings, 15,490—Adams	Gen	NP Assn	100	10	201	51	1,977
Mary Lanning Memorial Hospital	Gen	NP Assn	100	10	201	51	1,977
Holdrege 3,263—Phelps	Gen	Indiv	18	5	31	6	279
Holdrege Hospital	Gen	Indiv	18	5	31	6	279
Imperial 946—Chase	Gen	NP Assn	17	4	72	8	420
Imperial Community Hosp	Gen	NP Assn	17	4	72	8	420
Ingleside 1,699—Adams	Gen	State	1,068			1,075	346
Hastings State Hospital	Gen	State	1,068			1,075	346
Kearney 8,570—Buffalo	Gen	Church	60	12	141	30	1,023
Good Samaritan Hospital	Gen	Church	161			104	170
Hospital for the Tuberculous TB	Gen	Church	161			104	170
Kimball 1,711—Kimball	Gen	Indiv	10	5		Estab 1038	
Flett Hospital	Gen	Indiv	10	5		Estab 1038	
Lexington 2,960—Dawson	Gen	Corp	20	6	122	7	344
Lexington Community Hosp	Gen	Corp	20	6	122	7	344
Lincoln 10,933—Lancaster	Gen	Church	100	20	290	60	2,200
Bryan Memorial Hosp	Gen	Church	100	20	290	60	2,200
Green Gables Dr. Benj. F.	Gen	Corp	11	4	20	111	604
Bailey Sanatorium	Gen	Corp	11	4	20	111	604
Lincoln General Hospital	Gen	City	104	92	342	92	3,112
Lincoln State Hospital	Gen	State	1,000			1,218	263
Nebraska Orthopedic Hosp	Gen	State	110			97	614
St. Elizabeth Hospital	Gen	Church	174	25	425	192	3,407
Veterans Admin. Facility	Gen	City	201			182	1,494
Loup City 1,440—Sherman	Gen	Indiv	10	4	35	6	217
Loup City Hospital	Gen	Indiv	10	4	35	6	217
Lynch 490—Boyd	Gen	Church	20	3	27	6	198
Sacred Heart Hospital	Gen	Church	20	3	27	6	198
McCook 6,688—Redwood	Gen	Church	70	10	76	22	810
St. Catherine of Siena Hosp	Gen	Church	70	10	76	22	810
Minden 1,710—Kearney	Gen	Indiv	12	10	60	7	224
Seeley Hospital	Gen	Indiv	12	10	60	7	224
Nebraska City 7,200—Otoe	Gen	Church	70	12	217	0	1,172
St. Mary's Hospital	Gen	Church	70	12	217	0	1,172
Norfolk 10,717—Madison	Gen	Church	60	10	148	96	1,000
Lutheran Hospital	Gen	Church	60	10	148	96	1,000
Norfolk State Hospital	Gen	State	1,000			1,000	115
Our Lady of Lourdes Hosp	Gen	Church	32	6	52	12	400
Verges Sanitarium	Gen	Indiv	70	2	19	22	390
North Platte 12,061—Lincoln	Gen	Church	50	10	110	31	1,000
St. Mary Hospital	Gen	Church	50	10	110	31	1,000
Oakland 1,433—Bart	Gen	Indiv	10	3	50	4	200
Oakland Community Hosp	Gen	Indiv	10	3	50	4	200
Omaha 214,006—Douglas	Gen	Church	188	12	282	95	3,680
Bishop Clarkson Memorial Hospital	Gen	Church	188	12	282	95	3,680
Crelighton Memorial St. Joseph's Hospital	Gen	Church	372	23	844	226	7,600
Douglas County Hospital	Gen	County	412	12	57	310	1,063
Douglas County Psychiatric Hospital	Gen	County	412	12	57	310	1,063
Immanuel Deaconess Insti	Gen	Church	120	26	72	91	4,473
tute	Gen	Church	120	26	72	91	4,473
Lutheran Hospital	Gen	Church	111	10	207	14	1,841
Nebraska Methodist Episcopal Hospital	Gen	Church	170	20	424	110	4,406
Nicholas Senn Hospital	Gen	NP Assn	40	12	170	70	4,320
St. Catherine's Hospital	Gen	Church	100	20	407	84	3,708
Station Hospital	Gen	Army	8		2	2	110
University of Nebraska Hos	Gen	State	210	20	497	181	3,442
pital	Gen	State	210	20	497	181	3,442
Ord 2,226—Valley	Gen	Indiv	15	2	18	8	912
Ord Hospital	Gen	Indiv	15	2	18	8	912
Oxford 1,150—Furnas	Gen	Corp	14	5	43	5	218
Oxford General Hospital	Gen	Corp	14	5	43	5	218
Pawnee City 1,000—Pawnee	Gen	Indiv	26	4	80	19	661
Pawnee Hospital	Gen	Indiv	26	4	80	19	661
Scott Bluff 8,460—Scotts Bluff	Gen	Indiv	26	6	57	18	827
Scotts Bluff Hospital	Gen	Indiv	26	6	57	18	827
West Nebraska Methodist Episcopal Hospital	Gen	Church	60	12	241	37	1,600
Seward 2,700—Seward	Gen	Part	25	5	31	10	392
Seward Clinic Hospital	Gen	Part	25	5	31	10	392
Seward Hospital	Gen	Indiv	10	6	33	4	151
Sidney 3,300—Cheyenne	Gen	Indiv	12	4	54	6	313
Roche Hospital	Gen	Part	20	5	51	4	240
Taylor Hospital	Gen	Part	20	5	51	4	240
Stuart 703—Holt	Gen	Indiv	20	3	40	12	450
Willon Hospital	Gen	Indiv	20	3	40	12	450
Valentine, 1,672—Cherry	Gen	Indiv	18	4	30	8	440
General Hospital	Gen	Indiv	18	4	30	8	440

## NEBRASKA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Wahoo 2,600—Saunders	Gen	Indiv	10	4	71	10	503
Community Hospital	Gen	Indiv	10	4	71	10	503
Wamego, 653—Thurston	Gen	IA	71	9	92	30	962
Wamego Indian Hospital	Gen	IA	71	9	92	30	962
York, 5,712—York	Gen	Church	60	10	95	20	767
Lutheran Hospital	Gen	Church	60	10	95	20	767
Related Institutions							
Atkinson 1,144—Holt	Gen	Indiv	10	2	14	2	89
Atkinson General Hospital	Gen	Indiv	10	2	14	2	89
Avell 320—Kearney	Gen	Church	100			144	21
Bethphage Inner Mission	Gen	Church	100			144	21
Beatrice 10,297—Gage	Gen	State	1,373			1,319	130
Nebraska Institution for the Feeble-minded	Gen	State	1,373			1,319	130
Beemer, 571—Cuming	Gen	Indiv	10	2	11	1	49
Beemer Hospital	Gen	Indiv	10	2	11	1	49
Dalton 403—Cheyenne	Gen	Indiv	10	3	30	3	142
Pioneer Memorial Hospital	Gen	Indiv	10	3	30	3	142
Farnam 394—Dawson	Gen	Indiv	12	3	46	4	481
Reeves Memorial Hospital	Gen	Indiv	12	3	46	4	481
Fremont 11,407—Dodge	Gen	Church	25	9	148	13	774
Lutheran Good Samaritan Hospital	Gen	Church	25	9	148	13	774
Friend 1,214—Salline	Gen	City	15	4	60	4	1,020
Warren Memorial Hospital	Gen	City	15	4	60	4	1,020
Geneva 1,662—Fillmore	Gen	Indiv	15	6	No data supplied		
Geneva General Hospital	Gen	Indiv	15	6	No data supplied		
Genoa 1,089—Nance	Gen	Part	4	3	29	2	121
Emergency Hospital	Gen	Part	4	3	29	2	121
Hastings 15,490—Adams	Gen	Indiv	10	2	2	3	100
Dr. Lgbert Hospital	Gen	Indiv	10	2	2	3	100
Hebron 1,804—Thayer	Gen	Indiv	20	5	49	10	416
Blue Valley Hospital	Gen	Indiv	20	5	49	10	416
Kimball 1,711—Kimball	Gen	Part	10	4	No data supplied		
Kimball Hospital	Gen	Part	10	4	No data supplied		
Lincoln 70,983—Lancaster	Inst	State	22			6	364
Nebraska State Penitentiary Hospital	Inst	State	22			6	364
Milford 832—Seward	Inst	State	12	11	43	6	45
Nebraska Industrial Home	Inst	State	12	11	43	6	45
Nebraska Soldiers and Sailors Home Hospital	Inst	State	58			48	60
Odell 4,200—Gage	Gen	Indiv	9	3	33	5	209
Odell General Hospital	Gen	Indiv	9	3	33	5	209
Omaha 214,006—Douglas	Mat	Church	71	18	108	43	120
Salvation Army Booth Memorial Hospital	Mat	Church	71	18	108	43	120
Orchard 500—Antelope	Gen	Indiv	10	3	3	2	100
Orchard Hospital	Gen	Indiv	10	3	3	2	100
Plainview 1,216—Pierce	Gen	NP Assn	8	1	13	2	158
Plainview General Hospital	Gen	NP Assn	8	1	13	2	158
Stratton 663—Hitchcock	Gen	Indiv	13	1	11	2	158
Dr. Stewart's Private Hosp	Gen	Indiv	13	1	11	2	158
Sutherland 703—Lincoln	Gen	NP Assn	8	1	20	3	150
Sutherland Hospital	Gen	NP Assn	8	1	20	3	150
Sutton 1,540—Clay	Gen	Indiv	12	2	22	3	160
Sutton Hospital	Gen	Indiv	12	2	22	3	160
Tecumseh 1,804—Johnson	Gen	Indiv	10	2	20	3	172
Tecumseh Hospital	Gen	Indiv	10	2	20	3	172
Tilden 1,106—Madison	Gen	Indiv	10	2	0	3	124
Tilden Hospital	Gen	Indiv	10	2	0	3	124
Walsh 1,162—Thurston	Gen	Indiv	12	4	4	2	74
Dr. Picotte Memorial Hosp	Gen	Indiv	12	4	4	2	74
Westpoint 2,220—Cuming	Inst	Gen Church	16	2	45	9	355
St. Joseph Home and Hosp	Inst	Gen Church	16	2	45	9	355

## Summary for Nebraska

Hospitals and Sanatoriums	Number	Beds	Average Census	Admissions
Related institutions	72	8,044	6,690	76,567
Totals	27	1,931	1,647	5,004
Refused registration	19	410		

## NEVADA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Last Ely 600—White Pine	Gen	NP Assn	40	7	83	15	775
Stephens Valley Hospital	Gen	NP Assn	40	7	83	15	775
Elko 3,217—Elko	Gen	County	48	8	97	20	704
Elko General Hospital	Gen	County	48	8	97	20	704
Lily 3,040—White Pine	Gen	County	50	4	33	21	634
White Pine County and General Hospital	Gen	County	50	4	33	21	634
Las Vegas 5,160—Clark	Gen	Corp	31	11	164	22	1,063
Las Vegas Hospital	Gen	Corp	31	11	164	22	1,063
Reno 15,020—Washoe	Gen	State	346			366	92
Nevada State Hospital for Mental Diseases	Gen	State	346			366	92
St. Mary's Hospital	Gen	Church	54	12	241	50	1,817
Washoe General Hospital	Gen	County	190	17	377	143	2,772
Schurz 7—Mineral	Gen	IA	24	3	33	18	300
Walker River Indian Hosp	Gen	IA	24	3	33	18	300
Stewart 412—Ormsby	Gen	IA	25	4	20	23	293
Carson Indian Hospital	Gen	IA	25	4	20	23	293



## NEVADA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Tonopah 2,115—Nye Tonopah Mines Hospital	Gen	NPAasn	20	4	28	12	350
Winnemucca 1959—Humboldt Humboldt County General Hospital	Gen	County	53	5	60	20	694
<b>Related Institutions</b>							
Eureka 600—Eureka Eureka County Hospital	Gen	County	10		3	7	21
Hawthorne 750—Mineral Mineral County Hospital	Gen	County	18	2	10	10	87
Owyhee 25—Elko Western Shoshone Indian Agency Hospital	Gen	IA	20	2	21	8	190
Stewart 412—Ormsby Carson Indian School Hosp	Inst	IA	30			15	437
Yerington 1,000—Lyon Lyon County Hospital	InstGen	County	16			12	60

## Summary for Nevada

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	11	902	711	9,210
Related institutions	5	96	59	800
<b>Totals</b>	<b>16</b>	<b>998</b>	<b>770</b>	<b>10,010</b>
Refused registration	0			

## NEW HAMPSHIRE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Berlin 20 018—Coos St Louis Hospital	Gen	Church	70	10	105	51	1,043
Claremont 12 377—Sullivan Claremont General Hospital	Gen	NPAasn	59	11	182	40	1,179
Concord 20 298—Merrimack Margaret Pillsbury General Hospital	Gen	NPAasn	134	18	200	60	1,988
New Hampshire Memorial Hospital	Gen	NPAasn	44	11	238	39	893
New Hampshire State Hospital	Ment	State	2,180		2,091	601	
Dover 13 573—Strafford Wentworth Hospital	Gen	City	69	15	204	40	1,504
East Derry 390—Rockingham Alexander Eastman Hosp	Gen	NPAasn	23	6	58	9	316
Epping 16,2—Rockingham Mitchell Memorial Hosp	Gen	County	37	7	32	14	461
Exeter 4 872—Rockingham Exeter Hospital	Gen	NPAasn	40	12	241	39	1,200
Franklin 6 576—Merrimack Franklin Hospital	Gen	NPAasn	37	8	116	22	715
Glencliff 118—Grafton New Hampshire State Sanat	TB	State	140			107	74
Grasmere 200—Hillsboro Hillsborough County Gen	Gen	County	136	10	230	107	1,930
Hanover 3 043—Grafton Mary Hitchcock Memorial Hospital	Gen	NPAasn	184	12	279	130	4,447
Keene 13 794—Cheshire Elliot Community Hosp	Gen	NPAasn	76	14	209	63	2,137
Laconia 12 471—Belknap Laconia Hospital	Gen	Corp	80	25	298	12	2,286
Lancaster 2 887—Coos Lancaster Hospital	Gen	NPAasn	18	6	74	12	419
Littleton 4 558—Grafton Littleton Hospital	Gen	NPAasn	55	8	70	16	540
Manchester 76 834—Hillsboro Balch Hospital	Unit of Elliot Hospital						
Elliot Hospital	Gen	NPAasn	122	32	358	83	2,857
Lucy Hastings Hospital	Gen		20	6	7	17	342
Notre Dame de Lourdes Hospital	Gen	Church	80	10	218	62	1,852
Our Lady of Perpetual Help Maternity Hospital	Mat	Church	22	19	287	10	302
Sacred Heart Hospital	Gen	Church	70	1		55	2,419
Nashua 31 463—Hillsboro Nashua Memorial Hosp	Gen	NPAasn	84	16	249	67	2,111
St Joseph's Hospital	Gen	Church	92	13	224	50	1,813
New London 812—Merrimack New London Hospital	Gen	NPAasn	15	6	20	8	261
Newport 4 609—Sullivan Carrie F Wright Hospital	Gen	NPAasn	20	7	66	11	275
North Conway 1 600—Carroll Memorial Hospital	Gen	NPAasn	40	10	98	25	774
Pembroke (Suncook P O)—Merrimack Pembroke Sanatorium	TB	Corp	106			63	103
Peterborough 2 521—Hillsboro Peterborough Hospital	Gen	NPAasn	30	9	90	20	572
Plymouth 2 470—Grafton Emily Balch and Soldiers and Sailors Memorial Hosp	Gen	NPAasn	34	8		19	760
Portsmouth 14 490—Rockingham Portsmouth Hospital	Gen	NPAasn	92	18	293	61	1,408
U S Naval Hospital	Gen	Navy	100			23	315
Rochester 10 209—Strafford Frisbie Memorial Hospital	Gen	NPAasn	30	8	206	22	1,264

## NEW HAMPSHIRE—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Whitefield 1 693—Coos Morrison Hospital	Gen	NPAasn	58	8	37	12	369
Wolfeboro, 2 355—Carroll Huggins Hospital	Gen	NPAasn	30	6	94	23	847
Woodsville 1 500—Grafton Cottage Hospital	Gen	NPAasn	36	8	110	16	683
<b>Related Institutions</b>							
Epping 1 672—Rockingham Rockingham County Farm Hospital	Inst	County	100			23	470
Exeter 4 872—Rockingham Lamont Infirmary	Inst	NPAasn	03			8	613
Laconia 12 471—Belknap Laconia State School	McDe	State	616			575	109
Lebanon 7 073—Grafton Alice Peck Day Memorial Hospital	Gen	NPAasn	18	6	71	6	217
Manchester 76 834—Hillsboro Manchester Isolation Hosp	Iso	City	67			10	142
Portsmouth 14 490—Rockingham Mark H Wentworth Home for Chronic Invalids	Inc	NPAasn	50			43	16
Tilton, 1 712—Belknap New Hampshire Soldiers Home	Inst	State	20			7	57
West Stewartstown 300—Coos Coos County Hospital	Gen	County	36	4	40	24	490
Woodsville 1 500—Grafton Grafton County Hospital	Gen	County	30	4	20	27	222

## Summary for New Hampshire

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	37	4,333	3,064	39,990
Related institutions	9	990	793	2,352
<b>Totals</b>	<b>46</b>	<b>5,323</b>	<b>4,857</b>	<b>42,377</b>
Refused registration	0			

## NEW JERSEY

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Allentown 706—Monmouth Dr Farmer's Private Hosp	Gen	Indiv	25	6	37	18	604
Allenwood 166—Monmouth Allenwood Sanatorium and Monmouth County Hospital for Tuberculosis	TB	County	100			98	106
Atlantic City 66 198—Atlantic Atlantic City Hospital	Gen	NPAasn	231	40	969	190	6,790
Children's Seashore House at Atlantic City for Invalid Children	Orth	NPAasn	370			180	2,420
Bayonne 88 970—Hudson Bayonne Hospital and Dispensary	Gen	NPAasn	190	30	401	154	4,687
Sweeney Sanatorium	Gen	Indiv	16	6	01	5	239
Beach Haven 715—Ocean Seashore Branch of Babies Hospital	Unit of Babies Hospital						
Belle Mead 51—Somerset Belle Mead Sanatorium and Farm	N&M	Corp	60			44	82
Belleville 26 974—Essex Essex County Hospital for Contagious Diseases	Iso	County	540			148	2,177
Bernardsville 3 336—Somerset Shannon Lodge	Conv	Corp	30			12	80
Bound Brook 7 372—Somerset Bound Brook Hospital	Gen	NPAasn	30	10	50	17	460
Bridgeton 15 609—Cumberland Bridgeton Hospital	Gen	NPAasn	89	16	260	52	1,503
Browns Mills 313—Burlington Deborah Sanatorium	TB	NPAasn	56			43	61
Camden 118 700—Camden Bellevue Hospital	Gen	Corp	30	10	114	20	207
Cooper Hospital	Gen	NPAasn	310	60	1,491	286	8,211
Marion Childs Hospital for Children	Unit of West Jersey Homeopathic Hospital						
West Jersey Homeopathic Hospital	Gen	NPAasn	240	55	1,122	141	5,613
Cedar Grove 1 887—Essex Essex County Hospital	Ment	County	2,484			2,386	561
Dover 10 031—Morris Dover General Hospital	Gen	NPAasn	83	16	429	53	1,782
Dumont 2,861—Bergen Dumont Private Hospital	Gen	Indiv	17	5	36	5	1,000
East Orange 68 020—Essex East Orange General Hospital	Gen	NPAasn	95	20	567	73	3,311
Elizabeth 114 589—Union Alexian Brothers Hospital	Gen	Church	160			112	2,266
Elizabeth General Hospital and Dispensary	Gen	NPAasn	226	33	1,006	165	6,234
St Elizabeth Hospital	Gen	Church	218	44	802	173	5,114
Englewood 17,803—Bergen Englewood Hospital	Gen	NPAasn	196	42	787	147	5,740

Key to symbols and abbreviations is on page 933

## NEW JERSEY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Ft Hancock—Monmouth Station Hospital	Gen	Army	52		4	14	523
Franklin 416—Sussex	Gen	NPAssn	26	6	61	15	630
Freehold 684—Monmouth	Gen	Indiv	25	6		8	
Grechold Hospital	Gen	Indiv	25	6		8	
Glen Gardner 554—Hunterdon	TB	State	404			4.8	367
New Jersey State Sanat +	TB	State	404			4.8	367
Greenloch 245—Camden	Gen	County	165			161	1,214
Camden County Gen Hosp	Gen	County	165			161	1,214
Camden County Hospital for Mental Diseases	Ment	County	700			720	211
Lakeland Sanatorium	IB	County	240			220	251
Greystone Park—Morris	Gen	State	5,362			5,328	14,414
New Jersey State Hosp +	Ment	State	5,362			5,328	14,414
Hackensack 24 568—Bergen	Gen	NPAssn	250	42	1,104	227	7,907
Hackensack Hospital +	Gen	NPAssn	250	42	1,104	227	7,907
Hasbrouck Heights 5 658—Bergen	Gen	NPAssn	31			21	526
Hasbrouck Heights Hospital	Gen	NPAssn	31			21	526
Hoboken 59 961—Hudson	Gen	Church	400	30	442	230	6,454
St Mary Hospital +	Gen	Church	400	30	442	230	6,454
Irrington 56 732—Essex	Gen	City	96	17	363	69	2,301
Irrington General Hospital	Gen	City	96	17	363	69	2,301
Jersey City 318 715—Hudson	Gen	City	206	21	634	193	4,872
Christ Hospital +	Gen	Church	206	21	634	193	4,872
Fairmount Hospital	Gen	NPAssn	70	12	166	35	1,100
Greenville Hospital +	Gen	NPAssn	60	16	149	40	804
Hudson County Tuberculosis Hospital +	TB	County	500			375	509
Jersey City Hospital +	Gen	City	1,200			1,039	27,859
Margaret Hague Maternity Hospital +	Mat	County	900	285	5,587	193	6,306
Psychopathic Hospital	Unit of	Jersey City Hospital	228	12	115	163	3,935
St Francis Hospital +	Gen	Church	228	12	115	163	3,935
Kearny (Arlington P O) 40 710—Hudson	Gen	NPAssn	66	14	236	44	1,825
West Hudson Hospital	Gen	NPAssn	66	14	236	44	1,825
Lakehurst 947—Ocean	Gen	Navy	44	3	12	4	318
U S Naval Dispensary and Family Hospital	Gen	Navy	44	3	12	4	318
Lakewood 5 000—Ocean	Gen	NPAssn	76	11	136	41	1,430
Paul Kimball Hospital	Gen	NPAssn	76	11	136	41	1,430
Long Branch 18 390—Monmouth	Gen	NPAssn	95	30	234	72	2,555
Dr E O Hazard Hospital	Gen	NPAssn	95	30	234	72	2,555
Monmouth Memorial Hospital +	Gen	NPAssn	181	30	643	139	4,974
Lyons—Somerset	Ment	Yet	1,034			1,032	341
Veterans Admin Facility	Ment	Yet	1,034			1,032	341
Marlboro 500—Monmouth	Ment	State	2,311			2,189	708
New Jersey State Hospital +	Ment	State	2,311			2,189	708
Metuchen 5 748—Middlesex	TB	County	221			213	297
Roosevelt Hospital	TB	County	221			213	297
Midland Park 3 638—Bergen	N&M	NPAssn	180			156	270
Christian Sanatorium	N&M	NPAssn	180			156	270
Millville 14 750—Cumberland	Gen	NPAssn	37	6	165	30	1,083
Millville Hospital	Gen	NPAssn	37	6	165	30	1,083
Montclair 42 017—Essex	Gen	NPAssn	56	20	269	38	1,606
Montclair Community Hosp	Gen	NPAssn	56	20	269	38	1,606
Mountainside Hospital +	Gen	NPAssn	322	42	768	188	6,887
St Vincent's Hospital	Gen	Church	46	15	185	28	1,017
Morristown 16 197—Morris	Gen	Church	109	25	393	70	2,182
All Souls Hospital +	Gen	Church	109	25	393	70	2,182
Morristown Memorial Hosp +	Gen	NPAssn	130	20	244	84	2,860
Shonghum Mountain Sanat	TB	County	52			52	42
Mt Holly 6 543—Burlington	Gen	NPAssn	123	18	475	92	2,815
Burlington County Hosp +	Gen	NPAssn	123	18	475	92	2,815
Neptune 2 258—Monmouth	Gen	NPAssn	199	25	622	135	4,903
Fittin Memorial Hospital +	Gen	NPAssn	199	25	622	135	4,903
Newark 442 337—Essex	Chil	NPAssn	60			37	990
Babies Hospital Coit Memorial	Chil	NPAssn	60			37	990
Columbus Hospital	Gen	NPAssn	58	15	236	33	1,664
Community Hospital (col)	Gen	NPAssn	30	4	14	25	428
Hospital and Home for Crippled Children	Orth	NPAssn	110			75	448
Hospital of St Barnabas and for Women and Children	Gen	Church	250	47	470	122	3,737
Newark Beth Israel Hosp +	Gen	NPAssn	881	74	1,573	373	11,828
Newark City Hospital +	Gen	City	700	40	1,874	665	17,355
Newark Eye and Ear Infirmary +	ENT	NPAssn	69			35	2,411
Newark Memorial Hospital +	Gen	NPAssn	133	30	461	75	2,937
Presbyterian Hospital +	Gen	NPAssn	214	53	982	205	7,245
St James Hospital +	Gen	Church	104	21	417	64	2,654
St Michael's Hospital +	Gen	Church	318	25	490	225	6,090
New Brunswick 34 555—Middlesex	Gen	NPAssn	102	25	389	65	2,354
Middlesex General Hospital +	Gen	NPAssn	102	25	389	65	2,354
St Peter's General Hosp +	Gen	Church	166	34	603	107	4,323
New Lisbon 213—Burlington	TB	County	120			107	106
Fairview Sanatorium	TB	County	120			107	106
Newton 5 401—Sussex	Gen	NPAssn	42	9	151	37	1,110
Newton Memorial Hospital	Gen	NPAssn	42	9	151	37	1,110
Northfield 2 804—Atlantic	Ment	County	400			341	222
Atlantic County Hospital for Mental Diseases	Ment	County	400			341	222
Atlantic County Hospital for Tuberculous Diseases (Pine Rest Sanatorium)	TB	County	50			40	53
Oceanport 1 852—Monmouth	Gen	Army	56	4	14	22	768
Station Hospital	Gen	Army	56	4	14	22	768

## NEW JERSEY—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Orange 35 399—Essex	Gen	NPAssn	36			30	401
New Jersey Orthopaedic Hospital and Dispensary +	Orth	NPAssn	325	75	1,127	228	8,063
Orange Memorial Hosp +	Gen	NPAssn	150	26	504	69	2,500
St Mary's Hospital +	Gen	Church	150	26	504	69	2,500
Passaic 62 050—Passaic	Gen	NPAssn	67	14	276	35	1,497
Beth Israel Hospital	Gen	NPAssn	200	25	676	148	4,506
Passaic General Hospital +	Gen	NPAssn	214	36	990	125	5,329
St Mary's Hospital +	Gen	Church	214	36	990	125	5,329
Paterson 138 513—Passaic	Gen	NPAssn	116	29	587	98	3,501
Nathan and Miriam Barnert Memorial Hospital +	Gen	NPAssn	271	49	926	230	6,872
Paterson General Hospital +	Gen	NPAssn	400	47	951	230	7,040
St Joseph's Hospital +	Gen	Church	229			226	238
Valley View Sanatorium	TB	County	229			226	238
Perth Amboy 43 516—Middlesex	Gen	NPAssn	161	18	668	145	5,335
Perth Amboy General Hosp +	Gen	NPAssn	161	18	668	145	5,335
Phillipsburg 19 955—Warren	Gen	NPAssn	75	10	208	44	1,567
Warren Hospital	Gen	NPAssn	75	10	208	44	1,567
Pinevald (Bayville P O)—Ocean	Gen	NPAssn	85	6	43	18	501
Royal Pines Hospital	Gen	NPAssn	85	6	43	18	501
Plainfield 34 422—Union	Gen	NPAssn	241	35	1,032	171	6,462
Muhlenberg Hospital +	Gen	NPAssn	241	35	1,032	171	6,462
Point Pleasant 2 058—Ocean	Gen	NPAssn	26	10	100	18	564
Point Pleasant Hospital	Gen	NPAssn	26	10	100	18	564
Prentiss (Paterson P O)—Passaic	Gen	County	123			97	1,095
Hopedell County Welfare Hospital	Gen	County	123			97	1,095
Princeton 6 992—Mercer	Gen	NPAssn	57	13	121	41	1,095
Princeton Hospital	Gen	NPAssn	57	13	121	41	1,095
Rahway 16 011—Union	Gen	NPAssn	80	20	297	53	1,943
Rahway Hospital	Gen	NPAssn	80	20	297	53	1,943
Red Bank 11 622—Monmouth	Gen	NPAssn	29	10	138	16	688
Riverview Hospital	Gen	NPAssn	29	10	138	16	688
Ridgewood 12 188—Bergen	TbIso	County	500			305	643
Bergen Pines Bergen County Hospital	TbIso	County	500			305	643
Riverside 4 000—Burlington	Gen	NPAssn	42	15	168	23	856
Zurbrugg Memorial Hospital	Gen	NPAssn	42	15	168	23	856
Salem 8 047—Salem	Gen	NPAssn	30	10	269	30	1,369
Salem County Memorial Hospital	Gen	NPAssn	30	10	269	30	1,369
Scotch Plains 3 600—Union	TB	County	407			355	379
Bonnie Burn Sanatorium	TB	County	407			355	379
Secaucus 8 950—Hudson	Gen	County	176			59	1,012
Hudson County Contagious Disease Hospital	Gen	County	176			59	1,012
Hudson County Hospital	Gen	County	282			226	418
Hudson County Hospital for Mental Diseases	Ment	County	1,659			1,555	314
Hudson County Tuberculosis Sanatorium	TbChil	County	207			207	191
Skillman 23—Somerset	Epil	State	1,559			1,518	171
New Jersey State Village for Epileptics	Epil	State	1,559			1,518	171
Somers Point 2 073—Atlantic	Gen	NPAssn	65	9	94	17	805
Atlantic Shores Hospital	Gen	NPAssn	65	9	94	17	805
Somerville 8 255—Somerset	Gen	NPAssn	96	20	482	76	2,477
Somerset Hospital +	Gen	NPAssn	96	20	482	76	2,477
South Amboy 8 476—Middlesex	Gen	NPAssn	35	6	131	18	1,057
South Amboy Memorial Hospital	Gen	NPAssn	35	6	131	18	1,057
Summit 14 556—Union	Nerv	Corp	42			29	144
Fair Oaks Sanatorium	Nerv	Corp	42			29	144
Overlook Hospital +	Gen	NPAssn	123	26	408	110	3,165
Sussex 1 415—Sussex	Gen	NPAssn	22	6	36	8	318
Alexander Linn Hospital	Gen	NPAssn	22	6	36	8	318
Tonawick 3 200—Bergen	Gen	Church	184	41	762	175	4,663
Holy Name Hospital +	Gen	Church	184	41	762	175	4,663
Trenton 123 356—Mercer	Gen	NPAssn	50	10	57	36	590
Charles Hospital	Gen	NPAssn	213	37	534	121	4,981
Mercer Hospital +	Gen	NPAssn	213	37	534	121	4,981
New Jersey State Hospital	Ment	State	2,850			2,888	793
Orthopaedic Hospital and Dispensary	Orth	NPAssn	45			24	215
St Francis Hospital +	Gen	Church	232	39	760	171	5,971
Trenton Municipal Hospital	TbIso	City	35			253	411
William McKinley Memorial Hospital +	Gen	NPAssn	123	25	429	92	2,950
Union City 58 659—Hudson	Gen	NPAssn	35	5	78	25	850
Union City General Hosp	Gen	NPAssn	35	5	78	25	850
Verona 7 161—Essex	TB	County	446			418	563
Essex Mountain Sanatorium	TB	County	446			418	563
Vineland 7 556—Cumberland	Gen	Corp	87	15	299	50	1,307
Newcomb Hospital	Gen	Corp	87	15	299	50	1,307
Weehawken (Union City P O) 14 485—Hudson	Gen	NPAssn	173	18	315	107	3,674
North Hudson Hospital +	Gen	NPAssn	173	18	315	107	3,674
Woodbury 8 172—Gloucester	Gen	Indiv	20	5	66	6	460
Brewer Hospital	Gen	Indiv	20	5	66	6	460
Underwood Hospital	Gen	NPAssn	69	20	231	35	1,602
Wrightstown 176—Burlington	Gen	Army	70	1	1	58	2,023
Station Hospital	Gen	Army	70	1	1	58	2,023

## Related Institutions

Atlantic City 66 198—Atlantic	Drug	Indiv	25			No data supplied	
Dr Leonard's Private Sanit	Drug	Indiv	40			2	53
Municipal Hospital	Indiv	City	40				
Bridgeton 15 609—Cumberland	Ment	County	300			243	63
Cumberland County Hospital for Insane	Ment	County	300			243	63

Key to symbols and abbreviations is on page 933

## NEW JERSEY—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Browns Mills 313—Burlington	TB	Corp	53			30	33
Browns Mills Nursing Cottage	TB	Indiv	39			35	18
Manor Nursing Cottage	TB	Indiv	33			25	23
Sycamore Hall Sanatorium	TB	Indiv					
Burlington 10 814—Burlington	Inst	Frat	30			30	160
Masonic Home							
Caldwell 5 144—Essex							
Theresa Grotta Home for Convalecents	CardConv	NPAasn	40			30	3.2
Camden 118 700—Camden							
Municipal Hospital for Contagious Diseases	Iso	City	100			21	369
Cranford 6 601—Union							
Brookside Nursing Home	Conv	Indiv	22			16	37
Farmingdale 623—Monmouth							
Tuberculosis Preventorium for Children	TB	NPAasn	225			165	628
Haddonfield 8 837—Camden							
Bancroft School	MeDe	NPAasn	100				12
Jamesburg 2 048—Middlesex							
New Jersey State Home for Boys	Inst	State	30			10	8.9
Jersey City 316 715—Hudson							
Salvation Army Door of Hope Home and Hospital	Mat	Church	8	6	49	6	83
Longport 223—Atlantic							
Betty Bacharach Home for Afflicted Children	Orth	Frat	100			40	76
Menlo Park, 330—Middlesex							
New Jersey Home for Disabled Soldiers	Inst	State	100			70	159
Morristown 15 197—Morris							
Aurora Institute	Conv	Corp	90			20	423
Newark 449 337—Essex							
Florence Crittenton Home	Mat	NPAasn	62	15	40	20	48
Newark City Almshouse	Inst	City	100			90	339
Newark Convalescent Hosp	Conv	City	100			139	99
New Brunswick 34 530—Middlesex							
Infirmiry of New Jersey College for Women	Inst	State	22			6	115
Rutgers Infirmiry	Inst	NPAasn	12			3	185
Newfoundland 600—Morris							
Idylse Sanatorium	TB	Corp	50			27	33
New Lisbon 213—Burlington							
Burlington County Hospital for the Insane	Ment	County	250			165	72
State Colony for Feeble-minded Males	MeDe	State	820			776	112
Northfield 2 804—Atlantic							
Atlantic County Hospital	Inst	County	120		No data supplied		
Ocean Grove 1 182—Monmouth							
Methodist Episcopal Home for Aged	Inst	Church	15			14	22
Passaic 62 909—Passaic							
Passaic Municipal Hosp	TbIso	City	20	2	No data supplied		
Paterson 138 513—Passaic							
Paterson City Hospital	TbIso	City	115			50	206
Princeton 6 992—Mercer							
Isabella McCosh Infirmiry of Princeton University	Inst	NPAasn	54			12	1 153
Rahway 16 011—Union							
New Jersey Reformatory Hospital	Inst	State	16			8	307
Roseland 1 008—Essex							
Mountain View Rest	N&M	Corp	23			20	100
Sea Isle City 850—Cape May							
Sea Isle Hospital and Training School	N&M	Corp	40			31	75
Totowa (Little Falls P O ) 4 600—Passaic							
North Jersey Training School	MeDe	State	670			534	74
Trenton, 123 356—Mercer							
New Jersey State Prison Hospital	Inst	State	42			26	591
State Home for Girls	Inst	State	40	3	26	44	514
Upper Montclair—Essex							
Montclair Sanitarium	Conv	Part	10			7	01
Vineland 7 556—Cumberland							
Maplehurst School	MeDe	Indiv	18		No data supplied		
New Jersey Memorial Home for Disabled Soldiers Sailors Marines and Their Wives and Widows	Inst	State	60			40	271
Training School at Vineland	MeDe	NPAasn	635			520	70
Vineland State School	MeDe	State	1 520			1 461	113
West Englewood 2 700—Bergen							
Englewood Sanitarium (Lynwood Lodge)	N&M	Corp	25			14	13
Woodbine 2 164—Cape May							
Woodbine Colony for Feeble-minded Males	MeDe	State	718			665	72
Summary for New Jersey							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	127	37 674	31 780	319 593			
	43	6 946	5 693	8 266			
Total	170	44 620	37 470	327 859			
Refused registration	9	196					

## NEW MEXICO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Albuquerque 26 570—Bernalillo							
Ahepa Silver District Sanat	TB	Frat	46			42	76
Albuquerque Indian Sanat	FB	IA	100			89	106
A T & S F Hospital	Indus	NPAasn	67			29	336
Children's Home and Hosp	Orth	NPAasn	32			12	200
Methodist Sanatorium	TB	Church	60			46	70
St Joseph Sanatorium and Hospital	G&TB	Church	170	16	333	70	9 910
Southwestern Presbyterian Sanatorium	G&TB	Church	144	12	291	85	1 914
U S Indian School Hosp	Gen	IA	66	8	63	48	1 084
Veterans Admin Facility	G&TB	Vet	250			233	1 831
Black Rock (Zuni P O ),—McKinley							
Zuni Sanatorium	Gen	IA	43	8	26	18	512
Carlsbad 3 708—Eddy							
St Francis Hospital	Gen	Church	40	7	171	27	1 002
Clayton 2 518—Union							
St Joseph Hospital	Gen	Church	20	5	17	5	186
Clovis 8 027—Curry							
A T & S F Hospital	Indus	NPAasn	42			19	303
Baptist Hospital	Gen	Church	19	4	1.5	11	800
Conchas Dam —San Miguel							
Conchas Dam Infirmary	Gen	Fed	24	2			New
Crownpoint 90—McKinley							
Eastern Navajo Hospital	Gen	IA	40	4	25	30	900
Dawson 2 000—Cofax							
Phelps Dodge Corporation Hospital	Gen	Corp	30	4	26	6	161
Deming 3 377—Luna							
Deming Ladies Hospital	Gen	NPAasn	20	3	17	7	200
Dulce 44—Rio Arriba							
Jicarilla Hospital	Gen	IA	25	5	12	14	170
Farmington 1 300—San Juan							
Yerev General Hospital	Gen	Indiv	20	5	15	10	200
San Juan Episcopal Indian Mission Hospital	Gen	Church	16	1	8	8	210
San Juan Hospital	Gen	NPAasn	20	4	37	5	509
Ft Bayard 1 000—Grant							
Veterans Admin Facility	G&TB	Vet	300			197	1 174
Ft Stanton 490—Lincoln							
U S Marine Hospital	TB	USPHS	244			173	167
Ft Wingate 14—McKinley							
Charles H Burke Hospital	Gen	IA	34	4	15	24	785
Gallup 5 992—McKinley							
St Mary's Hospital	Gen	Church	78	12	134	20	1 076
Gardiner 300—Colfax							
Gardiner Hospital	Indus	NPAasn	40			14	60
Hot Springs 1 336—Serra							
Carrie Tingley Hospital for Crippled Children	Orth	State	100			86	297
Virginia Ann Clinic and Hospital	Gen	Indiv	18	6	24	10	800
Las Vegas 4 719—San Miguel							
Las Vegas Hospital (Carpenter Memorial)	Gen	NPAasn	20	5	39	13	55
New Mexico State Hospital	Ment	State	800			789	210
St Anthony's Hospital	G&Or	Church	48	6	84	34	663
Mescalero 300—Otero							
Mescalero Apache Indian Hospital	Gen	IA	31	4	31	13	521
Raton 6 090—Colfax							
New Mexico Miners Hosp	Gen	State	52	5	60	11	547
Rehoboth 150—McKinley							
Rehoboth Mission Hospital	Gen	Church	31	10	87	20	600
Roswell 11 173—Chaves							
St Mary's Hospital	Gen	Church	50	8	183	22	930
Santa Fe 11 176—Santa Fe							
St Vincent Sanatorium and Hospital	G&TB	Church	100	11	100	57	1 397
U S Indian Hospital (Chas F Lummis Hospital)	Gen	IA	70	6	20	32	870
Santa Rita 1,500—Grant							
Santa Rita Hospital	Gen	Corp	30	10	80	10	510
Shiprock 120—San Juan							
Northern Navajo Hospital	Gen	IA	48	4	43	48	909
Silver City 3 519—Grant							
Swift Memorial Hospital	Gen	NPAasn	43	10	108	15	927
Socorro 2 008—Socorro							
State Tuberculosis Sanat	TB	State	60			59	60
Toadlena 49—San Juan							
Toadlena Hospital	Gen	IA	12			7	106
Tucumcari 4 143—Quay							
Tucumcari General Hospital	Gen	Indiv	30	6	23	10	440
Valmora 125—Mora							
Valmora Sanatorium	TB	NPAasn	70			42	107
Related Institutions							
Dixon 800—Rio Arriba							
Brooklyn Cottage Hospital	Gen	Church	11	6	93	8	290
Dulce 44—Rio Arriba							
Jicarilla Indian Sanatorium	TbChl	IA	56			42	53
Funice 100—Lea							
Funice Hospital	Gen	Indiv	9	2	42	3	154
Hobbs 505—Lea							
Hobbs General Hospital	Gen	Indiv	22	4	116	13	912
Lordsburg 2 069—Hidalgo							
Lordsburg Hospital	Gen	Corp	20	3	27	6	370
Los Lunas 313—Valencia							
New Mexico Home and Training School for Mental Defectives	MeDe	State	76			72	13
Portale 2 019—Roosevelt							
Bravell Ho pital	Gen	Indiv	10	2	No data supplied		

Key to symbols and abbreviations is on page 933

## NEW MEXICO—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
Santa Fe 1116—Santa Fe New Mexico Penitentiary Hospital	Inst	State	46			7	151
Springer, 957—Colfax Springer Hospital	Gen	Indiv	10	3		2	60
Taos 500—Taos Thomas P. Martin Hospital	Gen	IA	16	3	1	8	206
Tohatchi 2104—McKinley Tohatchi General Hospital	Cen	IA	20	3	26	20	470

## Summary for New Mexico

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	4	3,796	2,549	28,023
Related Institutions	11	290	180	2,910
Totals	56	4,091	2,729	30,942
Refu ed registration	3	56		

## NEW YORK

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
Albany 127-412—Albany Albany Hospital**	Gen	NP Assn	593	40	870	640	12,062
Anthony N. Brady Maternity Home**	Mat	Church	54	60	1,241	47	1,340
Child's Hospital	Chil	Church	60			47	510
Memorial Hospital**	Gen	NP Assn	120	16	251	95	2,649
St. Peter's Hospital**	Gen	Church	157			118	3,234
Albion 418—Orleans Arnold Gregory Memorial Hospital	Gen	NP Assn	24	11	109	10	540
Amityville 4,437—Suffolk Brunswick General Hospital	Gen	Corp	100	16	No data supplied		
Long Island Home	N&M	Corp	207			161	206
Louden Knickerbocker Hall	N&M	Part	170			110	227
Reed General Hospital	Gen	Indiv	17	3	18	14	493
Amsterdam 8187—Montgomery Amsterdam City Hospital**	Gen	NP Assn	70	15	206	52	1,560
Montgomery Sanatorium	TB	County	72			67	169
St. Mary's Hospital**	Gen	Church	100	22	303	69	1,066
Auburn 36 6-2—Cayuga Auburn City Hospital**	Gen	NP Assn	133	22	547	116	4,198
Mersey Hospital	Gen	Church	80	14	167	41	1,230
Balkton Spa 4,591—Saratoga Benedict Memorial Hospital	Gen	NP Assn	16	6	77	8	242
Batavia 17,350—Genesee Batavia Hospital	Gen	NP Assn	72	12	283	42	1,577
St. Jerome's Hospital	Gen	Church	60	15	278	40	1,443
Veterans Admin Facility	Gen	Vet	297			275	2,365
Bath 4 015—Steuben Bath Memorial Hospital	Gen	NP Assn	68	8	154	40	1,679
Veterans Admin Facility	Gen	Vet	403			338	2,032
Bay Shore 4 080—Suffolk Dr. King's Hospital	Gen	Indiv	30	8	50	18	50
Southside Hospital	Gen	NP Assn	82	24	400	80	2,738
Beacon 11 933—Dutchess Craig House	N&M	Corp	77			50	64
Highland Hospital	Gen	NP Assn	40	10	146	23	800
Mattawauk State Hospital	Ment	State	1,425			1,415	129
Bedford Hills 1 000—Westchester Montefiore Hospital Country Sanatorium**	TB	NP Assn	230			928	207
Binghamton 76 662—Broome Binghamton City Hosp **	Gen	City	460	40	911	307	8,452
Binghamton State Hosp **	Ment	State	2,940			2,764	531
Our Lady of Lourdes Memorial Hospital	Cen	Church	79	22	281	45	1,625
Brentwood 134—Suffolk Pilgrim State Hospital	Ment	State	8,860			8,403	1,487
Ross Sanatorium	Gen	Indiv	30	2	24	18	181
Bronxville 6 387—Westchester Lawrence Hospital	Gen	NP Assn	86	20	301	63	2,126
Brooklyn 2 560-401—Kings Adelphi Hospital	Gen	Indiv	80	16	23	51	1,915
Bay Ridge Hospital	Gen	Corp	75	20	517	41	1,978
Bensonhurst Maternity Hosp	Mat	Corp	24	26	45	13	478
Bethany Deaconess Hosp	Gen	Church	81	20	390	38	1,806
Beth El Hospital**	Gen	NP Assn	190	50	1,470	106	6,871
Beth Moses Hospital**	Gen	NP Assn	194	30	1,470	140	4,750
Boro Park General Hospital	Gen	Indiv	70	30	571	30	1,597
Brooklyn Cancer Institute**	Unit of Kings County Hospital						
Brooklyn Eye and Ear Hospital	ENT	NP Assn	143			76	8,032
Brooklyn Hospital**	Gen	NP Assn	366	44	1,127	206	8,200
Brooklyn State Hospital	Ment	State	2,780			2,690	2,042
Brooklyn Thoracic Hospital	TB	NP Assn	123			118	144
Brooklyn Women's Hospital	Mat	NP Assn	42	40	1,033	30	1,344
Bushwick Hospital**	Gen	NP Assn	105	20	500	69	2,915
Caledonian Hospital**	Gen	NP Assn	100	30	337	61	2,163
Car on C. Peck Memorial Hospital	Gen	NP Assn	92	33	799	67	2,203
Coney Island Hospital**	Gen	City	307	20	914	276	9,113
Crown Heights Hospital	Gen	Corp	143	20	700	120	3,200
Cumberland Hospital**	Gen	City	284	34	1,020	267	8,108
Evangelical Deaconess Hosp	Gen	Church	100	20	411	50	1,325
Et Hamilton Station Hosp	Gen	Army	50			19	377
Greenpoint Hospital**	Gen	City	265	30	1,191	201	8,701

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
Harbor Hospital	Gen	NP Assn	53	11	No data supplied		
Hospital of the Holy Family	Gen	Church	62			62	1,662
House of St. Giles the Cripple	Orth	Church	30			39	103
Israel Zion Hospital**	Gen	NP Assn	300	100	3,320	296	9,778
Jewish Hospital**	Gen	NP Assn	547	114	2,068	390	12,204
Jewish Sanitarium and Hospital for Chronic Diseases	Chr	NP Assn	520			403	156
Kings County Hospital**	Gen	City	2,820	120	3,234	2,043	52,808
Kings County Avenue Hosp **	Gen	City	510			310	4,384
Kingsway Hospital	Gen	Indiv	22	10	149	8	305
Long Island College Hospital**	Gen	NP Assn	420	47	1,932	298	7,809
Lutheran Hospital	Gen	Church	90	22	583	55	3,348
Madison Park Hospital	Gen	Corp	103	37	1,043	78	2,703
Methodist Hospital**	Gen	Church	391	89	1,584	243	9,508
Midwood Hospital	Gen	Corp	55	21	456	39	1,511
Norwegian Lutheran Deaconess Home and Hosp **	Gen	Church	162	38	792	139	4,349
Prospect Heights Hospital**	Gen	NP Assn	175	39	577	84	2,836
Riverdale Hospital	Gen	Corp	40	36	402	12	649
St. Catherine's Hospital**	Gen	Church	260	53	1,260	222	7,951
St. Cecilia Hosp for Women	Mat	Church	56	50	616	22	612
St. Charles Hospital Orthopedic Clinic	Orth	Church	55			50	225
St. John's Hospital**	Gen	Church	204	30	607	178	4,781
St. Mary's Hospital**	Gen	Church	247	56	1,200	222	6,208
St. Peter's Hospital**	Gen	Church	203	23	422	103	2,904
Samaritan Hospital	Gen	Church	60	15	435	41	1,697
Shore Road Hospital	Gen	Corp	49	15	No data supplied		
Swedish Hospital	Gen	NP Assn	79	12	221	54	1,697
Trinity Hospital**	Gen	NP Assn	110	15	107	100	2,626
U. S. Naval Hospital**	Gen	Navy	508	7	27	257	2,673
Unity Hospital	Gen	NP Assn	209	39	843	137	4,537
Veterinary Memorial Hospital	Gen	NP Assn	60	21	468	39	1,605
Wade Hospital	Gen	Indiv	40	14	21	12	211
Williamsburgh Maternity Hospital	Mat	Indiv	65	55	977	28	1,175
Wyckoff Heights Hosp **	Gen	NP Assn	169	30	655	141	4,609
Buffalo 573 0-6—Erie Buffalo City Hospital**	Gen	City	1,025	38	677	862	10,543
Buffalo Columbus Hospital	Gen	NP Assn	120	10	171	83	2,245
Buffalo General Hosp **	Gen	NP Assn	446	29	720	339	10,565
Buffalo Hospital of the Sisters of Charity*	Gen	Church	200	24	500	137	4,083
Buffalo State Hospital**	Ment	State	2,224			2,083	562
Central Park Hospital	Gen	NP Assn	60	10	329	41	2,387
Children's Hospital**	MatChil	NP Assn	230	48	892	156	5,705
Deaconess Hospital**	Gen	NP Assn	198	41	1,046	157	6,130
Edward J. Meyer Memorial Hospital	See Buffalo City Hospital						
Emergency Hospital of the Sisters of Charity	Gen	Church	160			101	3,116
Lafayette General Hospital	Gen	NP Assn	66	17	280	32	1,520
Memorial Hospital	Gen	NP Assn	55	10	159	31	935
Mersey Hospital**	Gen	Church	164	34	941	152	4,037
Millard Fillmore Hosp **	Gen	NP Assn	309	73	1,707	188	6,712
Providence Retreat	N&M	Church	200			169	565
St. Mary's Infant Asylum and Maternity Hospital	Mat	Church	47	47	788	35	843
State Institute for the Study of Malignant Disease	SLCa	State	30			29	1,339
U. S. Marine Hospital	Gen	USPHS	70			63	815
Callicoon 850—Sullivan Callicoon Hospital	Gen	Indiv	12	4	50	6	206
Cambridge 1 762—Washington Mary McClellan Hospital	Gen	NP Assn	99	15	105	81	1,241
Canandaigua 7 541—Ontario Brigham Hall Hospital	N&M	Corp	80			57	74
Frederick Ferris Thompson Hospital	Gen	NP Assn	103	17	298	80	2,221
Veterans Admin Facility	Ment	Vet	1,115			800	513
Canastota, 4 230—Madison Canastota Memorial Hosp	Gen	City	22	6	80	12	490
Cassadaga, 480—Chautauqua Newton Memorial Hospital	TB	County	180			173	121
Castle Point 23—Dutchess Veterans Admin Facility	TB	Vet	470			469	673
Catskill 5 082—Greene Memorial Hospital of Greene County	Gen	County	51	12	100	48	1,450
Central Islip 670—Suffolk Central Islip State Hosp **	Ment	State	7,164			6,601	1,470
Central Valley 8 00—Orange Falkirk in the Ramapo	N&M	Corp	40			30	8
Cheango Bridge 260—Broome Broome County Tuberculosis Hospital	TB	County	120			90	81
Clifton Springs 1 810—Ontario Clifton Springs Sanitarium and Clinic**	Gen	NP Assn	205	8	79	121	2,480
Cold Spring 1 784—Putnam Julia L. Butterfield Memorial Hospital	Gen	NP Assn	20	5	39	11	433
Cohoes 23 226—Albany Cohoes Hospital	Gen	NP Assn	57	10	104	36	1,205
Cooperstown 2 909—Otsego Mary Imogene Bassett Hospital	Gen	NP Assn	90	10	143	71	1,877
Corning 15 777—Steuben Corning Hospital	Gen	NP Assn	110	20	445	56	2,820
Cornwall 1 910—Orange Cornwall Hospital	Gen	NP Assn	61	11	232	39	1,450

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Cortland 15 043—Cortland	Gen	NPAssn	133	21	411	95	3 023
Cortland County Hospital	Gen	NPAssn	17	6	77	11	403
Cuba 1 422—Allegany	Gen	NPAssn	1,144			990	140
Dannemora 3 348—Clinton	Gen	NPAssn	40	8	110	16	538
Dannemora State Hospital	Gen	NPAssn	32			21	42
Dansville 4 928—Livingston	Gen	NPAssn	41	11	91	21	729
Danville General Hospital	Gen	NPAssn	60	10	194	34	1 230
Delhi 1,840—Delaware	Gen	NPAssn	14	5	86	11	376
Delaware County Tuberculosis Sanatorium	Gen	NPAssn	20	5	26	5	135
Dobbs Ferry 5 741—Westchester	Gen	NPAssn	183	30	534	120	3 648
Dobbs Ferry Hospital	Gen	NPAssn	44			39	53
Dunkirk 17 802—Chautauqua	Gen	NPAssn	189	27	548	139	3 520
Brooks Memorial Hospital	Gen	NPAssn	116	30	564	71	2 766
Ellenville 3 280—Ulster	Gen	NPAssn	416			337	315
Veterans Memorial Hospital	Gen	NPAssn	114	20	476	91	3 412
Elizabethtown 636—Essex	Gen	NPAssn	16	6	59	6	213
Community House Hospital	Gen	NPAssn	66			42	679
Elmira 47 397—Chemung	Gen	NPAssn	274	78	1 416	108	6 490
Arnold Ogden Memorial Hospital	Gen	NPAssn	40	12	180	32	1 931
Chemung County Sanat	Gen	NPAssn	101	34	816	60	2 439
St Joseph's Hospital	Gen	NPAssn	83	4		31	700
Indecott 16 281—Broome	Gen	NPAssn	42			25	616
Ideal Hospital	Gen	NPAssn	145			50	1 948
Farmingdale 3 373—Nassau	Gen	NPAssn	29			14	474
Nassau County Sanatorium	Gen	NPAssn	36	11	274	23	1 510
Far Rockaway—Queens	Gen	NPAssn	128			50	60
St Joseph Hospital	Gen	NPAssn	97	20	231	48	1 643
Fillmore 488—Allegany	Gen	NPAssn	120	20	466	70	2 722
Genesee County Memorial Hospital	Gen	NPAssn	95	15	359	83	2 787
Fishers Island, 324—Suffolk	Gen	NPAssn	52			50	31
Station Hospital	Gen	NPAssn	102	20	302	68	2 290
Flushing—Queens	Gen	NPAssn	52	12	100	28	1 075
Flushing Hospital and Dispensary	Gen	NPAssn	65			39	49
Parsons Hospital	Gen	NPAssn	19	7	150	15	562
Physicians Hospital	Gen	NPAssn	170	9	88	145	2 310
Station Hospital	Gen	NPAssn	22	8	115	9	509
Ft Niagara (Youngstown P O)	Gen	NPAssn	16	5	105	11	357
Station Hospital	Gen	NPAssn	28	8	155	16	763
Ft Slocum—Westchester	Gen	NPAssn	200			176	99
Station Hospital	Gen	NPAssn	41			38	106
Ft Wadsworth (Staten Island P O)	Gen	NPAssn	2 228			2 414	481
Station Hospital	Gen	NPAssn	2,000			2 185	5 013
Fulton 12 462—Oswego	Gen	NPAssn	15	11	237	13	611
Albert Lindley Lee Memorial Hospital	Gen	NPAssn	30			6	485
Gabriels 200—Franklin	Gen	NPAssn	31	10	116	29	821
Sanatorium Gabriels	Gen	NPAssn	45			21	25
Geneva, 16 063—Ontario	Gen	NPAssn	162			150	120
Geneva General Hospital	Gen	NPAssn	44	10	150	28	1 050
Glen Cove 11 430—Nassau	Gen	NPAssn	104	16	234	54	2 330
North Country Community Hospital	Gen	NPAssn	103	15	257	76	3 152
Glens Falls 18 531—Warren	Gen	NPAssn	77	12	259	58	1 878
Glens Falls Hospital	Gen	NPAssn	25	6	154	23	1 073
Westmount Sanatorium	Gen	NPAssn	108			107	79
Gloversville 23 099—Fulton	Gen	NPAssn	2,000			2 185	5 013
Nathan Littauer Hospital	Gen	NPAssn	15	11	237	13	611
Goshen 2 591—Orange	Gen	NPAssn	30			6	485
Goshen Hospital	Gen	NPAssn	31	10	116	29	821
Interpines	Gen	NPAssn	45			21	25
Gouverneur 4 015—St Lawrence	Gen	NPAssn	162			150	120
Stephen B Van Duzee Hosp	Gen	NPAssn	44	10	150	28	1 050
Governors Island—New York	Gen	NPAssn	104	16	234	54	2 330
Station Hospital	Gen	NPAssn	103	15	257	76	3 152
Gowanda 3 042—Cattaraugus	Gen	NPAssn	25	6	154	23	1 073
Townsend Hospital	Gen	NPAssn	108			107	79
Granville 3 483—Washington	Gen	NPAssn	2,000			2 185	5 013
Emma Laing Stevens Hosp	Gen	NPAssn	15	11	237	13	611
Greenport 3 062—Suffolk	Gen	NPAssn	30			6	485
Eastern Long Island Hosp	Gen	NPAssn	31	10	116	29	821
Harrison 11 000—Westchester	Gen	NPAssn	45			21	25
St Vincent's Retreat	Gen	NPAssn	162			150	120
Hastings on Hudson 7 097—Westchester	Gen	NPAssn	44	10	150	28	1 050
Hastings Hillside Hosp	Gen	NPAssn	104	16	234	54	2 330
Helmuth 38—Erie	Gen	NPAssn	103	15	257	76	3 152
Gowanda State Homeopathic Hospital	Gen	NPAssn	25	6	154	23	1 073
Hempstead 12 650—Nassau	Gen	NPAssn	108			107	79
Meadowbrook Hospital	Gen	NPAssn	2,000			2 185	5 013
Mercy Hospital	Gen	NPAssn	15	11	237	13	611
Station Hospital	Gen	NPAssn	30			6	485
Herkimer 10 446—Herkimer	Gen	NPAssn	31	10	116	29	821
Herkimer Memorial Hosp	Gen	NPAssn	45			21	25
Holcomb 204—Ontario	Gen	NPAssn	162			150	120
Oak Mount Sanatorium	Gen	NPAssn	44	10	150	28	1 050
Holtsville 260—Suffolk	Gen	NPAssn	104	16	234	54	2 330
Suffolk Sanatorium	Gen	NPAssn	103	15	257	76	3 152
Hornell 16 250—Steuben	Gen	NPAssn	25	6	154	23	1 073
Bethesda Hospital	Gen	NPAssn	108			107	79
St James Mercy Hospital	Gen	NPAssn	2,000			2 185	5 013
Hudson 12,337—Columbia	Gen	NPAssn	15	11	237	13	611
Hudson City Hospital	Gen	NPAssn	30			6	485
Huntington 6 200—Suffolk	Gen	NPAssn	31	10	116	29	821
Huntington Hospital	Gen	NPAssn	45			21	25
Ilion 9 890—Herkimer	Gen	NPAssn	162			150	120
Ilion Hospital	Gen	NPAssn	44	10	150	28	1 050
Irrington 3 067—Westchester	Gen	NPAssn	104	16	234	54	2 330
Irrington House	Gen	NPAssn	103	15	257	76	3 152

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Ithaca 20 708—Tomplins	Gen	NPAssn	108	23	302	91	9 993
Hermann M Biggs Memorial Hospital	Gen	NPAssn	165	34	941	126	4 469
Tomplins County Memorial Hospital	Gen	NPAssn	260	60	1 627	224	8 366
Jamaica—Queens	Gen	NPAssn	41	12	106	19	909
Jamnic Hospital	Gen	NPAssn	644	12	1 580	565	13 682
Mary Immaculate Hosp	Gen	NPAssn	75	18	43	35	1 071
Memorial Hospital	Gen	NPAssn	100	15	46	75	3 500
Queens General Hospital	Gen	NPAssn	100	29	549	85	3 109
Van Wyck Hospital	Gen	NPAssn	8	2			New
Jamestown 45 155—Chautauqua	Gen	NPAssn	318	32	507	204	5 549
Jamestown General Hosp	Gen	NPAssn	318	32	507	204	5 549
Woman's Christian Association Hospital	Gen	NPAssn	318	32	507	204	5 549
Jefferson 484—Schoharie	Gen	NPAssn	318	32	507	204	5 549
Jefferson Hospital	Gen	NPAssn	318	32	507	204	5 549
Johnson City 13 567—Broome	Gen	NPAssn	318	32	507	204	5 549
Charles S Wilson Memorial Hospital	Gen	NPAssn	318	32	507	204	5 549
Katona 1 400—Westchester	Gen	NPAssn	318	32	507	204	5 549
Four Winds	Gen	NPAssn	318	32	507	204	5 549
Hillbourne Farms	Gen	NPAssn	318	32	507	204	5 549
Pinewood Sanatorium	Gen	NPAssn	318	32	507	204	5 549
Kings Park 1 067—Suffolk	Gen	NPAssn	318	32	507	204	5 549
Kings Park State Hosp	Gen	NPAssn	318	32	507	204	5 549
Kingston 25 088—Ulster	Gen	NPAssn	318	32	507	204	5 549
Benedictine Hospital (Our Lady of Victory Sanit)	Gen	NPAssn	318	32	507	204	5 549
Kingston Hospital	Gen	NPAssn	318	32	507	204	5 549
Dr C O Sahler Sanitarium	Gen	NPAssn	318	32	507	204	5 549
Ulster County Tuberculosis Hospital	Gen	NPAssn	318	32	507	204	5 549
Lackawanna 23 948—Frie	Gen	NPAssn	318	32	507	204	5 549
Moses Taylor Hospital	Gen	NPAssn	318	32	507	204	5 549
Our Lady of Victory Hosp	Gen	NPAssn	318	32	507	204	5 549
Lake Kashaqua 10—Franklin	Gen	NPAssn	318	32	507	204	5 549
Stony Wood Sanatorium	Gen	NPAssn	318	32	507	204	5 549
Lake Placid 2 930—Essex	Gen	NPAssn	318	32	507	204	5 549
Lake Placid General Hosp	Gen	NPAssn	318	32	507	204	5 549
Liberty 3 427—Sullivan	Gen	NPAssn	318	32	507	204	5 549
Malmondis Hospital	Gen	NPAssn	318	32	507	204	5 549
Workmen's Circle Sanat	Gen	NPAssn	318	32	507	204	5 549
Little Falls 11 105—Herkimer	Gen	NPAssn	318	32	507	204	5 549
Little Falls Hospital	Gen	NPAssn	318	32	507	204	5 549
Livingston 249—Columbia	Gen	NPAssn	318	32	507	204	5 549
Potts Memorial Hospital	Gen	NPAssn	318	32	507	204	5 549
Lockport 23 160—Niagara	Gen	NPAssn	318	32	507	204	5 549
Lockport City Hospital	Gen	NPAssn	318	32	507	204	5 549
Niagara Sanatorium	Gen	NPAssn	318	32	507	204	5 549
Long Beach 5 817—Nassau	Gen	NPAssn	318	32	507	204	5 549
Long Beach Hospital	Gen	NPAssn	318	32	507	204	5 549
Long Island City—Queens	Gen	NPAssn	318	32	507	204	5 549
Astoria Sanatorium	Gen	NPAssn	318	32	507	204	5 549
Boulevard Hospital	Gen	NPAssn	318	32	507	204	5 549
River Crest Sanitarium	Gen	NPAssn	318	32	507	204	5 549
St John's Long Island City Hospital	Gen	NPAssn	318	32	507	204	5 549
Lowville 3 424—Lewis	Gen	NPAssn	318	32	507	204	5 549
Lewis County General Hosp	Gen	NPAssn	318	32	507	204	5 549
Lyons 3 956—Wayne	Gen	NPAssn	318	32	507	204	5 549
Edward J Barber Hospital	Gen	NPAssn	318	32	507	204	5 549
Lyons Hospital	Gen	NPAssn	318	32	507	204	5 549
Malone 8 657—Franklin	Gen	NPAssn	318	32	507	204	5 549
Alice Hyde Memorial Hosp	Gen	NPAssn	318	32	507	204	5 549
Marcy 112—Oneida	Gen	NPAssn	318	32	507	204	5 549
Marcy State Hospital	Gen	NPAssn	318	32	507	204	5 549
Medina 6 071—Orleans	Gen	NPAssn	318	32	507	204	5 549
Medina Memorial Hospital	Gen	NPAssn	318	32	507	204	5 549
Middle Grove 260—Saratoga	Gen	NPAssn	318	32	507	204	5 549
Saratoga County Tuberculosis Hospital	Gen	NPAssn	318	32	507	204	5 549
Middletown 21 26—Orange	Gen	NPAssn	318	32	507	204	5 549
Elizabeth A Horton Memorial Hospital	Gen	NPAssn	318	32	507	204	5 549
Middletown Sanitarium and Hospital	Gen	NPAssn	318	32	507	204	5 549
Middletown State Homeopathic Hospital	Gen	NPAssn	318	32	507	204	5 549
Mineola 8 155—Nassau	Gen	NPAssn	318	32	507	204	5 549
Nassau Hospital	Gen	NPAssn	318	32	507	204	5 549
Monticello 3 450—Sullivan	Gen	NPAssn	318	32	507	204	5 549
Hamilton Avenue Hospital	Gen	NPAssn	318	32	507	204	5 549
Monticello Hospital	Gen	NPAssn	318	32	507	204	5 549
Mt Kisco 5 127—Westchester	Gen	NPAssn	318	32	507	204	5 549
Northern Westchester Hosp	Gen	NPAssn	318	32	507	204	5 549
Mt McGregor—Saratoga	Gen	NPAssn	318	32	507	204	5 549
Metropolitan Life Insurance Company Sanatorium	Gen	NPAssn	318	32	507	204	5

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
New Rochelle 51 000—Westchester	Gen	NPAssn	121	26	604	146	5 313
New Rochelle Hospital**	Gen	NPAssn	121	26	604	146	5 313
New York City 4 211 690—New York	Gen	NPAssn	102			106	3 428
Babies Hospital**	Child	NPAssn	100			65	2 012
Beekman Street Hospital*	Gen	NPAssn	100			65	2 012
Bellevue Hospital**	Gen	City	2 431	98	1 404	2 444	6 352
Beth David Hospital*	Gen	NPAssn	169	40	517	138	4 233
Beth Israel Hospital**	Gen	NPAssn	345	75	1 823	240	7 683
Black S Sanatorium	Gen	Corp	50	36	106	10	260
Broad Street Hospital	Gen	NPAssn	117	8	No data supplied		
Bronx Eye and Ear Infirmary	ENT	NPAssn	62			13	3 156
Bronx Hospital**	Gen	NPAssn	303	59	2 317	255	11 032
Bronx Maternity and Women's Hospital	Mat	NPAssn	30	34	646	18	719
Central and Neurological Hospital*	Neur	City	470			438	859
Charles B. Towns Hospital	Drug	Corp	50			15	575
Columbus Hospital*	Gen	Church	260	40	555	149	5 040
Columbus Hosp Extension	Gen	Church	100	15	256	67	1 593
Community Hospital	Gen	NPAssn	85	15	156	35	1 200
Concourse Hospital	Gen	Indiv	38	30	No data supplied		
Crotona Park Sanitarium	Gen	Corp	27	20	667	18	959
Doctors Hospital	Gen	NPAssn	275	60	612	116	3 556
Fitch Sanitarium	Gen	NPAssn	78	46	750	51	2 175
Flower Hospital Fifth Avenue Hospital**	Gen	NPAssn	301	63	1 099	254	8 440
Fordham Hospital**	Gen	City	558	61	1 288	471	14 148
Fordham Maternity Sanit	Mat	Indiv	10	10	140	4	155
French Hospital*	Gen	NPAssn	270	62	1 050	197	5 517
Gotham Hospital	Gen	Corp	101	24	294	36	1 744
Gouverneur Hospital*	Gen	City	174	29	302	161	3 924
Harlem Eye and Ear Hosp +	ENT	NPAssn	50			10	1 784
Harlem Hospital**	Gen	City	543	99	2 534	661	16 480
Herman Knapp Memorial Eye Hospital*	Eye	NPAssn	60			29	753
Hospital for Joint Diseases**	Gen	NPAssn	355			316	6 682
Hunts Point Hospital	Gen	Corp	90	27	521	48	1 991
Jewish Maternity Hospital	Unit of Beth Israel Hospital						
Jewish Memorial Hospital*	Gen	NPAssn	173	36	588	156	4 817
Knickbocker Hospital*	Gen	NPAssn	230	30	578	130	4 361
Lebanon Hospital**	Gen	NPAssn	139	15	241	90	2 423
Dr. Lef's Maternity Hosp	Mat	Indiv	35	35	468	14	514
Lenox Hill Hospital**	Gen	NPAssn	541	68	1 020	411	11 168
Le Roy Sanitarium	Gen	Corp	64	18	225	39	1 248
Lincoln Hospital**	Gen	City	331	37	1 584	397	9 740
Lutheran Hospital	Gen	NPAssn	120	26	538	97	3 220
Lying In Hospital*	Unit of New York Hospital						
Manhattan Eye, Ear and Throat Hospital*	ENT	NPAssn	212			140	16 130
Manhattan General Hosp *	Gen	Corp	226	22	422	124	4 499
Manhattan Maternity and Dispensary	Unit of New York Hospital						
Manhattan State Hospital	Ment	State	3 599			3 318	2 559
Medical Arts Center Hosp	Gen	Corp	131	18	236	84	3 174
Memorial Hospital for the Treatment of Cancer and Allied Diseases*	Ca	NPAssn	132			101	2 712
Metropolitan Hospital**	Gen	City	1 367	88	775	1 324	10 118
Midtown Hospital	Gen	NPAssn	60	10	35	40	2 497
Misericordia Hospital**	Gen	Church	246	67	1 141	152	4 630
Montefiore Hospital for Chronic Diseases**	Gen	NPAssn	714			689	1 744
Morrisania City Hospital**	Gen	City	471	68	1 144	471	13 180
Mother Cabrini Memorial Hospital	Sec	Columbus Hospital Extension					
Mt Eden Hospital	Gen	Indiv	40	30	472	27	1 442
Mt Sinai Hospital**	Gen	NPAssn	857			634	16 074
Murray Hill Hospital	Gen	Corp	73	8	83	38	1 771
Nazareth Hospital for Women and Children	TB	Church	250			247	383
Neurological Institute of New York**	Neur	NPAssn	216			147	3 243
New York City Cancer Institute Hospital*	Ca	City	192			187	1 049
New York City Hospital**	Gen	City	1 000	30	573	881	9 393
New York Eye and Ear Infirmary*	ENT	NPAssn	170			90	5 736
New York Foundling Hospital*	MatCh	Church	187	57	853	175	2 339
New York Hospital**	Gen	NPAssn	911	142	2 911	705	16 162
New York Infirmary for Women and Children**	Gen	NPAssn	126	41	846	85	3 543
New York Nursery and Childs Hospital	Unit of New York Hospital						
New York Ophthalmic Hospital	Unit of Flower Hosp Fifth Avenue Hosp						
New York Orthopaedic Dispensary and Hospital*	Orth	NPAssn	301			250	1 494
New York Polyclinic Medical School and Hospital**	Gen	NPAssn	329	37	841		8 722
New York Post Graduate Medical School and Hospital**	Gen	NPAssn	410			265	9 902
New York Society for the Relief of the Ruptured and Crippled*	Orth	NPAssn	250			171	3 635
New York State Psychiatric Institute and Hospital**	Ment	State	200			146	283
Park East Hospital	Gen	Corp	124	24	319	75	2 412
Parkway Hospital	Gen	Corp	75	10	321	35	1 790
Park West Hospital	Gen	Corp	68	12	191	35	2 200
Payne Whitney Psychiatric Clinic	Unit of New York Hospital						

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Presbyterian Hospital and Sloane Hospital for Women**	Gen	NPAssn	601	144	2 470	608	10 780
Psychiatric Pavilion of Bellevue Hospital	Unit of Bellevue Hospital						
Reconstruction Hospital	Unit of New York Post Graduate Medical School and Hospital						
Rikers Island Hospital	Gen	City	260			183	3 725
Riverside Hospital	TB	City	332			387	1 249
Roosevelt Hospital**	Gen	NPAssn	387			274	7 008
Royal Hospital	Gen	Indiv	110	42	No data supplied		
St Ann's Maternity Hosp	Unit of New York Foundling Hospital						
St Clare's Hospital	Gen	Church	152	30	445	88	2 390
St Elizabeth's Hospital	Gen	Church	110	36	469	76	2 785
St Francis Hospital*	Gen	Church	380			210	4 681
St John's Hospital	Unit of New York Foundling Hospital						
St Joseph's Hospital for Consumptives	TB	Church	270			288	308
St Luke's Hospital**	Gen	Church	492			342	8 048
St Vincent's Hospital**	Gen	Church	421	44	931	370	10 275
Seton Hospital	TB	Church	255			254	296
Sloane Hosp for Women**	See Presbyterian Hospital						
Sydenham Hospital*	Gen	NPAssn	181	24	658	152	4 853
Union Hospital	Gen	NPAssn	55	20	228	37	1 291
U S Marine Hospital*	Gen	USPHS	452			346	2 200
University Heights Hospital (Dr Jameson Sanit)	Gen	Corp	67	17	392	42	1 173
Veterans Admin Facility	Gen	Vet	973			852	4 482
Webb Sanitarium	Gen	Corp	21	12	121	13	669
Welfare Hospital for Chronic Diseases	Chr	City	1 500			Estab	1939
Westchester Square Hosp	Gen	Corp	107	32	739	55	2 432
West Hill Sanitarium	N&M	Indiv	63			54	190
Wickensham Hospital	Gen	Corp	60	9	101	45	1 953
Willard Parker Hospital**	TB	City	424			310	6 195
William Booth Memorial Hospital*	Gen	Church	48	24	250	26	707
Woman's Hospital*	GynOb	NPAssn	226	100	1 600	148	5 281
Nagara Falls 75 460—Nagara							
Mt St Mary's Hospital	Gen	Church	166	29	536	120	3 792
Nagara Falls Memorial Hospital	Gen	NPAssn	162	25	522	102	3 408
Northport 2 525—Suffolk							
Veterans Admin Facility	Ment	Vet	2 220			1 579	597
North Tonawanda 19 019—Nagara							
De Graff Memorial Hospital	Gen	City	48	18	352	27	1 577
Norwich 8 378—Chenango							
Chenango Memorial Hosp	Gen	NPAssn	68	15	137	37	1 368
Nyack 5 392—Rockland							
Nyack Hospital	Gen	NPAssn	88	16	275	71	1 968
Ogdensburg 16 915—St Lawrence							
A Barton Hepburn Hosp	Gen	Church	179	20	397	121	8 919
St John's Hospital	TB	Church	45			31	35
St Lawrence State Hosp**	Ment	State	2 226			2 166	372
Olean 21 790—Cattaraugus							
Mountain Clinic	Gen	Indiv	33	5	105	17	629
Olean General Hospital	Gen	NPAssn	80	20	370	51	1 727
Rocky Crest Sanatorium	TB	County	40			35	59
St Francis Hospital	Gen	Church	100	18		Estab	1938
Oneida 10 558—Madison							
Main Street Hospital	Gen	Indiv	18	4	52	8	270
Oneida City Hospital	Gen	City	82	17	151	50	1 399
Oneonta 12 530—Otsego							
Aurelia Osborn Fox Memorial Hospital	Gen	NPAssn	34	12	198	49	1 577
Homer Folks Tuberculosis Hospital*	TB	State	250			231	263
Orangeburg 360—Rockland							
Rockland State Hospital	Ment	State	5 675			5 228	1 748
Ossining 15 241—Westchester							
Ossining Hospital	Gen	NPAssn	75	10	191	45	1 380
Stony Lodge	N&M	Indiv	38			17	34
Oswego 22 652—Oswego							
Oswego Hospital	Gen	NPAssn	89	11	313	44	1 650
Station Hospital	Gen	Army	30			20	359
Otisville 809—Orange							
Municipal Sanatorium*	TB	City	393			375	707
Owego 4 742—Tioga							
Glenmary Sanitarium	N&M	Corp	50			7	12
Peekskill 17 125—Westchester							
Peekskill Hospital	Gen	NPAssn	77	17	309	51	1 899
Penn Yan 5 739— Yates							
Soldiers and Sailors Memorial Hospital	Gen	NPAssn	45	10	152	30	1 223
Perryburg 317—Cattaraugus							
J A Adam Memorial Hosp	TB	City	482			444	363
Philmont 1 868—Columbia							
Columbia Sanatorium	TB	County	76			54	59
Plattsburg 13 349—Clinton							
Champlain Valley Hosp	Gen	Church	104	15	314	85	2 610
Physicians Hospital	Gen	NPAssn	90	18	217	59	1 338
Station Hospital	Gen	Army	64	2	36	51	1 134
Pomona 155—Rockland							
Summit Park Sanatorium	TB	County	88			77	82
Port Chester 22 602—Westchester							
Mary Harkness Home for Convalescent Care	Conv	NPAssn	50			23	436
St Luke's Convalescent Hospital	Conv	Church	144			105	829
United Hospital*	Gen	NPAssn	166	36	758	157	5 159
Port Jefferson 2 200—Suffolk							
John T Mather Memorial Hospital	Gen	NPAssn	58	12	210	42	1 596

Key to symbols and abbreviations is on page 933



## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
St Charles Hospital for Crippled Children	Orth	Church	210			194	72
Wharton Memorial Institute	Unit of St Charles Hospital						
Port Jervis 10243—Orange	Gen	Church	50	10	88	21	787
St Francis Hospital	Gen	NPA'ssn	59	21	240	45	1 641
Potsdam 4136—St Lawrence	Gen	NPA'ssn	59	21	240	45	1 641
Potsdam Hospital	Gen	NPA'ssn	59	21	240	45	1 641
Poughkeepsie 40 28—Dutchess	Ment	State	4 460			4 467	691
Hudson River State Hosp +	Gen	Church	80	20	288	60	2 100
St Francis Hospital	Gen	Church	80	20	288	60	2 100
Samuel and Nettie Bowne Hospital	ThCard	NPA'ssn	51			31	126
Samuel W Bowne Memorial Hospital	TB	CoCo	120			125	103
Vassar Brothers Hosp +	Gen	NPA'ssn	192	33	643	131	4 692
Queens Village—Queens	Gen	NPA'ssn	192	33	643	131	4 692
Creedmoor State Hospital	Ment	State	4 427			4 284	989
Ray Brook 40—Fseex	TB	State	300			281	360
New York State Hospital	TB	State	300			281	360
Rhinebeck 1569—Dutchess	Gen	NPA'ssn	30	8	113	20	749
Northern Dutchess Health Service Center	Gen	NPA'ssn	30	8	113	20	749
Richland 600—Oswego	TB	County	105			94	88
Oswego County Sanatorium	TB	County	105			94	88
Rochester 328 132—Monroe	Gen	NPA'ssn	201	32	711	188	6 241
Genesee Hospital +	Gen	NPA'ssn	201	32	711	188	6 241
Highland Hospital +	Gen	NPA'ssn	201	32	711	188	6 241
Iola Monroe County Tuber culosis Sanatorium +	TB	County	400			387	414
Monroe County Infirmary	Gen	County	500	20	140	464	3 019
Park Avenue Hospital +	Gen	NPA'ssn	84	20	300	63	2 379
Rochester General Hosp +	Gen	NPA'ssn	312	63	1 100	236	8 074
Rochester Municipal Hosp +	Gen	City	321	36	608	268	7 322
Rochester State Hospital +	Ment	State	3 784			3 120	553
St Mary's Hospital +	Gen	Church	206	32	606	154	5 958
Strong Memorial Hosp +	Gen	NPA'ssn	264	36	309	188	6 889
Rockaway Beach—Queens	Gen	NPA'ssn	100	12	378	84	2 006
Rockaway Beach Hospital and Dispensary	Gen	NPA'ssn	100	12	378	84	2 006
Neponsit Beach Hospital for Children	TB	City	120			123	120
Rockville Centre 13 718—Nassau	Gen	NPA'ssn	60	18	880	54	2 014
South Nassau Communities Hospital	Gen	NPA'ssn	60	18	880	54	2 014
Rome 32 328—Oneida	Gen	County	200	10	100	196	2 086
Oneida County Hospital	Gen	County	200	10	100	196	2 086
Rome Hospital and Murphy Memorial Hospital	Gen	City	53	16	446	62	2 062
Rome Infirmary	Gen	Indiv	37	6	13	5	149
Sackett Harbor 742—Jefferson	Gen	Army	32			15	504
Station Hospital	Gen	City	41	10	175	27	1 521
Salamanca 9 577—Cattaraugus	Gen	City	41	10	175	27	1 521
City Hospital	Gen	City	41	10	175	27	1 521
Salisbury Center 341—Herkimer	TB	County	90			88	62
Pine Crest Sanatorium	TB	County	90			88	62
Saranac Lake 9 026—Franklin	Gen	NPA'ssn	34	10	82	27	1 044
General Hospital	Gen	NPA'ssn	34	10	82	27	1 044
Northwoods Sanatorium	TB	NPA'ssn	26			20	18
Reception Hospital	TB	NPA'ssn	26			17	30
St Mary's of the Lake	TB	Church	24			18	22
Will Rogers Memorial Hosp	TB	NPA'ssn	75			64	55
Saratoga Springs 13 169—Saratoga	Gen	NPA'ssn	90	17	184	46	1 383
Saratoga Hospital	Gen	NPA'ssn	90	17	184	46	1 383
Schenectady, 90 692—Schenectady	OrChil	NPA'ssn	35			19	66
Eastern New York Orthopaedic Hospital School	Gen	NPA'ssn	200	30	776	221	8 064
Ellis Hospital +	Gen	NPA'ssn	200	30	776	221	8 064
Schenectady County Tuber culosis Hospital (Glenridge Sanatorium)	TB	County	126			120	107
Seneca Falls 6 443—Seneca	Gen	City	20	11	126	21	702
Seneca Falls Hospital	Gen	City	20	11	126	21	702
Sherburne 1 077—Chenango	TB	County	33		No data supplied		
Chenango County Tuber culosis Hospital	TB	County	33		No data supplied		
Sodus 1 444—Wayne	Gen	Indiv	35	7	58	12	308
Myers Hospital	Gen	Indiv	35	7	58	12	308
Sonyea—Livingston	Epil	State	2 186			2 260	334
Craig Colony +	Epil	State	2 186			2 260	334
Southampton 3 737—Suffolk	Gen	NPA'ssn	101	19	274	43	1 897
Southampton Hospital	Gen	NPA'ssn	101	19	274	43	1 897
Stapleton (Staten Island P O)	—Richmond	Gen	716	6	3	609	7 076
U S Marine Hospital +	Gen	USPHS	716	6	3	609	7 076
Staten Island 158 346—Richmond	Gen	NPA'ssn	100	18	No data supplied		
Richmond Borough Hospital	Gen	NPA'ssn	100	18	No data supplied		
Richmond Memorial Hosp	Gen	Church	208	33	731	102	5 840
St Vincent's Hospital +	Gen	City	1 446	9	19	1 662	1 771
Sea View Hospital +	TB	Corp	219	40	1 039	140	5 905
Staten Island Hospital +	Gen	Corp	219	40	1 039	140	5 905
Suffern 3 757—Rockland	Gen	Church	55	10	204	50	2 120
Good Samaritan Hospital	Gen	Church	55	10	204	50	2 120
Sunmount—Franklin	TB	Vet	520			403	567
Veterans Admin Facility	TB	Vet	520			403	567
Syracuse 299 326—Onondaga	Iso	City	84			21	411
City Hospital	Gen	NPA'ssn	218	22	783	209	6 612
Crouse Irving Hospital +	Gen	NPA'ssn	80	20	598	76	2 744
General Hospital +	Gen	NPA'ssn	80	20	598	76	2 744
Hospital of the Good Shepherd +	Gen	NPA'ssn	210			109	4 575
Onondaga General Hospital	Gen	NPA'ssn	50	25	No data supplied		
Onondaga Sanatorium	TB	County	205			213	182
Peoples Hospital	Gen	NPA'ssn	33	8	52	8	230
St Joseph Hospital +	Gen	Church	200	31	737	103	7 088

## NEW YORK—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
St Mary's Maternity Hospital and Infants Asylum	Mat	Church	44	31	304	20	400
Syracuse Memorial Hosp +	Gen	NPA'ssn	210	40	1 219	191	5 838
Syracuse Psychopathic Hospital	Ment	NPA'ssn	60			48	686
Twin Elms	Indiv	State	10			7	63
Tarrytown 6 841—Westchester	Gen	NPA'ssn	57	13	731	40	1 200
Tarrytown Hospital	Gen	NPA'ssn	57	13	731	40	1 200
Ticonderoga 3 680—Essex	Gen	NPA'ssn	50	6	91	30	797
Moses Ludington Hospital	Gen	NPA'ssn	50	6	91	30	797
Troy 72 763—Rensselaer	Gen	NPA'ssn	80	20	385	92	7 023
Leonard Hospital	Gen	NPA'ssn	80	20	385	92	7 023
Marshall Sanatorium	NPA'ssn	NPA'ssn	60			40	241
Price Memorial Hospital	Unit of Samaritan Hospital	Unit of Samaritan Hospital	24	21	307	16	361
St Joseph's Maternity Hosp	Mat	Church	160	16	423	114	7 447
Samaritan Hospital +	G&Iso	NPA'ssn	202	22	296	181	3 700
Troy Hospital +	Gen	Church	202	22	296	181	3 700
Trudeau 230—Essex	TB	NPA'ssn	200			190	707
Trudeau Sanatorium +	TB	NPA'ssn	200			190	707
Tupper Lake 5 271—Franklin	Gen	Church	35	4	36	15	614
Mersey General Hospital	Gen	Church	35	4	36	15	614
Tuxedo Park, 2 000—Orange	Gen	NPA'ssn	33	7	63	17	512
Tuxedo Memorial Hospital	Gen	NPA'ssn	33	7	63	17	512
Utica 101 740—Oneida	Gen	NPA'ssn	115	16	316	86	3 208
Enon Hospital	Gen	NPA'ssn	115	16	316	86	3 208
Masonic Soldiers and Sailors Memorial Hospital	Gen	Frat	200			148	549
Oneida County Tuberculosis Sanatorium	TB	County	188			167	128
St Elizabeth Hospital	Gen	Church	130	20	458	100	3 344
St Luke's Home and Hosp	Gen	Church	123	28	308	73	542
Utica General Hospital	Gen	City	117	8	206	80	4 140
Utica Memorial Hospital	Gen	NPA'ssn	72	22	260	46	2 990
Utica State Hospital +	Ment	State	1 642			1 667	603
Valhalla 620—Westchester	Gen	County	780	16	207	666	5 602
Grasslands Hospital +	Gen	County	780	16	207	666	5 602
Warsaw 3 477—Wyoming	Gen	County	112	23	286	80	2 018
Wyoming County Community Hospital	Gen	County	112	23	286	80	2 018
Warwick 2 443—Orange	Gen	Indiv	20	3	16	11	269
Warwick Hosp and Clinic	Gen	Indiv	20	3	16	11	269
Waterloo 1 047—Seneca	Gen	Corp	22	5	71	13	431
Waterloo Memorial Hosp	Gen	Corp	22	5	71	13	431
Watertown 32 200—Jefferson	Gen	NPA'ssn	122	14	201	83	2 031
House of the Good Samaritan	Gen	NPA'ssn	122	14	201	83	2 031
Jefferson County Sanat +	J.B	County	78			66	111
Mercy Hospital	Gen	Church	113	14	317	66	1 046
Waverly 5 662—Tioga	Gen	NPA'ssn	56	12	149	48	1 436
Tioga County General Hosp	Gen	NPA'ssn	56	12	149	48	1 436
Wayland 1 814—Steuben	Gen	Part	17	3	39	10	330
Wayland Hospital	Gen	Part	17	3	39	10	330
Wellsville 5 674—Allegany	Gen	City	45	10	244	33	1 363
Memorial Hospital of Wm F and Gertrude F Jones	Gen	City	45	10	244	33	1 363
West Haverstraw 2 834—Rockland	OrChil	State	310			194	88
New York State Reconstruction Home +	OrChil	State	310			194	88
West Point 1 200—Orange	Gen	Army	160	8	57	80	3 001
Station Hospital	Gen	Army	160	8	57	80	3 001
White Plains 30 530—Westchester	N&M	NPA'ssn	300			246	311
New York Hospital—Westchester Division +	N&M	NPA'ssn	300			246	311
New York Orthopaedic Dispensary and Hospital	Unit of New York Orthopaedic Dispensary and Hospital	Unit of New York Orthopaedic Dispensary and Hospital					
Country Branch	Gen	Church	133	39	611	93	3 638
St Agnes Hospital +	Gen	NPA'ssn	107	22	240	86	2 031
White Plains Hospital +	Gen	NPA'ssn	107	22	240	86	2 031
Winifred Masterson Burke Relief Foundation	Conv	NPA'ssn	200			221	5 220
Willard 200—Seneca	Ment	State	3 065			2 920	4 700
Willard State Hospital	Ment	State	3 065			2 920	4 700
Wingdale 156—Dutchess	Gen	State	4 800			4 740	540
Harlem Valley State Hosp	Gen	State	4 800			4 740	540
Woodhaven—Queens	TB	Church	400			300	600
St Anthony's Hospital	TB	Church	400			300	600
Wyandtskill 167—Rensselaer	TB	County	152			142	123
Pawling Sanatorium	TB	County	152			142	123
Yonkers 134 646—Westchester	TB	City	50			50	50
Gray Oaks Hospital	TB	City	50			50	50
House of Rest at Sprain Ridge	TB	NPA'ssn	98			86	146
St John's Riverside Hosp +	Gen	NPA'sn	176	24	540	148	4 890
St Joseph's Hospital	Gen	Church	177	20	300	106	2 880
Yonkers General Hosp +	Gen	NPA'ssn	137	41	403	78	3 166

## Related Institutions

Albany 127 412—Albany	Inc	NPA'ssn	80			93	60
Albany's Hospital for Incubables	Inc	NPA'ssn	80			93	60
Evergreens Sanatorium	MeDe	Indiv	10			4	
School	MeDe	Indiv	10			4	
St Margaret's House and Hospital	Inst	Church	50			39	73
Albion 4 878—Orleans	MeDe	State	460	3	12	377	86
Albion State Training School	MeDe	State	460	3	12	377	86
Orleans Welfare Hospital	Gen	County	42	5	9	30	100
Alden 846—Erie	Inst	County	20			8	100
Frie County Penitentiary	Inst	County	20			8	100
Amityville 4 433—Suffolk	MeDe	Corp	200			No data supplied	
Brunswick Home Sanatorium	MeDe	Corp	200			No data supplied	

Key to symbols and abbreviations is on page 933

NEW YORK—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Auburn 366-2—Cayuga							
Auburn State Prison Hosp	Inst	State	30		No data supplied		
Bainbridge 1324—Chemung							
Bainbridge Hospital	Gen	Indiv	12	5	32	5	240
Bedford Hills 1000—Westchester							
Bedford Hills State Farm	Inst	State	48	31		21	754
Binghamton 76 662—Broome							
Binghamton Training School for Nervous Backward and Mental Defectives	MeDe	Indiv	50			42	13
Breesport 498—Chemung							
Chemung County Home Infirm	Inst	County	60			50	136
Brewster 1664—Putnam							
Mountainbrook Farm Sanit	Conv	Indiv	20			16	40
Brooklyn 2,500 401—Kings							
Brooklyn Hebrew Home and Hospital for Aged	Inst	NP Assn	520			506	161
Churchill Sanitarium	Gen	Indiv	12	3	20	4	74
Faith Home for Incurables	Inc	NP Assn	22			52	8
Hamilton Private Hospital	Gen	Indiv	22	4	No data supplied		
Buffalo 53 076—Erie							
Buffalo Eye and Ear Infirm							
Wettlaufer Clinic ENT	NP Assn		14			5	912
Crippled Children's Guild	Orth	StateCo	30			31	
Ingleside Home	Mat	NP Assn	46	9	70	20	70
Calcium 111—Jefferson							
Jefferson County Contagious Hospital	Iso	County	18			1	32
Camden 1912—Oneida							
Healthforte Dr. Bell's Private Rest Home	N&M	Indiv	15			6	10
Canandaigua 7541—Ontario							
Canandaigua Health Home	Conv	Indiv	20			10	40
Castile 900—Wyoming							
Green Sanitarium	Conv	Indiv	40			20	80
Cortland 15 043—Cortland							
Ver Nooy Sanitarium	Gen	Indiv	13	6	68	8	267
Dannemora 3 348—Clinton							
Clinton Prison General and Tuberculosis Hospital	Inst	State	123			115	1 048
Delhi 1 640—Delaware							
Delaware Infirmary	Inst	County	16			12	264
Delhi Hospital	Gen	NP Assn	13	6	30	5	201
Eastview 161—Westchester							
Solomon and Betty Loeb Memorial Home for Convalescents	Conv	NP Assn	108			111	1 656
Edmeston 749—Otsego							
Otsego School for Backward Children	MeDe	Indiv	27			20	6
Elmira 47 397—Chemung							
Chemung County Preventorium	TbChil	County	22			17	33
Elmira Reformatory	Inst	State	100			32	620
Gleason Health Resort	Conv	Indiv	28			15	80
Far Rockaway—Queens							
Brooklyn Jewish Home for Convalescents	Conv	NP Assn	40				
Wave Crest Convalescent Home	OrChil	NP Assn	70			68	88
Herkimer 10 446—Herkimer							
Herkimer County Home Hospital	Inst	County	18			17	29
Hudson 12 337—Columbia							
New York State Training School for Girls	Inst	State	30	2	18	33	601
Huntington 6 200—Suffolk							
Village Green Maternity Home	Mat	Indiv	9	9	22	4	22
Industry 280—Monroe							
Industry General Hospital	Inst	State	50			21	971
Iroquois 40—Erie							
Thomas Indian School Hosp	Inst	State	36			13	507
Ithaca 20 700—Tompkins							
Baile Jones Hospital	Gen	Indiv	14			6	182
Conklin Sanitarium	Gen	Indiv	14			7	157
Reconstruction Home	Orth	NP Assn	70			50	60
Johnson City 13 561—Broome							
Mrs. Springer's Private Hospital	MatConv	Indiv	17	14	114	6	193
Keene Valley 400—Essex							
Keene Valley Neighborhood House and Hospital	Gen	NP Assn	9	2	12	5	81
Kingston 28 088—Ulster							
Hackett Sanitarium and Nursing Home	Conv	Indiv	24		No data supplied		
Lake Ronkonkoma 49—Suffolk							
Gary de Vabre Academy	MeDe	Part	18			18	7
Margaretville 771—Delaware							
Margaretville Hospital	Gen	NP Assn	17	7	51	6	224
Millgrove (Alden P O) 110—Erie							
Erie County Home and Infirmary	Inst	County	1 329			1 096	404
Montour Falls 1 459—Schuyler							
Shepard Relief Hospital	Gen	NP Assn	27	8	120	20	657
Napanoch 633—Ulster							
Institution for Male Delinquent	MeDe	State	28			10	200
Newark 7 649—Wayne							
Newark State School	MeDe	State	2 106			2 794	340

NEW YORK—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
New York City 4 211 699—New York							
Beth Abraham Home for Incurables	Inc	NP Assn	200			203	70
Bronxwood Sanitarium	Conv	Corp	20		No data supplied		
Bryant Sanitarium	Mat	Indiv	10	10	97	3	106
Harts Island Prison Hosp	Inst	City	23		No data supplied		
Hebrew Convalescent Home	Conv	NP Assn	80			75	
Home for Aged and Infirm Hebrews	Inst	NP Assn	31			25	186
Home for Dependents	Inst	City	1 747			1 706	1 012
Home for Hebrew Infants	Inst	NP Assn	61			29	1 024
Home for Incurables	IncCa	Church	303			338	246
House of Calvary	SkCa	Church	142			130	433
Dr. Rogers Hospital	N&M	Indiv	20			11	164
St. Andrew's Convalescent Hospital	Conv	Church	30			15	274
St. Mary's Hosp for Children	Conv	Church	60			47	399
St. Rose's Free Home for Incurable Cancer	Ca	Church	91			85	307
Niagara Falls 70 460—Niagara							
Niagara Falls Municipal Hospital	Iso	City	38			12	170
Oneonta 12 536—Otsego							
Parshall Private Hospital	Gen	Indiv	20	6	63	11	341
Onondaga 260—Onondaga							
Onondaga County Hosp	InstGen	County	183		8	163	419
Oriskany 1 142—Oriskany							
Eastern Star Home and Infirmary	Inst	Frat	77			77	4
Ossining 15 241—Westchester							
Albert Homestead	Conv	Indiv	15				New
Greenmont on Hudson	Ment	Indiv	10			10	2
Sing Sing Prison Hospital	Inst	State	80			57	1 940
Oxford 1 601—Chemung							
New York State Woman's Relief Corps Home	Inst	State	72			63	262
Palmville 300—Greene							
St. Joseph's Burghardville Convalescent Home	Conv	Church	84			51	649
Pawling 1 204—Dutchess							
White Oak Farm	N&M	Corp	19			13	5
Pelham Manor 4 008—Westchester							
Pelham Home for Children	Card	NP Assn	30			28	44
Pleasantville 4 040—Westchester							
Hebrew Sheltering Guardian Orphan Asylum	Inst	NP Assn	33			6	286
Port Jervis 10 243—Orange							
Deerpark Hospital	Gen	Corp	17	4	17	9	282
Poughkeepsie 40 248—Dutchess							
Poughkeepsie City Home Infirmary	Inst	City	50		No data supplied	7	100
Sadler Hospital	Inst	Surge	9				
Swift Infirmary Vassar College	Inst	NP Assn	20			8	1 115
Queens Village—Queens							
Queens Village Sanatorium	Gen	Indiv	10	8	38	5	102
Rhinebeck 1 569—Dutchess							
Holiday Farm Home for Convalescent Children	Conv	Indiv	20			22	223
Rochester 328 132—Monroe							
Convalescent Hospital for Children	Conv	NP Assn	48			43	120
Field Sanitarium	Conv	Indiv	18				
Knorr Sanitarium	N&M	Indiv	40			16	50
Rockaway Park—Queens							
Convalescent Home for Hebrew Children	OrConv	NP Assn	112			100	264
Rome 32 338—Oneida							
Rome State School	MeDe	State	3 604	24	8	3 624	208
Roslyn 2 930—Nassau							
St. Francis Sanatorium for Cardiac Children	Card	Church	50			49	70
Rye 8 712—Westchester							
Halcyon Rest	N&M	Indiv	43			38	100
Saranac Lake 8 020—Franklin							
Franklin Manor	TB	Indiv	15			10	15
Schenectady 90 692—Schenectady							
Bellvue Maternity Home	Mat	Indiv	18	20	367	11	389
Schenectady City Hospital	Iso	City	30			20	407
Schenectady County Home and Hospital	Inst	County	60		No data supplied		
Sea Cliff 3 406—Nassau							
Country Home for Convalescent Babies	Conv	NP Assn	70			41	485
Staten Island 158 346—Richmond							
New York City Farm Colony	Inst	City	1 428			1 101	411
Sailors Snug Harbor Hosp	Gen	NP Assn	194			130	470
Seaside Hospital	Chil	NP Assn	196			146	623
State School—Orange							
Hospital of New York State Training School for Boys	Inst	State	20			17	672
Syracuse 269 326—Onondaga							
Syracuse State School	MeDe	State	1 068			1 004	142
Thiells 320—Rockland							
Letchworth Village	MeDe	State	3 664			3 624	517
Troy 72 763—Rensselaer							
Rensselaer County Hospital	Inst	County	68			68	602
Troy Orphan Asylum	Inst	NP Assn	20			5	493
Tupper Lake 0 271—Franklin							
American Legion Mountain Camp	Conv	NP Assn	55			45	198

Key to symbols and abbreviations is on page 933

## NEW YORK—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Utica, 101 740—Oneida Children's Hospital Home of Utica	Orth	NPAssn	40			32	76
Valhalla 620—Westchester Blythedale Hosp and Home for Crippled Children	Orth	NPAssn	62			56	111
Valley Cottage 931—Rockland Reed Farm and Nichols Cottage	ChilCard	Indiv	24			24	51
Walkkill 700—Ulster Walkkill State Prison Hosp	Inst	State	20			4	93
Wassanic 250—Dutchess Wassalle State School	MeDe	State	4,080		13	3 918	616
Watertown 32 205—Jefferson Jefferson County Home	Inst	County	20			15	25
White Plains 30 830—Westchester Martine Farm Children's Cardiac Home	Card	Indiv	20			20	47
Williamsville, 3 119—Erie Josephine Goodyear Convalescent Home	ConvChil	Indiv	60			50	201
Woodbourne 500—Sullivan Woodbourne Institution for Defective Delinquents	MeDe	State	700			427	126
Yonkers 134 640—Westchester Yonkers City Hospital for Communicable Diseases	Iso	City	87			10	314

## Summary for New York

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	468	130 310	135 508	1,278 500
Related institutions	115	26 279	24,318	33 923
Totals	583	181 389	159 826	1 312 423
Refused registration	28	701		

## NORTH CAROLINA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Albemarle 3 403—Stanly Stanly General Hospital	Gen	NPAssn	27	5	82	15	631
Yadkin Hospital	Gen	NPAssn	30	10	139	22	996
Asheboro 5 021—Randolph Randolph Hospital	Gen	NPAssn	36	6	84	19	977
Asheville, 50 193—Buncombe Ambler Heights Sanitarium	TB	Corp	22			15	20
Appalachian Hall	N&M	Corp	175			45	309
Asheville Mission Hosp	Gen	NPAssn	104	16	308	85	2 096
Asheville Physiatric Institute							
Wesnoea	NerConv	Indiv	25			36	1 487
Aston Park Hospital	Gen	NPAssn	54	6	180	28	1 190
Norburn Hospital	Gen	Corp	40	2	24		
St Joseph's Hospital (Converted into a general hospital 1939)	TB	Church	80			55	150
Zephyr Hill Sanatorium	TB	Indiv	30			20	25
Badin 3,040—Stanly	Gen	Corp	18		No data supplied		
Badin Hospital	Gen	Corp	18		No data supplied		
Banners Elk 340—Avery Grace Hospital	Gen	Church	60	8	87	43	808
Beaufort 2,507—Carteret Potter Emergency Hospital	Gen	Corp	12	4	45	2	213
Blittmore 172—Buncombe Blittmore Hospital	Gen	NPAssn	62	10	107	30	1 403
Black Mountain, 737—Buncombe Beallmont Park Sanatorium	N&M	Corp	20			8	80
Fellowship Sanatorium of the Royal League	TB	Frat	20			12	17
Western North Carolina Sanatorium	TB	State	130			126	247
Brevard 2 339—Transylvania Lyday Memorial Hospital	Gen	NPAssn	27	2	37	7	297
Burlington 9 737—Alamance Alamance General Hospital	Gen	NPAssn	40	5	100	24	1 271
Charlotte 82 675—Mecklenburg Charlotte Eye Ear & Throat Hospital	ENT	Part	20			10	1 717
Good Samaritan Hospital (col)	Gen	Church	88	6	93	36	1 532
Mercy Hospital	Gen	Church	110	20	523	95	3 977
New Charlotte Sanatorium	Gen	Corp	100	10	13	74	3 100
Presbyterian Hospital	Gen	Church	100	10	379	112	3 909
St Peter's Hospital	Gen	Church	64	12	290	62	2 819
Cherokee 35—Swain Eastern Cherokee Indian Hospital	Gen	IA	28	5	76	18	562
Concord, 11 820—Cabarrus Cabarrus County Hospital	Gen	County	63	10	184	44	1 900
Crossmore 181—Avery Garrett Memorial Hospital	Gen	NPAssn	15	7	51	10	314
Durham 52 037—Durham Duke Hospital	Gen	NPAssn	406	50	513	338	10 976
Lincoln Hospital (col)	Gen	NPAssn	90	9	147	60	1 827
McPherson Hospital	ENT	Indiv	30			9	960
Watts Hospital	Gen	NPAssn	200	25	540	137	5 575
Elizabeth City 10 037—Pasquotank Albemarle Hospital	Gen	CyCo	45	5	61	20	701

## NORTH CAROLINA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Elkin 2 357—Surry Hugh Chatham Memorial Hospital	Gen	Church	60	4	94	31	1 290
Erwin 4,000—Harnett Good Hope Hospital	Gen	NPAssn	34	6	51	6	207
Fayetteville 13 049—Cumberland Highsmith Hospital	Gen	NPAssn	120	5	130	90	3 010
Pittman Hospital	Gen	NPAssn	80	10	80	51	2 272
Fletcher 60—Henderson Mountain Sanitarium and Hospital	Gen	Church	50	3	76	39	907
Tt Bragg, —Cumberland Station Hospital	Gen	Army	115	7	71	106	9 600
Franklin 1 094—Macon Angel Hospital	Gen	NPAssn	60	4	30	27	1 211
Gastonia 17 093—Gaston Garrison General Hospital	Gen	NPAssn	45	6	No data supplied		
North Carolina Orthopedic Hospital	Orth	State	160			160	397
Goldboro 14 985—Wayne Goldboro Hospital	Gen	NPAssn	94	6	90	50	1 913
State Hospital (col)	Ment	State	2 120			2 067	500
Greensboro 63 560—Guilford Glenwood Park Sanitarium	N&M	Indiv	30				
Piedmont Memorial Hosp	Gen	NPAssn	50	10	163	41	1 330
L. Richardson Memorial Hospital (col)	Gen	NPAssn	60	8	62	30	1 033
St Leo's Hospital	Gen	Church	78	9	140	60	2 317
Sternberger Hospital for Women and Children	Gen	NPAssn	40	12	149	17	643
Wesley Long Hospital	Gen	Corp	65	10	226	59	2 586
Greenville 9 194—Pitt Pitt General Hospital	Gen	Corp	60	3	87	31	1 718
Hamlet 4 801—Richmond Hamlet Hospital	Gen	NPAssn	40	5	40	40	1 060
Hamptonville 116—Yadkin Trivette Clinic	Gen	Indiv	20	2	24	10	497
Henderson 6 345—Vance Jubilee Hospital (col)	Gen	Church	30	2	47	17	561
Maria Parham Hospital	Gen	NPAssn	41	6	144	23	1 943
Hendersonville 5 070—Henderson Patton Memorial Hospital	Gen	NPAssn	44	6	40	14	780
Hickory 7 363—Catawba Hickory Memorial Hospital	Gen	NPAssn	40	6	56	17	649
Richard Baker Hospital	Gen	Indiv	46	8	120	23	987
High Point 36 740—Guilford Burrus Memorial Hosp	Gen	NPAssn	75	7	193	47	1 720
Guilford General Hospital	Gen	NPAssn	30	5	108	22	1 197
Hiwassee Dam —Cherokee Hiwassee Dam Hospital	Gen	Fed	17	4	16	7	480
Huntersville 800—Mecklenburg Mecklenburg Sanatorium	TB	County	170			102	100
Jamestown 157—Guilford Guilford County Sanatorium	TB	County	130			122	146
Kinston 11 862—Lenoir Memorial General Hospital	Gen	NPAssn	60	6	163	41	2 903
Parrott Memorial Hospital	Gen	NPAssn	40	10	112	20	1 446
Laurinburg 2 312—Scotland Laurinburg Hospital	Gen	NPAssn	30	3	20	13	449
Leaksville 1 814—Rockingham Leaksville General Hosp	Gen	NPAssn	45	5	82	20	1 361
Lenoir 6 532—Caldwell Blackwelder Hospital	Gen	NPAssn	27	7	114	13	783
Caldwell Hospital	Gen	NPAssn	23	2	33	12	497
Dula Hospital	Gen	Indiv	15	5	23	8	490
Lexington 9 602—Davidson Davidson Hospital	Gen	County	20	6	44	11	477
Lincolnton 3 781—Lincoln Gordon Crowell Memorial Hospital	Gen	Corp	40	2	50	20	1 237
Reeves Hospital	Gen	Indiv	32	8	62	11	674
Lumberton 4 140—Robeson Baker Sanatorium	Gen	NPAssn	79	6	168	53	2 063
Thompson Memorial Hosp	Gen	NPAssn	70	10	274	60	3 061
Manteo 547—Dare Camp Wirth Hospital	Gen	Fed	18			10	167
Marion 2 467—McDowell Marion General Hospital	Gen	NPAssn	30	4	99	17	1 033
Monroe 6 100—Union Ellen Fitzgerald Hospital	Gen	NPAssn	30	5	60	10	560
Mooreville 5 619—Iredell Lowrance Hospital	Gen	NPAssn	60	10	203	40	1 680
Morehead City 3 483—Carteret Morehead City Hospital	Gen	City	28	3	97	16	410
Morganton 6 001—Burke Broad Oaks Sanatorium	N&M	Part	70			47	191
Grace Hospital	Gen	Church	62	13	300	40	2 161
State Hospital	Ment	State	2 383			2 225	717
Mt Alry 6 045—Surry Martin Memorial Hospital	Gen	NPAssn	50	6	53	38	990
Murphy 1 612—Cherokee Petrie Hospital	Gen	Corp	24	1	54	11	500
New Bern 11 981—Craven St Luke's Hospital	Gen	NPAssn	35	3	57	16	990
North Wilkesboro 3 663—Wilkes Wilkes Hospital	Gen	NPAssn	51	6	77	27	1 061
Oteen 504—Buncombe Veterans Admin Facility	TB	Vet	800			780	1 760
Oxford 4 101—Granville Granville Hospital	Gen	NPAssn	40	4	21	10	263
Sue Clayton Cheatham Memorial Hospital (col)	Gen	NPAssn	14	1	12	7	10
Pinehurst 55—Moore Moore County Hospital	Gen	NPAssn	60	8	102	44	1 652

Key to symbols and abbreviations is on page 933

## NORTH CAROLINA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Raleigh 373-0—Wake Central Prison Hospital	Gen	State	110			81	1 167
Mary Elizabeth Hospital	Gen	Corp	36	9	152	25	1 241
Rex Hospital	Gen	NPA'ssn	174	26	411	122	4 770
St Agnes Hospital (col) *	Gen	NPA'ssn	90	10	144	66	1 375
State Hospital	Ment	State	2 238			2 132	957
Wake County Tuberculosis Sanatorium	TB	CyCo	23			22	53
Reidsville 63-1—Rockingham Memorial Hospital	Gen	NPA'ssn	44	6	138	22	034
Roanoke Rapids 340-1—Hallifax	Gen	NPA'ssn	95	15	290	71	2 073
Rocky Mount 21412—Nash	Indus	NPA'ssn	50			73	908
Atlantic Coast Line Hosp	Gen	NPA'ssn	110	10	230	83	2 290
Park View Hospital	Gen	NPA'ssn	90	6	108	43	1 518
Rutherford 200-1—Rutherford	Gen	NPA'ssn	60	4	30	34	1 790
Salisbury 169-1—Rowan	Gen	NPA'ssn	74	12	184	54	2 086
Rowan Memorial Hospital	Gen	NPA'ssn					
Sanatorium 57—Hoke	TB	State	550			492	729
Sanford 43-3—Lee	Gen	County	47	8	73	25	1 163
Shelby 10789—Cleveland	Gen	CyCo	60	10	194	44	1 677
Siler City 1730—Chatham	Gen	NPA'ssn	16	4	30	8	361
Smithfield 2543—Johnston	Gen	NPA'ssn	35	10	44	20	677
Johnston County Hospital	Gen	NPA'ssn					
Southern Pines 2524—Moore	TB	Indiv	43			20	59
Pine-Crest Manor Sanat	Gen	CyCo	45	4	42	18	716
Southport 1700—Brunswick	Gen	CyCo					
Brunswick County Hospital	Gen	CyCo					
Statesville 10400—Iredell	Gen	NPA'ssn	130	12	141	93	3 482
Davis Hospital	Gen	NPA'ssn	70	6	53	42	1 699
H F Long Hospital	Gen	NPA'ssn					
Sylva 1340—Jackson	Gen	NPA'ssn	25	3	20	10	415
C J Harris Community Hospital	Gen	NPA'ssn					
Tarboro 6379—Edgecombe	Gen	Indiv	13	1	5	4	160
Bass Memorial Hospital	Gen	NPA'ssn	44	6	83	23	974
Edgecombe General Hospital	Gen	NPA'ssn					
Thomasville 10090—Davidson	Gen	City	31	5	No data supplied		
City Memorial Hospital	Gen	City					
Tryon 1560—Polk	Gen	NPA'ssn	29	5	77	13	615
St Luke's Hospital	Gen	NPA'ssn					
Wadesboro 3124—Anson	Gen	NPA'ssn	45	8	85	28	946
Anson Sanatorium	Gen	NPA'ssn					
Washington 7030—Beaufort	Gen	NPA'ssn	69	6	211	46	1 972
Taylor Hospital	Gen	NPA'ssn					
Waynesville 2414—Haywood	Gen	County	83	7	153	69	1 646
Haywood County Hospital	Gen	County					
Whiteville 2203—Columbus	Gen	NPA'ssn	20	4	77	17	1 011
Columbus County Hospital	Gen	NPA'ssn					
Wilmington 3220—New Hanover	Gen	Indiv	32	3	20	12	483
Bulluck Hospital	Gen	CyCo	26	4	109	21	861
Community Hospital (col)	Gen	CyCo					
James Walker Memorial Hos	Gen	NPA'ssn	177	20	821	122	6 020
pital *	Gen	NPA'ssn					
Wilmington Red Cross Sana	TB	NPA'ssn	40			34	25
torium	TB	NPA'ssn					
Wilson 12613—Wilson	Gen	NPA'ssn	36	2	100	21	1 063
Carolina General Hosp	Gen	NPA'ssn	54	6	131	33	1 773
Woodard Herring Hosp	Gen	NPA'ssn					
Winston Salem 7044—Forsyth	Gen	City	315	30	528	156	5 723
City Hospital *	Gen	City					
City Memorial Hospital	White Division of City Hospital						
Forsyth County Hospital	Gen	County	44	6	82	19	509
Forsyth County Sanatorium	TB	County	134			117	81
Kate Bittling Reynolds Memo	Colored Division of City Hospital						
rial Hospital							
North Carolina Baptist Hos	Gen	Church	108	16	513	90	4 000
pital *	Gen	Church					
Wrightsville Sound 23—New Hanover	Chil	NPA'ssn	35		No data supplied		
Babies Hospital	Chil	NPA'ssn					
Related Institutions							
Ashville 50193—Buncombe	IB	Corp	16			12	24
Sunset Heights	TB	Indiv	37			31	08
Violet Hill Sanatorium	TB	Part	40			16	48
Biltmore 172—Buncombe	TB	Part					
Hillcroft Sanatorium	TB	Part					
Candler 50—Buncombe	TB	Part					
Pisgah Sanitarium and Hos	Gen	Church	30	3	18	15	370
pital	Gen	Church					
Charlotte 82670—Mecklenburg	Mat	NPA'ssn	45	4	31	7	39
Florence Crittenton Indus	Mat	NPA'ssn					
trial Home	Mat	NPA'ssn					
Davidson 144—Mecklenburg	Inst	NPA'ssn	27			3	114
Davidson College Infirmary	Inst	NPA'ssn					
Fayetteville 13019—Cumberland	ENT	Part	12			4	513
Fayetteville Eye Ear Nose	ENT	Part					
and Throat Hospital	ENT	Part					
Goldsboro 14900—Wayne	Conv	Indiv	10			3	149
Whispering Cedars Rest	Conv	Indiv					
Home	Conv	Indiv					
Hallifax 821—Hallifax	TB	County	28			22	
Hallifax County Tuberculosis	TB	County					
Sanatorium	TB	County					
Henderson 634—Vance	TB	County	14			12	12
Scott Parker Sanatorium	TB	County					

## NORTH CAROLINA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Kinston 11362—Lenoir	MeDe	State	717			697	42
Caswell Training School	MeDe	State					
Monroe 6100—Union	Gen	Indiv	15	5	7	4	120
Quality Hill Sanit (col)	Gen	Indiv					
North Wilkesboro 3068—Wilkes	TB	County	14			6	13
Wilkes County Tuberculosis	TB	County					
Hut	TB	County					
Pinebluff 280—Moore	N&M	Indiv	32			21	122
Pinebluff Sanitarium	N&M	Indiv					
Raleigh 37379—Wake	Gen	Indiv	9	2	23	4	102
McCauley Private Hospital	Gen	Indiv					
(col)	Gen	Indiv					
North Carolina State School	Inst	State				2	270
for the Blind and Deaf	Inst	State					
Roaring Gap —Alleghany	Chil	Indiv	30				
Roaring Gap Baby Hospital	Chil	Indiv					
Saluda 503—Polk	Chil	Indiv	55			25	167
Infants and Children's Sanit	Chil	Indiv					
Spartanburg Baby Hospital	Chil	NPA'ssn	30			28	201
Tarboro 6330—Edgecombe	TB	County	33			30	39
Edgecombe County Tubercu	TB	County					
losis Sanatorium	TB	County					
Thomasville 10000—Davidson	Inst	Church	30			8	
Mills Home Infirmary	Inst	Church					
Washington 7030—Beaufort	Gen	NPA'ssn	16		No data supplied		
S R Boyle Memorial Hosp	Gen	NPA'ssn					
Wilson 12613—Wilson	Gen	CyCo	30	2	20	22	116
Mercy Hospital (col)	Gen	CyCo					
Summary for North Carolina							
Hospitals and sanatoriums	Number	Beds	Average	Admissions			
Related Institutions	134	16 300	13 073	178 392			
	23	1 297	1 006	3 704			
Totals	157	17 647	14 039	182 096			
Refused registration	5	168					

## NORTH DAKOTA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Ambrose 334—Divide	Gen	Church	17	4	38	8	300
Lutheran Good Samaritan	Gen	Church					
Hospital	Gen	Church					
Belcourt 200—Roulette	Gen	IA	50	10	105	39	840
Turtle Mountain Hospital	Gen	IA					
Bismarck 11000—Burleigh	Gen	Church	112	12	182	83	2 503
Bismarck Hospital	Gen	Church	144	12	224	86	2 455
St Alexius Hospital	Gen	Church	75	10	170	54	1 782
Bottineau 1322—Bottineau	Gen	Church					
St Andrew's Hospital	Gen	Church					
Carrington 1717—Foster	Gen	Corp	18	3	40	8	375
Carrington Hospital	Gen	Corp					
Carson 306—Grant	Gen	Indiv	9	4	31	3	140
Carson Hospital	Gen	Indiv					
Devils Lake 5401—Ramsey	Gen	NPA'ssn	50	8	72	35	1 991
General Hospital	Gen	NPA'ssn					
Mercy Hospital	Gen	Church	100	26	191	51	1 000
Dickinson 5020—Stark	Gen	Church	86	14	188	39	1 261
St Joseph's Hospital	Gen	Church					
Drayton 502—Pembina	Gen	NPA'ssn	18	4	54	10	572
Drayton Hospital	Gen	NPA'ssn					
Fargo 28610—Cass	Gen	Church	105	30	588	121	5 207
St John's Hospital	Gen	Church	100	17	220	73	2 627
St Luke's Hospital	Gen	Church					
Veterans Admin Facility	Gen	Vet	100			94	917
Ft Lincoln (Bismarck P O) —Burleigh	Gen	Army	80			20	607
Station Hospital	Gen	Army					
Ft Totten 125—Benson	Gen	IA	37	4	60	20	741
Ft Totten Hospital	Gen	IA					
Ft Yates 800—Sioux	Gen	IA	47	3		22	818
Standing Rock Indian Hosp	Gen	IA					
Grafton 3138—Walsh	Gen	Church	50	10	265	39	1 370
Grafton Deaconess Hosp	Gen	Church					
Grand Forks 17112—Grand Forks	Gen	Church					
Grand Forks Deaconess Hos	Gen	NPA'ssn	80	25	355	55	3 194
pital *	Gen	NPA'ssn					
St Michael's Hospital	Gen	Church	60	10	291	52	1 638
Harvey 2137—Wells	Gen	Church	35	6	26	21	760
St Alexius Hospital	Gen	Church					
Jamestown 8187—Stutsman	Ment	State	2 000			1 518	457
North Dakota State Hospital	Ment	State					
for Insane	Ment	State					
Trinity Hospital	Gen	Church	77	12	131	30	1 078
Kenmare 1494—Ward	Gen	Church	45	5	61	18	536
Kenmare Deaconess Hosp	Gen	Church					
Linton 1192—Emmons	Gen	Indiv	7	5	60	4	102
Linton Hospital	Gen	Indiv					
Mandan 5037—Morton	Gen	Church	40	8	118	30	1 105
Mandan Deaconess Hospital	Gen	Church					
McVie 513—Nelson	Gen	Corp	16	4	60	6	335
Community Hospital	Gen	Corp					
Minot 16099—Ward	ENT	Indiv	13			7	484
McCannel's Private Hosp	ENT	Indiv					
St Joseph's Hospital	Gen	Church	110	15	226	69	1 955
Trinity Hospital *	Gen	Church	105	16	233	100	2 977
New Rockford 2195—Eddy	Gen	Church	12	3			
City Hospital	Gen	Church					

Key to symbols and abbreviations is on page 933

Reopened

## NORTH DAKOTA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Northwood 971—Grand Forks	Gen	NPA'sn	25	4	83	13	526
Northwood Deaconess Hosp	Gen	Church	25	16	35	9	240
Oakes 1709—Dickey	Gen	NPA'sn	16	4		10	
Rolette, 423—Rolette	Gen	Church	50	12	208	47	242
Community Hospital	Gen	NPA'sn					
Rugby 1512—Pierce	Gen	Church					
Good Samaritan Hospital	Gen	Church					
San Haven—Rolette	Gen	Church					
North Dakota State Tuberculosis Sanatorium	TB	State	368			313	293
Valley City 526—Barnes	Gen	Church	87	13	160	50	179
Wahpeton 3176—Richland	Gen	Part	20	5	51	14	523
Wahpeton Hospital	Gen	Church	50	11	148	27	1100
Williston 5108—Williams	Gen	Church	100	12	100	20	1484
Good Samaritan Hospital	Gen	Church					
Mercury Hospital	Gen	Church					
Related Institutions							
Bismarck 11090—Burleigh	Inst	State	40			8	708
North Dakota State Penitentiary Hospital	Inst	State					
Bowman, 888—Bowman	Gen	Indiv	9	6	22	3	101
Bowman Hospital	Gen	Indiv					
Elbowoods 139—McLean	Gen	IA	25	5	56	12	496
Ft Berthold Indian Hosp	Gen	IA					
Flgin 505—Grant	Gen	Indiv	12	4	23	6	130
Elgin Community Hospital	Gen	Indiv					
Fargo 28619—Cass	Mat	Indiv	10	10	53	2	53
Camp Maternity Hospital	Gen	County	30	3	00	20	240
Cass County Hospital	Gen	NPA'sn	33	6	71	31	92
Florence Crittenton Home	Mat	NPA'sn					
Ft Totten 12—Benson	TB	IA	80			63	100
Grafton 3136—Walsh	MeDe	State	1093			866	102
Grafton State School	MeDe	State					
Grand Forks 17112—Grand Forks	Gen	City	16			17	60
Grand Forks City Hospital	Gen	City					
Jamestown 187—Stutsman	Gen	City					
Jamestown Hospital	Gen	City					
Isolation Hospital	Gen	City					
Jamestown Hospital	Gen	City					
Mayville 1199—Traill	Gen	NPA'sn	16	6	77	8	514
Union Hospital	Gen	NPA'sn					

## Summary for North Dakota

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	40	4 690	3 446	48 019
Related institutions	12	1 363	998	2 992
Totals	52	6 053	4 444	51 011
Refused registration	4	71		

## OHIO

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Akron 20040—Summit	Chil	NPA'sn	110			80	2738
Children's Hospital	Chil	NPA'sn	324	41	1570	231	9599
City Hospital	Gen	NPA'sn	138	20	636	80	4110
People's Hospital	Gen	Church	156	29	696	108	5088
St Thomas Hospital	Gen	Church					
Alliance 23047—Stark	Gen	City	80	15	298	42	1521
Alliance City Hospital	Gen	City					
Amherst 2844—Lorain	TB	County	91			90	66
Pleasant View Sanatorium	TB	County					
Ashland 11141—Ashland	Gen	NPA'sn	31	12	206	21	830
Samaritan Hospital	Gen	NPA'sn					
Ashtabula 23301—Ashtabula	Gen	NPA'sn	90	14	215	47	1444
Ashtabula General Hosp	Gen	NPA'sn					
Athens 7202—Athens	Ment	State	1672			1729	312
Athens State Hospital	Gen	Indiv	31	8	92	19	760
Sheltering Arms Hospital	Gen	Indiv					
Barberton 23934—Summit	Gen	Corp	52	10	242	27	1230
Citizens Hospital	Gen	Corp					
Barnesville 4602—Belmont	Gen	Corp	14	4	33	5	272
Barnesville General Hosp	Gen	Corp					
Bedford 6814—Cuyahoga	Gen	City	27	9	148	10	537
Bedford Municipal Hospital	Gen	City					
Bellaire 13327—Belmont	Gen	NPA'sn	45	5	260	31	1170
City Hospital	Gen	NPA'sn					
Bellevue 6206—Huron	Gen	NPA'sn	30	6	82	13	476
Bellevue Hospital	Gen	NPA'sn					
Berea 5097—Cuyahoga	Gen	NPA'sn	32	9	187	21	833
Community Hospital	Gen	NPA'sn					
Bryan 4689—Williams	Gen	NPA'sn	21	5	42	6	304
Cameron Hospitals	Gen	NPA'sn					
Bucyrus 10027—Crawford	Gen	City	43	6	141	24	963
Bucyrus City Hospital	Gen	City					
Cambridge 14613—Guernsey	Gen	Indiv	25	3	24	7	367
St Francis Hospital	Gen	Indiv					
Canton 104906—Stark	Gen	NPA'sn	137	24	637	60	3335
Aultman Hospital	Gen	NPA'sn					
Little Flower Hospital	Gen	Church	203	34	1133	149	6696
Mercury Hospital	Gen	Church					
Molly Stark Sanatorium	TB	County	166			149	240
Colina 4664—Mercer	Gen	Indiv	24	4	51	12	584
Otis Hospital	Gen	Indiv					

## OHIO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Chagrin Falls 2739—Cuyahoga	N&M	Corp	50			31	960
Windsor Hospital	N&M	Corp					
Chillicothe 18340—Ross	Gen	NPA'sn	60	6	102	37	890
Chillicothe Hospital	Gen	NPA'sn					
Mt Logan Sanatorium	TB	County	64			62	44
U S Industrial Reformatory	Inst	USPHS	73			30	1007
Veterans Admin Facility	Ment	Vet	1102			1061	347
Cincinnati 451160—Hamilton	Gen	Church	109	40	988	149	6466
Bethesda Hospital	Gen	Church	216			132	4601
Children's Hospital	Chil	Church	304	48	889	207	7830
Christ Hospital	Gen	Church	20			33	1100
Christian R Holmes Hosp	Gen	City	890	60	2281	696	10801
Cincinnati General Hosp	Gen	City	70			64	214
Cincinnati Sanitarium	N&M	Corp	170	20	614	100	4469
Deaconess Hospital	Gen	Church	200	60	1600	361	10551
Good Samaritan Hosp	Gen	Church					
Hamilton County Tuberculosis Sanatorium	TB	County	640			623	309
Jewish Hospital	Gen	NPA'sn	262	37	809	106	5990
Longview State Hospital	Ment	State	2620			200	201
Ohio Hospital for Women and Children	Unit of Bethesda Hospital						
St Mary Hospital	Gen	Church	200	20	520	161	4000
Circleville 7369—Pickaway	Gen	City	20	4	89	7	518
Berger Hospital	Gen	City					
Cleveland 900429—Cuyahoga	Unit of University Hospitals						
Babies and Childrens Hosp	Gen	City	1021	08	1010	120	13740
City Hospital	Gen	City					
City Psychopathic Hospital	Unit of City Hospital						
Cleveland Clinic Foundation	Gen	NPA'sn	238			149	5537
Hospital	Gen	NPA'sn					
Cleveland State Hospital	Ment	State	2280			2679	516
East 55th Street Hospital	Gen	Corp	60	12	6	11	120
Evangelical Deaconess Hosp	Gen	Church	144	35	70	99	330
Fairview Park Hospital	Gen	Church	91	18	469	70	3190
Glenview Hospital	Gen	NPA'sn	88	22	360	82	346
Grace Hospital	Gen	NPA'sn	32			14	741
John H Lowman Memorial Pavilion	Unit of City Hospital						
Lakeside Hospital	Unit of University Hospitals						
Leonard O Hanna House	Unit of University Hospitals						
Lutheran Hospital	Gen	Church	109	28	799	84	4138
Maternity Hospital	Unit of University Hospitals						
Mt Sinai Hospital	Gen	NPA'sn	220	40	740	197	844
Polyclinic Hospital	Gen	NPA'sn	90	15	370	87	2480
Prospect Hospital	N&M	Corp	120			194	13
Provident Hospital	Gen	NPA'sn	20	12		10	
St Alexis Hospital	Gen	Church	220			164	463
St Ann's Maternity Hosp	Mat	Church	47	47	1409	32	1570
St John's Hospital	Gen	Church	217	32	889	144	5823
St Luke's Hospital	Gen	Church	336	50	1463	283	11883
St Vincent Charity Hospital	Gen	Church	200			274	411
U S Marine Hospital	Gen	USPHS	201			223	2818
University Hospitals	Gen	NPA'sn	698	194	2172	502	19300
Woman's Hospital	Gen	NPA'sn	93	17	447	73	2101
Columbus 290564—Franklin	Chil	NPA'sn	88	12		70	2208
Children's Hospital	Chil	NPA'sn					
Columbus State Hospital	Ment	State	2600			2793	507
Franklin County Sanat	TB	County	260			190	167
Dr Gaver Sanitarium	N&M	Indiv	20			15	80
Grant Hospital	Gen	NPA'sn	303	30	848	200	6399
McMillen Sanitarium	N&M	Corp	35			00	100
Mercury Hospital	Gen	NPA'sn	60	15	122	00	1088
Mt Carmel Hospital	Gen	Church	220	20	631	160	5109
St Ann's Infant Asylum and Maternity Hospital	Mat	Church	00	25	610	28	1060
St Anthony Hospital	Gen	Church	160			183	830
St Clair Hospital	Gen	NPA'sn	90	4	14	14	340
St Francis Hospital	Gen	State	160			124	3063
Starling Loving University Hospital	Gen	State	264	32	701	160	0717
Station Hospital	Gen	Army	175	0	33	177	2200
White Cross Hospital	Gen	Church	213	28	1076	188	6060
Conneaut 9691—Ashtabula	Gen	NPA'sn	30	8	132	02	800
Brown Memorial Hospital	Gen	NPA'sn					
Coshocton 10808—Coshocton	Gen	City	44	8	231	26	901
Coshocton City Hospital	Gen	City					
Crestline 4420—Crawford	Gen	NPA'sn	20	4	48	8	254
Crestline Emergency Hosp	Gen	NPA'sn					
Cuyahoga Falls 19707—Summit	N&M	NPA'sn	60			57	140
Fair Oaks Villa	N&M	NPA'sn					
Dayton 200982—Montgomery	Ment	State	1740			1716	491
Dayton State Hospital	Gen	Church	200	48	990	100	4301
Good Samaritan Hosp	Gen	NPA'sn	380	46	1474	318	10813
Miami Valley Hospital	Gen	NPA'sn					
St Ann's Maternity Hosp	Gen	Church	400	30	1300	194	7110
St Elizabeth Hospital	Gen	Church	94			90	00
Stillwater Sanatorium	TB	County	1100			999	4320
Veterans Admin Facility	Gen	Vet					
Defiance 8818—Defiance	Gen	NPA'sn	30	5	172	20	947
Defiance Hospital	Gen	NPA'sn					
Dennison 4429—Tuscarawas	Gen	NPA'sn	30	0	73	10	408
Twin City Hospital	Gen	NPA'sn					
Dover 9716—Tuscarawas	Gen	NPA'sn	70	10	142	37	1011
Union Hospital	Gen	NPA'sn					
East Cleveland 39667—Cuyahoga	Gen	Corp	8			3	181
East Cleveland Hospital and Clinic	Gen	NPA'sn	200	40	1000	181	7203
Huron Road Hospital	Gen	NPA'sn					
East Liverpool 23029—Columbiana	Gen	City	89	10	360	59	1002
East Liverpool City Hosp	Gen	City					

Key to symbols and abbreviations is on page 933

## OHIO—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Elyria 3633—Lorain Elyria Memorial Hospital Cakes Hospital for Crippled Children	Gen	NPA'ssn	159	20	53	88	2 373
Findlay 19363—Hancock Findlay Hospital	Gen	NPA'ssn	63	12	241	31	1 343
Freemont 13422—Sandusky Community Hospital Memorial Hospital of Sandusky County	Gen	NPA'ssn	16	4	31	8	310
Galion 7644—Crawford Good Samaritan Hospital	Gen	NPA'ssn	52	8	343	44	1 713
Gallipolis 7106—Gallia Holzer Hospital	Gen	Part State	54	4	40	42	1 948
Green Springs 750—Geneca and Sandusky Onk Ridge Sanatorium	IB	Indiv	70			2 110	292
Greenville 7046—Darke Greenville Hospital	Gen	NPA'ssn	34	6	113	23	911
Hamilton 59176—Butler Ft Hamilton Hospital Mercy Hospital	Gen	NPA'ssn	8	2	31	46	1 411
Hillsboro 4040—Highland Hillsboro Hospital	Gen	NPA'ssn	200	40	305	98	3 144
Ironton 16621—Lawrence Lawrence County General Hospital Marting Hospital	Gen	County	6	12	150	28	1 570
Kenton 7009—Hardin McKittick Hospital San Antonio Hospital	Gen	NPA'ssn	2	5	73	2	602
Lakewood 70409—Cuyahoga Lakewood City Hospital	Gen	Church	26	5	21	20	300
Lima 4923—Allen District Tuberculosis Hosp Lima Memorial Hospital	TB	County	12			80	9
Lima State Hospital St Rita's Hospital	Gen	NPA'ssn	129	15	449	88	3 61
Lodi 14—Medina Lodi Hospital	Gen	State	169			1 167	167
Logan 0880—Hocking Cherrington Hospital	Gen	Church	101	16	283	60	2 881
Lorain 41512—Lorain St Joseph's Hospital Macedonia 734—Summit Hawthorneden Farm	Gen	Church	30	9	210	15	810
Massillon 3390—Richland Massillon General Hospital	Gen	NPA'ssn	30	4	29	11	36
Metzetta 1490—Washington Manetta Memorial Hosp	Gen	Church	100	20	534	67	2 461
Marion 3104—Marion Marion City Hospital Sawyer Sanatorium	Gen	NPA'ssn	50	10	218	29	1 286
Martins Ferry 14524—Belmont Martins Ferry Hospital	Gen	Part	50			24	121
Massillon 96400—Stark Massillon City Hospital Massillon State Hospital	Gen	NPA'ssn	90	11	360	84	2 884
McConnellsville 1704—Morgan Rocky Glen Sanatorium	Gen	NPA'ssn	106	14	439	54	2 313
Mentor 1580—Lake Delhurst Sanitarium	Gen	State	316			3 338	72
Middletown 29902—Butler Middletown Hospital	Gen	Corp	143			130	140
Mt Vernon 9370—Knox Mercy Hospital Mt Vernon Hospital Sanit	Gen	NPA'ssn	176			196	81
Newark 30596—Licking Licking County Tuberculo sis Sanatorium	Gen	Church	3	8	181	20	1 118
Newark Hospital North Royalton (Brecks) The P Mount Royal Sanatorium	Gen	NPA'ssn	50	10	126	23	944
Normal 7766—Huron Normal Memorial Hospital	Gen	State	207			222	474
Oberlin 4902—Lorain Allen Hospital Oberlin Col lege	Gen	NPA'ssn	41	5	99	16	1 011
Perrysburg 31302—Wood Community Hospital Rheinfank Hospital	Gen	NPA'ssn	57	18	320	40	1 77
Piqua 16000—Miami Memorial Hospital	Gen	NPA'ssn	106	18	439	54	2 313
Port Clinton 4408—Ottawa Pool Hospital	Gen	NPA'ssn	30	6	59	19	574
Portsmouth 4260—Scioto Mercy Hospital Portsmouth General Hosp	Gen	NPA'ssn	60	10	281	47	1 261
Portsmouth Hospital Ravenna 8010—Portage Robinson Memorial Hosp	Gen	NPA'ssn	35	7	160	10	567
Salem 10622—Columbiana Central Clinic and Hosp Salem City Hospital	Gen	NPA'ssn	30	6	59	19	574
St Clairsville 2440—Bulmont Belmont Sanatorium	Gen	NPA'ssn	60	10	281	47	1 261
Sandusky 24677—Erie Good Samaritan Hospital Providence Hospital	Gen	NPA'ssn	63	9	211	31	907
Shelby 6198—Richland Shelby Memorial Hospital	Gen	Church	64	10	225	32	1 340

## OHIO--Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassincts	Number of Births	Average Census	Admissions
Sidney 9 301—Shelby Wilson Memorial Hospital	Gen	NPA ssn	23	5	146	15	763
South Euclid 4 392—Cuyahoga Rainbow Hospital for Crippled and Convalescent Children							
Springfield 68 743—Clark County Tuberculosis Sanatorium	TB Gen	County City	120 2.8	40	875	107 131	140 5 06
Springfield Lake—Summit Edwin Shaw Sanatorium	TB	County	204			183	200
Steuensville 30 423—Jefferson Ohio Memorial Hospital	Gen	Church	25			16	520
Gill Valley Hospital	Gen	NPA ssn	100	25	6.8	90	3 683
Tiffin 16 493—Seneca Mercy Hospital	Gen	Church	35	10	104	26	1 003
Toledo 290 715—Iucas East Side Hospital	Gen	NPA ssn	41	4	26	18	576
Flower Hospital+ Lucas County General Hos pital+ +	Gen	Church	110	20	467	65	2 801
Mercy Hospital+ Robinwood Hospital+ St Vincent's Hospital+ Toledo Hospital+ Toledo Sanitarium	Gen Gen Gen Gen N&M Corp	County Church Church Church	202 115 25 2.5	33 25 12 20	716 420 169 664	215 94 41 110	5 886 2 932 1 313 9 931
Toledo State Hospital+ William W Roche Memorial Tuberculosis Hospital Women's and Children's Hospital+ +	Gen Gen TB Gen	State County	2 709 176			2 719 1.8	673 230
Troy 8 635—Miami Stouder Memorial Hospital	Gen	City	44	8	1.3	27	1 101
Urbana 7 742—Champaign Champaign County Hosp	Gen	County	35	6	67	18	332
Van Wert 8 472—Van Wert Van Wert County Hospital	Gen	NPA ssn	44	6	82	20	814
Wadsworth 5 930—Medina Wadsworth Municipal Hosp	Gen	City	27	10	128	14	4 53
Warren 41 062—Trumbull St Joseph's Riverside Hos pital	Gen	Church	50	10	362	50	1 823
Trumbull County Tuberculo sis Sanatorium	TB	County	50			47	76
Warren City Hospital+ Warrensville 1 507—Cuyahoga Sunny Acres Cleveland Tu berculosis Sanatorium+	Gen TB	NPA ssn City	131 434	22	415	80 432	3 387 4.8
Wauecon 2 889—Fulton De Fite Harrison Detwiler Memorial Hospital	Gen	NPA ssn	46	7	157	34	1 449
Willard 4 514—Huron Willard Municipal Hosp	Gen	City	30	6	84	16	649
Wilmington 5 332—Clinton Dr Kelley Hale Surgical Hospital	Gen	Indiv	17	7	23	8	267
Wooster 10 742—Wayne Kliney and Knestrick Hosp	Gen	Corp	25	5	No data supplied		
Wooster Hospital	Gen	Part	22	4	3	8	242
Worthington 1 239—Franklin Harding Sanitarium+	N&M	Corp	40			38	316
Xenia 10 007—Greene McClellan Hospital	Gen	Corp	20	4	46	10	487
Youngstown 170 002—Mahoning Mahoning Tuberculosis San atorium	TB Gen	County Church	167 233	25	1 118	160 170	104 6 443
St Elizabeth's Hospital+ + Youngstown Hospital+ + Zanesville 36 440—Muskingum Bethesda Hospital+ Good Samaritan Hospital+	Gen Gen Gen	NPA ssn Church	503 190 120	62 20 20	1 220 421 411	263 67 85	9 020 2 006 2 639
<b>Related Institutions</b>							
Akron 200 040—Summit Akron Clinic	Gen	Part	12			5	402
Goodyear Hospital and Dis pensary	Indus	Corp	2,			5	137
Just A Mere Home and Hosp Apple Creek 459—Wayne Institution for Feebleminded	N&M MeDe	Indiv State	1.0 596			140 5.00	342 93
Barnesville 4 602—Belmont Community Hospital	Gen	NPA ssn	5	1	1	3	75
Bay Village 2 294—Cuyahoga Cedarcrest Sanitarium	N&M	Corp	90			75	16
Beaufontaine 9 540—Logan Harbert Hospital	LNT	Indiv	6			1	113
Bluffton 2 030—Allen Bluffton Community Hosp	Gen	NPA ssn	22	4	82	12	310
Cambridge 14 012—Guernsey Children and Maternity Hos pital	MatCh Gen	NPA ssn NPA ssn	17 39	8 4	30 .5	7 6	235 3.9
Sran Hospital Celina 4 664—Mercer Gibbons Hospital	Gen	NPA ssn	19	4	56	12	573
Cincinnati 451 100—Hamilton Catherine Booth Home and Hospital	Mat	Church	10	10	111	13	120
Children's Convalescent Home of the Cincinnati Orphan Asylum Children's Home Evangeline Home Hospital and Nursery	Inst Inst Mat	NPA ssn NPA ssn Church	100 33 34			8 9 2	301 40 87

**Key to symbols and abbreviations is on page 933**



## OHIO—Continued

## OKLAHOMA

Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Hamilton County Home and Chronic Disease Hosp	Chr	County	260			243	553
Home for Incurables	Inc	NPAsn	70			70	8
Jewish Convalescent and Foster Homes	Conv	NPAsn	70		No data supplied		
Maple Knoll Hospital and Home for the Friendless	Mat	NPAsn	8	10	17	50	195
Ophthalmic Hospital	ENP	Indiv	10			1	73
Ridge Rest Home	N&M	Corp	3			20	48
St. Francis Hospital for Incurables	Inc	Church	2	3		2	181
St. Joseph Maternity Hospital and Infant Asylum	Mat	Church	20	20	117	3	122
Cleveland 909 429—Cuyahoga Booth Memorial Home and Hospital	Mat	Church	17	17	397	14	397
Children's Fresh Air Camp and Hospital	Conv	NPAsn	60			60	230
Emergency Hospital	Indus	Inst	20			11	44
Florence Crittenton Home	Mat	NPAsn	2	1	21	11	23
Ingleside Home	N&M	NPAsn	7			60	10
Jewish Orphan's Home	Inst	Frat	40			5	4
Columbus 290 664—Franklin Florence Crittenton Home	Mat	NPAsn	34	24	64	27	77
Franklin County Home	Inst	County	125			124	124
Institution for Feeble-minded MeDe	State	State	2 000	6	1	2 109	178
Ohio Penitentiary Hospital	Inst	State	127			121	2 640
Covington 1 807—Miami Covington Hospital	Gen	NPAsn	6	1	6	1	66
Dayton 200 982—Montgomery Convalescent Home for Crippled Children	Orth	NPAsn	3			27	128
Delaware 5 670—Delaware Girls Industrial School Hospital	Inst	State	32			11	421
Eucled 12 751—Cuyahoga Ream Sanitarium	Conv	Corp	90		No data supplied		
Rose Mary Home	Orth	Church	2			21	17
Fairfield 1 240—Greene Station Hospital	Gen	Army	10			1	65
Granville 1 467—Licking Whisler Hall Memorial Hosp	Inst	NPAsn	24			3	3
Greenfield 3 871—Highland Greenfield Hospital	Gen	NPAsn	21	8	5	8	142
Lancaster 18 716—Lairfield Boys Industrial School Hospital	Inst	State	100			25	872
Lebanon 3 222—Warren Blair Brothers Hospital	Gen	Part	8	3	42	5	2
Marysville 3 639—Union Harmon Hospital	Inst	State	34	3	1	5	319
Mt Vernon 9 376—Knox Avalon Sanatorium	TB	Indiv	50			43	87
Munroe Falls 702—Summit Summit County Hospital	Inst	County	1			14	46
Napoleon 4 74—Hurry S. M. Heller Memorial Hosp	Gen	City	14	4	4	8	430
New London 1 527—Huron New London Hospital	Gen	NPAsn	9	3	16	5	163
Orient 230—Pickaway Institution for Feeble-minded MeDe	State	State	2 540			2 308	202
Oxford 2 500—Butler Miami University Student Hospital	Inst	State	22			8	92
Reynoldsburg 562—Franklin Nightingale Cottage	TbChil	NPAsn	40			34	6
Springfield 68 743—Clark Ohio Rehekah Hospital	Inst	Frat	7			42	162
Rickly Memorial Hospital	Inst	Frat	280			24	192
State Soldiers Home—Frie Ohio Soldiers and Sailors Home Hospital	Inst	State	200			97	470
Tiffin 16 428—Seneca Kentucky Memorial Hosp	Inst	Frat	50			11	7
Toledo 290 718—Lucas Lucas County Hosp Annex	Chr	County	112			108	161
Municipal Hospital for Contagious Diseases	Iso	City	30			11	240
Toledo Society for Crippled Children	Orth	NPAsn	76			47	97
Warrensville 1 507—Cuyahoga Warrensville Chronic Hospital	MentInst	City	170			162	3
Wickliffe 2 401—Lake Ridge Cliff Sanitarium	N&M	Corp	100			72	15
Wooster 10 742—Wayne Hygela Hall	Inst	NPAsn	25			3	317
Xenia 10 507—Greene Ohio Soldiers and Sailors Orphan's Home Hosp	Inst	State	63			31	1 494
Yellow Springs 1 427—Greene Antioch College Infirmary	Inst	NPAsn	10			4	396
Youngstown 170 602—Mahoning Youngstown Municipal Hospital	Iso	City	60			3	59
Summary for Ohio							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	187	4 237	39 010	426 88			
	65	9 060	5 613	19 706			
Totals	252	54 302	46 820	446 591			
Refused registration	30	600					

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Ada 11 261—Pontotoc Breco's Memorial Hospital	Gen	NPAsn	2	2	53	9	504
Valley View Hospital	Gen	NPAsn	62	9		Estab	10.8
Altus 8 439—Jackson City Hospital	Gen	City	2	4	27	4	74
Alva 5 121—Woods Alva General Hospital	Gen	City	26	6	93	17	790
Anadarko 5 020—Caddo Anadarko Hospital	Gen	Part	21	3	51	11	524
Ardmore 15 741—Carter Hardy Sanitarium	Gen	Indiv	41	8	193	19	1 119
Von Keller Hospital and Clinic	Gen	NPAsn	28	5	48	11	1 702
Bartlesville 14 761—Washington Washington County Memorial Hospital	Gen	County	50	10	204	26	1 151
Beaver 1 078—Beaver Beaver Hospital	Gen	Part	20	4	41	5	320
Blackwell 9 621—Kay Blackwell Hospital	Gen	NPAsn	38	5	31	6	212
Riverside Clinic Hospital	Gen	Part	1	5	14	8	460
Bristow 6 610—Creek Cowart Sister Hospital	Gen	Part	18	5	40	5	3
Cherokee 2 236—Alfalfa Cherokee Hospital	Gen	Frat	50	7	69	20	817
Chickasha 14 090—Grady Chickasha Hospital	Gen	Part	54	4	56	25	1 661
Cottage Hospital	Gen	Indiv	10	4	2	9	476
General Hospital	Gen	NPAsn	20	5	62	7	604
Claremore 3 720—Rogers Claremore Indian Hospital	Gen	IA	56	16	2.8	52	1 430
Clinton 7 512—Custer Clinton Indian Hospital	Gen	IA	33	5	3	14	397
Clinton Indian Hospital Western Oklahoma Charity Hospital	Gen	State	162	8	76	89	1 886
Western Oklahoma Tuberculosis Sanatorium	TB	State	312			269	422
Concho 290—Canadian Cheyenne and Arapaho Hospital	Gen	IA	46	8	72	24	643
Cordell 2 936—Washita Florence Hospital	Gen	Indiv	50	6	38	6	34
Cushing 9 301—Payne Masonic Hospital	Gen	Frat	34	6	108	2	9
Duncan 8 363—Stephens Patterson Hospital	Gen	Indiv	2	6	78	10	66
Weedn Hospital	Gen	Indiv	60	8		14	512
Durant 7 463—Bryan Durant Hospital	Gen	Corp	2	2	77	14	672
Evergreen Sanitarium	Gen	Indiv	21	3	21	8	2.5
Hayden Coker Hospital	Gen	Part	11	2	43	10	407
Elk City 5 666—Beckham Tisdal Hospital	Gen	Indiv	35	3	2	10	584
El Reno 9 884—Canadian Catto Hospital	Gen	Indiv	19	3	25	3	186
El Reno Sanitarium	Gen	Corp	37	6	5	1	654
Enid 26 328—Garfield Enid General Hospital	Gen	NPAsn	60	10	14	59	1 932
Independence Hospital	Gen	NPAsn	16	4	3	8	479
St. Mary's Enid Springs Hospital	Gen	Church	41	9	214	24	1 671
University Hospital	Gen	Church	7	1	1	36	1 290
Erick 2 231—Beckham Erick Hospital	Gen	NPAsn	14	2	25	4	200
Fort Sill 5 557—Comanche Station Hospital	Gen	Army	3	6	172	224	5 198
Frederick 4 08—Tillman Frederick Clinic Hospital	Gen	Part	29	3	70	10	770
Spurgeon Arrington and Allen Hosp and Clinic	Gen	Corp	14	6	65	4	210
Grandfield 1 416—Tillman Grandfield Hospital	Gen	Indiv	16	2	51	5	168
Guthrie 9 582—Logan Cimarron Valley Wesley Hospital	Gen	NPAsn	31	5	10	1	32
Duke Sanitarium	Gen	Corp	2			1	100
Henryetta 7 694—Okmulgee Henryetta Hospital	Gen	Indiv	20	2	37	12	617
John Taylor Hospital	Gen	Indiv	14	2	18	11	700
Hobart 4 982—Kiowa General Hospital	Gen	Part	21	5	187	9	694
Holdenville 7 268—Hughes Holdenville Hospital	Gen	Indiv	28	2	22	10	46
Hollis 2 914—Harmon Hollis Hospital	Gen	Indiv	1	3	46	8	3
Hominy 3 48—Osage Hominy Hospital	Gen	Indiv	14	4	49	4	293
Lawton 12 121—Comanche Lawton Indian Hospital	Gen	IA	106	16	194	117	2 270
Kiowa Indian Hospital	Gen	Part	2	4	42	6	4
Southwestern Hospital	Gen	Part	50	6	No data supplied		
Mangum 4 566—Greer Border Hospital and Clinic	Gen	Indiv	20	4	12	3	1
Marlow 3 084—Stephens Weedn Hospital	Gen	Indiv	20	4	12	3	1
Maud 4 326—Seminole Maud Hospital	Gen	Indiv	18	2	2	6	21
McAlester 11 804—Pittsburg Albert Pike Hospital	Gen	Indiv	2	4	3	2	1 23
St. Mary's Infirmary	Gen	Church	23	2	31	5	499
Miami 8 064—Ottawa Miami Baptist Hospital	Gen	Church	40	8	7	1	709

Key to symbols and abbreviations is on page 933

## OKLAHOMA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Muskogee 3700—Muskogee Muskogee Provident Hospital (col)	Gen	City Church	20	2	No data supplied		
Oklahoma Baptist Hospital Veterans Admin Facility	Gen	City Church	125	11	233	30	1 871
Norman 9083—Cleveland Central Oklahoma State Hospital	Gen	City Church	423			383	3 275
Okemah 4602—Okfuskee Clinic Hospital	Gen	City Church	20	2	No data supplied		
Oklahoma City, 18, & 9—Oklahoma Farm Sanatorium	Gen	City Church	125	11	233	30	1 871
Great Western Hosp (col)	Gen	City Church	423			383	3 275
Hospital for Bone and Joint Diseases and McBride Clinic	Orth	City Church	20	2	No data supplied		
Oklahoma City General Hospital	Gen	City Church	20	2	No data supplied		
Polysplenic Hospital	Gen	City Church	20	2	No data supplied		
St Anthony Hospital	Gen	City Church	20	2	No data supplied		
Samarian Hospital	Gen	City Church	20	2	No data supplied		
State University and Crippled Children's Hospital	Gen	City Church	20	2	No data supplied		
Wesley Hospital	Gen	City Church	20	2	No data supplied		
Okmulgee 17,097—Okmulgee Okmulgee City Colored Hospital	Gen	City Church	20	2	No data supplied		
Okmulgee City Hospital	Gen	City Church	20	2	No data supplied		
Pauls Valley 4730—Garvin Lindsey Johnson Shirley Hospital	Gen	City Church	20	2	No data supplied		
Pawhuska, 5931—Osage Osage County Hospital	Gen	City Church	20	2	No data supplied		
Pawhuska Municipal Hospital	Gen	City Church	20	2	No data supplied		
Pawnee, 2502—Pawnee Pawnee-Ponca Hospital	Gen	City Church	20	2	No data supplied		
Picher 7773—Ottawa American Hospital	Gen	City Church	20	2	No data supplied		
Picher Hospital	Gen	City Church	20	2	No data supplied		
Ponca City 16136—Kay Ponca City Hospital	Gen	City Church	20	2	No data supplied		
Poteau 3169—Le Flore Woodson Hospital	Gen	City Church	20	2	No data supplied		
Prague 1209—Lincoln Rollins Hospital	Gen	City Church	20	2	No data supplied		
Samino 1149—Seminole Barber Hospital	Gen	City Church	20	2	No data supplied		
Shattuck 1490—Ellis Shattuck Hospital	Gen	City Church	20	2	No data supplied		
Shawnee 23,783—Pottawatomie A C H Hospital	Gen	City Church	20	2	No data supplied		
Shawnee Indian Sanatorium	Gen	City Church	20	2	No data supplied		
Shawnee Municipal Hospital	Gen	City Church	20	2	No data supplied		
Sulphur 4742—Murray Soldiers Tubercular Sanat	Gen	City Church	20	2	No data supplied		
Sulphur Clinic	Gen	City Church	20	2	No data supplied		
Supply 230—Woodward Western Oklahoma Hospital	Gen	City Church	20	2	No data supplied		
Taft 600—Muskogee State Hospital for Negro Insane	Gen	City Church	20	2	No data supplied		
Tablequah 7400—Cherokee Wm W Hastings Indian Hospital	Gen	City Church	20	2	No data supplied		
Tallhanna 1032—Le Flore Choctaw Chickasaw Sanat	Gen	City Church	20	2	No data supplied		
Eastern Oklahoma State Tuberculosis Sanatorium	Gen	City Church	20	2	No data supplied		
Tonkawa 3311—Kay Tonkawa Hospital	Gen	City Church	20	2	No data supplied		
Tulsa 14105—Tulsa Flower Hospital	Gen	City Church	20	2	No data supplied		
Merer Hospital and Surgical Institute	Gen	City Church	20	2	No data supplied		
Morningside Hospital	Gen	City Church	20	2	No data supplied		
Oakwood Sanitarium	Gen	City Church	20	2	No data supplied		
St John's Hospital	Gen	City Church	20	2	No data supplied		
Vinita 4973—Craig Eastern Oklahoma Hospital	Gen	City Church	20	2	No data supplied		
Vinita Hospital	Gen	City Church	20	2	No data supplied		
Waurika 268—Jefferson Waurika Hospital	Gen	City Church	20	2	No data supplied		
Weoka 10401—Seminole Knight Hospital	Gen	City Church	20	2	No data supplied		
Weoka Hospital	Gen	City Church	20	2	No data supplied		
Woodward 186—Woodward Woodward General Hospital	Gen	City Church	20	2	No data supplied		
Related Institutions							
Chelsea 132—Rogers Jennings Hospital	Gen	City Church	20	2	No data supplied		
Chillicothe 900—Kay Chillicothe Indian School Hospital	Gen	City Church	20	2	No data supplied		
Durant 746—Bryan Bryan County Hospital	Gen	City Church	20	2	No data supplied		
El Reno 934—Canadian U S Southwestern Reformatory	Gen	City Church	20	2	No data supplied		
Enid 909—Garfield Northern Oklahoma Hospital	Gen	City Church	20	2	No data supplied		

## OKLAHOMA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Fairfax 2134—Osage Fairfax Hospital	Gen	City Church	20	2	No data supplied		
Ft Reno (Ft Reno P O) 150—Canadian Station Hospital	Gen	City Church	20	2	No data supplied		
Hobart 4982—Klawa Hobart Hospital	Gen	City Church	20	2	No data supplied		
Kingsfisher 2726—Kingsfisher Kingsfisher Hospital	Gen	City Church	20	2	No data supplied		
Lawton 12121—Comanche Angus Hospital	Gen	City Church	20	2	No data supplied		
McAlester 11804—Pittsburg Oklahoma State Prison Hospital	Gen	City Church	20	2	No data supplied		
Okeene 1,075—Blaine Okeene Hospital	Gen	City Church	20	2	No data supplied		
Oklahoma City 15,489—Oklahoma Home of Redeeming Love	Gen	City Church	20	2	No data supplied		
Ryan 124—Jefferson Ryan Hospital	Gen	City Church	20	2	No data supplied		
Stillwater 7016—Payne Agriculture and Mechanical College Infirmary	Gen	City Church	20	2	No data supplied		
1 Chequah 2490—Cherokee Sequoyah Training School Hospital	Gen	City Church	20	2	No data supplied		
Tulsa 141,248—Tulsa Municipal Hosp No 2 (col)	Gen	City Church	20	2	No data supplied		
Tulsa General Hospital	Gen	City Church	20	2	No data supplied		
Tulsa Junior League Home for Convalescent Crippled Children	Gen	City Church	20	2	No data supplied		
Watonga 2223—Baldie Watonga Hospital	Gen	City Church	20	2	No data supplied		
Weatherford 2417—Custer Weatherford General Hosp	Gen	City Church	20	2	No data supplied		
Summary for Oklahoma							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	105	13 870	11 165	104,222			
Totals	21	1 573	1 237	6 541			
Refused registration	126	15 243	12,402	111 063			

## OREGON

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Albany 5820—Linn Albany General Hospital	Gen	City Church	20	2	No data supplied		
Ashland 4544—Jackson Community Hospital	Gen	City Church	20	2	No data supplied		
Astoria 10349—Clatsop Columbia Hospital	Gen	City Church	20	2	No data supplied		
St Mary's Hospital	Gen	City Church	20	2	No data supplied		
Baker 7838—Baker St Elizabeth Hospital	Gen	City Church	20	2	No data supplied		
Bend 8848—Deschutes St Charles Hospital	Gen	City Church	20	2	No data supplied		
Burns 2399—Harney Valley View Hospital	Gen	City Church	20	2	No data supplied		
Cornwall 7331—Benton Cornwall General Hospital	Gen	City Church	20	2	No data supplied		
Dallas 297—Polk Dallas Hospital	Gen	City Church	20	2	No data supplied		
Enterprise 1779—Wallowa Enterprise Hospital	Gen	City Church	20	2	No data supplied		
Eugene 18901—Lane Eugene Hospital and Clinic	Gen	City Church	20	2	No data supplied		
Sacred Heart General Hosp	Gen	City Church	20	2	No data supplied		
Grants Pass 4606—Josephine Josephine County General Hospital	Gen	City Church	20	2	No data supplied		
Hood River 2757—Hood River Hood River Hospital	Gen	City Church	20	2	No data supplied		
Klamath Agency, 100—Klamath Klamath Indian Hospital	Gen	City Church	20	2	No data supplied		
Klamath Falls 16094—Klamath Hillside Hospital	Gen	City Church	20	2	No data supplied		
Klamath Valley Hospital	Gen	City Church	20	2	No data supplied		
La Grande 8008—Union St Joseph Hospital	Gen	City Church	20	2	No data supplied		
Lebanon 181—Linn Lebanon General Hospital	Gen	City Church	20	2	No data supplied		
McMinnville 2917—Yamhill McMinnville Hospital	Gen	City Church	20	2	No data supplied		
Medford 1100—Jackson Sacred Heart Hospital	Gen	City Church	20	2	No data supplied		
Vinauque 176—Clackamas Portland Open Air Sanat	Gen	City Church	20	2	No data supplied		
Myrtle Point 1362—Coos West and Wilson Hospital	Gen	City Church	20	2	No data supplied		
Newberg 931—Yamhill Willamette Hospital	Gen	City Church	20	2	No data supplied		

## OREGON—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
North Bend 4012—Coos Kelzer Brothers Hospital	Gen	Corp	68	10	No data	supplied	
Mercury Hospital	Gen	Church	50	4	57	10	378
Ontario 1941—Malheur Holy Rosary Hospital	Gen	Church	40	5	72	26	981
Oregon City 5761—Clackamas Hutchinson General Hosp	Gen	Indiv	31	7	115	11	59
Oregon City Hospital	Gen	Corp	53	10	236	30	1 078
Pendleton 6,621—Umatilla Eastern Oregon State Hosp	Ment	State	130			1 303	264
St Anthony's Hospital	Gen	Church	80	12	159	41	1 789
Portland 301 81—Multnomah Coffey Memorial Hospital	Gen	Corp	100	6		25	1 233
Doernbecher Memorial Hospital for Children	Unit of University of Oregon Medical School Hospitals and Clinics						
Immanuel Hospital	Gen	Church	263	60	1 404	211	8 119
Good Samaritan Hosp	Gen	Church	325	34	747	200	10 155
Juvenile Hospital for Girls	VcnMat	NPA'sn	115	13	33	6	134
Morningside Hospital	Ment	Fed	310			200	73
Multnomah Hospital	Unit of University of Oregon Medical School Hospitals and Clinics						
Portland Convalescent Hospital	Med	Indiv	25			10	100
Portland Medical Hospital	Gen	Corp	57			24	481
Portland Sanitarium and Hospital	Gen	Church	110	24	677	93	5 519
St Vincent's Hospital	Gen	Church	386	36	810	333	9 236
Shriners Hospital for Crippled Children	Orth	Frat	50			52	280
Theo B Wilcox Memorial Hospital	Unit of Good Samaritan Hospital						
University of Oregon Medical School Hospitals and Clinics	Gen	CoState	35	30	65	336	7 574
Veterans Admin Facility	Gen	Vet	383			344	2 378
Waverleigh Sanatorium	N&M	Part	10			7	71
Roseburg 4362—Douglas Mercy Hospital	Gen	Church	40	7	190	21	1 000
Veterans Admin Facility	Ment	Vet	566			260	470
St Helens 3994—Columbia St Helens General Hosp	Gen	Corp	19	6	21	8	534
Salem 2626—Marion Oregon State Hospital	Ment	State	2 630			2 615	951
Oregon State Tuberculosis Hospital	TB	State	320			327	214
Salem Deaconess Hospital	Gen	Church	100	10	216	76	1 582
Salem General Hospital	Gen	NPA'sn	72	20	317	43	1 862
Silverton 2462—Marion Silverton Hospital	Gen	Corp	20	8	130	14	436
The Dalles 5833—Wasco Eastern Oregon State Tuberculosis Hospital	TB	State	200			153	136
Mid Columbia Hospital	Gen	Indiv	22	6	36	14	630
The Dalles Hospital	Gen	Corp	75	8	180	37	1 368
Tillamook 2549—Tillamook Chariton Hospital	Gen	Indiv	35	8	57	12	580
Toledo 2,137—Lincoln Lincoln Hospital	Gen	Part	20	4	89	13	463
Troutdale 227—Multnomah Multnomah County Tuberculosis Pavilion	TB	County	41			38	81
Warm Springs 50—Jefferson Warm Springs Hospital	Gen	IA	20	5	6	13	100
Woodburn 1 670—Marion Woodburn Hospital	Gen	Indiv	10	4		5	190
Related Institutions							
Chemawa 700—Marion Salem Indian School Hosp	Gen	IA	60	3	15	17	889
Coquille 2 732—Coos Coquille Hospital	Gen	Part	25	8	124	10	662
Corvallis 7 585—Benton Student Health Service Oregon State College	Inst	State	30			15	876
Lakeview 1 789—Lake Lakeview Hospital	Gen	Corp	12	4	48	9	497
Portland 301 815—Multnomah L Henry Wemme White Shield	Mat	NPA'sn	36	12	36	13	49
Isolation Hospital	Gen	City	68			28	452
Salvation Army White Shield Home	Mat	Church	30	6	80	28	120
Prairie City 438—Grant Grant County Hospital	Gen	Indiv	12	5	40	7	284
Salem 26 266—Marion Oregon Fairview Home	McDe	State	997			90	169
Oregon State Penitentiary Hospital	Inst	State	32			20	341
Oregon State School for the Deaf	In t	State	11			3	141
Waldport 667—Lincoln Waldport Community Hosp	Gen	Indiv	10	4	24	3	63
Summary for Oregon							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	61	9 534	7 964	90 776			
	12	1 307	1 133	4,478			
Totals	73	10 841	9 097	95 254			
Refused registration	14	301					

## PENNSYLVANIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Ablington, 3 200—Montgomery Ablington Memorial Hosp	Gen	NPA'sn	204	51	781	179	6 411
Allentown 92 563—Lehigh Allentown Hospital	Gen	NPA'sn	349	30	613	277	7 681
Allentown State Hospital	Ment	State	1,600			1 616	337
Baer Hospital	Gen	Indiv	25	10	No data	supplied	
Sacred Heart Hospital	Gen	Church	300	25	684	194	0 006
Allenwood 400—Union Devils Camp	TB	NPA'sn	108			86	0 000
Altoona 82 054—Blair Altoona Hospital	Gen	NPA'sn	162	18	473	91	2 077
Mersey Hospital	Gen	Church	127	17	522	89	3 402
Ambler, 3 944—Montgomery Dufur Hospital	N&M	Indiv	50			50	83
Ashland 7 164—Schuylkill Ashland State Hospital	Gen	State	150	20	492	101	5 015
Aspinwall (Sharpsburg P O) 4,263—Allegheny Veterans Admin Facility	Gen	Vet	503			490	0 003
Beaver Falls 17 147—Beaver Providence Hospital	Gen	Church	49	9	234	40	1 320
Bedford 2 903—Bedford Timmins Hospital	Gen	Indiv	17	3	8	6	208
Bellevue 4 004—Centre Centre County Hospital	Gen	NPA'sn	53	16	271	43	1 410
Bellevue 10 2—Allegheny Suburban General Hospital	Gen	NPA'sn	110	14	328	07	2 025
Bethlehem 07 892—Northampton St Luke's Hospital	Gen	NPA'sn	192	23	562	108	4 416
Berwick 12 660—Columbia Berwick Hospital	Gen	NPA'sn	52	10	183	30	1 150
Bloomsburg 9 093—Columbia Bloomsburg Hospital	Gen	NPA'sn	117	18	281	74	2 442
Blossburg 1 676—Tioga Blossburg State Hospital	Gen	State	90	11	211	80	0 033
Bradock 19 329—Allegheny Bradock General Hosp	Gen	NPA'sn	191	16	642	74	2 969
Bradford 19 506—McKean Bradford Hospital	Gen	NPA'sn	110	20	491	72	0 380
Bristol 11 709—Bucks Dr Wagners Private Hosp	Gen	Indiv	18	6		10	
Brookville 4 387—Jefferson Brookville Hospital	Gen	NPA'sn	34	7	84	23	851
Brownsville 2 869—Fayette Brownsville General Hosp	Gen	NPA'sn	90	10	171	53	1,028
Bryn Mawr 10 206—Montgomery Bryn Mawr Hospital	Gen	NPA'sn	200	30	604	170	5 667
Butler 23 068—Butler Butler County Memorial Hospital	Gen	NPA'sn	99	15	304	54	3 079
Canonsburg 12 508—Washington Canonsburg General Hosp	Gen	NPA'sn	66	14	326	48	2 008
Carbondale 20 061—Lackawanna Carbondale General Hosp	Gen	NPA'sn	58	12	180	40	1 697
St Joseph's Hospital	Gen	Church	88	10	128	44	1 000
Carlisle 12 596—Cumberland Carlisle Hospital	Gen	NPA'sn	77	18	204	50	1 918
Station Hospital	Gen	Army	50	2	19	46	730
Chambersburg 13 788—Franklin Chambersburg Hospital	Gen	NPA'sn	90	12	188	60	1 177
Chester 59 164—Delaware Chester Hospital	Gen	NPA'sn	200	30	723	196	4 000
J Lewis Crozer Home for Incurables and Homeopathic Hospital	Gen	NPA'sn	80	10	308	51	1 100
Clarke Summit 2 604—Lackawanna Hillside Home and Hospital for Mental Diseases	Ment	County	900			846	000
Clearfield 9 221—Clearfield Clearfield Hospital	Gen	NPA'sn	100	10	203	78	2 000
Clifton Heights 0 007—Delaware Burn Brae Hospital	N&M	Indiv	40			39	800
Coaldale 6 921—Schuylkill Coaldale State Hospital	Gen	State	104	18	003	99	2 433
Coatesville 14 682—Chester Coatesville Hospital	Gen	NPA'sn	85	10	207	65	1 916
Veterans Admin Facility	Ment	Vet	1 461			1 400	450
Columbia 11 349—Lancaster Columbia Hospital	Gen	NPA'sn	40	11	121	17	000
Colver 1,800—Cambria Colver Hospital	Gen	NPA'sn	19	4	No data	supplied	
Confluence 989—Somerset Frantz Hospital	Gen	Indiv	12	3	32	8	233
Connellsville 13 290—Fayette Connellsville State Hosp	Gen	State	93	10	357	60	1 492
Corry 7 152—Erie Corry Hospital	Gen	NPA'sn	46	8	190	18	000
Coudersport 2 740—Potter Coudersport General Hosp	Gen	NPA'sn	28	4	41	10	000
Danville 7 180—Montour Danville State Hospital	Ment	State	2 082			1 007	500
Geo F Geisinger Memorial Hospital	Gen	NPA'sn	161	18	533	170	5 443
Darby 9 899—Delaware Fitzgerald Mercy Hospital	Gen	Church	200	43	820	123	3 000
Diyomont 100—Allegheny Diyomont Hospital	N&M	NPA'sn	1 000			1 140	000
Drexel Hill 1 110—Delaware Delaware County Hospital	Gen	NPA'sn	56	14	300	50	1 000
Du Bois 11 590—Clearfield Du Bois Hospital	Gen	Church	50	7	140	25	000
Maple Avenue Hospital	Gen	NPA'sn	63	7	140	27	1,000

Key to symbols and abbreviations is on page 933

## PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Eagleville 200—Montgomery							
Eagleville Sanatorium for Consumptives	TB	NP Assn	188			170	177
Easton 34408—Northampton	Gen	NP Assn	40	10	140	21	1,017
Betts Hospital	Gen	NP Assn	200	20	216	142	6,089
Easton Hospital	Gen	NP Assn	30			15	61
East Stroudsburg 6,099—Monroe							
General Hospital of Monroe County	Gen	NP Assn	47	8	161	33	1,661
Elizabethtown 3,940—Lancaster							
Philadelphia Freemasons Memorial Hospital	Gen	Frat	160			138	651
State Hospital for Crippled Children	Orth	State	120			122	224
Ellwood City 1,334—Lawrence							
Ellwood City Hospital	Gen	NP Assn	50	12	210	20	794
Erie 11596—Erie							
Erie County Tuberculosis Hospital	TB	County	66			62	118
Hamot Hospital	Gen	NP Assn	224	31	1,092	173	6,061
St Vincent's Hospital	Gen	NP Assn	186	30	812	160	6,337
Zem Zem Hospital for Crippled Children	Orth	Frat	50			36	40
Everett, 1,874—Bedford							
Everett Hospital	Gen	Indiv	20	5	53	11	460
Franklin 10,204—Venango							
Franklin Hospital	Gen	NP Assn	47	10	148	31	1,162
Gettysburg 5,584—Adams							
Annie M Warner Hospital	Gen	NP Assn	30	6	173	32	1,220
Gladwyne 1,200—Montgomery							
Gladwyne Colony	N & M	Indiv	12			79	109
Greensburg, 16,508—Westmoreland							
Westmoreland Hospital	Gen	NP Assn	140	12	637	106	3,403
Greenville 8,628—Mercer							
Greenville Hospital	Gen	NP Assn	50	12	51	20	1,208
Grove City 6,156—Mercer							
Grove City Hospital	Gen	NP Assn	32	6	70	10	382
Hamburg, 3,637—Berks							
Hamburg State Sanatorium for Tuberculosis	TB	State	540			517	508
Hanover, 11,800—York							
Hanover General Hospital	Gen	NP Assn	50	10	318	30	1,327
Harrisburg 80,339—Dauphin							
Harrisburg Hospital	Gen	NP Assn	230	20	768	193	6,684
Harrisburg Psychiatric Hospital	Gen	NP Assn	160	32	561	111	4,008
Harrisburg State Hospital	Ment	State	1,921			1,993	310
Keystone Hospital	Gen	Indiv	27	6	104	18	632
Hazleton 26,760—Luzerne							
Corrigan Maternity Hosp	Mat	Part	18	16	300	11	300
Hazleton State Hospital	Gen	State	100	14	530	130	5,480
Hollidaysburg 5,909—Blair							
Blair County Hospital for Mental Diseases	Ment	County	330			322	116
Homestead 20,141—Allegheny							
Homestead Hospital	Gen	Corp	120	20	426	101	2,931
Honesdale 5,490—Wayne							
Wayne County Memorial Hospital	Gen	NP Assn	32	7	90	17	618
Huntingdon 7,508—Huntingdon							
J C Blair Memorial Hosp	Gen	NP Assn	84	14	204	51	2,100
Indiana 9,560—Indiana							
Indiana Hospital	Gen	NP Assn	130	15	192	100	3,706
Jersey Shore 9,681—Lycoming							
Community Hospital	Gen	NP Assn	32	10	57	9	467
Johnstown 66,993—Cambria							
Conemaugh Valley Memorial Hospital	Gen	NP Assn	312	33	727	260	6,977
Lee Homeopathic Hospital	Gen	NP Assn	54	19	202	48	1,212
Mendenhall Maternity Hosp	Mat	Indiv	14	12	160	10	216
Mercy Hospital	Gen	Church	104	23	408	70	2,204
Kane 6,030—McKean							
Community Hospital	Gen	NP Assn	69	12	167	41	1,411
Kane Summit Hospital	Gen	NP Assn	21	6	70	13	311
Kingston, 21,600—Luzerne							
Nesbitt Memorial Hosp	Gen	NP Assn	118	12	460	92	3,106
Kittanning 7,808—Armstrong							
Armstrong County Hospital	Gen	NP Assn	66	4	120	40	1,016
Lancaster 59,949—Lancaster							
Lancaster General Hosp	Gen	NP Assn	237	40	876	160	6,127
Rossmore Sanatorium	TB	Cy Co	7			3	120
St Joseph's Hospital	Gen	Church	200	32	356	116	4,290
Lansdale 8,379—Montgomery							
Flm Terrace Hospital	Gen	NP Assn	30	12	110	17	600
Lattrobe 10,644—Westmoreland							
Lattrobe Hospital	Gen	NP Assn	75	15	370	52	1,567
Lebanon 20,001—Lebanon							
Good Samaritan Hospital	Gen	NP Assn	101	19	292	71	2,051
Lebanon Sanatorium	Gen	Corp	28	6	98	20	673
Leedsdale 2,744—Allegheny							
D T Watson Home for Crippled Children	Orth	NP Assn	100			90	116
Lewisburg 3,300—Union							
Evangelical Hospital	Gen	Church	26	7	114	17	501
U S Public Health Service Hospital	Gen	USPHS	84			45	142
Lewistown 13,300—Mifflin							
Lewistown Hospital	Gen	NP Assn	99	13	219	82	2,002
Lock Haven 9,660—Clinton							
Lock Haven Hospital	Gen	NP Assn	68	16	290	40	1,300
Teah Private Hospital	Gen	Indiv	21	4	23	8	264

## PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Lock No 4 618—Washington							
Charleford Monessen Hosp	Gen	NP Assn	93	20	313	64	1,627
Mayview 420—Allegheny							
Pittsburgh City Home and Hospitals	Gen	City	688	6	17	634	1,993
Pittsburgh City Home and Hospitals	N & M	City	2,802			2,889	633
McKeesport 51,632—Allegheny							
McKeesport Hospital	Gen	NP Assn	200	40	1,030	166	5,376
McKees Rocks, 18,116—Allegheny							
Ohio Valley General Hosp	Gen	NP Assn	62	21	428	50	2,016
Meadville 16,698—Crawford							
Meadville City Hospital	Gen	NP Assn	90	14	250	68	1,981
Spencer Hospital	Gen	NP Assn	98	18	330	67	2,288
Media 5,372—Delaware							
Media Hospital	Gen	Indiv	27	4	26	13	324
Mercer 2,125—Mercer							
Mercer Cottage Hospital	Gen	Corp	46	4	35	28	862
Mercer Sanatorium	N & M	Part	40			30	123
Meyersdale, 3,065—Somerset							
Hazel McGilvery Hospital	Gen	Indiv	14	5	21	5	240
Meyersdale Wenzel Hosp	Gen	Indiv	12	3	7	2	123
Monaca 4,641—Beaver							
Beaver County Sanatorium	TB	County	62			60	76
Monessen 20,268—Westmoreland							
Gemmill Hospital	FNT	Part	13			4	442
Mopongahela 8,670—Washington							
Memorial Hospital	Gen	NP Assn	72	8	144	30	957
Mt Pleasant, 5,869—Westmoreland							
Henry Clay Frick Memorial Hospital	Gen	NP Assn	61	10	207	45	1,078
Nanticoke 26,043—Luzerne							
Nanticoke State Hospital	Gen	State	120	10	267	83	2,800
New Brighton 9,900—Beaver							
Beaver Valley General Hosp	Gen	NP Assn	71	10	192	39	1,248
New Castle 48,674—Lawrence							
Jameson Memorial Hosp	Gen	NP Assn	168	23	454	96	3,002
New Castle Hospital	Gen	Church	103	20	416	80	2,033
New Kensington 16,762—Westmoreland							
Citizens General Hospital	Gen	NP Assn	86	12	398	70	2,080
Norristown 3,803—Montgomery							
Montgomery Hospital	Gen	NP Assn	90	20	380	66	2,710
Norristown State Hospital	Ment	State	3,630			3,495	466
Riverview Hospital	Gen	NP Assn	30	10	240	20	710
Sacred Heart Hospital	Gen	Church	40	11	330	30	1,376
Northampton 9,839—Northampton							
Haff Hospital	Gen	Indiv	32	3	17	20	407
Oil City 22,075—Venango							
Grand View Institution	TB	NP Assn	50			19	58
Oil City General Hospital	Gen	NP Assn	90	20	374	50	1,928
Palmerton 7,678—Carbon							
Palmerton Hospital	Gen	NP Assn	65	7	178	58	1,773
Peekville 8,000—Lackawanna							
Mid Valley Hospital	Gen	NP Assn	62	8	233	40	1,600
Philadelphia 1,00,961—Philadelphia							
American Hospital for Diseases of the Stomach	Gen	NP Assn	30	3	64	17	747
American Oncologic Hosp	SKCa	NP Assn	40			24	410
Anderson Hospital	Gen	Corp	76	26	206	20	1,702
Broad Street Hospital	Gen	NP Assn	80	30	290	37	1,480
Buckman's Sanitarium	N & M	Indiv	20			15	50
Chestnut Hill Hospital	Gen	NP Assn	89	25	318	63	1,834
Children's Heart Hospital	Card	NP Assn	60			60	77
Children's Hospital	Chil	NP Assn	134			90	2,007
Children's Hospital of the Mary J Drexel Home	Chil	Church	60			20	564
Fairmount Farm	N & M	Corp	44			27	141
Frankford Hospital	Gen	Corp	144	48	342	92	3,640
Frederick Douglass Memorial Hospital (col)	Gen	NP Assn	80	11	116	40	681
Friends Hospital	N & M	NP Assn	176			144	146
Garretson Hospital	Unit of Temple University Hospital						
Germanatown Dispensary and Hospital	Gen	NP Assn	340	06	1,282	292	7,027
Graduate Hospital of the University of Pennsylvania	Gen	NP Assn	461			216	6,815
Hahnemann Hospital	Gen	NP Assn	100	77	1,398	449	12,683
Home for Consumptives	TB	Church	104			91	115
Hospital of the Protestant Episcopal Church	Gen	Church	482	48	1,170	34	7,087
Hospital of the University of Pennsylvania	Gen	State	595	41	971	33	11,694
Hospital of the Woman's Medical College	Gen	NP Assn	102	21	600	98	3,698
Institute of the Pennsylvania Hospital	N & M	NP Assn	60			36	540
Jeanes Hospital	N & M	NP Assn	68			01	599
Jefferson Medical College Hospital	Gen	NP Assn	688	57	1,637	409	13,302
Jewish Hospital	Gen	NP Assn	400	70	1,224	280	8,270
Joseph Price Memorial Hospital	Gen	NP Assn	55	5	20	15	399
Kensington Hospital for Women	Gyn/Mat	NP Assn	66	30	909	40	2,663
Lankenau Hospital	Gen	NP Assn	200	30	419	188	4,570
Lying In Hospital	Unit of Pennsylvania Hospital						
Memorial Hospital	Gen	NP Assn	82	10	207	68	1,894
Mercy Hospital (col)	Gen	NP Assn	100	10	203	3	1,872
Methodist Episcopal Hosp	Gen	Church	170	36	700	100	3,822
Mercordia Hospital	Gen	Church	194	36	806	167	4,432
Mt Sinai Hospital	Gen	NP Assn	261	55	1,001	200	7,036
National Stomach Hospital	Gen	NP Assn	44	7	23	15	502
Northern Liberties Hospital	Gen	NP Assn	102	15	473	50	2,523
Northern Liberties Hosp	Gen	NP Assn	58	11	75	41	1,673

## PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Northwestern General Hosp Pennsylvania Hospital**	Unit of Gen	Temple NPAssn	430	130	2 447	328	8,915
Pennsylvania Hospital Department for Mental and Nervous Diseases**	N&M	NPAssn	225			100	238
Philadelphia General Hospital**	Gen	City	2,676	60	1 534	2 023	24 189
Philadelphia Hospital for Contagious Diseases	Iso	City	1 000			252	3 912
Philadelphia Italian Hosp	Gen	NPAssn	40	12		7	
Philadelphia Orthopaedic Hospital and Infirmary for Nervous Diseases*	Orth&Neur	NPAssn	141			56	459
Philadelphia State Hosp	Mont	State	5 416			5 300	400
Presbyterian Hospital**	Gen	Church	314	42	418	175	5 699
Preston Retreat	Mat	NPAssn	50	30	407	26	400
Rush Hospital for Consumption and Allied Diseases	TB	NPAssn	144			110	428
St Agnes Hospital*	Gen	Church	346	60	1 317	234	5 612
St Christopher's Hospital for Children*	Chil	NPAssn	82			56	1 871
St Joseph's Hospital*	Gen	Church	160	22	417	70	2 439
St Luke's and Children's Hospital*	Gen	NPAssn	219	40	809	140	4 610
St Mary's Hospital*	Gen	Church	200	44	734	122	4 440
St Vincent's Hospital for Women and Children	Gen	Church	133	24	324	70	1 026
Shriner's Hospital for Crippled Children	Orth	Frat	100			90	437
Skin and Cancer Hospital*	Sk&Ca	NPAssn	31			26	157
Stetson Hospital	Gen	NPAssn	72	10	117	21	1 304
Temple University Hosp**	Gen	NPAssn	396	41	1 068	333	10 200
U S Naval Hospital*	Gen	Navy	650			662	7 000
Urologic Clinic	Urol	Part	1			13	151
Wills Hospital*	Fye	NPAssn	200			118	3 688
Women's Hospital*	Gen	NPAssn	109	41	886	82	3 766
Women's Homeopathic Hospital*	Gen	NPAssn	160	40	441	73	3 079
Philipsburg 3 600—Centre Dr McKirk Sanitarium	Gen	Indiv	26	6	85	5	221
Philipsburg State Hospital*	Gen	State	120	12	329	99	3 175
Phoenixville 12 029—Chester Phoenixville Hospital	Gen	NPAssn	67	12	106	30	979
Pittsburgh 609 517—Allegheny Allegheny General Hosp**	Gen	NPAssn	538	54	816	371	8 070
Belvedere General Hospital Children's Hospital*	Chil	NPAssn	40	10	97	10	96
Elizabeth Steel Magee Hospital*	Gen	NPAssn	100	112	2 747	202	9 142
Eye and Ear Hospital*	F&E	NPAssn	401			48	3 400
Haddon Maternity Hospital	Mat	Corp	30	15	240	12	506
Leech Farm Sanatorium	IB	City	900			20	411
Mercy Hospital**	Gen	Church	222	48	811	543	11 799
Montefiore Hospital**	Gen	NPAssn	243	32	786	190	6 359
Municipal Hospital for Contagious Diseases	Iso	City	100			69	710
Passavant Hospital*	Gen	Church	116	24	267	70	2 345
Pittsburgh Hospital*	Gen	NPAssn	208	24	708	144	4 002
Presbyterian Hospital**	Gen	NPAssn	140			91	2 400
Roselin Foundling and Maternity Hospital	Mat&Ch	NPAssn	143	16	208	123	524
St Francis Hospital**	Gen	Church	600	46	1 060	546	10 769
St John's General Hosp**	Gen	NPAssn	180	40	860	101	4 337
St Joseph's Hospital*	Gen	Church	128	12	368	88	2 007
St Margaret Memorial Hospital*	Gen	Church	120	21	300	64	2 880
Shady Side Hospital*	Gen	NPAssn	230	40	801	178	5 810
South Side Hospital*	Gen	NPAssn	207	18	404	125	4 308
Tuberculosis League Hosp	TB	NPAssn	160			140	212
U S Marine Hospital	USPHS		73			73	9
Western Pennsylvania Hospital**	Gen	NPAssn	600	61	1 903	373	11 419
Pittston 18 946—Luzerne Pittston Hospital	Gen	NPAssn	113	17	366	79	3 956
Pottstown 19 430—Montgomery Homeopathic Hospital	Gen	NPAssn	60	10	178	21	900
Pottstown Hospital	Gen	NPAssn	63	12	243	40	1 604
Pottsville 24 309—Schuylkill Lemos B Varne Hospital	Gen	Indiv	70	12	126	36	1 242
A C Milliken Hospital	Gen	NPAssn	50	10	218	37	1 017
Pottsville Hospital*	Gen	NPAssn	148	12	419	123	3 301
Punxsutawney 9 906—Jefferson Adrian Hospital	Gen	NPAssn	76	10	291	66	2 601
Quakertown 4 883—Bucks Quakertown Hospital	Gen	NPAssn	53	12	137	20	781
Ransom 100—Lackawanna Ransom Home and Mental Hospital	N&M	County	376			372	69
Reading 111 171—Berks Berks County Tuberculosis Sanatorium	TB	County	134			131	139
Homeopathic Medical and Surgical Hospital*	Gen	NPAssn	100	19	386	63	2 692
Reading Hospital**	Gen	NPAssn	202	37	703	214	6 097
St Joseph's Hospital*	Gen	Church	180	20	657	100	4 412
Renovo 3 747—Clinton Renovo Hospital	Gen	NPAssn	26	4	99	10	719
Retreat 2 000—Luzerne Retreat Mental Hospital	N&M	County	100			100	193
Ridgway 6 313—Elk Elk County General Hosp	Gen	NPAssn	62	9	189	39	1 509
Ridley Park 3 306—Delaware Taylor Hospital	Gen	NPAssn	70	18	291	41	1 740

## PENNSYLVANIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Roaring Spring, 2 024—Blair Nason Hospital	Gen	NPAssn	58	12	127	28	890
Rochester 7 726—Beaver Rochester General Hosp	Gen	NPAssn	89	10	No data supplied		
St Marys 7 423—Elk Andrew Kaul Memorial Hosp	Gen	Church	48	12	171	01	1 000
Sayre 7 902—Bradford Robert Packer Hospital**	Gen	NPAssn	304	21	563	200	7 000
Schuylkill Haven 6 514—Schuylkill Schuylkill County Hospital for Mental Diseases*	Ment	County	520			554	121
Seranton 143 403—Lackawanna Lackawanna County Tuberculosis Hospital	TB	County	150			149	110
Mercy Hospital*	Gen	Church	104	20	308	70	2 728
Moses Taylor Hospital*	Gen	NPAssn	120			80	2 150
St Joseph's Children's and Maternity Hospital*	Mat&Ch	Church	180	24	46	01	109
St Mary's Mater Misericordiae Hospital*	Gen	Church	83	12	243	50	1 418
Seranton Private Hospital	Gen	Corp	32	5	6	14	810
Seranton State Hospital*	Gen	State	120	10	303	140	008
West Side Hospital*	Gen	NPAssn	60	10	370	72	1 006
Sellersville 2 063—Bucks Grind View Hospital	Gen	NPAssn	60	10	242	41	1 300
Seneca 1 009—Allegheny Valley Hospital*	Gen	NPAssn	113	27	579	80	3 054
Shamokin 20 774—Northumberland Shamokin State Hospital	Gen	State	91	16	313	60	0 608
Sharon 2 906—Mercer Christian H Buhl Hospital*	Gen	NPAssn	100	17	543	103	3 104
Shenandoah 21 782—Schuylkill Locust Mountain State Hospital	Gen	State	77	12	316	64	2 774
Somerset, 4 300—Somerset Somerset Community Hosp	Gen	NPAssn	30	6	98	26	1 186
South Mountain 200—Franklin Pennsylvania State Tuberculosis Sanatorium No 1	TB	State	1 004			1 000	803
Spangler 2 701—Cambria Altners Hospital of Northern Cambria	Gen	NPAssn	86	10	205	66	2 947
State—Cambria Pennsylvania State Tuberculosis Sanatorium No 2	TB	State	840			803	633
Sunbury 25 606—Northumberland Mary M Packer Hospital	Gen	NPAssn	72	12	200	60	2 020
Susquehanna 900—Susquehanna Simon H Barnes Memorial Hospital	Gen	NPAssn	10	5	46	8	317
Tarentum 9 001—Allegheny Allegheny Valley Hospital*	Gen	NPAssn	88	10	306	69	2 101
Taylor 10 428—Lackawanna Taylor Hospital	Gen	NPAssn	44	12	160	36	1 030
Titusville 8 000—Crawford Titusville Hospital	Gen	NPAssn	50	15	208	30	939
Torrance 500—Westmoreland Torrance State Hospital	Ment	State	1 688			1 628	397
Uniontown 19 544—Fayette Uniontown Hospital*	Gen	NPAssn	210	10	402	100	4 837
Warren 14 863—Warren Warren General Hospital*	Gen	NPAssn	82	17	400	64	0 094
Warren State Hospital*	Ment	State	2 300			2 000	569
Warrington 100—Bucks Horace Berk Memorial Hosp	N&M	NPAssn	13			Estab	1000
Washington 24 000—Washington Hillsview Farms Sanitarium	Indiv	Indiv	48	1	20	20	100
Washington Hospital*	Gen	NPAssn	138	20	426	106	3 499
Wayne 902—Wayne Wayne State Hospital	Ment	State	800			800	66
Waynesboro 10 167—Franklin Waynesboro Hospital	Gen	NPAssn	36	10	200	29	1 107
Waynesburg 4 915—Greene Greene County Memorial Hospital	Gen	NPAssn	68	12	95	06	970
Wernersville 1 096—Berks Wernersville State Hosp	Ment	State	1 400			1 444	260
West Chester 12 320—Chester Chester County Hospital*	Gen	NPAssn	137	22	006	88	4 057
Homeopathic Hospital of Chester County*	Gen	NPAssn	63	10	218	30	1 331
Marshall Square Sanitarium	N&M	Part	50			20	90
White Haven 1 537—Luzerne White Haven Sanatorium*	TB	NPAssn	200			203	006
Wilkes Barre 86 606—Luzerne Mercy Hospital*	Gen	Church	190	20	401	100	4 307
Wilkes Barre General Hospital*	Gen	NPAssn	363	41	845	243	8 600
Wyoming Valley Homeopathic Hospital*	Gen	NPAssn	60	20	347	50	2 020
Wilkinsburg 29 539—Allegheny Columbia Hospital*	Gen	Church	184	30	717	133	3 401
Williamsport 40 720—Lycoming Rothfuss Clinic and Hosp	Gen	Indiv	20	5	30	6	000
Williamsport Hospital*	Gen	NPAssn	201	44	696	141	5 340
Windber 9 200—Somerset Windber Hospital*	Gen	NPAssn	107	10	315	83	2 071
Woodville 4 000—Allegheny Allegheny County Home and Hospital for the Insane	Ment	County	3 840	3	10	3 000	1 201
York 00 204—York West Side Sanitarium	Gen	Indiv	50	10	44	00	710
York Hospital*	Gen	NPAssn	184	25	800	100	5 681

Key to symbols and abbreviations is on page 933

## PENNSYLVANIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Bellefonte 4804—Centre Western State Penitentiary Hospital	Inst	State	22			10	430
Bellefonte 10 32—Allegheny Salvation Army Women's Home and Hospital	Mnt	Church	10	10	47	4	59
Broomall 1 900—Delaware Convalescent Hospital	Conv	Frat	31			23	305
Bryn Mawr 10 906—Montgomery Bryn Mawr College Infirmary	Inst	NPA'ssn	16			2	301
Cambridge Springs, 1 665—Crawford San Rosario Sanitarium	Conv	Church	30			14	440
Chester 59 164—Delaware Mercy Hospital	Gen	Indiv	30	8	75	9	327
Darby 9 809—Delaware St. Francis Country House for Convalescents and St. Francis Country House for Incurables	Conv	Church	68			40	370
Ebensburg 3 063—Cambria Cambria County Hospital	Inst	County	119			100	150
Flynn 200—Delaware Flynn Training School	MeDe	NPA'ssn	1 070			1 000	124
Embserville 500—Chester Chester County Institution	Ment	County	350			340	113
Frie 11 967—Erie Lakeview Hospital	Iso	City	84			15	
Harmarville 7 70—Allegheny Harmarville Convalescent Home	Conv	NPA'ssn	40	30		57	380
Huntingdon 7 508—Huntingdon Pennsylvania Industrial School	Inst	State	36			10	516
Johnstown 66 993—Cambria Municipal Hospital	Iso	City	60			No data supplied	
Lancaster 59 049—Lancaster Lancaster County Home and Hospital for Incurables	Ment	County	498			470	
Laurelton 37—Union Laurelton State Village	MeDe	State	713			690	32
Mercer, 2 10—Mercer Mercer County Home and Hospital	Ment	County	360			337	109
Middletown 6 083—Dauphin Odd Fellows Home	Inst	Frat	30			25	10
Mont Clare 900—Montgomery River Crest Preventorium	TB	NPA'ssn	100			80	231
Morgantown 1 700—Washington Pennsylvania Training School	Inst	State	20			10	790
Muncy 2 400—Lycoming Muncy Valley Hospital	Gen	NPA'ssn	20	6	33	8	217
New Wilmington 907—Lawrence Overlook Sanitarium	Conv	Part	30			22	187
North East 3 670—Erie St. Barnabas' House by the Lake	Inc	Church	32			30	16
Oakburne (West Chester P. O.) 100—Chester James C. Smith Memorial Home	Conv	Church	20			16	337
Pennsylvania Folklytic Hospital and Colony Farm	Epil	NPA'ssn	139			115	33
Olyphant 10 743—Jacksawanna Blakely Home	Ment	County	107			143	28
Pennhurst (Spring City P. O.) 100—Chester Pennhurst State School	MeDe	State	1 746			1 723	90
Philadelphia 1 900 961—Philadelphia Babies Hospital	Chil	NPA'ssn	14			9	302
Belmont Hospital Salvation Army Home and Hosp	Mat	Church	10	10	103	6	189
Eastern State Penitentiary Hospital	Inst	State	80			48	1 087
Florence Crittenton Home	Mat	NPA'ssn	10	16	36	12	46
Home of the Merciful Saviour for Crippled Children	Orth	NPA'ssn	62			62	
Homewood School	Inst	NPA'ssn	118	12		130	42
Kenwood Sanitarium	Conv	Corp	72			28	120
Philadelphia County Prison Hospital (Holmesburg)	Inst	CyCo	50			12	516
Philadelphia County Prison Hospital (Reed St.)	Inst	County	40			15	526
Philadelphia Home for Incurables	Inc	NPA'ssn	207			No data supplied	
Pine Hall Convalescent Home	Conv	Indiv	19			15	48
Sharon Hall	Conv	Corp	52			40	150
Wildener Memorial Industrial Training School for Crippled Children	Orth	NPA'ssn	100			70	6
Pittsburgh 669 817—Allegheny Fairview Sanitarium	Ment	Corp	12			8	11
Industrial Home for Crippled Children	Orth	NPA'ssn	80			70	169
Irish Home for the Aged	Inst	NPA'ssn	53			61	52
Western Penitentiary Hosp	Inst	State	30			16	406
Polk 2 27—Wenango Polk State School	MeDe	State	3 000			2,874	144
Pottstown 10 470—Montgomery Mill School Infirmary	Inst	NPA'ssn	26			8	400

## PENNSYLVANIA—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Retreat 2 000—Luzerne Retreat Home and Hospital for Chronic Diseases	Inst	County	500			342	142
Rochester 7 720—Beaver Passavant Memorial Homes for the Care of Epileptics	Epil	Church	150			120	20
Scranton, 143 443—Lackawanna Municipal Hospital for Contagious Diseases	Iso	City	45			7	90
Sellingrove 2 707—Snyder Sellingrove State Colony for Epileptics	Epil	State	404			430	53
Somerset 4 300—Somerset Somerset County Home and Hospital	Ment	County	300			500	119
State College 4 400—Centre Pennsylvania State College Health Service Hospital	Inst	State	30			8	564
Towanda 4 101—Bradford Mills Private Hospital	Gen	Indiv	37	8	132	11	301
Troy 1 100—Bradford Martha Lloyd School	MeDe	NPA'ssn	100			98	25
Wawa 300—Delaware Sanatorium School	Orth	Indiv	30			16	16
Wellboro, 3 647—Tioga Wellboro Hospital	Gen	NPA'ssn	9	2	18	4	117
Wilkes Barre 86 626—Luzerne Contagious Disease Hosp	Iso	City	12			2	61
Williamstown 2 908—Dauphin Williams Valley Hospital	Gen	Indiv	24	2		1	30
Willow Grove 3 000—Montgomery Willow Crest for Convalescents	Conv	NPA'ssn	75			70	1 009

## Summary for Pennsylvania

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	293	74 820	62 228	707 817
Related institutions	59	11 808	10 630	14 106
Totals	352	86 628	73 108	721 443
Refused registration	23	549		

## RHODE ISLAND

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Central Falls 25 898—Providence Notre Dame Hospital	Gen	NPA'ssn	45	11	117	21	1 076
East Greenwich 3 666—Kent Crawford Allen Memorial Hospital	Unit of Rhode Island Hospital	Providence					
East Providence 29 900—Providence Emma Pendleton Bradley Home	NervChil	NPA'ssn	50			45	75
Hillsgrove 1 000—Kent St. Joseph's Sanatorium	TB	Church	70			35	16
Howard 5 000—Providence State Hospital for Mental Diseases	Ment	State	3 000			2 117	633
State Infirmary	Gen	State	1 183	13	33	802	802
Newport 27 612—Newport Newport Hospital	Gen	NPA'ssn	160	35	306	113	3 141
Station Hospital	Gen	Army	44			20	793
U. S. Naval Hospital	Gen	Nav	152			147	2 152
Pawtucket, 77 149—Providence Memorial Hospital	Gen	NPA'ssn	166	30	604	128	3 164
Providence 202 981—Providence Butler Hospital	N&M	NPA'ssn	174			102	188
Charles V. Chapin Hosp	TB	City	260			187	1 094
Homeopathic Hospital	Gen	NPA'ssn	166	34	841	127	4 701
Jane Brown Memorial Hosp	Unit of Rhode Island Hospital						
Miriam Hospital	Gen	NPA'ssn	63	14	229	45	1 742
Providence Lying In Hosp	Mat	NPA'ssn	100	103	3 020	169	3 430
Rhode Island Hospital	Gen	NPA'ssn	300			334	8 147
St. Joseph's Hospital	Gen	Church	307	43	810	187	4 736
Wakefield 4 000—Washington South County Hospital	Gen	NPA'ssn	39	10	177	22	907
Wallum Lake 100—Providence State Sanatorium	TB	State	60			400	361
Westerly 10 997—Washington Westerly Hospital	Gen	NPA'ssn	61	12	202	31	1 173
Woonsocket 49 376—Providence Woonsocket Hospital	Gen	NPA'ssn	149	37	546	70	2 603
Related Institutions							
Bristol 11 903—Bristol Rhode Island Soldiers Home	Inst	State	51			51	99
Howard 5 000—Providence Rhode Island State Prison Hospital	Inst	State	19			16	271
Howe 13—Kent Lakeside Home and Mary Murray Preventorium	TB	NPA'ssn	65			43	125
La Fayette 600—Washington Fayer School	MeDe	State	700			674	62



## RHODE ISLAND—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Providence, 232 981—Providence	Conv	Indiv	20			14	29
Heath Sanatorium	Conv	Indiv	14			12	20
Heath Sanatorium Annex							
St Elizabeth Home for Incapacitated	Inc	Church	69			60	37

## Summary for Rhode Island

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	20	7 14	5 607	44 822
Related institutions	7	941	876	539
Totals	27	8 255	6 483	45 361
Refused registration	1	60		

## SOUTH CAROLINA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Abbeville 4 414—Abbeville	Gen	NPA'ssn	21	2	33	11	24
Abbeville County Memorial Hospital							
Aiken 6 031—Aiken	Gen	County	60	12	143	53	244
Aiken County Hospital							
Anderson 14 383—Anderson	Gen	NPA'ssn	84	10	344	71	366
Anderson County Hospital							
Bennettsville 3 607—Marlboro	Gen	NPA'ssn	32	8	98	23	114
Marlboro County General Hospital							
Camden 5 183—Kershaw	Gen	NPA'ssn	50	4	174	39	179
Camden Hospital							
Charleston 62 265—Charleston	Gen	NPA'ssn	50	10	144	28	177
Baker Memorial Sanatorium	Gen	NPA'ssn	20	20	688	270	740
Roper Hospital							
St Francis Xavier Infirmary	Gen	Church	50	13	174	30	1026
U S Naval Hospital	Gen	Navy	57	2	16	2	36
Chester 5 528—Chester	Gen	NPA'ssn	58	6	66	19	1011
Pryor Hospital							
Clinton 5 643—Laurens	Gen	NPA'ssn	1	3	24	7	279
Hays Hospital							
Columbia 51 551—Richland	Gen	County	200	30	674	233	7673
Columbia Hospital							
Good Samaritan Waverly Hospitals (col)	Gen	NPA'ssn	70	6			
Providence Hospital	Gen	Church	100	10			
South Carolina Baptist Hospital	Gen	Church	101	6	132	80	269
South Carolina State Hospital	Gen	State	4 372		4 171	1 619	
Veterans Admin Facility	Gen	Vet	618		453	379	
Waverly Sanitarium	N&M	Corp	3		21	264	
Conway 3 011—Horry	Gen	NPA'ssn	41	7	29	29	241
Conway Hospital							
Florence 14 744—Florence	Gen	NPA'ssn	71		66	104	
Florence Darlington Tuberculosis Sanatorium	TB	County	188	12	243	146	180
McLeod Infirmary	Gen	NPA'ssn	6	4	66	48	1930
Saunders Memorial Hosp	Gen	NPA'ssn	48	4	14	27	2867
Gaffney 6 827—Cherokee	Gen	County	48	4	14	27	2867
Cherokee County Hospital							
Greenville 29 154—Greenville	TB	County	81	15	513	160	562
Greenville County Tuberculosis Sanatorium							
Greenville General Hosp	Gen	City	10		3	381	
Dr Jervess Private Hosp	Gen	Church	90	20	360	79	236
St Francis Hospital							
Shriners Hospital for Crippled Children	Orth	Frat	60		60	340	
Working Benevolent Hospital (col)	Gen	Frat	22	2	33	12	210
Greenwood 11 020—Greenwood	Gen	CyCo	2	6	46	15	417
Brewer Hospital (col)	Gen	NPA'ssn	70	7	140	36	1641
Greenwood Hospital							
Hartsville 5 067—Darlington	Gen	NPA'ssn	38	6	160	20	104
Byerly Hospital	Gen	Indiv	15	2	49	12	442
Powe Hospital							
Lancaster 3 435—Lancaster	Gen	Indiv	32	2	31	20	342
Lancaster Hospital							
Laurens 5 443—Laurens	Gen	County	29	0	38	12	607
Laurens County Hospital							
Moncks Corner 623—Berkeley	Gen	NPA'ssn	52	6	41	27	363
Berkeley County Hospital							
Moultrieville 515—Charleston	Gen	Army	90	3	24	70	1963
Station Hospital							
Mullins 3 158—Marion	Gen	NPA'ssn	60	8	126	48	1781
Mullins Hospital							
Navy Yard 1 020—Charleston	TB	County	60		60	12	
Pinehaven Sanatorium							
Newberry 7 298—Newberry	Gen	NPA'ssn	28	0	30	14	600
Newberry County Hospital							
Orangeburg 8 716—Orangeburg	Gen	NPA'ssn	116	12	103	60	2906
Tri County Hospital							
Parris Island 200—Beaufort	Gen	Navy	137	4	133	35	336
U S Naval Hospital							
Ridgewood (Columbia P O) 600—Richland	TB	NPA'ssn	70		37	46	
Ridgewood Tuberculosis Camp							
Rock Hill 11 222—York	Gen	Church	70	6	101	67	2681
St Philip's Mercy Hospital							

## SOUTH CAROLINA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Six Mile 150—Piedmont	Gen	Indiv	30	1	2	18	504
Dr Peck's Hospital							
Spartanburg 28 723—Spartanburg	Gen	NPA'ssn	42	3	5	3	1860
Mary Black Memorial Hosp	Gen	County	230	16	511	161	5673
Spartanburg General Hosp							
State Park—Richland							
Palmetto Sanatorium (col) Unit of South Carolina Sanatorium	TB	State	100			209	536
Summerville 2 079—Dorchester	Gen	County	22	10	37	17	442
Dorchester County Hosp							
Sumter 11 780—Sumter	Gen	NPA'ssn	160	10	193	66	1987
Tuomey Hospital							
Walterboro 2 592—Colleton	Gen	Indiv	30	6	77	20	1804
Charles Es Dorn Hospital							

## Related Institutions

Charleston 62 963—Charleston	Inst	City	24			4	190
Charleston Orphan House							
Clinton 5 642—Laurens	Inst	Church	40			7	59
Lesh Infirmary of Thornwell							
Orphanage	Inst	McDe	710			714	80
State Training School							
Greenville 29 154—Greenville	Inst	NPA'ssn	44			2	191
Webb Memorial Infirmary							
Ridgeland 715—Jasper	Gen	Indiv	18	3	28	9	404
Evangelical Hospital							
Spartanburg 28 723—Spartanburg	Conv	Indiv	20				160
Broadview Sanitarium							
Summerville 2 548—Dorchester	Gen	NPA'ssn	12	2	No data supplied		
Arthur B Lee Hosp (col)							
Sumter 11 780—Sumter							
Camp Alice Sumter County	TB	CyCo	26			22	47
Tuberculosis Sanitarium							
Union 7 419—Union	Gen	County	20	3	60	13	520
Wallace Thomson Hospital							

## Summary for South Carolina

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	51	9 099	7 403	83 968
Related institutions	9	999	781	2 984
Totals	60	10 098	8 184	86 952
Refused registration	3	62		

## SOUTH DAKOTA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Aberdeen 76 463—Brown	Gen	Church	139	20	257	70	2572
St Luke's Hospital							
Belle Fourche 2 032—Butte	Gen	NPA'ssn	20	9	90	7	369
John Burns Memorial Hosp							
Bowdle 773—Edmunds	Gen	NPA'ssn	11	3	41	4	302
Community Hospital							
Brookings 4 376—Brookings	Gen	City	33	12	121	16	896
Brookings Municipal Hosp							
Burke 603—Gregory	Gen	NPA'ssn	19	5	37	8	277
Cheyenne Agency 121—Dewey	Gen	IA	47	6	43	31	459
Cheyenne River Indian Hosp							
Deadwood 2 539—Lawrence	Gen	Church	50	10	182	32	1999
St Joseph's Hospital							
Dell Rapids 1 657—Minnehaha	Gen	Corp	30	6	34	10	350
Dell Rapids Hospital							
Edgemont 1 103—Fall River	Gen	Indiv	12	2	26	3	260
Edgemont Hospital							
Furka 1 208—McPherson	Gen	NPA'ssn	24	4	56	14	471
Eureka Community Hosp							
Faulkton 739—Faulk	Gen	County	18	3	51	10	492
Faulk County Hospital							
Flandreau 1 934—Moody	Gen	City	19	5	60	11	297
Flandreau Municipal Hosp							
Ft Meade 800—Meade	Gen	Army	120	2	13	54	180
Station Hospital							
Ft Thompson 180—Buffalo	Gen	IA	20	7	60	15	350
Crow Creek Hospital							
Hot Springs 2 908—Fall River	Gen	Church	50	5	74	21	301
Lutheran Sanatorium and Hospital	G&Or						
Our Lady of Lourdes Hospital and Sanitarium	Gen	Church	60	6	47	30	1592
Veterans Admin Facility	Gen	Vet	281			116	1080
Huron 10 946—Beadle	Gen	NPA'ssn	54	9	100	26	1000
Sprague Hospital							
Lead 5 733—Lawrence	Gen	NPA'ssn	20	5		16	671
Homestake Hospital							
Lemmon 1 508—Perkins	Gen	Indiv	12	0	22	6	190
Lemmon Hospital							
Madison 4 289—Lake	Gen	NPA'ssn	50	10	117	97	943
Madison Community Hosp							
St Bernard Providence Hospital	Gen	Church	26	8	98	10	400
Miller 1 417—Hand	Gen	Indiv	16	5	76	11	304
Miller Hospital and Clinic							
Mitchell 10 949—Davison	Gen	Church	100	10	164	60	2200
Methodist State Hospital	Gen	Church	110	13	215	60	2440
St Joseph Hospital							
Wobridge 3 464—Walworth	Gen	Indiv	20	6	42	8	379
Wobridge Hospital							
Wobridge Hospital	Gen	NPA'ssn	20	0	42	11	000

Key to symbols and abbreviations is on page 933

## SOUTH DAKOTA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
New Underwood 311—Pennington	Gen	NPAsn	13	0	59	5	297
New Underwood Community Hospital	Gen	Indiv	13	4	16	5	110
Onida 636—Sully	Gen	Church	102	18	223	70	2,437
Pierre 360—Hughes	Gen	Church	102	18	223	70	2,437
St Mary's Hospital	Gen	Church	102	18	223	70	2,437
Pine Ridge, 61—Shannon	Gen	IA	40	11	151	41	1,321
Pine Ridge Hospital	Gen	IA	40	11	151	41	1,321
Rapid City 1040—Pennington	Gen	Church	60	7	107	35	1,218
Black Hills Methodist Hospital	Gen	Church	60	7	107	35	1,218
St John's McNamara Hospital	Gen	Church	70	12	106	50	1,803
Sioux Sanatorium	TB	IA	111			Estab 1978	
Redfield 661—Spink	Gen	City	12	4	31	6	316
Baldwin Community Hosp	Gen	IA	64	7	104	40	971
Rosebud 190—Todd	Gen	IA	64	7	104	40	971
Rosebud Agency Indian Hospital	Gen	IA	64	7	104	40	971
Sanator 10—Custer	TB	State	192			146	138
South Dakota State Sanatorium for Tuberculosis	TB	State	192			146	138
Sioux Falls 23,362—Minnehaha	Gen	Church	120	19	347	72	2,391
McKenna Hospital	Gen	Indiv	56	8	115	27	1,290
Moe Hospital and Clinic	Gen	NPAsn	116	20	24	78	2,000
Sioux Valley Hospital	Gen	NPAsn	116	20	24	78	2,000
Volga 604—Brookings	Gen	Corp	16	4	45	10	320
Watertown 10914—Codington	Gen	Corp	60	11	133	33	1,618
Watertown Hospital	Gen	Corp	60	11	133	33	1,618
Luther Hospital	Gen	Church	70	10	100	39	1,200
Webster 180—Day	Gen	Indiv	50	9	146	33	1,340
Penobscot Hospital	Gen	Indiv	50	9	146	33	1,340
Winner 2290—Tripp	Gen	Indiv	10	2	20	3	148
Wilson Hospital	Gen	Indiv	10	2	20	3	148
Winner General Hospital	Gen	Indiv	10	2	20	3	148
Yankton 6002—Yankton	Gen	Church	130	20	190	84	2,137
Sacred Heart Hospital	Gen	Church	130	20	190	84	2,137
Yankton State Hospital	Gen	State	178			1,623	3,000
Related Institutions							
Flandreau 1934—Moody	Gen	IA	33		5	8	400
Flandreau Indian School Hospital	Gen	IA	33		5	8	400
Garretson 600—Minnehaha	Gen	Indiv	10	2	7	1	51
DeVal Hospital	Gen	Indiv	10	2	7	1	51
Hot Springs 2908—Fall River	Inst	State	35			23	207
State Soldiers Home Hosp	Inst	State	35			23	207
Pierre 360—Hughes	Inst	IA	14			7	400
Pierre Indian School Hosp	Inst	IA	14			7	400
Platte 190—Charles Mix	Gen	Indiv	12	5	23	4	190
Platte Hospital	Gen	Indiv	12	5	23	4	190
Redfield 2661—Spink	MeDe	State	750			661	700
State School and Home for Feeble-minded	MeDe	State	750			661	700
Sisseton 1500—Roberts	Gen	IA	32	8	40	15	490
Sisseton Indian Hospital	Gen	IA	32	8	40	15	490
Wagner 1420—Charles Mix	Gen	Indiv	14	3	61	8	313
Duggan Hospital	Gen	Indiv	14	3	61	8	313
Yankton Indian Hospital	Gen	IA	20	5	42	15	520
Summary for South Dakota							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	47	4,000	3,224	44,036			
Totals	9	934	737	2,027			
Refused registration	06	5,439	3,961	46,063			
	4	124					

## TENNESSEE

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Athens 300—McMinn	Gen	Indiv	24	2	71	8	512
Epworth Clinic-Hospital	Gen	Part	23	6	47	10	463
Force Hospital	Gen	Part	23	6	47	10	463
Brownsville 3004—Haywood	Gen	NPAsn	35	4	46	17	640
Haywood County Memorial Hospital	Gen	NPAsn	35	4	46	17	640
Chattanooga 119708—Hamilton	Gen	CyCo	225	28	1,183	200	7,000
Baroness Erlanger Hosp	Gen	CyCo	73	11	244	52	1,467
Children's Hospital	Gen	Part	60	4	24	35	1,300
Newell and Newell Sanit	Gen	NPAsn	200			247	213
Pine Breeze Sanatorium	TB	NPAsn	200			247	213
Clarksville 9012—Montgomery	Gen	Indiv	20			8	420
Clarksville Home Infirmary (col)	Gen	NPAsn	30	0	70	18	739
Clarksville Hospital	Gen	NPAsn	30	4	9	4	4,6
Cleveland 910—Bradley	Gen	NPAsn	30	4	9	4	4,6
Speck Hospital	Gen	NPAsn	30	4	9	4	4,6
Columbia 100—Maury	Gen	NPAsn	60	10	82	20	1,740
Kings Daughters Hospital	Gen	Indiv	12	4	210	6	218
Dayton 2000—Rhea	Gen	Corp	50	8	33	13	804
Dyersburg 833—Dyer	Gen	Corp	30	0	70	6	512
Baird Brewer General Hosp	Gen	Corp	30	0	70	6	512
Elizabethton 803—Carter	Gen	Corp	30	0	70	6	512
St Elizabeth General Hosp	Gen	Corp	30	0	70	6	512

## TENNESSEE—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Erwin 3623—Unicoi	Gen	Corp	14	4	27	3	211
Legion Memorial Hospital	Gen	Corp	14	4	27	3	211
Greeneville 5244—Greene	Gen	Corp	60	3	40	20	974
Greeneville Sanatorium and Hospital	Gen	NPAsn	52	6	78	30	1,294
Takoma Hospital and Sanit	Gen	Indiv	10	3	40	4	310
Humboldt 461—Gibson	Gen	NPAsn	31	6	39	14	639
Oursler Clinic	Gen	Part	23	6	73	10	647
Jackson 22172—Madison	Gen	NPAsn	24	6	39	15	706
Fitts White Clinic	Gen	Corp	24	6	39	15	706
Memorial Hospital	Gen	Corp	24	6	39	15	706
Webb Williamson Hospital	Gen	Corp	24	6	39	15	706
Jefferson City 1808—Jefferson	Gen	Indiv	30	3	72	16	612
Jefferson Hospital	Gen	Indiv	30	3	72	16	612
Johnson City 2080—Washington	Gen	NPAsn	56	12	200	34	1,003
Appalachian Hospital	Gen	NPAsn	56	12	200	34	1,003
Campbell's Eye Ear Nose and Throat Hospital	ENT	Indiv	10			2	700
Jones Eye Ear Nose and Throat Hospital	ENT	Part	17			9	891
Parker Budd Clinic and Hos	Gen	Part	20	2	5	7	279
Kingsport 11914—Sullivan	Gen	NPAsn	53	9	220	42	1,812
Holston Valley Community Hospital	Gen	NPAsn	53	9	220	42	1,812
Knoxville 10802—Knox	TB	CyCo	100			125	141
Beverly Hills Sanatorium	TB	CyCo	100			125	141
Dr H E Christenberry Eye Ear Nose and Throat In	ENT	Indiv	12		No data supplied		
Eastern State Hospital	ENT	State	1,070		1,112	491	
Ft Sanders Hospital	Gen	NPAsn	150	16	610	115	4,000
Knoxville General Hosp	Gen	City	2,000	33	726	189	8,010
St Mary's Memorial Hosp	Gen	Church	63	12	201	44	1,700
Lawrenceburg 3102—Lawrence	Gen	Corp	22	2	42	8	449
Lawrenceburg Sanitarium and Hospital	Gen	Corp	22	2	42	8	449
Lebanon 4606—Wilson	Gen	Indiv	20	2	27	8	480
Martha Gaston Hospital	Gen	Indiv	20	2	27	8	480
McFarland Hospital	Gen	Indiv	20	2	27	8	480
Livingston 1526—Overton	Gen	Indiv	12	2	30	5	140
Lady Ann Hospital	Gen	Indiv	12	2	30	5	140
Loudon 2578—Loudon	Gen	NPAsn	12	1	3	3	110
Harrison Memorial Hospital	Gen	NPAsn	12	1	3	3	110
Madison College—Davidson	Gen	NPAsn	100	6	80	78	1,378
Madison Rural Sanitarium and Hospital	Gen	NPAsn	100	6	80	78	1,378
Maryville 4905—Blount	Gen	Indiv	30		5	10	267
Ft Craig Hospital	Gen	Indiv	30		5	10	267
Memphis 203143—Shelby	Gen	Church	480	20	760	320	14,401
Baptist Memorial Hosp	Gen	Church	480	20	760	320	14,401
Collins Chapel Connectional Hospital (col)	Gen	NPAsn	50	25	20	18	460
Crippled Children's Hospital	Orth	NPAsn	40			37	114
School	Orth	NPAsn	40			37	114
Gartly Ramsay Hospital	Gen	Corp	42	8	61	26	1,200
Hospital for Crippled Adults	Orth	NPAsn	60			50	213
John Gaston Hospital	Gen	City	500	61	1,300	449	14,345
Lynchburg Sanitarium	N&M	Indiv	20			8	27
Memphis Eye Ear Nose and Throat Hospital	ENT	NPAsn	60			20	1,000
Methodist Hospital	Gen	Church	100	30	771	140	6,773
St Joseph's Hospital	Gen	Church	200	40	893	140	5,801
Turner Gotten Sanatorium	N&M	Part	22			12	120
U S Marine Hospital	Gen	USPHS	130			107	2,906
Veterans Admin Facility	Gen	Vet	400			295	4,481
Wallace Sanitarium	N&M	Indiv	70			28	300
Willis C Campbell Clinic	Orth	Part	60			41	990
Morristown 7305—Hambien	Gen	NPAsn	20	6	30	6	307
Morristown General Hospital	Gen	NPAsn	20	6	30	6	307
Mountain Home—Washington	Gen	Vet	500			480	3,466
Veterans Admin Facility	Gen	Vet	500			480	3,466
Murfreesboro 7993—Rutherford	Gen	NPAsn	50	8	124	18	1,116
Rutherford Hospital	Gen	NPAsn	50	8	124	18	1,116
Nashville 15386—Davidson	Gen	State	1,835			1,812	498
Central State Hospital	Gen	State	1,835			1,812	498
City View Sanitarium	N&M	Indiv	60			29	340
Davidson County Tuberculo	TB	County	300			232	270
sis Hospital	TB	County	300			232	270
Geo W Hubbard Hospital	Gen	NPAsn	160	21	201	107	2,601
of Meharry Medical College (col)	Gen	NPAsn	160	21	201	107	2,601
Hospital for the Criminal	Unit of	Central State Hospital	260	30	1,028	178	7,214
Insane	Gen	NPAsn	104	18	511	81	3,117
Nashville General Hosp	Gen	Church	200	20	725	158	6,249
Protestant Hospital	Gen	Church	200	20	725	158	6,249
St Thomas Hospital	Gen	Church	200	20	725	158	6,249
Vanderbilt University Hos	Gen	NPAsn	320	08	332	168	5,431
pital	Gen	NPAsn	320	08	332	168	5,431
Newport 2909—Cocke	Gen	Indiv	13	1	6	3	01
Surgical Clinic and Infirmary	Gen	Indiv	13	1	6	3	01
Okaville 16—Shelby	TB	CyCo	300			No data supplied	
Okaville Memorial Sanat	TB	CyCo	300			No data supplied	
Parle 8164—Henry	Gen	Indiv	24	4	20	8	461
McSwain Clinic	Gen	Part	20	3	35	7	436
Nobles Memorial Hospital	Gen	Part	20	3	35	7	436
Pleasant Hill 160—Cumberland	Gen	G&TB NPAsn	44	6	20	6	175
Uplands Cumberland Moun	Gen	G&TB NPAsn	44	6	20	6	175
tain Sanatorium	Gen	G&TB NPAsn	44	6	20	6	175
Preman's Home 160—Hawkins	Gen	NPAsn	40			18	14
International Printing Pre	TB	NPAsn	40			18	14
men and Assistant's Union	TB	NPAsn	40			18	14
Sanatorium	TB	NPAsn	40			18	14

Key to symbols and abbreviations is on page 933

## TENNESSEE—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Pulaski 3367—Giles	Gen	Indiv	23	2	31	9	450
Pulaski Hospital							
Raleigh 287—Shelby							
Cheerfield Farm Preventorium	Unit of	Oakville Memorial Sanat					Oakville
Ridgetop 196—Robertson	TB	Corp	40			16	40
Watauga Sanitarium							
Rockwood 388—Roane	Gen	NPA'ssn	50	10	60	20	9.5
Chamberlain Memorial Hosp							
Rogersville 1890—Hawkins	Gen	Indiv	15	4	30	9	180
Lyons Hospital							
Sewanee 530—Franklin	Gen	Church	20	10	51	11	551
Emerald Hodgson Memorial Hospital							
Springfield 5577—Robertson	Gen	County	45	6	42	18	464
Robertson County Hospital							
Sweetwater, 2271—Monroe	Gen	NPA'ssn	28	4	22	7	489
Sweetwater Hospital							
Western State Hospital—Hardman	Ment	State	2042			1972	770
Western State Hospital							
Woodbury 502—Cannon	Gen	Indiv	25	6	7	14	462
Good Samaritan Hospital							
Related Institutions							
Chattanooga 119798—Hamilton							
William L Bork Memorial Hospital	Ment	County	211			195	174
Copperhill 1000—Polk	Gen	Corp	10			No data supplied	
Tennessee Copper Company's Hospital							
Donelson 110—Davidson	MeDe	State	514			619	50
Tennessee Home and Training School for Feeble minded Persons							
Etowah, 4209—McMinn	Gen	Indiv	12	3	24	3	203
Etowah Hospital							
Layetteville 3822—Lincoln	Gen	County	70	2	72	18	600
Lincn County Hospital							
Knoxville 100809—Knox	Orth	NPA'ssn	70			17	100
Knox County Crippled Children's Hospital	Inst	State	20			2	22
Tennessee School for Deaf	Inst	State	13			4	301
University of Tennessee Hospital							
Memphis 203143—Shelby	Inst	County	80			53	400
Shelby County Hospital							
Nashville 138866—Davidson	G&Ment	County	777	4	12	713	488
Davidson County Hosp							
Junior League Home for Crippled Children	Orth	NPA'ssn	36			36	106
Tennessee State Penitentiary Hospital	Inst	State	68			40	570
Shelbyville 5010—Bedford	Gen	NPA'ssn	50	2	47	22	620
Bedford County Hospital							
Summary for Tennessee							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	81	12,776	10,441	130,300			
	13	2,000	2,198	3,903			
Totals	94	1,240	12,779	133,406			
Refused registration	10	216					

## TEXAS

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Abilene 23170—Taylor	Epil	State	1197			1196	201
Abilene State Hospital							
Hendrick Memorial Hosp	Gen	Church	70	15	387	55	2,973
Alice 4239—Jim Wells	Gen	Corp	20	4	51	8	530
Alice Hospital							
Amarillo, 43132—Potter	Gen	County	70	10	227	58	2,116
Northwest Texas Hospital							
St Anthony's Hospital	Gen	Church	89	12	37	63	2,600
Atlanta 1680—Cass	Gen	Part	11	4	79	9	437
Ellington Memorial Hospital							
Austin 53120—Travis	Ment	State	2451			2372	413
Austin State Hospital							
Brackenridge Hospital	Gen	City	150	16	843	96	4,121
St David's Hospital	Gen	Church	44	8	114	22	1,880
Seton Infirmary	Gen	Church	110	10	384	68	3,202
Bastrop 1800—Bastrop	Gen	NPA'ssn	16	3	19	4	148
F A Orgain Memorial Hosp							
Bay City 4000—Matagorda	Gen	Indiv	16	6	47	4	244
Dr Loos Hospital							
Beaumont 57732—Jefferson	Gen	Church	160	15	447	90	3,007
Hotel Dieu Hospital							
Jefferson County Tuberculosis Hospital	TB	County	85			84	143
Jefferson County Tuberculosis Hospital (col)	TB	County	22			21	30
St Therese Hospital	Gen	Church	70	10	321	44	1,906
Beeville 4806—Bee	Gen	Indiv	35	4	21	15	416
Beeville Hospital							
Thomas Memorial Hospital	Gen	Part	22	4	80	14	512
Belton 3779—Bell	Gen	Part	12	2	No data supplied		
Belton General Hospital							

## TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Big Spring 13730—Howard	Gen	Corp	30	6	153	20	1,310
Big Spring Hospital							
Malone and Hogan Clinic	Gen	Part	18	6		Estab 19.8	
Bonham 5600—Fannin	Gen	NPA'ssn	30	4	54	19	66
S B Allen Memorial Hosp							
Borger 6002—Hutchinson	Gen	County	20	6	40	12	435
North Plains Hospital							
Bowie 3131—Montague	Gen	Corp	10	2	24	8	394
Bowie Clinic Hospital							
Brackettville 1822—Kinney	Gen	Army	40	2	20	20	500
Station Hospital							
Brady 3983—McCulloch	Gen	Part	57	5	126	22	1,007
Brady Hospital							
Brenham 5974—Washington	Gen	Church	30	5	32	8	407
St Francis Hospital							
Sarah B Milroy Memorial Hospital	Gen	Corp	21	2	24	5	76
Brownfield 1907—Terry	Gen	Part	20	6	63	9	440
Treadaway Danell Hospital							
Brownsville 22021—Cameron	Gen	Church	50	8	107	14	409
Mersey Hospital	Gen	Army	60	1	21	10	100
Station Hospital							
Brownwood 12789—Brown	Gen	Corp	30	2	50	12	700
Central Texas Hospital							
Medical Arts Hospital	Gen	Corp	36	4	79	8	700
Stump Hospital	Gen	Indiv	10	3	94	4	490
Bryan 7814—Brazos	Gen	Church	30	3	86	10	711
St Joseph Hospital							
Willerson Memorial Clinic	Gen	Indiv	19	2	114	8	618
Cameron 4760—Milam	Gen	Part	54	4	102	18	419
Cameron Hospital							
Canadian 2068—Hemphill	Gen	Indiv	10	3	66	3	203
Canadian Hospital							
Canyon 2821—Randall	Gen	Indiv	10	3	29	5	00
Neblett Hospital							
Carthage 1601—Panola	Gen	Indiv	20	3	No data supplied		
Carthage General Hospital							
Center 2010—Shelby	Gen	Indiv	13	5	24	4	257
Center Sanitarium							
Warren Hospital	Gen	Part	12	1	6	3	100
Childress 7163—Childress	Gen	Part	30	2	76	5	277
Hotel Townsend Hospital							
Cisco 6027—Eastland	Gen	Indiv	22	2	31	5	180
Griffin Sanitarium							
Cleburne 11539—Johnson	Gen	Indiv	12	4	47	3	00
Cleburne Sanitarium							
Coleman 6008—Coleman	Gen	CyCo	50	2	68	8	480
Overall Memorial Hospital							
Colorado 4601—Mitchell	Gen	Indiv	14	2	46	5	348
C L Root Hospital							
Conroe 2437—Montgomery	Gen	Indiv	20	4	14	6	460
Mary Swain Sanitarium							
Corpus Christi 27741—Nueces	Gen	NPA'ssn	55	10	180	44	2,000
Fred Roberts Memorial Hospital							
Medical Professional Hosp	Gen	Corp	30	4	38	16	1,000
Spohn Hospital	Gen	Church	80	18	304	44	2,800
Corpus Christi 10202—Navarro	Gen	Corp	20	2	23	5	213
Corpus Christi Hosp and Clinic							
Navarro Clinic Hospital	Gen	Part	28	4	64	10	512
Physicians and Surgeons Hospital	Gen	County	50	6	106	12	600
Crockett 4441—Houston	Gen	Part	16	2	47	6	366
Jim Smith Memorial Hospital							
and Crockett Clinic							
Crystal City 6609—Zavala	Gen	Corp	12	2	18	2	184
Crystal Hospital							
Cuero 4672—De Witt	Gen	Church	35	3	16	10	307
Burns Hospital							
Lutheran Hospital	Gen	Church	20	4	18	7	310
Dallas 260470—Dallas	Gen	Church	400	60	1000	300	1,316
Baylor University Hosp							
Beverly Hills Sanitarium	Gen	Corp	30			20	101
Bradford Memorial Hospital							
for Babies	Chil	NPA'ssn	60			23	900
Carrell Girard Clinic	Orth	Part	20			10	
Dallas Medical and Surgical Clinic Hospital	Gen	Part	20			19	106
Medical Arts Hospital	Gen	Indiv	86			60	400
Methodist Hospital	Gen	Church	140	2	500	72	3,500
Nightingale Lying in Hosp	Unit of	Baylor University Hospital					
Parkland Hospital	Gen	CyCo	400	30	1000	200	10,200
Pinkston Clinic (col)	Gen	Indiv	17	2	12	6	278
St Paul's Hospital	Gen	Church	270	30	1042	293	10,017
Texas Scottish Rite Hospital							
for Crippled Children	Orth	Frat	60			50	810
Timberlawn Sanitarium	Ment	Corp	78			26	200
Woodlawn Hospital	TB	CyCo	118			95	100
Deceatur 2037—Wise	Gen	Indiv	18	5	97	11	768
Rogers Hospital							
Denison 13800—Grayson	Gen	NPA'ssn	28	3	90	12	500
Denison City Hospital							
M K T Railroad Employees Hospital	Indus	NPA'ssn	60			No data supplied	
Denton 9587—Denton	Gen	Indiv	20	4	61	7	544
Denton Hospital and Clinic							
Medical and Surgical Clinic	Gen	Part	12	2	40	6	200
Edinburg 4821—Hidalgo	Gen	CyCo	60	12	41	19	400
City County Hospital							
Electra 6712—Wichita	Gen	Indiv	24	4			
Electra Hospital							
El Paso 102421—El Paso	Gen	CyCo	212	20	400	115	4,000
El Paso City County Hospital							
El Paso Masonic Hospital	Gen	Frat	30	12	100	20	1,000

Key to symbols and abbreviations is on page 933

## TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Hendricks Laws Sanatorium	TB	Part	70			12	48
Hotel Dieu Sisters Hosp	Cen	Church	100	20	357	63	2 731
Long Sanatorium	TB	Indiv	50			17	20
Newark Conference Maternity Hospital	Mat	Church	20	14	264	6	204
Price Sanatorium	TB	Indiv	20			16	20
Providence Hospital	Gen	Indiv	40	3	42	21	1 200
St Joseph's Sanatorium	TB	Church	75			29	100
Southwestern General Hosp	Gen	Corp	100	12	201	52	1 561
William Beaumont General Hospital	Gen	Army	602	6	52	340	3 887
Floresville 1581—Wilson							
Oxford Archer Hospital	Gen	Part	11	2	21	3	418
Ft Worth, 163 447—Tarrant							
All Saints Episcopal Hosp	Gen	Church	60	12	244	33	1 568
City and County Hosp	Cen	CyCo	150	14	876	3	3 331
W I Cook Memorial Hosp	Cen	NP Assn	53	8	100	31	1 194
Ft Worth Children's Hosp	Chil	NP Assn	30			27	208
Harris Memorial Methodist Hospital	Cen	Church	270	30	811	118	4 070
St Joseph's Hospital	Gen	Church	200	21	612	69	4 216
U S Public Health Service Hospital	Drug	Fed	280			1	1038
Freeport 3 162—Brazoria							
Freeport Hospital	Gen	Corp	14	5	94	6	1 620
Galveston 5798—Galveston							
Galveston State Psychopathic Hospital	Ment	State	100			66	446
Hospital for Crippled and Deformed Children	Unit of	John Sealy Hospital					
John Sealy Hospital	Gen	City	434	20	610	319	6 408
Negro Hospital	Unit of	John Sealy Hospital					
St Mary's Infirmary	Cen	Church	200	20	438	120	3 746
Station Hospital	Gen	Army	31			15	560
U S Marine Hospital	Gen	USPHS	206			168	2 412
Georgetown 3 583—Williamson							
Martin Hospital	Gen	Indiv	20	4	26	5	243
Gilmer 1 063—Lubbock							
Flintwood Sanitarium	Gen	Indiv	12	3	46	4	270
Oak Lawn Sanitarium	Gen	Part	10	3	31	4	337
Ragland Clinic Hospital	Gen	Part	10	4	124	7	543
Gladeview 6 000—Gregg							
Gladeview Hospital	Gen	Indiv	12	2	47	2	180
Gonzales 3 800—Gonzales							
Holmes Hospital	Gen	Corp	20	1	No data supplied		
Goose Creek 5 000—Harris							
Goose Creek Hospital	Gen	Corp	12	6	167	8	620
Lillie and Duke Hospital	Gen	Part	21	6	90	7	509
Gorman 1 104—Eastland							
Blackwell Sanitarium	Gen	Part	33	3	230	18	584
Graham 4 901—Young							
Graham Hospital	Gen	NP Assn	18	4	14	11	771
Greenville 12 407—Hunt							
Goode and Phillips Hosp	Gen	Part	13	5	44	3	140
Dr E P Becton's Hosp	Surg	Indiv	16		4	2	403
Groesbeck 2 000—Limestone							
Dr Cox's Hospital	Gen	Indiv	12	2	18	1	60
Hallettsville 1 400—Lavaca							
Renger Hospital	Gen	Indiv	13	3	27	4	172
Hamilton 2 084—Hamilton							
Hamilton Sanitarium	Gen	Corp	21	3	102	10	682
Harlingen 12 124—Cameron							
Medical Arts Clinic	Gen	Indiv	8	3	73	4	222
Valley Baptist Hospital	Gen	Church	43	8	120	20	980
Henderson 2 037—Rock							
Henderson Hospital	Gen	Corp	49	9	85	15	870
Hereford 2 438—Deaf Smith							
Deaf Smith County Hospital	Gen	County	20	6	No data supplied		
Hillsboro 7 823—Hill							
Boyd Sanitarium	Gen	Indiv	23	3	10	6	320
Houston 292 302—Harris							
Autry Memorial Hospital							
School	Unit of	Houston Tuberculosis Hospital					
Houston Eye Ear Nose and Throat Hospital	FNT	NP Assn	23			3	1 060
Dr Greenwood's Sanitarium	N&M	Corp	40			27	150
Heights Clinic Hospital	Cen	Corp	40	8	260	16	900
Herrmann Hospital	Gen	NP Assn	140	16	460	123	4 590
Houston Negro Hospital	Gen	NP Assn	34	4	64	26	645
Houston Tuberculosis Hosp	TB	CyCo	172			160	444
Jefferson Davis Hospital	Gen	CyCo	470	30	1 036	290	10 891
Memorial Hospital	Gen	Church	200	18	1 433	184	8 781
Methodist Hospital	Gen	Church	120	10	467	92	3 569
Park View Hospital	Gen	Corp	30	6	121	13	711
St Joseph's Infirmary	Gen	Church	270	70	1 863	166	7 800
Southern Pacific Hospital	Indus	NP Assn	140			84	1 944
Turner Urological Institute	Urol	Part	16			8	422
Wright Clinic and Hospital	Gen	Indiv	14		83	11	365
Huntsville 5 028—Walker							
Huntsville Memorial Hosp	Gen	NP Assn	21	3	38	4	726
Jackboro 1 877—Jack							
Jackboro Hospital	Gen	Part	10	3	34	5	279
Jacksville 6 748—Cherokee							
Nan Travis Memorial Hosp	Gen	NP Assn	30	10	121	31	1 817
Jasper 3 393—Jasper							
Hardy Hancock Hospital	Gen	Part	17	2	No data supplied		
Richardson and Kelly Hosp	Gen	Part	14	3	70	8	300
Kelly Field—Bexar							
Station Hospital	Gen	Army	30			18	1 076
Kendy 2 610—Karnes							
Kendy Clinic and Hospital	Gen	Corp	17	2	20	5	294
Kerrville 4 046—Kerr							
Kerrville General Hospital	Gen	NP Assn	20	4	24	6	23
Kerrville State Sanatorium	TB	State	172			117	311

## TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Mountain View Sanatorium	TB	Indiv	30			16	39
Sunnyside Sanatorium	TB	Indiv	20			15	57
Kingsville 6 815—Kleberg							
Kleberg County Hospital	Gen	County	38	5	58	18	760
Knox City 900—Knox							
Knox County Hospital	Gen	County	29	4	109	10	490
La Grange 2 304—Fayette							
La Grange Hospital	Gen	Corp	50	5	51	16	605
Lamesa 3 528—Dawson							
Lamesa Sanitarium	Gen	Indiv	10	2	34	2	119
J C Loveless Hospital	Gen	Indiv	18	4	200	10	602
Lampasas 2 769—Lampasas							
Rollins Brook Hospital	Gen	Part	20	3	109	13	710
Laredo 32 618—Webb							
Merced Hospital	Gen	Church	80	6	11	30	1 162
Station Hospital	Gen	Army	41	1	6	8	225
Legion 100—Kerr							
Veterans Admin Facility	G&TB	Vet	402			424	2 002
Levelland 1 661—Hockley							
Phillips Dupre Hospital	Gen	Part	12	5		Estab	1033
Liberty 2 187—Liberty							
Merced Hospital	Gen	Church	22	6	84	20	
Littlefield 3 218—Lamb							
Payne Shotwell Hospital and Clinic	Gen	Part	20	6		15	
Livingston 1 160—Polk							
Bergman Hospital	Gen	Indiv	14	2	No data supplied		
Livingston Hospital	Gen	Indiv	16	2	94	5	531
Longview 5 036—Gregg							
Hurst Eye Ear Nose and Throat Hospital	ENT	Indiv	12			3	800
Markham McRee Memorial Hospital	Gen	NP Assn	43	8	161	9	632
Lubbock 20 520—Lubbock							
Lubbock Sanitarium	Gen	Corp	85	15	130	61	3 293
Palmas Hospital and Clinic	Gen	Part	20	5	171	16	1 208
West Texas Hospital	Gen	Corp	60	10	135	26	2 025
Lufkin 7 311—Angelina							
Angelina County Hospital	Gen	County	43	5	96	28	900
Madisonville 1 294—Madison							
Health Hospital and Clinic	Gen	Indiv	18	2	40	5	370
Marfa 3 909—Presidio							
Station Hospital	Gen	Army	50	2	13	12	462
Marlin 5 388—Falls							
Rule Allen Hospital	Gen	Indiv	22	2	19	18	670
Torbett Clinic and Hosp	Gen	Corp	54	4	61	17	1 118
Marshall 16 203—Harrison							
Kahn Memorial Hospital	Gen	NP Assn	36	6	13	12	543
Texas and Pacific Railway Employees Hospital	Indus	NP Assn	105			45	2 650
McAllen 9 074—Hidalgo							
McAllen Municipal Hosp	Gen	City	60	10	128	22	838
McKinney 7 307—Collin							
McKinney City Hospital	Gen	City	46	4	52	30	794
Memphis 4 207—Hall							
Memphis Hospital	Gen	Indiv	15	2	12	5	218
Mercedes 6 008—Hidalgo							
Mercedes General Hospital	Gen	NP Assn	22	5	65	5	200
Midland 5 484—Midland							
Midland Clinic Hospital	Gen	Indiv	12	1	48	4	260
Mineral Wells 5 986—Palo Pinto							
Nazareth Hospital	Gen	Church	36	4	30	10	425
Nacogdoches 5 687—Nacogdoches							
City Memorial Hospital	Gen	City	45	6	60	18	1 006
Navasota 5 128—Grimes							
Brazos Valley Sanitarium	Gen	Corp	22	4	73	9	710
New Braunfels 6 242—Comal							
Comal Sanitarium	Gen	Indiv	20	2	No data supplied		
New Braunfels Hospital	Gen	Indiv	20	3	27	6	291
Newport—Wharton							
Texas Gulf Sulphur Company Hospital	Gen	NP Assn	23	2	71	6	395
Odesa 2 407—Fedor							
Headlee Hospital	Gen	Part	20	8	115	10	672
Orange 7 913—Orange							
Frances Ann Luther Hosp	Gen	Indiv	40	10	91	14	500
Paducah 2 502—Cottle							
W Q Richards Memorial Hospital	Gen	Indiv	30	12	No data supplied		
Palestine 11 445—Anderson							
Missouri Pacific Lines Hosp	Indus	NP Assn	70	2	86	36	1 006
Palestine Sanitarium	Corp	Corp	20			5	300
Pampa 10 470—Gray							
Worley Memorial Hospital	Gen	Indiv	48	8	230	20	2 272
Paris 15 649—Lamar							
Lamar County Hospital	Gen	County	30	7	100	20	949
St Joseph's Hospital	Gen	Church	60	6	72	10	527
Sanitarium of Paris	Gen	Corp	62	7	90	09	1 847
Pasadena 1 647—Harris							
Pasadena Hosp and Clinic	Gen	Part	20	6	101	5	630
Pecos 3 304—Reeves							
Camp and Camp Hospital	Gen	Part	20	4	65	6	414
Phillips 2 500—Hutchinson							
Pantex Hospital of the Phillips Petroleum Co	Gen	NP Assn	12	3	57	3	192
Plainview 8 834—Hale							
Plainview Sanitarium and Clinic	Gen	Part	50	6	94	31	1 000
Port Arthur 50 002—Jefferson							
St Mary's Hospital Gates Memorial	Gen	Church	175	20	43	70	2 793
Prairie View 10—Waller							
Prairie View Hosp (col)	Gen	State	50		7	26	771
Quanah 4 464—Hardeman							
Memorial Hospital	Gen	County	40	8	97	12	939

Key to symbols and abbreviations is on page 933

## TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
Ranger 6208—Eastland	Gen	CyCo	30	3	49	10	510
City County Hospital	Gen	Corp	18	2	26	9	281
West Texas Clinic Hospital	Gen	Corp	30	1	13	7	217
Rio Grande City 2283—Starr	Gen	Army	14	4	No data supplied		
Station Hospital	Gen	Corp	23	7	50	6	625
Robstown 4183—Nueces	Gen	Corp	23	7	50	6	625
Robstown Clinic Hospital	Gen	Corp	23	7	50	6	625
Roscoe 1270—Nolan	Gen	Indiv	23	7	50	6	625
Young Hospital	Gen	Indiv	23	7	50	6	625
Rusk 3800—Cherokee	Gen	Indiv	23	7	50	6	625
Rusk State Hospital	Ment	State	2224			2136	402
San Angelo 25308—Tom Green	Gen	Corp	40	8	218	30	1702
Clinic Hospital	Gen	Corp	20	9	67	10	769
St John's Hospital	Gen	Church	20	9	67	10	769
Shannon West Texas Memorial Hospital	Gen	NPA'ssn	100	15	290	57	3,021
San Antonio 231542—Bexar	Gen	NPA'ssn	100	15	290	57	3,021
Grace Lutheran Sanatorium for Tuberculosis	IB	Church	30	8	31	8	299
Dr Kenney's Sanatorium	Gen	Indiv	30	8	31	8	299
Medical and Surgical Memorial Hospital	Gen	NPA'ssn	110	10	366	56	3,478
Dr Moody's Sanatorium	Gen	N&M	59		39	20	206
Nix Hospital	Gen	Corp	140	24	457	88	4,888
Robert B Green Memorial Hospital	Gen	County	200	15	670	148	4,488
San Antonio State Hospital	Ment	State	2,511		2,421	724	
Santa Rosa Hospital	Gen	Church	200	26	716	100	6,192
Station Hospital	Gen	Army	600	23	307	408	6,904
Woodmen of the World War Memorial Hospital	TB	Frat	100			114	169
Sanatorium 1040—Tom Green	IB	State	860			825	2,344
State Tuberculosis Sanatorium	IB	State	860			825	2,344
San Marcos 5134—Hays	Gen	CyCo	27	2	30	5	300
Soldiers and Sailors Memorial Hospital	Gen	CyCo	27	2	30	5	300
Santa Anna 1883—Coleman	Gen	Indiv	30	3	117	22	1,144
Sealy Hospital	Gen	Indiv	9	2	19	5	360
Sealy 1800—Austin	Gen	Indiv	9	2	19	5	360
Seguin 5220—Guadalupe	Gen	NPA'ssn	22	3	60	6	342
Seguin Hospital	Gen	NPA'ssn	22	3	60	6	342
Seymour 2076—Baylor	Gen	County	16	3	60	7	607
Baylor County Hospital	Gen	County	16	3	60	7	607
Shamrock 3080—Wheeler	Gen	Indiv	20	5	54	9	480
Shamrock General Hospital	Gen	Indiv	20	5	54	9	480
Sherman 15713—Grayson	Gen	Church	0	6	100	23	1,369
St Vincent's Sanatorium	Gen	NPA'ssn	66	6	149	37	1,854
Wilson N Jones Hospital	Gen	NPA'ssn	66	6	149	37	1,854
Shiner 1372—Lavaca	Gen	Indiv	20	2	21	7	204
Dr Wagner's Hospital	Gen	Indiv	20	2	21	7	204
Sinton 3576—Lubbock	Gen	Church	40	6	40	6	486
Mercy Hospital	Gen	Church	40	6	40	6	486
Snyder 3008—Scurry	Gen	Corp	24	4	No data supplied		
Snyder General Hospital	Gen	Corp	24	4	No data supplied		
Spur 1890—Dickens	Gen	Indiv	20	4	10	4	152
Nichols Sanatorium	Gen	Indiv	20	4	10	4	152
Stamford 4005—Jones	Gen	Part	60	10	223	30	1,600
Stamford Sanatorium	Gen	Part	60	10	223	30	1,600
Stephenville 3944—Frat	Gen	NPA'ssn	30	3	64	10	861
Stephenville Hospital	Gen	NPA'ssn	30	3	64	10	861
Sugar Land 1840—Ft Bend	Gen	NPA'ssn	30	2	66	10	719
Laura Eldridge Hospital	Gen	NPA'ssn	30	2	66	10	719
Sweetwater 10848—Nolan	Gen	City	40	8	121	18	1,445
Sweetwater Hospital	Gen	City	40	8	121	18	1,445
Taylor 7463—Williamson	Gen	Corp	15	3	58	8	292
Wedemeyer Hospital	Gen	Corp	15	3	58	8	292
Teague 3509—Freestone	Gen	Indiv	20	3	50	5	370
Davidson Sanatorium	Gen	Indiv	20	3	50	5	370
Temple 10345—Bell	Gen	Indiv	20	3	50	5	370
Gulf Colorado and Santa Fe Hospital	Indus	NPA'ssn	100			30	1,318
Kings Daughters Clinic and Hospital	Gen	NPA'ssn	110	8	52	71	2,780
Scott and White Hospital	Gen	Corp	109	6	52	106	3,409
Woodson Eye, Ear, Nose and Throat Hospital	INT	Part	11			4	
Terrell 8790—Kaufman	Gen	Part	25	2	No data supplied		
Alexander Holton Hospital	Ment	State	2,000			2,546	600
Terrell State Hospital	Ment	State	2,000			2,546	600
Texarkana 16602—Bowie	Gen	NPA'ssn	60	8	116	23	1,333
Texarkana Hospital	Gen	NPA'ssn	60	8	116	23	1,333
Tiler 17113—Smith	Gen	Part	16	3	61	10	737
Bryant Clinic and Sanatorium	Gen	Church	67	16	210	29	1,574
Mother Frances Hospital	Gen	Church	67	16	210	29	1,574
Uvalde 5286—Uvalde	Gen	Indiv	8	3	45	5	202
Merritt Hospital	Gen	Indiv	8	3	45	5	202
Vernon 9137—Wilbarger	Gen	Church	20	3	18	3	170
Christ the King Hospital	Gen	Church	10	3	21	5	263
Moore Brothers Hospital	Gen	Indiv	24	4	120	7	462
Vernon Sanatorium	Gen	Indiv	24	4	120	7	462
Victoria 7421—Victoria	Gen	Indiv	30	6	53	14	500
De Tar Memorial Hospital	Gen	Corp	22	7	45	9	590
Victoria Hospital	Gen	Corp	22	7	45	9	590
Von Ormy 300—Bexar	Gen	Corp	30			17	26
Von Ormy Cottage Sanatorium	TB	Corp	30			17	26
Waco 52848—McLennan	Gen	Church	70	10	290	39	1,971
Hillcrest Memorial Hospital	Gen	Church	70	10	290	39	1,971
Men's Hospital Baylor University	Gen	Church	17			3	406
Providence Hospital	Gen	Church	140	20	400	70	4,700
Veterans Admin Facility	Ment	Yet	947			847	592

## TEXAS—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassnets	Number of Births	Average Census	Admissions
Waxahachie 8042—Ellis	Gen	NPA'ssn	32	1	51	14	616
Waxahachie Sanatorium	Gen	NPA'ssn	32	1	51	14	616
Weatherford 4912—Parker	Gen	Part	10	4	54	4	320
Medical and Surgical Clinic	Gen	Part	10	4	54	4	320
Wellington 3570—Collingsworth	Gen	Indiv	10	3	48	3	257
Collingsworth Hospital	Gen	Indiv	10	3	48	3	257
St Joseph's Hospital	Gen	Church	20	3	26	5	203
Wharton 2691—Wharton	Gen	Corp	20	4	67	10	663
Caney Valley Hospital	Gen	Corp	20	4	67	10	663
Wheeler 931—Wheeler	Gen	Part	12	3	88	4	443
Wheeler Hospital	Gen	Part	12	3	88	4	443
Wichita Falls 43690—Wichita	Gen	Church	40	8	327	19	1,904
Bethania Hospital	Gen	Church	40	8	327	19	1,904
Wichita Falls Clinic Hospital	Gen	Part	81	6	100	50	733
Wichita Falls State Hospital	Ment	State	2,323			2,286	804
Wichita General Hospital	Gen	CyCo	140	8	343	64	3,021
Yokum 5656—Lavaca	Gen	CyCo	140	8	343	64	3,021
Huth Memorial Hospital	Gen	Church	50	10	30	10	300
Lorktown 1882—De Witt	Gen	Indiv	12	3	7	5	200
Allen Hospital	Gen	Indiv	12	3	7	5	200
Related Institutions							
Arlington 3661—Tarrant	Inst	Frat	25			18	108
Knights Templar Hospital	Inst	Frat	25			18	108
Austin 3120—Travis	Inst	N&M	100			137	470
Austin State School	Inst	N&M	100			137	470
Oaks Sanatorium	Inst	N&M	100			137	470
Texas Confederate Home	Inst	State	100			137	470
Bellville 1003—Austin	Gen	Part	8	1	40	4	300
Bellville Hospital	Gen	Part	8	1	40	4	300
College Station 100—Brazos	Inst	State	120			5	1,601
Agricultural and Mechanical College Hospital	Inst	State	120			5	1,601
Dallas 260470—Dallas	Mat	Church	30	10	39	15	191
Virginia K Johnson Home and School	Mat	Church	30	10	39	15	191
Falls 7089—Falls	Gen	City	20	3	40	8	206
Municipal Hospital	Gen	City	20	3	40	8	206
Lorcy 1216—Kaufman	Gen	NPA'ssn	25	7	5	1	14
Torrey Sanatorium	Gen	NPA'ssn	25	7	5	1	14
Ft Worth 16747—Farrant	TB	CyCo	66			64	27
Elmwood Sanatorium	TB	CyCo	66			64	27
Howard Sanatorium	N&M	Indiv	12			9	4
Gatesville 2601—Coryell	Gen	Part	11	2	40	3	194
Milton Powell Memorial Hospital	Gen	Part	11	2	40	3	194
Greenview 12407—Hunt	Surg	Indiv	17	2	9	6	212
Dr Joe Becton's Hospital	Surg	Indiv	17	2	9	6	212
Hallettsville 1406—Lavaca	Gen	Indiv	8	2	10	3	60
Dufner Hospital	Gen	Indiv	8	2	10	3	60
Houston 292302—Harris	N&M	Indiv	20			22	149
Keightley Sanatorium	N&M	Indiv	20			22	149
Huntsville 5028—Walker	Inst	State	100			90	2,400
Texas State Prison Hospital	Inst	State	100			90	2,400
Hutchins 400—Dallas	Conv	CyCo	200			180	100
City County Convalescent Hospital	Conv	CyCo	200			180	100
Julia 5070—Caldwell	Gen	Part	11	3	20	4	228
Luling Hospital	Gen	Part	11	3	20	4	228
Marlin 5030—Falls	Orth	NPA'ssn	36			20	200
Crippled Children Hospital	Orth	NPA'ssn	36			20	200
Marshall 16001—Harrison	Gen	Indiv	33	3	No data supplied		
Sheppard Sanatorium (col)	Gen	Indiv	33	3	No data supplied		
Midland 5444—Midland	Gen	Indiv	12	3	62	5	294
Ryan Hospital Clinic	Gen	Indiv	12	3	62	5	294
Mt Vernon 1227—Franklin	Gen	NPA'ssn	10	2	7	1	90
Crutcher Hospital	Gen	NPA'ssn	10	2	7	1	90
Nixon 1037—Coryell	Gen	Indiv	8	2	14	2	10
Crest View Hospital	Gen	Indiv	8	2	14	2	10
Odean 2407—Fector	Gen	Indiv	10	3	50	5	474
Wood Hospital	Gen	Indiv	10	3	50	5	474
Pearshall 2036—Frio	Gen	Indiv	10	4	16	4	142
J F Beall's Day Hospital	Gen	Indiv	10	4	16	4	142
Pecos 3804—Reeves	Gen	Indiv	12	3	51	3	100
Pecos Sanatorium	Gen	Indiv	12	3	51	3	100
Perryton 2021—Ochiltree	Gen	Indiv	10	2	19	3	106
Perryton Hospital	Gen	Indiv	10	2	19	3	106
Potter 1001—Atascosa	Gen	Indiv	10	2	2	1	8
Shotts Memorial Hospital	Gen	Indiv	10	2	2	1	8
San Antonio 231542—Bexar	TB	Indiv	20			6	10
Dr Farmer's Sanatorium	TB	Indiv	20			6	10
Medical Arts Hospital	Gen	Corp	33	5	106	21	1,609
Physicians and Surgeons Hospital	Gen	Corp	60	12	213	28	1,454
Salvation Army Women's Home	Mat	Church	11	18	50	10	10
Station Hospital	Gen	Army	18			3	221
Shamrock 3780—Wheeler	Gen	Part	10	3	61	4	291
Shamrock Clinic Hospital	Gen	Part	10	3	61	4	291
Southton 89—Bexar	TB	County	80			70	100
Bexar County Tuberculosis Colony	TB	County	80			70	100
Tulsa 2202—Swisher	Gen	County	10	4	No data supplied		
Swisher County Hospital	Gen	County	10	4	No data supplied		
Wichita Falls 43690—Wichita	Drug	Indiv	10			10	
Dr White's Sanatorium	Drug	Indiv	10			10	
Summary for Texas							
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions			
Related institutions	20	31,646	24,134	330,680			
	37	2,836	2,042	13,197			
Totals	307	34,482	26,103	344,113			
Refused registration	31	706					

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UTAH						
Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census
Bingham Canyon 3245—Salt Lake	Gen	Indiv	30	6	42	16
Bingham Canyon Hospital	Gen	Indiv	30	6	42	16
Brigham 5093—Box Elder	Gen	NP Assn	18	12	172	10
Cooley Memorial Hospital	Gen	NP Assn	18	12	172	10
Cedar City 3615—Iron	Gen	County	38	12	242	21
Iron County Hospital	Gen	County	38	12	242	21
Ft Douglas 1041—Salt Lake	Gen	Army	60			44
Station Hospital	Gen	Army	60			44
Ft Duchesne 104—Uintah	Gen	IA	23	6	51	14
Utah and Ouray Agency Indian Hospital	Gen	IA	23	6	51	14
Heber 244—Wasatch	Gen	Indiv	9	4	40	3
Heber Hospital	Gen	Indiv	9	4	40	3
Lehi 2596—Utah	Gen	City	10	5	70	5
Lehi Hospital	Gen	City	10	5	70	5
Logan 999—Cache	Gen	NP Assn	50	16	248	30
Cache Valley General Hosp	Gen	NP Assn	50	16	248	30
William Budge Memorial Hospital	Gen	NP Assn	68	18	315	33
Moab 800—Grand	Gen	County	10	5	72	6
Grand County Public Hosp	Gen	County	10	5	72	6
Ogden 4092—Weber	Gen	Church	204	36	1174	141
Thomas D De Memorial Hospital	Gen	Church	204	36	1174	141
Park City 4281—Summit	Gen	Corp	50	10	61	10
Park City Mines Hospital	Gen	Corp	50	10	61	10
Payson 3040—Utah	Gen	Part & Cy	22	6		Etab 1838
Payson City Hospital	Gen	Part & Cy	22	6		Etab 1838
Price 4684—Carbon	Gen	City	56	12	221	46
Price City Hospital	Gen	City	56	12	221	46
Provo 14766—Utah	Ment	State	104			1016
Utah State Hospital	Ment	State	104			1016
Richfield 3067—Sevier	Gen	Indiv	27	8	127	8
Sevier Valley Hospital	Gen	Indiv	27	8	127	8
St George 2434—Washington	Gen	Indiv	32	5	70	11
Washington County Hosp	Gen	Indiv	32	5	70	11
Salina 1353—Sevier	Gen	Corp	20	8	No data supplied	
Salina Hospital	Gen	Corp	20	8	No data supplied	
Salt Lake City 14096—Salt Lake	Gen	Church	374	70	1688	243
Dr W H Groves Latter Day Saints Hospital	Gen	Church	374	70	1688	243
Holy Cross Hospital	Gen	Church	200	42	926	107
Primary Children's Hosp	Gen	Church	30			21
St Mark's Hospital	Gen	Church	150	14	375	131
Salt Lake County General Hospital	Gen	County	231	23	403	150
Shriners Hospital for Crip	Orth	Frat	20			20
pled Children	Orth	Frat	20			20
Veterans Admin Facility	Gen	Vet	104			102
Tremonton 1009—Box Elder	Gen	NP Assn	20	8	88	7
Valley Hospital	Gen	NP Assn	20	8	88	7
Related Institutions						
American Fork 3017—Utah	McDe	State	549			430
Utah State Training School	McDe	State	549			430
Murray 5172—Salt Lake	Mat	Church	26	24	591	14
Cottonwood Stake Maternity Hospital	Mat	Church	26	24	591	14
Provo 14766—Utah	Mat	Indiv	17	16	266	7
Crane Maternity Hospital	Mat	Indiv	17	16	266	7
Spanish Fork 3017—Utah	Gen	Indiv	8	3	15	2
Hughes Memorial Hospital	Gen	Indiv	8	3	15	2
Vernal 1744—Uintah	Gen	Indiv	14	6	28	3
Clark Hospital	Gen	Indiv	14	6	28	3
Summary for Utah						
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions		
Related institutions	26	2 993	2 254	36 911		
	5	614	461	1 330		
Totals	31	3 607	2 745	38 246		
Refused registration	0					

VERMONT						
Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census
Barre 1170—Washington	Gen	NP Assn	70	15	222	38
Barre City Hospital	Gen	NP Assn	70	15	222	38
Washington County Sanat	TB	NP Assn	47			40
Bellows Falls 3000—Windham	Gen	NP Assn	37	9	153	34
Rockingham General Hosp	Gen	NP Assn	37	9	153	34
Bennington 7300—Bennington	Gen	NP Assn	56	20	194	48
Henry W Putnam Memorial Hospital	Gen	NP Assn	56	20	194	48
Brattleboro 8700—Windham	Gen	NP Assn	60	12	68	36
Brattleboro Memorial Hosp	Gen	NP Assn	60	12	68	36
Brattleboro Retreat	Ment	NP Assn	900			706
Burlington 2479—Chittenden	Gen	Church	110	12	209	80
Bishop DeGoesbriand Hos	Gen	Church	110	12	209	80
pital	Gen	Church	110	12	209	80
Green Mountain Sanat	IntMed	Indiv	14			7
Lakeview Sanatorium	IntMed	Indiv	14			7
Mary Fletcher Hospital	Gen	NP Assn	130	15	000	124
Ft Ethan Allen 106—Chittenden	Gen	Army	100			139
Station Hospital	Gen	Army	100			139
Hardwick 1607—Caledonia	Gen	NP Assn	15	4	22	5
Hardwick Hospital	Gen	NP Assn	15	4	22	5

VERMONT—Continued						
Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census
Middlebury 2003—Addison	Gen	NP Assn	45	10	63	13
Porter Memorial Hospital	Gen	NP Assn	45	10	63	13
Montpelier 7837—Washington	Gen	NP Assn	78	8	162	52
Heaton Hospital	Gen	NP Assn	78	8	162	52
Morrisville 1822—Lamoille	Gen	NP Assn	33	5	58	12
Copley Hospital	Gen	NP Assn	33	5	58	12
Newport 5094—Orleans	Gen	Corp	33	6	77	20
Orleans County Memorial Hospital	Gen	Corp	33	6	77	20
Pittsford 637—Rutland	TB	State	80			70
Vermont Sanatorium	TB	State	80			70
Proctor 2515—Rutland	Gen	NP Assn	35	7	57	12
Proctor Hospital	Gen	NP Assn	35	7	57	12
Randolph 1907—Orange	Gen	NP Assn	53	10	99	26
Gifford Memorial Hospital	Gen	NP Assn	53	10	99	26
Rutland 17315—Rutland	Gen	NP Assn	140	20	336	82
Rutland Hospital	Gen	NP Assn	140	20	336	82
St Albans 8090—Franklin	Gen	NP Assn	48	8	183	49
St Albans Hospital	Gen	NP Assn	48	8	183	49
Sherwood Sanitarium	Gen	Indiv	10	10	10	6
St Johnsbury 7920—Caledonia	Gen	NP Assn	55	10	132	36
Brightlook Hospital	Gen	NP Assn	55	10	132	36
St Johnsbury Hospital	Gen	Church	30	5	22	10
Springfield 4943—Windsor	Gen	NP Assn	30	6	122	23
Springfield Hospital	Gen	NP Assn	30	6	122	23
Waterbury 1716—Washington	Ment	State	1080			1054
Vermont State Hospital for the Insane	Ment	State	1080			1054
White River Junction 2271—Windsor	Gen	Vet	110			Etab 1938
Veterans Admin Facility	Gen	Vet	110			Etab 1938
Winouski 5308—Chittenden	Gen	Church	80	10	127	67
Fanny Allen Hospital	Gen	Church	80	10	127	67
Related Institutions						
Brandon 1731—Rutland	McDe	State	312			280
Brandon State School	McDe	State	312			280
Pittsford 637—Rutland	TB	NP Assn	80			70
Caverly Preventorium	TB	NP Assn	80			70
Windsor 3680—Windsor	Inst	State	12			7
Vermont State Prison Hosp	Inst	State	12			7
Windsor Hospital	Inst	NP Assn	15	4	34	8
Summary for Vermont						
Hospitals and sanatoriums	Number	Beds	Average Census	Admissions		
Related institutions	28	3 397	2 956	21 050		
	4	422	366	540		
Totals	32	3 819	3 322	21 590		
Refused registration	2	28		31 639		

VIRGINIA						
Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census
Abingdon 2877—Washington	Gen	NP Assn	60	5	41	30
Johnston Memorial Hosp	Gen	NP Assn	60	5	41	30
Alexandria 24149—Arlington	Gen	NP Assn	97	23	578	65
Alexandria Hospital	Gen	NP Assn	97	23	578	65
Bedford 3713—Bedford	Gen	Indiv	23	3	16	11
Hartwell Hospital	Gen	Indiv	23	3	16	11
John Russell Hospital	Gen	Corp	23	4	29	9
Bristol 8840—Washington	Gen	Corp	23	4	29	9
Kings Mountain Memorial Hospital	Gen	NP Assn	40	3	220	20
Brook Hill 50—Henrico	TB	City	256			209
Pine Camp Hospital	TB	City	256			209
Burkeville 700—Nottoway	State	State	150			142
Piedmont Sanatorium (col)	TB	State	150			142
Catawba Sanatorium 160—Roanoke	TB	State	340			331
Catawba Sanatorium	TB	State	340			331
Charlottesville 1524—Albemarle	TB	State	240			261
Blue Ridge Sanatorium	TB	State	240			261
Martha Jefferson Hospital and Sanitarium	Gen	NP Assn	50	10	158	28
University of Virginia Hos	Gen	NP Assn	50	10	158	28
pital	Gen	NP Assn	50	10	158	28
Christiansburg 1900—Montgomery	Gen	NP Assn	25	8	97	15
New Altamont Hospital	Gen	NP Assn	25	8	97	15
Clifton Forge 6830—Alleghany	Gen	NP Assn	130	8	83	86
Chesapeake and Ohio Railway Hospital	Gen	NP Assn	130	8	83	86
Clinchwood 720—Dickenson	Gen	Indiv	20	3	51	8
Dickenson County Hospital	Gen	Indiv	20	3	51	8
Coeburn 704—Wise	Gen	Part	50	1	19	19
Coeburn Hospital	Gen	Part	50	1	19	19
Covington 6508—Alleghany	Gen	Indiv	15	4	20	11
Covington General Hospital	Gen	Indiv	15	4	20	11
Dante 2600—Russell	Gen	Corp	25	2	10	10
Clinchfield Hospital	Gen	Corp	25	2	10	10
Danville 22247—Pittsylvania	TB	NP Assn	60			50
Hilltop Sanatorium	TB	NP Assn	60			50
Memorial Hospital	Gen	NP Assn	118	14	313	80
Farmville 3133—Prince Edward	Gen	NP Assn	40	6	107	30
Southside Community Hosp	Gen	NP Assn	40	6	107	30
Ft Belvoir —Fairfax	Gen	Army	40			21
Station Hospital	Gen	Army	40			21
Ft Myer 1000—Arlington	Gen	Army	82			37
Station Hospital	Gen	Army	82			37

Key to symbols and abbreviations is on page 933



## VIRGINIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Fortress Monroe 126—Elizabeth City	Gen	Army	90	6	63	50	1 562
Franklin 2930—Southampton	Gen	Indiv	34	5	51	23	634
Fredericksburg 6819—Spotsylvania	Gen	NPAasn	75	10	244	50	2 282
Mary Washington Hospital	Gen	NPAasn	75	10	244	50	2 282
Galax 2544—Grayson	Gen	Corp	30	3	11	16	444
Galax Hospital and Clinic	Gen	Corp	30	3	11	16	444
Grundy 815—Buchanan	Gen	Indiv	50	6	20	20	838
Hampton 6382—Elizabeth City	Gen	NPAasn	62	10	145	31	1 180
Divle Hospital	Gen	NPAasn	129	11	276	100	4 530
Hopewell 11327—Prince George	Gen	Corp	18	4	51	5	201
John Randolph Hospital	Gen	Corp	18	4	51	5	201
Hot Springs 1500—Bath	Gen	NPAasn	14	4	23	5	150
Community House	Gen	NPAasn	14	4	23	5	150
Keoughtan 1900—Elizabeth City	Gen	Vet	810			484	1 409
Veterans Admin Facility	Gen	Vet	810			484	1 409
Langley Field—Elizabeth City	Gen	Army	63		28	30	1 088
Stanton Hospital	Gen	Army	63		28	30	1 088
Leesburg 1640—Loudoun	Gen	County	28	7	70	17	677
Loudoun County Hospital	Gen	County	28	7	70	17	677
Lexington 3782—Rockbridge	Gen	NPAasn	65	8	66	22	1 312
Stonewall Jackson Memorial Hospital	Gen	NPAasn	65	8	66	22	1 312
Luray 1459—Page	Gen	NPAasn	12	3	31	5	207
Page Memorial Hospital	Gen	NPAasn	12	3	31	5	207
Lynchburg 40661—Campbell	Gen	NPAasn	12	3	31	5	207
Guggenheimer Memorial Hospital	Gen	NPAasn	12	3	31	5	207
Lynchburg General Hospital	Gen	NPAasn	12	3	31	5	207
Marshall Lodge Memorial Hospital	Gen	NPAasn	12	3	31	5	207
Virginia Baptist Hospital	Gen	NPAasn	12	3	31	5	207
Marion 4156—Smyth	Gen	NPAasn	12	3	31	5	207
Southwestern State Hospital	Gen	NPAasn	12	3	31	5	207
Nassawadox 1000—Northampton	Gen	NPAasn	12	3	31	5	207
Northampton Accomac Memorial Hospital	Gen	NPAasn	12	3	31	5	207
Newport News 34417—Warwick	Gen	NPAasn	12	3	31	5	207
Elizabeth Buxton Hospital	Gen	NPAasn	12	3	31	5	207
Riverside Hospital	Gen	NPAasn	12	3	31	5	207
Whittaker Memorial Hospital (col)	Gen	NPAasn	12	3	31	5	207
Norfolk 129710—Norfolk	Gen	NPAasn	12	3	31	5	207
Charles R. Grandy Sanat	Gen	NPAasn	12	3	31	5	207
Henry A. Wise Hospital for Contagious Diseases	Gen	NPAasn	12	3	31	5	207
Hospital of St Vincent de Paul	Gen	NPAasn	12	3	31	5	207
Leigh Memorial Hospital	Gen	NPAasn	12	3	31	5	207
Norfolk Community Hospital (col)	Gen	NPAasn	12	3	31	5	207
Norfolk General Hospital	Gen	NPAasn	12	3	31	5	207
Tidewater Victory Memorial Hospital	Gen	NPAasn	12	3	31	5	207
U. S. Marine Hospital	Gen	NPAasn	12	3	31	5	207
Norton 3077—Wise	Gen	NPAasn	12	3	31	5	207
Norton Hospital	Gen	NPAasn	12	3	31	5	207
Pennington Gap 1003—Lee	Gen	NPAasn	12	3	31	5	207
Lee General Hospital	Gen	NPAasn	12	3	31	5	207
Petersburg 28064—Dinwiddie	Gen	NPAasn	12	3	31	5	207
Central State Hospital (col)	Gen	NPAasn	12	3	31	5	207
Medical Center Hospital	Gen	NPAasn	12	3	31	5	207
Petersburg Hospital	Gen	NPAasn	12	3	31	5	207
Portsmouth 45704—Norfolk	Gen	NPAasn	12	3	31	5	207
Kings Daughters Hospital	Gen	NPAasn	12	3	31	5	207
Norfolk Naval Hospital	Gen	NPAasn	12	3	31	5	207
Parrish Memorial Hospital	Gen	NPAasn	12	3	31	5	207
Pulaski 7108—Pulaski	Gen	NPAasn	12	3	31	5	207
Pulaski Hospital	Gen	NPAasn	12	3	31	5	207
Radford 6227—Montgomery	Gen	NPAasn	12	3	31	5	207
St Albans Sanatorium	Gen	NPAasn	12	3	31	5	207
Richlands 135—Tazewell	Gen	NPAasn	12	3	31	5	207
Clinch Valley Clinic Hosp	Gen	NPAasn	12	3	31	5	207
Mattie Williams Hospital	Gen	NPAasn	12	3	31	5	207
Richmond 182029—Henrico	Gen	NPAasn	12	3	31	5	207
Crippled Children's Hosp	Gen	NPAasn	12	3	31	5	207
Dooley Hospital	Gen	NPAasn	12	3	31	5	207
Grace Hospital	Gen	NPAasn	12	3	31	5	207
Johnston Willis Hospital	Gen	NPAasn	12	3	31	5	207
Medical College of Virginia Hospital Division	Gen	NPAasn	12	3	31	5	207
Retreat for the Sick	Gen	NPAasn	12	3	31	5	207
Richmond Community Hospital (col)	Gen	NPAasn	12	3	31	5	207
St Elizabeth's Hospital	Gen	NPAasn	12	3	31	5	207
St Luke's Hospital	Gen	NPAasn	12	3	31	5	207
St Philip Hosp (col)	Gen	NPAasn	12	3	31	5	207
Shelving Arms Hospital	Gen	NPAasn	12	3	31	5	207
Stuart Circle Hospital	Gen	NPAasn	12	3	31	5	207
Tucker Sanatorium	Gen	NPAasn	12	3	31	5	207
Westbrook Sanatorium	Gen	NPAasn	12	3	31	5	207
Roanoke 69206—Roanoke	Gen	NPAasn	12	3	31	5	207
Burrell Memorial Hospital (col)	Gen	NPAasn	12	3	31	5	207
Civil Memorial Eye Ear and Throat Hospital	Gen	NPAasn	12	3	31	5	207

## VIRGINIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Jefferson Hospital	Gen	NPAasn	111	12	226	70	2 317
Lewis Gale Hospital	Gen	NPAasn	122	12	114	60	2 600
Roanoke Hospital	Gen	NPAasn	97	13	314	49	2 272
Shenandoah Hospital	Gen	Corp	50	8	139	20	1 497
Veterans Admin Facility	Gen	Vet	678			612	443
Salem 4833—Roanoke	Gen	Vet	678			612	443
Mount Regis Sanatorium	TB	Indiv	20			12	48
Saltville 2004—Smyth	Gen	Corp	15	3	9	8	309
Matheson Hospital	Gen	Corp	15	3	9	8	309
South Boston 4841—Halifax	Gen	Indiv	36	4	58	22	921
South Boston Hospital	Gen	Indiv	36	4	58	22	921
Staunton 11990—Augusta	Gen	NPAasn	85	10	123	39	1 176
Kings Daughters Hospital	Gen	NPAasn	85	10	123	39	1 176
Stuart 588—Patrick	Gen	Indiv	20	2	10	8	203
Suffolk 10271—Nansemond	Gen	Indiv	20	2	10	8	203
Lakeview Hospital	Gen	Corp	55	6	81	30	1 181
Virginia General Hospital	Gen	NPAasn	20	10	47	17	780
University—Albemarle	Gen	NPAasn	20	10	47	17	780
University of Virginia Hosp	Gen	NPAasn	20	10	47	17	780
Warrenton 1400—Fauquier	Gen	NPAasn	31	4	78	13	443
Fauquier County Hospital	Gen	NPAasn	31	4	78	13	443
Waynesboro 6226—Augusta	Gen	NPAasn	30	6	87	14	668
Waynesboro Community Hospital	Gen	NPAasn	30	6	87	14	668
Williamsburg 3708—James City	Gen	Indiv	17	2	19	7	374
Bell Hospital	Gen	Indiv	17	2	19	7	374
Eastern State Hospital	Gen	State	1 730			1 601	521
Winchester 10800—Frederick	Gen	NPAasn	122	14	288	70	2 823
Winchester Memorial Hospital	Gen	NPAasn	122	14	288	70	2 823

## Related Institutions

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Beaumont—Powhatan	Gen	State	21			6	878
Virginia Industrial School for Boys	Inst	State	21			6	878
Clover 201—Halifax	Gen	Indiv	4	3	16	6	53
Little Retreat Hospital	Gen	Indiv	4	3	16	6	53
Colony 100—Amherst	Gen	Indiv	4	3	16	6	53
State Colony for Epileptics and Feeble-minded	Gen	State	1 300			1 261	209
Danville 22247—Pittsylvania	Gen	Corp	39	2	31	10	404
Providence Hospital (col)	Gen	Corp	39	2	31	10	404
Falls Church 2019—Fairfax	Gen	Corp	39	2	31	10	404
Gundry Home and Training School for Feeble-minded	Gen	Indiv	80			77	12
Lawrenceville 1629—Brunswick	Gen	Indiv	80			77	12
Louise Taylor Letcher Memorial Hospital (col)	Inst	Church	18			1	60
Martinsville 7700—Henry	Gen	Indiv	14	2	11	2	121
St Mary Hospital (col)	Gen	Indiv	14	2	11	2	121
Shackelford Hospital	Gen	Indiv	50	8	48	21	965
Norfolk 129710—Norfolk	Gen	Indiv	50	8	48	21	965
McCoy Stokes Hospital	ENT	Part	11			3	836
Richmond 182029—Henrico	Gen	Indiv	11			3	836
City Home	Inst	Gen	579	36	119	412	1 123
Leo Camp Soldiers Home	Inst	State	30			13	5
Penitentiary Hospital	Inst	State	49			30	789
State Farm 60—Goochland	Inst	State	100			61	540
State Farm Hospital	Inst	State	100			61	540
Staunton 11990—Augusta	Unit of Western State Hospital	State	2 438			2 389	1 110
De Jarnette Sanatorium	Unit of Western State Hospital	State	2 438			2 389	1 110
Western State Hospital	Unit of Western State Hospital	State	2 438			2 389	1 110
Stonewall 201—Wise	Indus	NPAasn	18			3	109
Stonewall Hospital	Indus	NPAasn	18			3	109
Sweet Briar 200—Amherst	Inst	NPAasn	17			2	512
Sweet Briar College Infirmary	Inst	NPAasn	17			2	512

## Summary for Virginia

Hospitals and Sanatoriums	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	83	15 008	12 848	140 007
Related institutions	16	4 718	4 300	6 809
Totals	109	20 626	17 203	146 866
Refused registration	1	8		

## WASHINGTON

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinsets	Number of Births	Average Census	Admissions
Aberdeen 21773—Gray's Harbor	Gen	Church	77	18	400	50	1 082
St Joseph's Hospital	Gen	Church	77	18	400	50	1 082
American Lake 500—Pierce	Gen	Church	77	18	400	50	1 082
Veterans Admin Facility	Vet	Vet	710			639	236
Anacortes 6564—Skagit	Gen	Corp	20	5	72	11	488
Anacortes Hospital	Gen	Corp	20	5	72	11	488
Auburn 3006—King	Gen	Corp	40	6	60	10	480
Suburban Hospital	Gen	Corp	40	6	60	10	480
Bellevue 30873—Whatcom	Gen	Indiv	17	4	44	10	100
St Frances Hospital	Gen	Church	100	15	402	64	2 100
St Joseph's Hospital	Gen	NPAasn	70	12	208	43	1 700
St Luke's General Hospital	Gen	NPAasn	70	12	208	43	1 700
Whatcom County Hospital and Infirmary	Gen	County	78	4	77	21	701

Key to symbols and abbreviations is on page 933

## WASHINGTON—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Bremerton 10 170—Kitsap U S Naval Hospital	Gen	Navy	203	8	90	125	1 957
Centralia 8 608—Lewis St Luke's Hospital and Sweet Clinic	Gen	Part	20	8	151	11	567
Chehalis 4 907—Lewis St Helen's Hospital	Gen	Church	24	6	137	12	517
Chevelah 1 315—Stevens St Joseph's Hospital	Gen	Church	22	6	94	15	576
Colfax 2 782—Whitman St Ignatius Hospital	Gen	Church	60	10	168	50	2 111
Colville 1 608—Stevens Mt Carmel Hospital	Gen	Indiv	29	4	84	16	529
Dayton 9 570—Columbia John Brining Memorial Hospital	Gen	Indiv	20	4	83	11	492
Ellensburg 4 671—Kittitas Ellensburg General Hosp	Gen	Corp	20	6	122	12	540
Elma 1 545—Grays Harbor Elma General Hospital	Gen	Indiv	15	5		6	
Oakhurst Sanatorium	TB	County	60			60	91
Everett 30 567—Snohomish General Hospital	Gen	NPA's'n	84	16	332	61	2 676
Providence Hospital	Gen	Church	100	16	404	55	2 502
Forks 600—Clallam Olympic Hospital	Gen	Indiv	21	3	24	7	360
Ft Lewis—Pierce Station Hospital	Gen	Army	167	7	80	107	2 483
Ft Steilacoom 2 050—Pierce Western State Hospital	Ment	State	2 004			240	500
Ft Worden (Port Townsend P O) 387—Jefferson Station Hospital	Gen	Army	40	1	7	13	262
Kirkland 1 714—King Kirkland Hospital	Gen	Indiv	12	4	51	4	192
Lakerview 300—Pierce Mountain View Sanatorium	TB	County	142			116	273
Leavenworth 1 415—Chelan Cascade Sanitarium	Gen	NPA's'n	30	6	No data	supplied	
Longview 10 650—Cowlitz Cowlitz General Hospital	Gen	NPA's'n	45	14	269	22	1 054
Longview Memorial Hospital	Gen	Corp	80	16	230	24	1 570
Medical Lake 1 671—Spokane Eastern State Hospital	Ment	State	1 960			1 740	421
Mt Vernon 3 690—Skagit Mt Vernon General Hospital	Gen	Indiv	30	6	77	11	500
Nespelem 120—Okanogan Colville Hospital	Gen	IA	40	5	66	30	800
Newport 1 050—Pend Oreille Newport Community Hosp	Gen	NPA's'n	20	6	49	6	202
Olympia 11 733—Thurston St Peter's Hospital	Gen	Church	110	15	268	55	2 603
Pasco 3 496—Franklin Our Lady of Lourdes Hosp	Gen	Church	58	9	170	36	1 973
Port Angeles 10 188—Clallam Davidson and Hay Hospital	Part		50	10	96	20	1 079
Port Angeles General Hosp	Gen	NPA's'n	160	10	162	51	1 416
Port Gamble 500—Kitsap McCormick General Hospital	Gen	Indiv	10	2	No data	supplied	
Port Townsend 3 779—Jefferson St John's Hospital	Gen	Church	86	12	134	42	820
Puallup 7 694—Pierce Puget Sound Sanatorium	NCM	Indiv	26			18	90
Renton 4 067—King Bronson Memorial Hospital	Gen	Indiv	30	6	62	8	219
Richmond Highlands 600—King Firland Sanatorium and Isolation Hospital	TbIso	City	200			231	120
Seattle 360 583—King Ballard Accident and General Hospital	Gen	NPA's'n	33	12		18	1 000
Children's Orthopedic Hospital	Orth	NPA's'n	132			114	1 500
Columbus Hospital	Gen	Church	200	30	364	71	2 511
Firlawm Sanatorium	NAM	Corp	20			12	60
King County Hospital Unit No 1 (Harborview) 440	Gen	County	304	51	1 081	300	12 509
King County Tuberculosis Hospital	TB	County	160			150	290
Laurel Bench Sanatorium	TB	Part	8			77	178
Maynard Hospital	Gen	NPA's'n	130	30	524	80	3 054
Meadows Sanatorium	NAM	Corp	30			20	
Medical and Dental Building							
Surgery	Surg	Indiv	1			8	2 571
Providence Hospital	Gen	Church	292	08	900	204	6 606
Riverton Sanatorium	TB	NPA's'n	50			48	6
St Luke's Hospital	Gen	Corp	46	15	197	18	890
Seattle General Hospital	Gen	NPA's'n	120	20	364	64	3 066
Station Hospital	Gen	Army	28			10	249
Swedish Hospital	Gen	NPA's'n	200	65	1 016	204	6 417
U S Marine Hospital	Gen	USPHS	400			10	3 007
Virginia Mason Hospital	Gen	NPA's'n	143	30	436	90	5 877
Sedro Woolley 2 719—Skagit Memorial Hospital	Gen	NPA's'n	20	7	132	20	457
Northern State Hospital and State Narcotic Farm Colony	MentDrug	State	1 951			1 645	732
Shelton 3 691—Vason Shelton General Hospital	Gen	NPA's'n	40	15	213	26	932

## WASHINGTON—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Snohomish 2 608—Snohomish Aldercrest Sanatorium	TB	County	57			53	53
Snohomish General Hospital	Gen	Indiv	15	4	48	7	232
South Bend 1 798—Pacific South Bend General Hosp	Gen	Part	21	5	27	9	150
Spokane 110 514—Spokane Deaconess Hospital	Gen	Church	185	30	745	126	5 222
Edgeliff Sanatorium	Gen	County	147			117	04
Sacred Heart Hospital	Gen	Church	300	40	1 114	276	0 118
St Luke's Hospital	Gen	NPA's'n	160	18	257	118	3 320
Salvation Army Women's Hospital and Home	Mat	Church	40	30	101	29	126
Shriners Hospital for Crippled Children	Orth	Frat	20			20	112
Station Hospital	Gen	Army	76	2	5	40	954
Stanwood 715—Snohomish Stanwood General Hospital	Gen	Indiv	14	3	31	5	220
Tacoma 106 517—Pierce Northern Pacific Beneficial Association Hospital	Gen	NPA's'n	111	9	23	61	2 042
Pierce County Hospital	Gen	County	198	22	537	184	4 496
St Joseph's Hospital	Gen	Church	300	50	629	92	3 880
Tacoma General Hospital	Gen	NPA's'n	180	35	822	90	4 912
Tacoma Hospital	GATB	IA	268			220	868
Toppenish 2 774—Yakima Yakima Sanatorium	TB	IA	37			32	79
Vancouver 15 766—Clark Clark County Hospital	Gen	County	37	8	82	40	744
Clark General Hospital	Gen	NPA's'n	52	12	195	27	1 038
St Joseph's Hospital	Gen	Church	100	20	179	34	1 574
Station Hospital	Gen	Army	118		19	57	1 489
Walla Walla 10 976—Walla Walla St Mary's Hospital	Gen	Church	80	15	246	52	2 276
Veterans Admin Facility	GATB	Vet	400			379	1 322
Walla Walla Sanitarium and Hospital	Gen	Church	50	9	132	24	839
Wenatchee 11 827—Chelan Central Washington Deaconess Hospital	Gen	Church	50	14	261	37	1 466
St Anthony's Hospital	Gen	Church	72	10	201	39	1 243
Yakima 22 101—Yakima St Elizabeth's Hospital	Gen	Church	194	30	877	140	4 368
Yakima County Hospital	Gen	County	148	13	517	98	1 464

## Related Institutions

Chehalis 4 907—Lewis State Training School for Boys	Inst	State	18			8	301
Cle Elum 2 808—Kittitas Roslyn Cle Elum Beneficial Company Hospital	Gen	NPA's'n	21	1	4	14	576
Ione 594—Pend Oreille Ione Hospital	Gen	Indiv	10	3	35	5	195
Medical Lake 1 671—Spokane State Custodial School	MeDe	State	1 673			1 643	167
Monroe 1 500—Snohomish Monroe General Hospital	Gen	Indiv	13	4	28	3	160
Snohomish County Hospital and Farm	InstGen	County	43	1	6	40	145
Mt Vernon 3 690—Skagit Rowley General Hospital	Gen	Indiv	50	7	113	20	729
Seattle 360 583—King Florence Crittenton Home	Mat	NPA's'n	20	15	22	27	33
Freedlander's Sanitarium	Conv	Indiv	11			4	130
Junior League Convalescent Home	Conv	NPA's'n	20			16	70
King County Hospital Unit No 2 (Georgetown Branch) University of Washington Health Center	InstChr	County	205			258	807
Spangle 218—Spokane Spokane County Hospital	Inst	County	130			No data	supplied
Spokane 110 514—Spokane Florence Crittenton Home	Mat	NPA's'n	19	6	24	2	37
Riverview Hospital	Gen	City	100			7	136
Sprague 639—Lincoln Sprague Hospital	Gen	Indiv	12	3	15	2	50
Steilacoom 722—Pierce U S Penitentiary Hospital	Inst	Fed	85			67	806
Sumas 647—Whatcom Sumas General Hospital	Gen	Indiv	12	2	7	1	39
Tacoma 106 517—Pierce Washington Minor Hospital	Gen	NPA's'n	14			10	1 057
White Shield Home	Mat	NPA's'n	20	10	41	14	54
Tulalip 100—Snohomish Tulalip Hospital	Gen	IA	10	4	31	8	206
Walla Walla 15 906—Walla Walla Blue Mountain Sanatorium	TB	County	36			32	46
Yakima 2 101—Yakima Cottage Hospital	Gen	Indiv	15	10		5	

## Summary for Washington

Hospitals and sanatoriums	Number	Beds	Average Census	Admissions
Related institutions	23	2 697	12 478	143 167
Totals	114	18 509	2 319	8 784
Refused registration	24	613		1 010

Key to symbols and abbreviations is on page 933

## WEST VIRGINIA

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Beckley 9 307—Raleigh	Gen	Part	155	20	90	126	8 834
Beckley Hospital	TB	State	148			146	101
Pincrest Sanitarium	Gen	Corp	66	4	39	45	1 441
Raleigh General Hospital	Gen	Corp	100	10	159	68	4 118
Bluefield 19 399—Mercer	Gen	Corp	40	3	No data supplied		
Bluefield Sanitarium	Gen	Indiv	25	2	4	8	286
Brown's Hospital (col)	Gen	Indiv	70	8	103	50	2 039
Providence Hospital (col)	Gen	Corp	36	6	51	18	517
St Luke's Hospital	Gen	Church	220	20	373	187	7,174
Buckhannon 4 374—Upshur	Gen	Church	120	12	154	94	2 943
St Joseph's Hospital	Gen	NP Assn	90	10	130	91	2 398
Charleston 60 408—Kanawha	Gen	NP Assn	77	12	180	46	3 687
Charleston General Hosp	Gen	NP Assn	100	15	271	57	2 780
Kanawha Valley Hospital	Gen	Corp	28	4	64	15	627
McMillan Hospital	Gen	Corp	46	3	62	37	1 352
Mountain State Hospital	Gen	Church	20	6	32	8	403
St Francis Hospital	Gen	NP Assn	158	15	200	84	3 007
Salvation Army Hospital	Gen	NP Assn	52	10	193	42	1 608
Staats Hospital	Gen	NP Assn	120	10	203	60	2 370
Charles Town 2 434—Jefferson	Gen	NP Assn	60	6	36	40	1 333
Charles Town General Hosp	Gen	NP Assn	80	10	112	31	887
Clarkburg 28 806—Harrison	Gen	NP Assn	71	4	33	33	1 206
St Mary's Hospital	Gen	Church	30	1	5	12	584
Union Protestant Hospital	Gen	NP Assn	470			477	314
Elkins 7 340—Randolph	Gen	NP Assn	110	20	54	92	2 581
Davis Memorial Hospital	Gen	NP Assn	20	2	202	18	628
Flkins City Hospital	Gen	NP Assn	115	20	112	61	2 161
Fairmont 23 150—Marion	Gen	NP Assn	50			20	513
Cook Hospital	Gen	NP Assn	5			2	227
Fairmont Emergency Hosp	Gen	State	220	23	583	101	3 883
Glen Dale 1 193—Marshall	Gen	Church	210			191	1 831
Reynolds Memorial Hosp	Gen	Church	50	8	76	30	1 086
Hinton 6 654—Summers	Gen	Corp	400			370	121
Hinton Hospital	Gen	Corp	100	8	78	52	1 806
Holden 4,000—Logan	Gen	NP Assn	60	10	20	45	1 110
Holden Hospital	Gen	NP Assn	39	4	25	10	776
Hopemont 300—Preston	Unit of Hopemont Sanitarium						
Conley Hospital	TB	State	75	10	40	10	1 188
Hopemont Sanitarium	TB	State	60	6	110	36	1 391
Huntington 70 572—Cabell	Gen	NP Assn	42	1	70	15	1 090
Chesapeake and Ohio Railway	Gen	NP Assn	60	5	26	40	1 200
Hospital	Gen	NP Assn	170	30	707	104	3 663
Huntington City Hospital	Gen	City	14	4	31	8	1 186
Huntington Memorial Hos	Gen	NP Assn	70	8	141	41	902
pital	Gen	NP Assn	125	15	220	81	2 909
Huntington Orthopedic Hos	Orth	NP Assn	50	10	160	30	1 069
pital	Orth	NP Assn	170	30	707	104	3 663
Moore Beckner Fye Far and	ENT	Part	5			2	227
Throat Hospital	Gen	Church	220	23	583	101	3 883
St Mary's Hospital	Gen	Church	210			191	1 831
Veterans Admin Facility	Gen	Vet	50	8	76	30	1 086
Keyser 6 248—Mineral	Gen	Corp	400			370	121
Potomac Valley Hospital	Gen	Corp	100	8	78	52	1 806
Lakin 50—Mason	Ment	State	60	10	20	45	1 110
Lakin State Hospital (col)	Ment	State	39	4	25	10	776
Logan 4 396—Logan	Gen	Corp	75	10	40	10	1 188
Logan General Hospital	Gen	Corp	60	6	110	36	1 391
Mercy Hospital	Gen	Corp	42	1	70	15	1 090
Marlinton 1 586—Pocahontas	Gen	County	60	5	26	40	1 200
Pocahontas Memorial Hosp	Gen	County	170	30	707	104	3 663
Martinsburg 14 857—Berkeley	Gen	NP Assn	75	10	40	10	1 188
City Hospital	Gen	NP Assn	60	6	110	36	1 391
Kings Daughters Hospital	Gen	NP Assn	42	1	70	15	1 090
Matewan 932—Mingo	Gen	Indiv	60	5	26	40	1 200
Matewan Clinic Hospital	Gen	Indiv	170	30	707	104	3 663
McKendree 50—Fayette	Gen	State	14	4	31	8	1 186
McKendree Emergency Hos	Gen	State	70	8	141	41	902
pital	Gen	State	125	15	220	81	2 909
Montgomery 2 906—Fayette	Gen	Corp	50	4	24	11	396
Laird Memorial Hospital	Gen	Corp	34	6	36	10	618
Morgantown 16 186—Monongalia	Gen	Indiv	50	3	37	04	1 283
City Hospital	Gen	Indiv	12	2	No data supplied		
Eastmont Tuberculosis San	TB	NP Assn	120	18	262	61	2 478
atorium	TB	NP Assn	100	10	211	83	2 906
Monongalia County Hosp	Gen	County	38	3	30	19	983
Mullens 2 356—Wyoming	Gen	Indiv	37			19	1 004
Wyle Hospital	Gen	Indiv	40	2	27	8	313
New Martinsville 2 814—Wetzel	Gen	NP Assn	50	4	24	11	396
Wetzel County Hospital	Gen	NP Assn	34	6	36	10	618
Oak Hill 2 076—Fayette	Gen	Part	50	5	39	31	2 161
Oak Hill Hospital	Gen	Part	122	18	262	61	2 478
Parkersburg 29 693—Wood	Gen	City	100	10	211	83	2 906
Camden Clark Memorial Hos	Gen	City	38	3	30	19	983
pital	Gen	City	37			19	1 004
St Joseph's Hospital	Gen	Church	40	2	27	8	313
Philippi 1 767—Barbour	Gen	Part	50	4	24	11	396
Myers Clinic Hospital	Gen	Part	34	6	36	10	618
Princeton 6 905—Mercer	Gen	Corp	50	3	37	04	1 283
Mercer Memorial Hospital	Gen	Corp	12	2	No data supplied		
Princeton Hospital	Gen	Corp	120	8	54	60	2 604
Richwood 5 720—Nicholas	Gen	Indiv	100	6	90	78	4 013
McClung Hospital	Gen	Church	115	2	29	41	3 037
Sacred Heart Hospital	Gen	Church	120	8	54	60	2 604
Ronceverte 2 204—Greenbrier	Gen	Corp	100	6	90	78	4 013
Greenbrier Valley Hosp	Gen	Corp	115	2	29	41	3 037
South Charleston 5 904—Kanawha	Gen	Indiv	12	2	No data supplied		
Dunn Hospital	Gen	Indiv	120	8	54	60	2 604
Welch 5 306—McDowell	Gen	Corp	100	6	90	78	4 013
Grace Hospital	Gen	Corp	115	2	29	41	3 037
Stevens Clinic Hospital	Gen	Corp	120	8	54	60	2 604
Welch Emergency Hospital	Gen	State	100	6	90	78	4 013

## WEST VIRGINIA—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Weston 8 646—Lewis	Gen	Indiv	44	3	31	90	191
General Hospital	Gen	Indiv	44	3	31	90	191
Weston City Hospital	Gen	Corp	30	7	120	20	493
Wheeling 61 659—Ohio	Gen	NP Assn	204	22	685	171	5 942
Ohio Valley General Hosp	Gen	NP Assn	210	30	537	114	3 228
Wheeling Hospital	Gen	Church	85	4	61	58	2 382
Williamson 9 410—Mingo	Gen	Corp	85	4	61	58	2 382
Williamson Memorial Hosp	Gen	Corp	85	4	61	58	2 382
Related Institutions							
Berkeley Springs 1 039—Morgan	Orth	NP Assn	40			16	17
The Pines West Virginia	Orth	NP Assn	40			16	17
Foundation for Crippled	Orth	NP Assn	40			16	17
Children	Orth	NP Assn	40			16	17
Cabincreek 840—Kanawha	Gen	Indiv	10	3	13	1	70
Cabincreek Hospital	Gen	Indiv	10	3	13	1	70
Charleston 60 408—Kanawha	TbChil	NP Assn	41			35	46
Hill Crest Sanatorium	TbChil	NP Assn	41			35	46
Huntington 75 572—Cabell	Ment	State	906			900	480
Huntington State Hospital	Ment	State	906			900	480
Milton 1 300—Cabell	Conv	NP Assn	75			30	
Morris Memorial Hospital for	Conv	NP Assn	75			30	
Crippled Children	Conv	NP Assn	75			30	
Moundsville 14 411—Marshall	TB	County	30			23	34
Grand View Sanatorium	TB	County	30			23	34
West Virginia Penitentiary	Inst	State	74			50	
Hospital	Inst	State	74			50	
St Mary's 2 182—P easants	MeDe	State	82			81	4
West Virginia Training	MeDe	State	82			81	4
School	MeDe	State	82			81	4
Spencer 2 49—Rornc	Gen	Indiv	20	6	20	11	523
De Pue Hospital	Gen	Indiv	20	6	20	11	523
Spencer State Hospital	Ment	State	947			900	331
Weston 8 646—Lewis	Ment	State	1 603			1 643	543
Weston State Hospital	Ment	State	1 603			1 643	543
Wheeling 61 659—Ohio	Mat	NP Assn	46	2	12		36
Florncce Crittenton Home	Mat	NP Assn	46	2	12		36
Ohio County Tuberculosis San	TB	County	30			30	21
atorium	TB	County	30			30	21

## Summary for West Virginia

Hospitals and sanatoriums	Number	Beds	Average Census	Admissions
Related institutions	66	6 069	4 160	119 430
	13	3 909	3 709	2 822
Totals	79	10 068	7 919	122 257
Refu ed registration	3	92		

## WISCONSIN

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Algoma 2 902—Kewaunee							
Algoma Hospital	Gen	NPA'ssn	10	4	42	6	199
Amery 1 304—Polk							
Amery Hospital	Gen	Indiv	15	5	40	9	250
Antigo 8 610—Langlade							
Langlade County Memorial Hospital	Gen	Church	50	10	160	30	1 069
Appleton 20 967—Outagamie							
St Elizabeth Hospital*	Gen	Church	170	30	707	104	3 663
Arcadia, 1 469—Trempealeau							
St Joseph's Hospital	Gen	Church	14	4	31	8	1 186
Ashland 10 622—Ashland							
Ashland General Hospital	Gen	NPA'ssn	70	8	141	41	902
St Joseph's Hospital <sup>o</sup>	Gen	Church	125	15	220	81	2 909
Baldwin 800—St Croix							
Baldwin Community Hosp	Gen	NPA'ssn	21	6	36	7	370
Baraboo 5 545—Sauk							
St Mary's Ringling Hosp	Gen	Church	50	10	202	20	1 089
Beaver Dam 9 867—Dodge							
Lutheran Deaconess Hosp	Gen	Church	43	8	188	27	1 151
Beloit 23 611—Rock							
Beloit Municipal Hospital	Gen	City	74	26	492	54	2 600
Berlin 4 106—Green Lake							
Berlin Memorial Hospital	Gen	NPA'ssn	25	7	77	10	392
Black River Falls 1 900—Jackson							
Krohn Clinic and Hospital	Gen	Part	28	10	174	22	738
Boscobel 1 762—Grant							
Brookside Parker Hospital	Gen	Part	22	8	37	5	1 13
Burlington 4 114—Racine							
Memorial Hospital	Gen	NPA'ssn	30	10	160	18	710
Chippewa Falls 9 530—Chippewa							
St Joseph's Hospital	Gen	Church	146	14	241	68	1 853
Columbus 2 214—Columbia							
St Mary's Hospital	Gen	Church	40	7	137	27	730
Cumberland 1 532—Barron							
Cumberland Hospital*	Gen	Part	26	6	67	8	314
Darlington 1 764—Lafayette							
Drs Quinn and McConnell Hospital	Gen	Part	8	4	48	5	917
Dodgeville 1 937—Iowa							
Dodgeville General Hospital	Gen	NPA'ssn	23	5	100	14	1 200
St Joseph's Hospital	Gen	Church	60	10	119	33	1 200

## WISCONSIN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Eau Claire 26 287—Eau Claire Luther Hospital*	Gen	NP Assn	155	20	470	75	2 900
Edgerton 2 900—Rock Edgerton Memorial Hospital	Gen	NP Assn	18	6	120	13	4 83
Elkhorn 2 340—Walworth Walworth County Hospital	Gen	County	41	11	222	31	1 572
Fond du Lac 26 449—Fond du Lac St Agnes Hospital*	Gen	Church	250	32	663	212	5 863
Ft Atkinson 5 703—Jefferson Ft Atkinson General Hosp	Gen	Indiv	15	4	56	5	300
Frederic 680—Polk Frederic Hospital	Gen	Indiv	12	4		10	548
Grantsburg 777—Burnett Community Hospital	Gen	NP Assn	20	4	56	16	5 46
Green Bay 87 410—Brown Bellin Memorial Hospital*	Gen	Church	77	11	262	53	2 821
St Mary's Hospital*	Gen	Church	100	22	390	56	3 301
St Vincent's Hospital*	Gen	Church	217	20	583	100	7 366
Hartford 3 754—Washington St Joseph's Hospital	Gen	Church	50	8	100	17	720
Hawthorne 70—Douglas Middle River Sanatorium	TB	County	133			130	89
Hayward 1 207—Sawyer Hayward Indian Hospital	Gen	IA	50	5	100	38	636
Hillsboro 972—Vernon Hansberry Hospital	Gen	Indiv	30	5	49	15	441
Iola 763—Waupaca Iola Hospital	Gen	Corp	20	4	27	10	271
Janesville 21 623—Rock Mercy Hospital*	Gen	Church	144	22	394	71	1 992
Pinchurst Sanatorium	TB	County	65			66	86
Jefferson 2 630—Jefferson Forest Lawn Sanatorium	TB	County	52			51	68
Kaukauna 6 551—Outagamie Riverview Sanatorium	TB	County	60			60	120
Kenosha 50 062—Kenosha Kenosha Hospital	Gen	NP Assn	180	30	308	63	2 168
St Catherine's Hospital and Sanitarium	Gen	Church	48	15	304	34	1 249
Willowbrook Sanatorium	TB	County	72			46	49
Keshena 500—Shawano St Joseph's Indian Hosp	Gen	Church	67	7	104	30	908
La Crosse 39 614—La Crosse Grandview Hospital	Gen	NP Assn	106	10	107	42	1 309
La Crosse Hospital	Gen	NP Assn	50	12	161	30	1 531
La Crosse Lutheran Hosp *	Gen	Church	130	9	181	71	2 650
St Francis Hospital*	Gen	Church	200	30	620	166	4 850
Ladysmith 3 493—Rusk St Mary's Hospital	Gen	Church	43	8	178	24	763
Lancaster 2 432—Grant Doolittle Glyn Hospital	Gen	Indiv	12	3	18	6	186
Lancaster General Hospital	Gen	Part	12	6	20	6	200
Laona 1 500—Forest Ovilz Hospital	Gen	Indiv	17	4	40	6	204
Madison 57 890—Dane Lake View Sanatorium	TB	County	140			136	101
Madison General Hospital*	Gen	NP Assn	160	20	561	119	4 851
Methodist Hospital*	Gen	Church	110	10	120	42	2 132
Morningside Sanatorium	TB	NP Assn	50			46	30
Normandale	N&M Corp	Corp	30			20	188
St Mary's Hospital*	Gen	Church	170	30	603	110	5 231
State of Wisconsin General Hospital*	Gen	State	600	22	200	643	11 689
Wisconsin Orthopedic Hospital for Children	Unit of State of Wisconsin General Hospital						
Wisconsin Psychiatric Institute	Unit of State of Wisconsin General Hospital						
Manitowoc 22 903—Manitowoc Holy Family Hospital*	Gen	Church	140	20	300	72	2 490
Marinette 13 734—Marinette Marinette and Menominee Hospital	Gen	NP Assn	50	10	234	29	1 170
Marshfield 8 708—Wood St Joseph's Hospital*	Gen	Church	162	18	334	109	3 301
Mauston 2 107—Juneau Mauston Hospital	Gen	Corp	37	8	78	20	790
Medford 1 918—Taylor Medford Clinic	Gen	Corp	30	6	62	19	830
Mendota 400—Dane Mendota State Hospital	Ment	State	871			891	1 336
Veterans Admin Facility	Ment	Vet	290			290	80
Menomonie 5 000—Dunn Menomonie City Hospital	Gen	City	20	7	60	17	504
Merrill 8 400—Lincoln Holy Cross Hospital	Gen	Church	61	11	209	27	1 001
Lincoln County Hospital	Gen	County	30	4	02	19	1 003
Milwaukee 0 240—Milwaukee Columbia Hospital*	Gen	NP Assn	120	20	402	70	3 061
Evangelical Deaconess Hospital*	Gen	Church	10	28	84	90	4 125
Johnston Emergent Hosp	Emerg	City	25	4	9	9	10
Milwaukee Children's Hospital*	Chil	NP Assn	200			112	3 783
Milwaukee County Hospital Dispensary Emergency Unit	Unit of Milwaukee County Hospital	Waupaca					

## WISCONSIN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Milwaukee Hospital, The	Gen	Church	265	36	733	170	6 296
Passavant *	Gen	Church	110	40	600	79	3 381
Misericordia Hospital*	Gen	NP Assn	188	28	887	142	6 088
Mt Sinai Hospital*	Gen	Church	300			134	2 097
Sacred Heart Sanitarium*	Gen	Church	43	12	462	34	1 516
St Anthony Hospital	Gen	Church	325	72	1 407	183	7 943
St Joseph's Hospital*	Gen	Church	130	30	701	71	3 147
St Luke's Hospital*	Gen	Church	104			71	404
St Mary's Hill	N&M Corp	Corp	217	30	509	104	4 416
St Mary's Hospital*	Gen	Church	50			32	208
Shorewood Hospital Sanit	N&M Corp	Corp	200			86	1 318
South View Hospital	Unit of Milwaukee Children's Hospital	Gen	1 178			972	5 478
Stark Hospital	Gen	NP Assn	20	7	47	7	400
Veterans Admin Facility	Gen	NP Assn	20	7	47	7	400
West Side Hospital	Gen	NP Assn	20	7	47	7	400
Monroe 5 015—Green Evangelical Deaconess Hosp	Gen	Church	42	15	223	32	1 146
Mt Horeb 1 420—Dane Buckner Hospital	Gen	Indiv	14	4	30	3	292
Neenah 9 151—Winnebago Theda Clark Memorial Hosp	Gen	NP Assn	72	17	365	38	1 372
New London 4 661—Waupaca Community Hospital	Gen	Church	50	12	105	21	731
Memorial Hospital	Gen	Indiv	13	6	27	3	115
Oconomowoc 4 190—Waukesha Rogers Memorial Sanitarium	N&M Corp	NP Assn	55	4	56	40	98
Summit Hospital	Gen	Corp	30	4	56	30	475
Oconto Falls 1 921—Oconto Oconto Falls Hospital	Gen	City	14	3	64	7	268
Onalaska 1 408—La Crosse Oak Forest Sanatorium	TB	County	66			63	29
Oscola 607—Polk Ladd Memorial Hospital	Gen	Part	10	2	15	6	238
Oshkosh 40 108—Winnebago Mercy Hospital*	Gen	Church	140	20	342	116	3 138
Park Falls 3 036—Price Park Falls Hospital	Gen	Indiv	20	4	70	12	564
Pewaukee 1 067—Waukesha Oak Sanatorium	TB	County	42			40	55
Platteville 4 047—Grant Andrew Hospital	Gen	Indiv	20	4		6	227
Wilson Cunningham Hosp	Gen	Part	25	5		12	300
Plum City 320—Pierce Plum City Hospital	Gen	Indiv	14	5	55	7	200
Plymouth 3 882—Sheboygan Plymouth Hospital	Gen	Church	36	8	111	19	562
Rocky Knoll Sanatorium	TB	County	90			92	56
Portage 6 308—Columbia St Saviour's General Hosp	Gen	Church	68	11	180	36	1 121
Prairie du Chien 3 943—Crawford Beaumont Hospital	Gen	Indiv	24	4	64	11	267
Prairie du Chien Sanitarium	Gen	Corp	60	8	100	23	1 089
Prescott 755—Pierce St Croixdale Sanitarium	Gen	N&M Corp	50	4	10	34	103
Pureair (Bayfield P O) —Bayfield Pureair Sanatorium	TB	County	70			68	74
Racine 67 542—Racine St Luke's Hospital*	Gen	Church	120	38	571	40	2 208
St Mary's Hospital*	Gen	Church	178	33	690	85	4 339
Sunny Rest Sanatorium	TB	County	08			57	41
Reedsburg 2 967—Sauk Reedsburg Municipal Hosp	Gen	City	31	8	99	14	580
Rhineland 8 019—Oneida St Mary's Hospital	Gen	Church	80	10	167	40	1 281
Rice Lake 5 177—Barron Lakeside Methodist Hospital	Gen	Church	50	12	100	31	1 810
St Joseph's Hospital	Gen	Church	40	6	58	18	843
Richland Center 3 632—Richland Richland Hospital	Gen	NP Assn	63	14	119	40	1 700
Ripon 3 954—Fond du Lac Ripon Municipal Hospital	Gen	City	18	7	85	12	600
St Croix Falls 902—Polk St Croix Falls Hospital	Gen	Indiv	20	5	44	8	301
Shawano 4 188—Shawano Shawano Municipal Hospital	Gen	City	40	8	179	23	1 139
Sheboygan 39 201—Sheboygan St Nicholas Hospital	Gen	Church	100	18	534	90	2 716
Sheboygan Memorial Hosp	Gen	NP Assn	86	18	347	55	1 733
Shullsburg 1 014—Lafayette Dr Ennis Hospital	Gen	Indiv	8	3	15	6	194
South Milwaukee 10 706—Milwaukee South Milwaukee Hospital	Gen	Indiv	13	4	68	4	200
Sparta 4 949—Monroe St Mary's Hospital	Gen	Church	50	10	206	43	1 600
Stanley 1 988—Chippewa Victory Hospital	Gen	NP Assn	16	4	74	11	779
Staten 121—Waukesha Wisconsin State Sanat *	TB	State	240			200	122
Stevens Point 13 623—Portage River Pines Sanatorium	TB	Church	62			61	73
St Michael's Hospital	Gen	Church	70	10	101	00	1 682
Stoughton 4 497—Dane Stoughton Community Hos	Gen	NP Assn	22	9	140	17	699
Sturgeon Bay 4 903—Door Fgeland Hospital	Gen	Indiv	20	5	78	8	701
Lenox Hospital	Gen	Indiv	15			No data supplied	

Key to symbols and abbreviations is on page 933

## WISCONSIN—Continued

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Superior, 38 113—Douglas	Gen	Church	55	10	110	43	998
St. Francis Hospital	Gen	Church	38	14	New building		
St. Joseph's Hospital	Gen	Church	118	15	219	72	1,929
St. Mary's Hospital	Gen	Church					
Tomah, 3,354—Monroe	Gen	IA	42	5	39	28	510
Tomah Indian Hospital	Gen	Church	70	10	50	10	652
Tomahawk, 2,919—Lincoln	Gen	City	40	10	160	27	1,322
Sacred Heart Hospital	Gen	Church	70	10	50	10	652
Two Rivers, 10,053—Manitowoc	Gen	City	40	10	160	27	1,322
Two Rivers Municipal Hosp	Gen	City	40	10	160	27	1,322
Washburn, 2,238—Bayfield	Gen	AP Assn	17	5	21	5	204
Washburn Hospital	Gen	AP Assn	17	5	21	5	204
Waters, 10,618—Jefferson	Gen	Church	90	15	287	50	1,333
St. Mary's Hospital	Gen	Church	90	15	287	50	1,333
Waukesha, 17,176—Waukesha	Gen	City	109	24	414	55	2,102
Waukesha Municipal Hosp	Gen	City	109	24	414	55	2,102
Waukesha Springs Sanit	Gen	City	109	24	414	55	2,102
Waupun, 5,765—Fond du Lac	Gen	City	50		No data supplied		
Central State Hospital for Insane	Ment	State	310		322	80	
Wausau, 21,775—Marathon	Gen	County	66		61	75	
Mount View Sanatorium	Gen	County	66		61	75	
St. Mary's Hospital	Gen	County	66		61	75	
Wausau Memorial Hospital	Gen	AP Assn	90	20	302	62	2,200
Wauwatosa, 21,194—Milwaukee	Gen	County	1,588	70	1,467	573	20,031
Blue Mound Preventorium	Gen	County	1,588	70	1,467	573	20,031
Milwaukee Asylum for Chronic Insane	Ment	County	1,588	70	1,467	573	20,031
Milwaukee County Hosp	Gen	County	1,588	70	1,467	573	20,031
Milwaukee County Hospital for Mental Diseases	Ment	County	1,588	70	1,467	573	20,031
Milwaukee Sanatorium	Gen	County	1,588	70	1,467	573	20,031
Muirdale Sanatorium	Gen	County	1,588	70	1,467	573	20,031
West Bend, 4,760—Washington	Gen	County	100	20	302	62	2,200
St. Joseph's Hospital	Gen	County	100	20	302	62	2,200
West De Pere—Brown	Gen	County	100	20	302	62	2,200
Hickory Grove Sanatorium	Gen	County	100	20	302	62	2,200
Whitehall, 915—Frempeleau	Gen	County	100	20	302	62	2,200
Whitehall Community Hosp	Gen	County	100	20	302	62	2,200
Whitewater, 2,600—Manitowoc	Gen	County	100	20	302	62	2,200
Maple Crest Sanatorium	Gen	County	100	20	302	62	2,200
Winnebago, 1,000—Winnebago	Gen	County	100	20	302	62	2,200
Sunny View Sanatorium	Gen	County	100	20	302	62	2,200
Winnebago State Hospital	Gen	County	100	20	302	62	2,200
Wisconsin Rapids, 8,726—Wood	Gen	County	100	20	302	62	2,200
Riverview Hospital	Gen	County	100	20	302	62	2,200

## Related Institutions

Adams, 1,231—Adams	Gen	County	10	2	18	7	200
Adams Friendship Hospital	Gen	County	10	2	18	7	200
Appleton, 2,261—Outagamie	Gen	County	204		184	41	
Outagamie County Asylum for Chronic Insane	Ment	County	204		184	41	
Barron, 1,561—Barron	Gen	County	10	4	26	6	201
Barron City Hospital	Gen	County	10	4	26	6	201
Chippewa Falls, 9,570—Chippewa	Gen	County	330		302		
Chippewa County Chronic Insane Asylum	Ment	County	330		302		
Northern Wisconsin Colony and Training School	MeDe	State	1,099	4	5	100	269
Clintonville, 3,572—Waupaca	Gen	County	12	4	47	5	209
Clintonville Community Hospital	Gen	County	12	4	47	5	209
Dodgeville, 1,937—Iowa	Gen	County	160		147	10	
Iowa County Insane Asylum	Ment	County	160		147	10	
Fau Claire, 26,287—Fau Claire	Gen	County	233		278	21	
Fau Claire County Insane Asylum	Ment	County	233		278	21	
Elkhorn, 2,340—Walworth	Gen	County	167		163	167	
Walworth County Asylum for the Insane	Ment	County	167		163	167	
Fond du Lac, 26,440—Fond du Lac	Gen	County	268		261	24	
Fond du Lac County Insane Asylum	Ment	County	268		261	24	
Green Bay, 27,415—Brown	Gen	County	230		267		
Brown County Insane Asylum	Ment	County	230		267		
Wisconsin State Reformatory Hospital	Inst	State	10		4	206	
Itasca, 315—Douglas	Gen	County	298		280		
Douglas County Asylum Home and Sanatorium	Ment	County	298		280		
Janesville, 21,628—Rock	Gen	County	330		310	63	
Rock County Hospital	Gen	County	330		310	63	
Jefferson, 2,639—Jefferson	Gen	County	270		193	33	
Jefferson County Asylum for Chronic Insane	Ment	County	270		193	33	
Juneau, 1,154—Dodge	Gen	County	200		197	26	
Dodge County Insane Asylum and Poor House	Ment	County	200		197	26	
Kewaunee, 2,409—Kewaunee	Gen	County	10	2	14	2	75
Dana and Dockery Hospital	Gen	County	10	2	14	2	75
Lake Tomahawk, 60—Onondaga	Gen	County	42		41	46	
Lake Tomahawk State Camp	Gen	County	42		41	46	
Lancaster, 2,432—Grant	Gen	County	200		230		
Grant County Asylum	Gen	County	200		230		
Madison, 3,799—Dane	Gen	County	64		3	116	
East Washington Ave Hosp	Gen	County	64		3	116	
Manitowoc, 27,963—Manitowoc	Gen	County	220		190	23	
Manitowoc County Insane Asylum	Ment	County	220		190	23	
Marshfield, 8,775—Wood	Gen	County	211		218	23	
Wood County Asylum for Chronic Insane	Ment	County	211		218	23	

## WISCONSIN—Continued

Related Institutions	Type of Service	Ownership or Control	Beds	Basinets	Number of Births	Average Census	Admissions
Menomonie, 5,530—Dunn	Gen	County	183		174	19	
Dunn County Asylum	Gen	County	183		174	19	
Milwaukee, 5,824—Milwaukee	Gen	County	33		33	34	
Layton Home	Gen	County	33		33	34	
Monroe, 6,019—Cren	Gen	County	230		200	12	
Green County Asylum	Gen	County	230		200	12	
Nellsville, 2,118—Clark	Gen	County	14	4	26	8	280
Nellsville Hospital	Gen	County	14	4	26	8	280
New Richmond, 2,112—St. Croix	Gen	County	174		160	27	
St. Croix County Asylum for Chronic Insane	Ment	County	174		160	27	
Oconto, 5,030—Oconto	Gen	County	30	6	46	23	706
Oconto County and City Hospital	Gen	County	30	6	46	23	706
Oshkosh, 40,108—Winnebago	Gen	County	85		80	201	
Alexian Brothers Hospital	Gen	County	85		80	201	
Owen, 1,102—Clark	Gen	County	308		335	63	
Clark County Hospital	Gen	County	308		335	63	
Oxford, 307—Marquette	Gen	County	10	2	3	7	86
Oxford Hospital	Gen	County	10	2	3	7	86
Peabody, 1,519—Marquette	Gen	County	249		210	24	
Marquette County Insane Asylum	Ment	County	249		210	24	
Racine, 6,142—Racine	Gen	County	311	8	292	51	
Lincoln Memorial Hosp for Communicable Diseases	Gen	County	311	8	292	51	
Racine County Asylum	Gen	County	311	8	292	51	
Racine County Hospital	Gen	County	311	8	292	51	
Reedsburg, 2,960—Sauk	Gen	County	333		180		
Sauk County Asylum	Gen	County	333		180		
Richland Center, 3,632—Richland	Gen	County	100		137	33	
Richland County Asylum for Insane	Ment	County	100		137	33	
Shawano, 4,188—Shawano	Gen	County	190		182	17	
Shawano County Insane Asylum	Ment	County	190		182	17	
Sheboygan, 3,911—Sheboygan	Gen	County	210		200	27	
Sheboygan County Asylum for Chronic Insane	Ment	County	210		200	27	
Sparta, 4,910—Monroe	Gen	County	145		145		
Monroe County Insane Asylum	Ment	County	145		145		
Union Grove, 7,111—Racine	Gen	County	790		768	96	
Southern Wisconsin Colony and Training School	MeDe	State	790		768	96	
Vernon, 4,111—Dane	Gen	County	400		290		
Dane County Asylum for Chronic Insane	Ment	County	400		290		
Viroqua, 2,742—Vernon	Gen	County	135	8	123	17	
Vernon County Asylum	Gen	County	135	8	123	17	
Viroqua Hospital	Gen	County	135	8	123	17	
Watertown, 10,611—Jefferson	Gen	County	370		360		
Bethesda Lutheran Home for Feeble-minded and Epileptics	MeDe	County	370		360		
Waukesha, 17,176—Waukesha	Gen	County	200		270	80	
Waukesha County Asylum for Chronic Insane	Ment	County	200		270	80	
Wisconsin Industrial School for Boys	Inst	State	18		8	460	
Waupaca, 3,131—Waupaca	Gen	County	12	2	33	8	217
Waupaca Hosp and Clinic	Gen	County	12	2	33	8	217
Waupun, 5,768—Fond du Lac	Gen	County	8	4	37	4	177
Clark and Swartz Hospital	Gen	County	8	4	37	4	177
Wisconsin State Prison Hospital	Inst	State	21		20	336	
Wausau, 23,708—Marathon	Gen	County	167		203	14	
Marathon County Asylum for Chronic Insane	Ment	County	167		203	14	
Marathon County Home and Hospital	Inst	County	60		62	190	
Wauwatosa, 21,194—Milwaukee	Gen	County	80		48	1,464	
Milwaukee County Home for Dependent Children	Inst	County	80		48	1,464	
St. Camillus Hospital	Inc	Church	68		62	112	
Salvation Army Martha Washington Women's Home and Hospital	Mat	Church	76	14	110	42	131
West Bend, 4,760—Washington	Gen	County	100		100	14	
Washington County Asylum for Chronic Insane	Ment	County	100		100	14	
West Salem, 1,011—La Crosse	Gen	County	200		248	19	
La Crosse County Asylum for Insane	Ment	County	200		248	19	
Weyauwega, 1,067—Waupaca	Gen	County	200		188	22	
Waupaca County Insane Asylum	Ment	County	200		188	22	
Whitehall, 915—Frempeleau	Gen	County	149		103	10	
Frempeleau County Asylum for Chronic Insane	Ment	County	149		103	10	
Winnebago, 150—Winnebago	Gen	County	202		168	70	
Winnebago County Asylum	Gen	County	202		168	70	
Wyocena, 490—Columbia	Gen	County	297				
Columbia County Asylum	Ment	County	297				

## Summary for Wisconsin

	Number	Beds	Average Census	Admissions
Hospitals and Sanatoriums	161	19,708	14,983	24,126
Related Institutions	10	11,700	10,009	8,910
Totals	221	31,517	20,052	24,126
Refused registration	13	767		

Key to symbols and abbreviations is on page 933

## WYOMING

Hospitals and Sanatoriums	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Basin 903—Big Horn Wyoming Tuberculosis Sanatorium	TB	State	33			28	50
Burns 216—Laramie Burns Private Hospital	Gen	Indiv	10	5	No data supplied		
Casper 16 619—Natrona Memorial Hospital of Natrona County	Gen	County	50	10	32	61	2702
Cheyenne 17 361—Laramie Memorial Hospital of Laramie County	Gen	County	133	15	312	60	2221
Veterans Admin Facility	Gen	Vet	100			102	840
Douglas 191—Converse Douglas Hospital	Gen	Indiv	18	4	28	10	318
Evans 3 070—Laramie Wyoming State Hospital	Ment	State	610			507	123
Ft Warren 22—Laramie Station Hospital	Gen	Army	240	6	36	160	3008
Ft Washakie 130—Fremont Wind River Indian Hospital	Gen	IA	44	6	70	26	623
Gillette 1340—Campbell McHenry Hospital	Gen	Indiv	10	3	20	0	274
Jackson 533—Teton St John's Hospital	Gen	Church	29	4	28	12	500
hemmerer 1 84—Lincoln Lincoln County Minors Hospital	Gen	NPA'ssn	20	5	43	8	403
Lander 1 826—Fremont Bishop Randall Hospital	Gen	Church	20	6	05	10	060
Lovell 1 807—Big Horn Lovell Hospital	Gen	Indiv	20	6	109	10	090
Powell 1 106—Park Whitlock Hospital	Gen	Corp	20	5	61	5	340
Rock Springs 8 440—Sweetwater Wyoming General Hospital	Gen	State	100	12	340	66	3009
Sheridan 8 536—Sheridan Sheridan County Memorial Hospital	Gen	County	68	12	203	51	1029
Veterans Admin Facility	Ment	Vet	598			579	230
Wheatland 1 090—Platte Wheatland General Hospital	Gen	NPA'ssn	48	7	00	22	740

## Related Institutions

Basin 903—Big Horn Basin Hospital	Gen	Indiv	12	2	10	2	90
Evans 3 070—Laramie Jacoby Hospital	Gen	Indiv	10	3	6	3	112
Greybull 1 806—Big Horn St Luke's Hospital	Gen	Indiv	12	2	19	3	197
Hanna 1 500—Carbon Hanna Hospital	Gen	NPA'ssn	14	3	23	7	201
Lander 1 826—Fremont Wyoming State Training School	MeDe	State	360			360	33
Sheridan 8 536—Sheridan Reynolds Home	Gen	Indiv	9	4	53	2	142
Thermopolis 2 129—Hot Springs General Hospital	Gen	Indiv	40	10	61	18	802
Yellowstone Park 200—Yellowstone National Park Mammoth Hospital	Gen	Indiv	33	2	1	17	241

## Summary for Wyoming

	Number	Beds	Average Census	Admissions
Hospitals and sanatoriums	19	2 924	1 86	18 62
Related institutions	8	499	419	1 983
Totals	27	2 723	2 279	20 340
Refused registration	4	111		

## ALASKA

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Anchorage 2 277 Alaska Railroad Base Hosp	Gen	Fed	30	5	67	20	943
Cordova 980 Cordova General Hospital	Gen	Indiv	10	3	13	7	003
Fairbanks 2 101 St Joseph's Hospital	Gen	Church	48	6	77	30	820
Ft Yukon 04 Hud on Stuck Memorial Hospital	Gen	Church	40	2	21	24	150
Haines 344 Station Hospital	Gen	Army	10	1	9	7	186
Juneau 404 St Ann's Hospital	Gen	Church	64	9		14	
U S Hospital for Natives	G&TB	IA	60	8	46	44	71
Kanaiak 177 Kanaiak Native Hospital	Gen	IA	14	2	10	16	201
Kennecott 217 Kennecott Copper Corporation Hospital	Indus	Corp	12	1	2	3	
Ketchikan 3 006 Ketchikan General Hospital	Gen	Church	50	6	29	28	1012
Kotzebue 291 Kotzebue Hospital	Gen	IA	16	2	3	9	148
Mountain Village 6 U S Hospital for Natives (Mountain Village Hosp)	Gen	IA	22	3	10	16	152

## ALASKA—Continued

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Nome 1213 Maynard Columbus Hospital	Gen	Church	20	2	13	7	101
Palmer Matanuska Valley Hospital	Gen	Corp	20	4	40	8	220
Petersburg 1 202 Petersburg General Hospital	Gen	City	9	3	23	5	206
Seward 830 Seward General Hospital	Gen	Church	22	3	24	12	392
Sitka 1 006 Pioneer's Home Hospital	Inst	Ter	43			30	115
Tanana 180 Tanana Hospital	Gen	IA	20	3	12	18	144
Wrangell 948 Bishop Rowe General Hosp	Gen	Church	14	3	13	4	139

## CANAL ZONE

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Ancon 1 140 Gorgas Hospital*	Gen	Fed	800	20	620	406	13 060
Balboa 2 902 Palo Seco Leper Colony	Lepro	Fed	120			110	11
Station Hospital	Gen	Army	30			26	1 486
Corozal 1 790 Corozal Hospital	Ment	Fed	340			280	169
Station Hospital	Gen	Army	00			40	
Cristobal 089 Colon Hospital	Gen	Fed	114	15	35	90	426
Ft Davis 293 Station Hospital	Gen	Army	50			42	1 293
Ft Randolph (Coco Solo P O)	Gen	Army	11			9	
Station Hospital	Gen	Army	50			30	948

## GUAM

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Agaña Susana Hospital for Natives	Unit of U S Naval Hospital	Gen	171	10	147	56	1 607
U S Naval Hospital	Gen	Navy					

## HAWAII

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Bassinets	Number of Births	Average Census	Admissions
Aiea 3 021—Honolulu Honolulu Plantation Hosp	Gen	NPA'ssn	46	4	30	19	741
Hiale 312—Kauai McBryde Sugar Company Hospital	Gen	NPA'ssn	30	4	56	22	596
Hwa 4 000—Honolulu Hwa Plantation Company Hospital	Gen	NPA'ssn	45	6	67	20	1 076
Haina —Hawaii Honolulu Sugar Company Hospital	Gen	NPA'ssn	28	4	34	16	373
Hakalau 030—Hawaii Hakalau Plantation Hosp	Gen	NPA'ssn	22	2	21	11	388
Hann 293—Maui Hana Hospital	Gen	County	22	4	37	8	490
Hilo 19 468—Hawaii Hilo Memorial Hospital	Gen	County	140	18	278	104	2 406
Puunahoe Home County of Hawaii Tuberculosis Hosp	TB	County	142			140	117
Honolulu 137 582—Honolulu Japanese Hospital	Gen	NPA'ssn	120	5	00	77	2 843
Kapiolani Maternity and Gynecological Hospital	GynMat	NPA'ssn	44	30	780	00	1 600
Kauilaolani Children's Hosp	Chil	NPA'ssn	70			48	2 127
Leahi Home	TB	NPA'ssn	400			4	400
Queen's Hospital	Gen	NPA'ssn	300	20	70	216	880
St Francis Hospital	Gen	Church	60	10	207	60	2306
Shriners Hospital for Crippled Children	Orth	Frat	28			28	0
Tripler General Hospital	Gen	Army	300	10	103	278	3 620
Hoolahua —Maul Robert W Shingle Jr Memorial Hospital	Gen	Church	20	6	58	12	403
Kahuku 1 500—Honolulu Kahuku Plantation Company Hospital	Gen	NPA'ssn	20	6	103	25	633
Kalaupapa —Kalaupapa Leprosy Hospital	Lepro	Ter	52			41	216
Kaneohe (Heaia P O) 112—Honolulu Territorial Hospital	Ment	Ter	86			876	20
Kealahou 300—Hawaii Kona County Hospital	Gen	County	28	3	89	16	287
Keaia 100—Kauai Samuel Mahelona Memorial Hospital	TB	County	110			10	66

Key to symbols and abbreviations is on page 933

## HAWAII—Continued

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Kilauea, 1 232—Kauai	Gen	NP Assn	25	4			
Kilauea Hospital							
Kohala 720—Hawaii	Gen	County	48	6	101	20	70
Kohala County Hospital							
Koloa 1 844—Kauai	Gen	NP Assn	22	3	30	9	330
Koloa Sugar Company's Hospital							
Kula (Waiakoa P O) 20—Maui	G & TB	County	210	3	50	156	637
Kula Sanatorium							
Lahaina 2 730—Maui	Gen	NP Assn	63	9	160	40	1 724
Pioneer Mill Company's Hospital							
Lanai City—Maui	Gen	NP Assn	27	4	83	20	806
Lanai Hospital							
Makaweli 974—Kauai	Gen	NP Assn	40	3	42	37	913
Hawaiian Sugar Company's Hospital							
Olaa 597—Hawaii	Indus	NP Assn	40			23	791
Olaa Hospital							
Ookala 226—Hawaii	Gen	NP Assn	10	4	34	4	174
Hospital of Kaimuki Sugar Company							
Paaubau 536—Hawaii	Gen	NP Assn	16	2		7	
Paaubau Plantation Company Ltd Hospital							
Paaubau 1 233—Hawaii	Gen	NP Assn	14	3	16	5	1 460
Paaubau Hospital							
Pahala, 290—Hawaii	Gen	NP Assn	30	6	100	24	764
Hawaiian Agricultural Company Hospital							
Paia 4 171—Maui	Gen	NP Assn	102	10	188	48	2 047
Maui Agricultural Company's Hospital							
Papaaloa 73—Hawaii	Gen	NP Assn	23	4	16	5	140
Laupahoehoe Hospital							
Pearl City 1 071—Honolulu	McDe	Ter	368			329	00
Waimano Home for Feeble-minded Persons							
Pearl Harbor, 200—Honolulu	Gen	Navy	260			149	1 806
U S Naval Hospital							
Pepeekeo 520—Hawaii	Gen	NP Assn	41	4	100	20	968
Pepeekeo Central Hospital							
Puunene 4 050—Maui	Gen	NP Assn	100	24	298	70	3 404
Puunene Hospital							
Schofield Barracks (Honolulu P O) 4 200—Honolulu	Gen	Army	441	12	82	200	7 929
Station Hospital							
Waiakua 4 511—Honolulu	Gen	NP Assn	40	6	101	24	890
Waiakua Agricultural Company Ltd Hospital							
Wailuku 6 098—Maui	Gen	County	83	10	212	71	1 066
Malunani Hospital							
Yamashiro Hospital							
Waima 2 091—Kauai	Gen	NP Assn	36	6	111	41	1 400
Waima Hospital							
Waiapahu 5 874—Honolulu	Gen	NP Assn	62	8		00	
Oahu Sugar Company Ltd Hospital							
Tamara Hospital							

## PHILIPPINE ISLANDS

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Bacolod 19 300—Occidental Negros	Gen	Gov t	100	6	26	73	2 677
Occidental Negros Provincial Hospital							
Provincial Maternity and Children's Hospital	MatCh	Gov t	62	18		42	
Baguio 5 464—Benguet	Gen	Gov t	92	8	197	100	2 003
Baguio Hospital							
Hospital Notre Dame de Lourdes	Gen	Church	100	5	47	30	802
Station Hospital							
Batangas 41 182—Batangas	Gen	Gov t	30	5		28	
Batangas Provincial Hosp							
Bayombong 5 580—Nueva Vizcaya	Gen	Gov t	27	1	12	16	705
Bayombong Hospital							
Binalbagan 8 892—Occidental Negros	Gen	NP Assn	10	2			
Rizal Memorial Hospital							
Bontoc 600—Mountain	Gen	Gov t	30	3			
Bontoc Hospital							
Butuan 9 790—Agusan	Gen	Gov t	32			26	
Butuan Public Hospital							
Cabanatuan 15 282—Nueva Ecija	Gen	Gov t	90	10			
Nueva Ecija Prov Hospital							
Cagayan 28 164—Misamis Oriental	Gen	Church	55	5	21	13	647
Cagayan Mission Hospital							
Misamis Oriental Provincial Hospital							
Calamba 18 062—Laguna	Gen	NP Assn	39				
Calamba Sugar Estate Hospital							
Capiz 13 980—Capiz	Gen	Gov t	30	0	14	20	947
Capiz Provincial Hospital							
Capiz 21 906—Capiz	Gen	Church	00	5	110	52	2 224
Emmanuel Hospital							
Cavite 22 163—Cavite	Gen	Part	12	8	78	3	110
Cosca Hospital							
U S Naval Hospital							

## PHILIPPINE ISLANDS—Continued

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Cebu 60 300—Cebu	Gen	Part	24	4		17	
Cebu General Clinic							
Cebu Maternity House	Gen	NP Assn	33	26	120	20	1 319
Chong Hoa Chinese Hosp							
St Joseph's Hospital	Gen	NP Assn	20				
Southern Islands Hosp	Gen	Gov t	110	4			
Cervantes 2 513—Iloos Sur	Gen	Gov t	30	2			
Cervantes Hospital							
Corregidor—Cavite	Gen	Army	150	4			
Station Hospital							
Cotabato 410—Cotabato	Gen	Gov t	40	2			
Cotabato Public Hospital							
Cullion—Palawan	Gen	Gov t	618	16	133	517	2 768
Cullion Leper Colony Hospitals							
Emergency Hospital No 1	Gen	Gov t	20	3			
Cuyo 14 768—Palawan							
Cuyo Public Hospital							
Dagupan 22 612—Pangasinan	Gen	Gov t	50				
Pangasinan Provincial Hosp							
Dahican—Camarines Norte	Gen	NP Assn	30	2	18	26	900
Dahican Hospital							
Dansalan 5 908—Lanao	Gen	Gov t	50				
Lanao Public Hospital							
Dapitan 12 860—Zamboanga	Gen	Gov t	30				
Rizal Memorial Hospital							
Davao 13 046—Davao	Gen	Church	40	1			
Davao Mission Hospital							
Davao Oriental Hospital	Gen	Corp	30		30	30	1 300
Davao Public Hospital	Gen	Gov t	60	5			
Mindanao Hospital	Gen	Corp	70	10			
Del Carmen—Pampanga	Gen	NP Assn	32	3	29	15	891
Del Carmen Hospital							
Dumaguete 16 227—Oriental Negros	Gen	Church	70	2	02	40	1 760
Dumaguete Mission Hosp							
Fabrics—Occidental Negros	Gen	Corp	00		48	38	1 400
Ilo Hospital							
Ft Stotsenburg—Pampanga	Gen	Army	110	4	318	41	2 643
Station Hospital							
Iloilo 49 114—Iloilo	MatCh	Indiv	11	4		6	
Iloilo Maternity and Children's Hospital							
Iloilo Mission Hospital	Gen	Church	88	12		72	
Iloilo Polyclinic and Hosp	Gen	Indiv	24	6		12	
St Paul's Mission Hospital	Gen	Church	100				
Isabela 2 281—Zamboanga	Indus	Corp	24				
Basilan Lumber Hospital							
Iwahig—Palawan	Gen	Gov t	76	5	19	30	644
Iwahig Penal Colony Hosp							
Iolo 5 796—Sulu	Gen	Gov t	46	10			
Sulu Public Hospital							
Kabasaran—Zamboanga	Gen	NP Assn	20				
Pathfinder Estate Hospital							
Kiangnan 276—Iligan	Gen	Gov t	10	1	2	10	620
Kiangnan Hospital							
Kolambagan 1 260—Lanao	Gen	NP Assn	30		11	18	012
Kolambagan Hospital							
Laong 28 460—Iloos Norte	Gen	Church	40	2			
Sallie Long Read Memorial Hospital							
San Antonio Hospital	Gen	Indiv	18	1			
Legaspi 52 750—Albay	Gen	Gov t	30	2			
Albay Provincial Hospital							
Bicol Treatment Station	Gen	Gov t	230				
Milwaukee Hospital	Gen	Church	29	6			
Los Banos 6 330—Laguna	Gen	Gov t	20	2	5	2	401
University of the Philippines							
Los Banos Infirmary							
Lubuanan 226—Kalinga	Gen	Gov t	8				
Lubuanan Hospital							
Lucena 11 000—Tavabas	Gen	Gov t	80	12		68	
Tavabas Provincial Hosp							
Makati 12 400—Rizal	Gen	NP Assn	34				
Hospital Espanol de Santiago							
Malaybalay 9 868—Bulidnon	Gen	Gov t	16	1	01	21	668
Bulidnon Public Hospital							
Malolos 26 444—Bulacan	Gen	Gov t	30	6			
Bulacan Provincial Hosp							
Mandaluyong 6 230—Rizal	Gen	Gov t	800				
Insular Psychopathic Hosp							
Mandaue 21 464—Cebu	Gen	Gov t	780		5	934	306
Eversley Child Treatment Station							
Manila 2 530—Rizal	Gen	Gov t	300	6	10	200	2 607
Bilibid Hospital							
Camp Murphy Post Hosp	Gen	Gov t	80				
Chinese Hospital	Gen	NP Assn	150	18			
Hospital de San Juan de Dios	Gen	Church	272	36	100	205	5 340
Manila Sanit and Hosp	Gen	Church	70	10	45	26	1 209
Mary Chiles Hospital	Gen	Church	70	12	180	35	1 095
Mary Johnston Hospital	Gen	Church	80	30		64	
Maternity and Children's Hospital	MatCh	Gov t	77	60			
Philippine General Hosp	Gen	Gov t	663	64	5 010	641	22 740
St Joseph's Hospital	Gen	Corp	70	10	180	48	1 000
St Luke's Hospital	Gen	Church	150	10	218	100	3 420
St Paul's Hospital	Gen	Church	100	14	247	61	2 490
St Therese's Hospital	Gen	Indiv	60	10			
San Lazaro Hospital	ThIso	Gov t	760				
Sampaloc Maternity Hosp	Gen	Indiv	30	8	175	7	250
Sternberg General Hospital	Gen	Army	315	8			

Key to symbols and abbreviations is on page 933



## PHILIPPINE ISLANDS—Continued

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Margosatubig—Zamboanga Margosatubig Emergency Hospital	Gen	Gov t	18				
Mati 6440—Davao Mati Emergency Hospital	Gen	Gov t	6				
Naga 9396—Camarinas Sur Hospital Virgen Milagrosa	Gen	Indiv	40	18	14	936	
Naga Hospital	Gen	Gov t	22				
Olongapo—Zambales Camilla Simpson Hospital	Gen	Gov t	19	6	23	6	207
Paracale 6348—Camarines Norte General Hospital	Gen	Corp	30	3		14	
Pasay 18893—Rizal Harrison Hospital	Gen	Indiv	40			13	
Mercy Hospital	Gen	Indiv	20	8		6	
Port Lamon—Surigao Port Lamon Hospital	Gen	Corp	24	2	1	10	300
Puerto Princesa 5827—Palawan Puerto Princesa Hospital	Gen	Gov t	16				
Sagada 167—Bontoc St Theodore's Hospital	Gen	Church	50	4	22	18	988
San Carlos 41820—Occidental Negros San Carlos Milling Com pany Ltd Hospital	Gen	NP Assn	15	5			
San Fernando 19880—La Union Bethany Hospital	Gen	Church	36	4	79	21	1242
Pampanga Provincial Hosp San Jose de Buenavista 20750—Antique Antique Provincial Hospital	Gen	Gov t	16	6			
San Juan del Monte 6618—Rizal Manila Heights Hospital	Gen	Indiv	100				
San Miguel 18147—Bulacan Eladia Memorial Hospital	Gen	City	12	1	10	5	145
San Pablo 31214—Laguna San Pablo Hospital	Gen	City	20				
San Roque—Cavite Coca Hospital	Gen	Part	12	8	78	3	110
San Ramon Hospital	Gen	Indiv	14	10			
Santa Barbara 30913—Iloilo Western Visayas Treatment Station	Lepro	Gov t	200				
Santa Cruz 14151—Laguna Laguna Provincial Hosp	Gen	Gov t	57	9		31	
Santol—Rizal Quezon Institute	TB	NP Assn	300			318	717
Silay 20650—Occidental Negros Silay Maternity and Child rens Hospital	Gen	City	21	6			
Sorsogon 17049—Sorsogon Sorsogon Provincial Hosp	Gen	Gov t	16	2		8	596
Tacloban 15478—Leyte Bethany Hospital	Gen	Church	34	1	15	20	813
Leyte Provincial Hospital	Gen	Gov t	40	5			
Tagbilaran 12590—Bohol Bohol Provincial Hospital	Gen	Gov t	43	7			
Presbyterian Mission Hosp Tarlac 23686—Tarlac Tarlac Provincial Hospital	Gen	Gov t	30	6			
Tayabas 14633—Tayabas Tayabas Maternity Hosp	MatCh	Gov t	12	4	48	6	190
Vigan 17764—Ilocos Sur Ilocos Sur Provincial Hosp	Gen	Gov t	30	4	20	25	1033
Philippine Christian Insti tute Hospital	Gen	Church	30	5			
Zamboanga 30798—Zamboanga Brent Hospital	Gen	Church	82	8	22	30	1007
San Ramon Penal Farm Hospital	Inst	Gov t	46		7	24	494
Station Hospital	Gen	Army	16			3	115
Zamboanga General Hosp	Gen	Gov t	92	8			

## PUERTO RICO

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Aguadilla 10902—Aguadilla Hospital Municipal	Gen	City	24	4			
Anasco 3064—Aguadilla Municipal Hosp of Anasco	Gen	City	16	3			
Arecibo 17563—Arecibo Clinica Dr Saez	Gen	Indiv	100	10	12	70	2885
Municipal Hospital	Gen	City	120	2	150	12	3039
Bayamon 19986—San Juan Hospital Municipal de Baya mon	Gen	City	30				
Cabo Rojo 4600—Mayaguez Hospital Municipal	Gen	City	20		46	10	301
Caguas 19791—Guayama Clinica San Rafael	Gen	Indiv	70	6	42	21	786
Cayey 5903—Guayama Clinica Dr Villeneuve	Gen	Indiv	12	12	27	8	140
Central Aguirre—Guayama Aguirre Hospital	Gen	NP Assn	30	2	6	17	509
Cidre 1750—Arecibo Hospital Municipal	MatCh	Gov t	20		17	10	110
Fajardo 7322—Humacao Coombs Hospital	Gen	Corp	30		14	30	1160
Luis Manuel Hospital	Gen	City	32	4			

## PUERTO RICO—Continued

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Guayama 10902—Guayama Hospital de Tuberculosos	TB	Gov t	100			98	242
Gurabo 3468—Humacao Municipal Hospital	Gen	City	14	2	10	12	260
Humacao 7937—Humacao Clinica Oriente	Gen	Part	30	2	12	13	503
Ryder Memorial Hospital	Gen	Church	50	8	70	39	1000
Jayuya 4508—Ponce Figueroas Memorial Hosp	Gen	City	14		0	10	222
Juana Diaz 2466—Ponce Hospital Municipal	Gen	City	40	2	99	40	1139
Juncos 5097—Humacao Hospital Municipal	Gen	City	16		10	15	500
Lares 3040—Aguadilla Clinica San Jose	Gen	Indiv	8	2			
Las Piedras 1333—Humacao Las Piedras Municipal Hosp	Gen	City	16				
Loiza 1666—Humacao Loiza Municipal Hospital	Gen	City	21			15	
Manati 7449—Arecibo Hospital Municipal Manati	Gen	City	50	5			
Maunabo 1117—Guayama San Carlos Municipal Hosp	Gen	City	14	2	12		300
Mayaguez 37060—Mayaguez Clinica Betances	Gen	Indiv	70	6	17	20	439
Mayaguez and Western Polyclinic	Gen	Indiv	100	6	196	60	
Mayaguez Sanatorium Sanatorio Antituberculosis	TB	Gov t	200				
Mayaguez 4087—Humacao Municipal Hospital	Gen	City	58	1		20	
Ponce 63430—Ponce Asylum for the Blind	Inst	Gov t	100			90	170
Clinica Quirurgica del Dr Pina	Gen	Indiv	198	10	53	63	1649
Hospital Municipal Valentin Tricacheo	Gen	City	191	5	274	182	5105
St Luke's Memorial Hosp Santo Asilo de Damas Hos pital	Gen	Church	70	10	68	39	1807
Tuberculosis Hospital and Center	TB	Gov t	312			308	718
Rio Piedras 13408—San Juan Clinica Dr M Julia	N&M	Indiv	100			120	
Insular Leper Colony	Lepro	Gov t	80			60	68
Insular Tuberculosis Sanat Psychiatric Hospital of Puerto Rico	TB	Gov t	800			790	964
Sanatorio de la Sociedad Española de Auxilio Mutuo y Beneficencia de Puerto Rico	Gen	Frat	100	25	83	41	1484
Salinas 2202—Guayama Hospital de Salinas	Gen	City	40	6	97	30	403
San Juan 114715—San Juan Capital City Hospitals	Gen	City	360	60			
Clinica Blascoechea	Gen	Indiv	50	10	38	28	562
Clinica Diaz Garcia	Gen	Corp	75	6	23	30	797
Clinica Miramar	Gen	Indiv	150	5	0	50	497
Contagious Disease Hosp	Iso	Gov t	50			15	400
Hospital de la Penitenciaría	InstGen	Gov t	38	20			
Hospital San Jose	Gen	Corp	132	14	32	58	1348
Instituto Medico Quirurgico	Gen	NP Assn	35	6	22	15	309
Presbyterian Hospital	Gen	Church	116	20	431	87	2777
Puerto Rico Sanatorium	Gen	Indiv	16	16	173	12	600
Station Hospital	Gen	Army	102	2	13	71	880
University Hospital of the School of Tropical Medicine	Gen	Gov t	55				New building
Santurce—San Juan Hospital Mimya	Gen	Indiv	100	10	43	60	578
Utua 4758—Arecibo Clinica San Miguel	Gen	Indiv	80	3	10	50	684
Vega Baja 4784—Arecibo Dr J M Armaiz S Hospital	Gen	Indiv	15	2	9	3	132
Vega Baja Municipal Hosp	Gen	City	25	6	32	29	620
Vieques 3101—Humacao Municipal Hospital	Gen	City	40	10	60	22	480
Yabucoa 3841—Humacao Yabucoa City Hospital	Gen	City	24	2			
Yauco 8607—Mayaguez Clinica El Amaro	Gen	Indiv	22		4		40
Yauco Hospital	Gen	City	30				

## VIRGIN ISLANDS

Hospitals Sanatoriums and Related Institutions	Type of Service	Ownership or Control	Beds	Basins	Number of Births	Average Census	Admissions
Charlotte Amalie 7036—St Thomas Island Municipal Hospital	Gen	CyCo	100	12	103	55	924
Christiansted 3767—St Croix Island Christiansted Municipal Hos pital	Gen	City	64	8	211	46	1603
Richmond Hospital	Ment	City	50				
St Croix Hospital for Lep rosy	Lepro	City	92			68	3
Frederiksted 608—St Croix Island Frederiksted Municipal Hos pital	Gen	City	42	11			

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 11, 1939

## APPRECIATION FOR COOPERATION

The vast amount of accurate data presented in this issue of THE JOURNAL relative to the hospitals of the United States and the educational aspects of hospital care is made possible by the personal cooperation of great numbers of administrators of hospitals and of other workers in this field. When it is realized that all this material has been accumulated, tabulated and presented within less than three months after the close of the year covered, the promptness of the response becomes apparent. The Council on Medical Education and Hospitals and THE JOURNAL wish to express thanks and appreciation to all of those who have given cooperation, for without their help such presentation would not have been possible. It is hoped also that the cooperation may be taken as a recognition of the confidence which hospital administrators and workers in the field of medicine have in the work of the Council. This confidence is highly prized.

## HOSPITAL SERVICE 1938

The list published in this issue of THE JOURNAL indicates 6,166 registered hospitals. A year ago there were 6,128. For the first time since 1930 the number has increased over the previous year. Other evidences also point to more than ordinary expansion in hospital facilities but at the same time a greater number of idle beds.

The number of beds in registered hospitals is greater than a year ago by 36,832, about 50 per cent more than the average annual gain. There is an increase of 1,181 bassinets.

Since 1909 hospital facilities have increased each year by an average of 24,677 beds, or the equivalent of a sixty-eight bed hospital for every day in the year, Sundays and holidays included. During 1938 the net gain in registered hospital facilities was equal to a 101 bed hospital for each day of the year. Sixty-seven hospitals are known to be under construction and 185 additional ones are planned with construction pending.

Supplementary to these facilities there are 2,529 institutions, emergency stations, clinics and cottages designed to give emergency and other auxiliary types of hospital and medical care of which the Council on Medical Education and Hospitals has record.

The extent to which the people have absorbed expanding hospital facilities is attested by the admission of 9,421,075 patients to all registered hospitals, the equivalent of one person in every fourteen of the entire population. The registered hospitals admitted patients at the rate of one every three and three-tenths seconds throughout the entire year, day and night, Sundays and holidays included. The average stay per patient in general hospitals was 12.5 days. More than a million babies, 1,026,771 to be exact, were born in hospitals during the year.

The growth of hospital facilities has outstripped the advance in population. The increase of population in the United States from July 1, 1927, to July 1, 1938, was 8.9 per cent. In the same time the beds in all registered hospitals increased 36.1 per cent. The beds in all general hospitals increased 23.2 per cent, in nervous and mental hospitals 58.5 per cent and in tuberculosis hospitals 20.3 per cent. The ratio of general hospital beds to population has increased during these years from 2.9 beds per thousand to 3.3 beds per thousand. Such increases in proportion to population cannot be maintained indefinitely.

Hospital facilities must be provided where and when needed. They must be the implements of competent medical, nursing and other personnel. In order that really satisfactory service may be rendered it is essential that hospitals command the support of well trained physicians and a community of adequate size. The guiding principle must always be the welfare of the patients. Hospitals have been developed coincidentally with the advance and progress in medicine in such methods and means of treatment as antitoxins, toxoids, serums and vaccines, and diagnostic and treatment apparatus, useful in the hands of experts but dangerous in the hands of the ignorant.

More than ever the use of these modern aids in medical practice requires preparation in the sciences fundamental to medicine, training in an approved medical school, an approved internship followed by postgraduate training, and experience to develop skill in examining patients, in making accurate diagnoses and in applying the particular form of treatment which the condition of the patient indicates. Because of these valuable aids in combating disease, hospitals have become more essential in the practice of medicine. Hospitals have reached a higher standard of development than ever before, but there are still further heights to attain in their service to humanity. No influence, either from within or from without, should be permitted to destroy their high educational, moral and professional standards.

## THE WAGNER BILL FOR MEDICAL CARE

On February 28 Senator Wagner of New York introduced into the Senate of the United States a bill, S 1620, entitled A Bill to provide for the general welfare by enabling the several states to make more adequate provision for public health, prevention and control of disease, maternal and child health services, construction and maintenance of needed hospitals and health centers, care of the sick, disability insurance, and training of personnel. The bill had been announced again and again in newspaper publicity since the day when Congress convened. Much secrecy surrounded its preparation and development. Apparently up to the moment of its introduction even Mr. Wagner himself and his office were not sure as to just what the bill would include. On one day the press would state that it was proposed to include compulsory sickness insurance. A few days later it would be rumored that such inclusion was not contemplated. Obviously it is the purpose of the measure to begin fulfillment of the so-called National Health Program, although the measure is, in many of its recommendations, exceedingly vague.

Elsewhere in this issue appears an analysis of this measure by the Bureau of Legal Medicine and Legislation of the American Medical Association. Essentially the measure embarks on a three year program providing more than \$98,250,000 the first year and subsequent grants in ensuing years, indeterminate in amount except in a few particulars but sufficient to make effective the purposes of the bill. The details of the sums allotted are shown in the tabulation (page 1000).

The House of Delegates of the American Medical Association, in considering the National Health Program, approved expansion of public health service where need could be shown, approved medical care to the indigent and to the medically indigent where need could be shown, and approved even expansion of hospital construction, provided the need could be demonstrated, recommending, however, utilization of existing facilities to the utmost before a new building program was authorized. The House of Delegates also approved the principle of assistance to the worker for temporary disability resulting from illness. Now the Wagner act goes far beyond these recommendations. First, it authorizes the expenditure of vast sums before the need has been shown, second, it expands tremendously the work of the Children's Bureau, the United States Public Health Service and the Social Security Board, without any demonstration that such expansion is warranted, third, it proposes to place the state health officers in a commanding position as far as concerns the dispensing of the funds allotted, subject only to approval of all plans by the federal agency to which the task is assigned. Vast funds are provided for the construction of hospitals and health centers and for their maintenance, notwithstanding the fact that there

is not yet available any dependable determination of the exact nature and extent of needs that prevail. Who can imagine for a moment that the money once appropriated will not be expended? Finally, the measure introduces the principle of allotment of federal money to the individual states for medical care, by the Social Security Board, without specifying the means to be used in the individual states for providing such service other than to demand the approval of the Social Security Board.

As is emphasized in the analysis made by the Bureau of Legal Medicine and Legislation, the advisory councils to be set up are vague as to their membership, their duties and their responsibilities. There is one criticism that is to be made above all others in relation to this proposed legislation, namely its extreme vagueness in the light of the vast sums of money to be dispensed and the great powers conferred on certain federal officers in the control of the spending, and particularly the decision as to which of the individual states shall benefit by the expenditures.

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## INTERNSHIPS, RESIDENCIES AND FELLOWSHIPS

Hospital internships, residencies and fellowships have gained further prominence of late in view of their relation to the certification of specialists. Internships were first to become firmly established as an essential period of hospital training following graduation. They acquired official recognition in 1914, when 508 general hospitals were approved for intern training by the Council on Medical Education. Since that time there has been a steady expansion of educational facilities, until at present 7,373 internships are available in 734 approved hospitals.

Now the demand for interns exceeds the annual supply of medical graduates, many hospitals are unable to secure the required number of applicants. Even in the face of strong competition for desirable interns, additional hospitals are planning to enter the educational field, as evidenced by their application for approval as institutions suitable for the training of interns. As in other fields, the strong will survive, gradually a balance will be restored through the elimination of services that are poor in educational returns.

The certification of specialists, which has held the attention of the medical profession during the last few years, has wrought conspicuous changes in the field of graduate medical education. Most significant has been the rapid increase in number of residencies and fellowships, the change in length and character of training, the introduction of basic science requirements and the evident desire on the part of hospitals to supply instruction on an approved basis. A steadily increasing number of young physicians are seeking the direct approach to specialization without an intervening period of general practice. Their search for specialized training is

causing more and more hospitals to enter on courses of graduate instruction. Residencies are of comparatively recent origin and have not yet attained the degree of stability and uniformity which characterizes the intern field.

In 1927 a separate residency classification was established, when 278 hospitals and 1,776 individual residencies were approved. The rapid expansion of educational opportunities has increased the approved hospitals to 503 and the residencies and fellowships to 3,977. Last year the Council extended the residency classification to include fellowship training. In spite of the large number of approved positions there is no indication that a saturation point has been reached in any of the specialties.

Another development of profound significance is the close cooperation that has been established between the Council on Medical Education and Hospitals, the Advisory Board for Medical Specialties and the individual certifying boards. Cooperation has already been developed with the American Board of Radiology, the American Board of Pathology and the American Board of Anesthesiology. As soon as possible a similar procedure will be inaugurated with each of the remaining boards, that uniformity in the investigation and appraisal of educational opportunities may be accomplished. With the aid of the specialty boards a complete revision of the "Essentials of Approved Residencies and Fellowships" is in process. The educational requirements of individual specialties will then be more definite and more clearly apparent.

## Current Comment

### A COLOR TEST FOR MALARIA

After reviewing Henry's theory of immunity in malaria and Henry's melanoreaction, Proske and Watson<sup>1</sup> have described a protein tyrosine test which they consider valuable in the diagnosis of malaria. The principal reagents consist of sodium sulfate solution, sodium hydroxide solution, tyrosine standard solution and the phenol reagent of Folin and Ciocalteu. This test, when serums are used, they assert, gives a simple accurate colorimetric reading which obviates the necessity for a photometer, which was required by the Henry serodiagnostic test. The procedure is based on the fact that proteins possess a chromogenic property which can be measured quantitatively against the color produced by pure tyrosine in the presence of a phenol reagent. This chromogenic value is constant for a given protein and the intensity of the color produced can be used as a measure of the amount of protein examined. The tyrosine chromogenic index is determined by comparison with standards procured from pure tyrosine. As a result of the examination of more than 2,000 normal blood serums, these investigators

found that the tyrosine index for euglobulin fluctuates between 50 and 80 while that for serum from malaria patients ranges from 80 to 280 or higher. The test was found to be indicative of the presence of malaria in 97.4 per cent of known malaria cases examined as compared with 81.9 per cent positive thick blood films examined at the same time. Like the Henry test and its modifications this test, it is pointed out, is non-specific but its high sensitivity in malaria may make it a useful adjunct in the laboratory diagnosis of this disease and possibly in the differential diagnosis of other pathologic conditions characterized by an increase in serum euglobulin.

### REFRACTIVE ERRORS IN CHILDREN

A tabulation of the refractive errors observed in the right eyes of 1,481 children examined twice or more at varying intervals indicates, according to Ciocco,<sup>1</sup> that interesting changes take place in the frequency of stated refractive errors. The proportion of individuals with emmetropia (eyes needing no correction whatever) and mixed astigmatism did not alter, the frequency of hyperopia was reduced by almost 20 per cent, the number of cases of hyperopic astigmatism increased by about 40 per cent and the frequency of myopia and myopic astigmatism increased by about 70 and 65 per cent respectively. More than 75 per cent of the eyes with any of the main types of refractive errors however remained unchanged during the stated interval. When changes did occur, the nonastigmatic conditions (simple myopia and hyperopia) were transformed to astigmatism, while the astigmatisms changed back to the simple refractive errors. The chances of a change in type of refractive error appear to decrease with increase in the age of the children. Within the two and one half year interval, the age specific incidence rate of myopia was highest for the children from 10 to 11 years of age at the first examination and was lowest for the children of 14 years and over. For astigmatism, the age specific incidence rate was highest for children from 6 to 7 and from 12 to 13 years old, the lowest incidence of new cases of astigmatism was found among children of 14 years and over.

### DISEASE NOMENCLATURE

This year for the first time the Council on Medical Education and Hospitals included a question asking for the disease nomenclature used by hospitals. Of those which replied, 753 stated they were using the Standard Classified Nomenclature of Disease, now published by the American Medical Association, 1,063 stated they were using either the Ponton Alphabetical Nomenclature of Disease, the Bellevue Hospital or the Massachusetts General Hospital nomenclature, and 1,167 reported use of other classifications or none at all. Hence only 1,816 hospitals are employing what can be considered today as modern methods of classifying disease.

<sup>1</sup> Proske H. O. and Watson R. B. The Protein Tyrosine Reaction. Pub. Health Rep. 54: 158 (Feb. 3) 1939.

<sup>1</sup> Ciocco Antonio. Changes in the Types of Visual Refractive Errors of Children. Pub. Health Rep. 53: 1571 (Sept. 2) 1938.

# ORGANIZATION SECTION

## THE WAGNER BILL FOR THE NATIONAL HEALTH PROGRAM AN ANALYSIS BY THE BUREAU OF LEGAL MEDICINE AND LEGISLATION

Senator Robert F. Wagner of New York, February 28, introduced a bill to carry into effect the recommendations of the Interdepartmental Committee to Coordinate Health and Welfare Activities, appointed by the President in August 1935. The bill, S. 1620, was referred to the Senate Committee on Education and Labor.<sup>1</sup> Although the bill is actually an amendment to the Social Security Act, the bill proposes that if it is enacted it be called the "National Health Act of 1939."

The Social Security Act imposes pay roll taxes to finance the payment of the old age benefits and unemployment compensation provided for by the act, but it imposed no taxes to pay for the other federal aid it provided, such as maternal and child health services, public health services, child welfare services, and services for crippled children. The cost of the services last named is paid for from the general revenues of the Country and raised by general taxation. The present bill proposes no payroll taxes or other taxes for raising the funds necessary to meet the expenses that its enactment would entail. All expenses are to be met by general taxation, federal and state.

### SCOPE OF BILL

This new bill, which will be referred to for convenience as the Wagner National Health Bill, proposes to amend and supplement the provisions of the Social Security Act in relation to the following matters:

- 1 Maternal and child health services
- 2 Services for crippled children
- 3 Administration of grants to states for maternal and child welfare
- 4 Public health work
- 5 Grants to states for hospitals and health centers
- 6 Grants to states for medical care
- 7 Grants to states for temporary disability compensation
- 8 Rules for the determination of the financial status of states

### MATERNAL AND CHILD HEALTH SERVICES

The state maternal and child health services for which grants-in-aid are now authorized by the Social Security Act are limited to services for the promotion of the health of mothers and children. The pending bill proposes to authorize such grants to enable states "to extend and improve services, supplies and facilities for promoting the health of mothers and children, and medical care during maternity and infancy, including medical, surgical, and other related services, and care in the home or in institutions, and facilities for diagnosis, hospitalization, and aftercare", and to develop more effective measures for carrying out such purposes, including the training of personnel.

<sup>1</sup> Senate Committee on Education and Labor. Elbert D. Thomas of Utah chairman. David I. Walsh of Massachusetts. James E. Murray of Montana. Vic Donahey of Ohio. Rush D. Holt of West Virginia. Claude Pepper of Florida. Allen J. Ellender of Louisiana. Josh Lee of Oklahoma. Lister Hill of Alabama. William E. Borah of Idaho. Robert M. LaFollette Jr. of Wisconsin. James J. Davis of Pennsylvania. Robert A. Taft of Ohio.

### CRIPPLED CHILDREN

The Social Security Act now authorizes grants to enable the states to extend and improve services for locating crippled children and for providing medical, surgical, corrective and other services and care, and facilities for diagnosis, hospitalization and aftercare, for children who are crippled or who are suffering from conditions which lead to crippling. The Wagner National Health Bill proposes to enlarge such grants so as to authorize their use to enable states "to extend and improve services, supplies, and facilities for the medical care of children, and services to crippled children and other physically handicapped children in need of special care, such services and facilities to include medical, surgical, corrective, and other related services and care in the child's home or in institutions, and facilities for diagnosis, hospitalization, or other institutional care, and aftercare", and to develop more effective measures for carrying out such purposes, including training of personnel.

### MATERNAL AND CHILD WELFARE GENERALLY

The Social Security Act now authorizes the chief of the Children's Bureau to make such studies and investigations as will promote the efficient administration of the provisions of the act relating to grants to states for maternal and child welfare. The pending bill proposes to enlarge this so as to authorize also "demonstrations" and provision for the training of personnel.

### EXTENSION OF PUBLIC HEALTH SERVICE

For the purpose of assisting states, counties, health districts and other political subdivisions of the States in establishing and maintaining adequate public health services, including the training of personnel, the Social Security Act authorizes appropriations from which allotments are made by the Surgeon General of the Public Health Service. The Wagner National Health Bill proposes to limit such allotments to states and to authorize the making of such allotments "to extend and improve public-health work, including services, supplies, and facilities for the control of tuberculosis and malaria, for the prevention of mortality from pneumonia and cancer, for mental health, and industrial hygiene activities," and for the development of more effective measures for carrying out such purposes, including the training of personnel. The Social Security Act authorizes an appropriation for the investigation of disease and problems of sanitation by the Public Health Service, and the Wagner National Health Bill proposes to extend such authority so as to promote the use of the appropriations so authorized for the purpose of making "demonstrations" and for the training of personnel. The Wagner National Health Bill proposes to authorize the appointment of additional commissioned officers in the U. S. Public Health Service in accordance with law but without regard to the limitation as to number and research qualifications, including not to exceed four assistants to the Surgeon General.

The President, it is proposed, is to be authorized to change the names and reallocate the existing divisions of the Public Health Service and to create such additional administrative divisions as he may deem necessary to carry out the purposes of the act.

#### DETERMINATION OF ALLOTMENTS TO STATES

Various methods are proposed in the Wagner National Health Bill for determining the proportions of available funds that may be allotted to the several states. Allotments for maternal and child health services are to be determined in accordance with the rules and regulations prescribed by the chief of the Children's Bureau with the approval of the Secretary of Labor, the following factors being taken into consideration: (1) the total number of births in the latest calendar year for which the Bureau of the Census has available statistics, (2) the number of mothers and children in need of the services, (3) the special problems of maternal and child health and (4) the financial resources of the state. The financial resources of each state are to be measured by per capita income according to the inhabitants thereof as determined jointly by the Secretary of the Treasury, Secretary of Labor and the chairman of the Social Security Board annually.

Allotments for medical services for children and services for crippled and other physically handicapped children are to be determined in accordance with rules and regulations prescribed by the chief of the Children's Bureau with the approval of the Secretary of Labor, taking into account (1) the child population, (2) the number of children in each state in need of the services, (3) the special problems of medical care of children and (4) the financial resources of the state, determined as described.

Allotments to the several states for public health work are to be made in accordance with rules and regulations prescribed by the Surgeon General of the Public Health Service with the approval of the Secretary of the Treasury, taking into consideration (1) the population, (2) the number of individuals in need of the services, (3) the special health problems and (4) the financial resources of the state, determined as described.

Allotments to the states for hospital and health centers are to be made by the Surgeon General in accordance with rules and regulations prescribed by him, with the approval of the Secretary of the Treasury, which take into consideration (1) the needed hospitals and (2) the financial resources, determined as stated.

Allotments for medical care are to be determined in accordance with rules and regulations prescribed by the Social Security Board, taking into consideration (1) the population, (2) the number of individuals in need of the services, (3) the special health problems and (4) the financial resources.

The allotment to a state for temporary disability compensation is to be made only if that state has a plan for such compensation approved by the Social Security Board. The amount that may be paid is based on the sums expended as temporary disability compensation under the state plan. These payments are in the nature of supplementary unemployment compensation and so much as is to be paid by the federal government is to be taken from the general revenues of the country and not to be taken from a payroll or other similar tax.

#### NEW SERVICES

The Wagner National Health Bill proposes to authorize grants for three purposes that are not covered by the Social Security Act: (1) to provide and maintain hospital accommodations, (2) to provide medical care and (3) to provide temporary disability compensation.

#### HOSPITALS AND HEALTH CENTERS

Grants are proposed under the pending bill to enable the Surgeon General to allot to the several states money to enable them to construct and improve governmental hospitals where needed, to assist the states for a period of three years in defraying the operating cost of added facilities, and to develop more effective measures for providing hospitals. No provision is made whereby, by grant or loan, any nongovernmental charitable hos-

*Appropriations Proposed to Be Authorized by S 1620,  
the Wagner National Health Bill*

Purpose	Fiscal Year 1940	Fiscal Year 1941	Fiscal Subsequent Year 1942	Fiscal Years
Title V Part 1 Maternal and child health services	\$3,000,000	\$3,000,000	\$5,000,000	No limit
Title V Part 2 Medical services for chil- dren for crippled children and for other physically handicapped children	15,000,000	2,000,000	2,000,000	No limit
Title V Part 5 Administration	2,000,000	No limit	No limit	No limit
Title VI Part 1—Public Health Work				
(a)—Payments to states	15,000,000	2,000,000	20,000,000	No limit
(b)—Administration	1,500,000	No limit	No limit	No limit
Title VI Part 2 Investigations by Public Health Service	7,000,000	3,000,000	4,000,000	No limit
Title VII				
Grants for general hospi- tals	8,000,000	50,000,000	100,000,000	No limit
Grants for mental and tuberculosis hospitals	No limit	No limit	No limit	No limit
Administration	1,000,000	No limit	No limit	No limit
Title VIII				
Grants for medical care	3,000,000	No limit	No limit	No limit
Administration	1,000,000	No limit	No limit	No limit
Title XIV				
Grants for temporary dis- ability compensation	10,000,000	No limit	No limit	No limit
Administration	2,000,000	No limit	No limit	No limit

pital can be used in making improvements or extensions or the construction of new hospitals of this class promoted. The term "hospital" is defined to include "health, diagnostic, and treatment centers, institutions, and related facilities."

State plans for the construction of hospitals in order to be approved by the Surgeon General must provide for financial participation by the state and include provisions similar to the provisions on which the approval of state plans for other purposes covered by this bill is conditioned. They must provide in addition, however, "such methods of administration as are found by the Surgeon General of the Public Health Service to be necessary for the efficient operation of the plan", provide that ownership of real estate, improvements and equipment be vested in the state or its political subdivisions, and provide such safeguards as may be necessary to assure satisfactory title, location, design, construction and equipment. Such plans must provide, too, a system of financial support which will give reasonable assurance of continuing maintenance of added hospitals and of their potential availability to all

groups of the population in the designated area subject only to the suitability of the hospitals for particular diseases and conditions and to the financial arrangement for payment for service. Such plans must provide that wages paid or to be paid laborers and mechanics employed in the construction of hospitals are not less than the wages paid in the locality for work of a similar nature. The Surgeon General is to be authorized to utilize the Federal Emergency Administration of Public Works or, on the termination thereof, another appropriate agency of the United States designated by the President, for the purpose of reviewing the title, location, plans and specifications for the construction, alteration and repair of buildings and equipment, and of supervising the awarding and performance of contracts pursuant to plans approved by the Surgeon General. Funds made available for defraying the operating cost of added facilities are to be paid for at the rate of \$300 per added bed for general and tuberculosis hospitals and \$150 per added bed for mental hospitals during the first year of operation, two thirds of these amounts, respectively, for the second year of operation, and one third of these amounts, respectively, for the third year of operation.

#### PROVISION OF MEDICAL CARE

Allotments to the several states to enable them to provide medical care are to be made under authority of the Social Security Board. They are intended to extend and improve medical care, including all services and supplies necessary for the prevention, diagnosis and treatment of illness and disability and to develop more effective measures for providing such care, including the training of personnel. These grants of federal money to the several states are to enable them to extend and improve medical care and are to be made on the basis of state plans approved by the Social Security Board. The bill is silent as to the permissible extensions and improvements of medical care that a state may make and as to whether such care shall be provided through a state medical service, similar to the public educational system, or by a system of state health insurance, or by payment for services on the fee basis.

#### TEMPORARY DISABILITY COMPENSATION

The provisions of the Wagner National Health Bill relating to grants to states for temporary disability compensation are intended to assist them in "the development, maintenance, and administration of plans for temporary disability compensation" and are to be administered by the Social Security Board on the basis of plans submitted by the several states and approved by the board. The term 'temporary disability compensation' is defined to mean "cash benefits payable to individuals for not more than fifty-two weeks with respect to their disability and not arising out of or in the course of their employment," but agricultural labor, domestic service in a private home, and casual labor in the course of an employer's trade or business does not come within the definition or within the benefits of the act, nor do merchants or mechanics operating on their own account.

#### CONDITIONS UNDER WHICH FEDERAL GRANTS MAY BE OBTAINED

The conditions laid down in the Wagner National Health Bill with which a state must comply in order to obtain the supposed benefits of the act are more

rigid than the conditions imposed by the Social Security Act, except with respect to grants to states for temporary disability compensation, which stand in a class by themselves.

Insistence has been placed on the provision of methods of establishing and maintaining standards of medical and institutional care and of remuneration for such care, such methods to be prescribed by the state agency after consultation with such professional advisory committees as the state agency may establish. Each state must provide, too, for an advisory council or councils, composed of members of the professions and agencies, public and private, that furnish services under the state plan, and other persons informed on the need for, or provision of, maternal and child health services. No limitation is placed on the number of such councils or on the number of members and their distribution as among the different classes eligible for membership, and no definition is given as to the nature and extent of their advisory authority. Federal advisory councils of similarly indefinite character are proposed for the chief of the Children's Bureau, the Surgeon General of the Public Health Service and the Social Security Board. Each of the officers and the agency named is to be authorized to appoint an advisory council or councils analogous to those required to be appointed by each state participating in any of the benefits proposed in this bill. Rule making likewise is given a prominent place in the bill, since a state plan with respect to any of the benefits named, except that for temporary disability compensation, must authorize the state agency "to make and publish such rules and regulations as are necessary for efficient operation of the services, having special regard for the quality and economy of the service," and the chief of the Children's Bureau, the Surgeon General of the Public Health Service, the Federal Emergency Administrator of Public Works and the Social Security Board is each to be authorized to make and publish rules and regulations. What the nature of such rules and regulations is to be and the manner of their enforcement are not disclosed.

#### AUTHORIZED APPROPRIATIONS

The accompanying table presents the appropriations that the Wagner National Health Bill proposes to authorize.

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#### CLINICS VERSUS FREE CHOICE IN AUSTRIA

Even Nazi Germany does not consider clinics and contract physicians preferable to a system of free choice. In an article on the Introduction of German Sickness Insurance into Austria, Dr. Paul Petersilie, writing in the *Deutsches Aerzteblatt* (69:49 [Jan 14] 1939), emphasizes the fact that one of the first changes to be made in Austria was the abolition of the clinics and the district physicians in Vienna.

Under the clinic system contract physicians were required to maintain regular hours. When physicians were changed "a patient who in the course of a continuous treatment, was required to visit the clinic more than once could not depend on always being treated by the same physician." In Germany physicians had already decided that this sort of medical care was ineffective and that clinic treatment and the maintenance of contract physicians were not in the interests of the insured. The German sickness insurance administration has insisted that in the interests of the insured the clinics should be abolished and free choice of physician should be introduced universally throughout Austria.



## OFFICIAL NOTES

## CONFERENCE ON MEDICAL PATENTS

All class A medical schools and universities having medical schools, all manufacturers who have products before the Council on Pharmacy and Chemistry, all foundations having patents, and individuals who have expressed special interest have been invited to a conference on medical patents at the headquarters building of the American Medical Association in Chicago March 16. The response has been gratifying. Well over a hundred of these representatives as well as members of the Council on Pharmacy and Chemistry and members of the Board of Trustees have indicated their intention to participate. The program is not completed but the following have accepted invitations to speak.

## Opening Statement on Medical Patents

DR ROGER I. LEE, member of the Board of Trustees and member of the Harvard Corporation

## The Administration of Medical Patents for the Public Welfare

DR GLADYS DICK of the Scarlet Fever Committee

MR F. LORNE HUTCHISON, Secretary of the Insulin Committee, University of Toronto

## Manufacturers' Point of View on Medical Patents in Relation to Public Welfare

DR JOHN F. ANDERSON, President of American Drug Manufacturers' Association and Vice President of E. R. Squibb & Sons

DR A. W. LESCOHIER, President of Parke, Davis & Co.

## The Public's Stake in the Administration of Medical Patents

EARL SHEPARD JOHNSON, Assistant Professor of Sociology, University of Chicago

## Medical Patents and the Licensing System from the Point of View of the Council on Pharmacy and Chemistry

DR TORALD SOLLMANN, Chairman of the Council on Pharmacy and Chemistry and Professor of Pharmacology at Western Reserve University School of Medicine

## THE ST LOUIS SESSION

## Program of Entertainment by Woman's Auxiliary

Entertainment for all women attending the St. Louis session of the American Medical Association and of the national Woman's Auxiliary, May 15-19, has been arranged by the Committee on Women's Activities.

St. Louis women and pre-convention guests are requested to register in advance at Women's Headquarters at Hotel Chase in St. Louis Saturday May 13 between 1 and 4 p. m. or on Sunday May 14 between 10 a. m. and 4 p. m. All visiting women are requested to register as soon as possible after arrival.

The preliminary program is as follows:

## SUNDAY, MAY 14

10 a. m. to 4 p. m. Registration. Hostess Committee to receive visitors in afternoon.

4 p. m. to 7 p. m. Tea for the National Board in honor of Mrs. Charles C. Tomlinson at the residence of Mrs. Willard Bartlett.

## MONDAY, MAY 15

9 a. m. National board meeting, Empire Room, Hotel Chase.

1:30 p. m. to 4:45 p. m. Visit to St. Louis County private gardens and tea (complimentary). Bus fare 75 cents.

## TUESDAY, MAY 16

9 a. m. to 12. Opening of convention of Woman's Auxiliary.

General session of Woman's Auxiliary, Empire Room, Hotel Chase.

12:30 p. m.

1:45 p. m.

4 p. m.

8 p. m.

9 a. m.

1 p. m.

2:30 p. m.

Wednesday Evening

9 a. m.

10 a. m.

12:30 p. m. to 3:30 p. m.

7 p. m.

9 p. m.

Luncheon, St. Louis Woman's Club \$1.25.

Optional tours, \$1.

(a) Park area.

(b) Arts tour.

Tea (complimentary). Guests of St. Louis University Woman's Club.

Opening General Meeting of the American Medical Association at Municipal Auditorium.

(Special busses from Hotel Chase to Auditorium and return, 50 cents round trip.)

## WEDNESDAY, MAY 17

Annual Meeting of Woman's Auxiliary, Empire Room, Hotel Chase.

Annual luncheon, Chase Club \$1.25.

Exhibits and music, Empire Room. Conferences.

Reception, supper and program (complimentary). The Woman's Auxiliary invites all visiting ladies. Motion pictures, U. S. seal fisheries and fur fashion show.

## THURSDAY, MAY 18

Forenoon. Post-convention meetings.

Executive Committee meeting.

Board of Directors meeting.

Mississippi River steamboat trip for men and women, \$1. Usual light refreshments available at reasonable prices. Transportation by special bus for those who buy tickets in advance, 50 cents.

Annual Bring Your Husband Dinner, \$2.

President's Reception and Ball. Hosts, American Medical Association.

(Bus arrangements from Hotel Chase to Hotel Jefferson, 25 cents.)

## FRIDAY, MAY 19

Women's golf round and blind bogey. Trophies and prizes provided.

## The William Beaumont Exhibit and the Exhibit of Medals

Many visitors to St. Louis during the Annual Session of the American Medical Association will be interested in the collection of letters and notebooks relating to Dr. William Beaumont, the pioneer American physiologist, who served in St. Louis as an army surgeon and later became a busy practitioner of medicine in St. Louis. Beaumont was one of the early presidents of the St. Louis Medical Society. The most important scientific collection of Beaumontiana in existence can be seen at the Library of Washington University School of Medicine, Euclid Avenue and Kingshighway.

At the Library of the St. Louis Medical Society will be a display of medals, plaquettes and coins in the Hugo W. Bartsch Room on the library floor. This exhibit consists of tokens of honors conferred on physicians and commemorative disks of epoch-making contributions to medicine. Some of these are curious "touch pieces," coins that were given to such victims of the King's Evil (scrofula or struma) when the rulers of Great Britain "touched" such patients to cure them by the "divine power of royalty." Plastic disks and plates are actually miniature monuments to achievements in medical science. They are not ordinarily exhibited to the public. It is gratifying that their owners have lent their possessions to this unique cooperative display.

## RADIO BROADCASTS

The fourth series of programs broadcast in dramatic form portraying fictitious but typical incidents of significance in relation to health by the American Medical Association and the National Broadcasting Company, entitled "Your Health," began Wednesday October 19 and will run consecutively for thirty-four weeks. The program is broadcast each Wednesday over the blue network of the National Broadcasting Company at 2 p. m. eastern standard time (1 p. m. central standard time, 12 noon mountain time, 11 a. m. Pacific time).<sup>1</sup>

These programs are broadcast on what is known in radio as a sustaining basis, that is, the time is furnished gratis by the radio network and local stations and no revenue is derived

from the programs. Therefore, local stations may or may not take the program, at their discretion, except those stations which are owned and operated by the National Broadcasting Company.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

March 15	Guarding Fresh Foods
March 22	Auditing the Health Record
March 29	Animal Diseases Transmitted to Man

<sup>1</sup> Owing to program conflicts there will be no Chicago broadcast of the network program. Instead a recording of the program will be broadcast over station WENR at 8 p. m. each Wednesday. This recording will be an identical rebroadcast of the network program broadcast earlier the same day.

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Changes in Status*—S 685, proposing to create a Division of Water Pollution Control in the United States Public Health Service, has been reported to the Senate without amendment. S 1464 has been reported to the Senate, with amendment, proposing to extend the facilities of the United States Public Health Service to active officers of the Foreign Service of the United States. For illness or injury directly attributable to service on foreign assignment, medical and surgical treatment and hospitalization by the United States Public Health Service will be supplied, it is contemplated, at government expense. For illness or disability not the direct result of foreign service suffered by any officer or American employee of the Foreign Service only, any dependent member of the family of such officer or employee, such illness or injury having originated while on foreign station, medical and dental treatment and hospitalization may be furnished by the United States Public Health Service at a cost to the officer or employee in accordance with rates established by regulations of the Surgeon General of the Public Health Service. H R 1776 has been reported to the House, with amendment, providing for the assignment of medical officers of the United States Public Health Service for duty on vessels of the Coast and Geodetic Survey. H R 4425 has been reported to the House, without amendment, proposing to provide for reorganizing agencies of the government.

*Bills Introduced*—S 1540, introduced by Senator Overton, Louisiana, proposes to increase the compensation of members of the National Advisory Health Council not in the regular employment of the government from \$5 to \$25 per diem. S 1582, introduced (by request) by Senator Bulow, South Dakota, proposes to authorize the President to bestow a Meritorious Service Medal on any civil officer or employee of the United States, including commissioned officers of the United States Public Health Service and of the Coast and Geodetic Survey, for the performance of an outstanding act or service involving great physical bravery or heroism, or for the performance of a service to the government or to humanity characterized by exceptional merit and involving a high degree of labor or effort above and beyond the ordinary and usual requirements of his office. S 1615, introduced by Senator Sheppard, Texas, proposes to authorize the appointment of female dietitians and female physiotherapy and occupational therapy aides in the Medical Department of the Army. S 1620, introduced by Senator Wagner, New York, proposes to provide for the general welfare by enabling the several states to make more adequate provision for public health, prevention and control of disease, maternal and child health services, construction and maintenance of needed hospitals and health centers, care of the sick, disability insurance, and training of personnel. S 1691, introduced by Senator Clark, Missouri, proposes to prevent the pollution of the navigable waters of the United States. H R 4311, introduced by Representative Gearhart, California, proposes to prohibit the importation of dairy products produced from milk or cream other than from cows either accredited free of bovine tuberculosis or under test for bovine tuberculosis. H R 4314 introduced (by request) by Representative Mansfield, Texas, proposes to provide federal aid to states in the control of water pollution

and to create a Division of Water Pollution Control in the United States Public Health Service. H R 4401, introduced by Representative Tenerowicz, Michigan, proposes to authorize an appropriation of \$250,000 to provide a 250 bed patient addition to the veterans' hospital at Dearborn, Mich. H R 4530, introduced by Representative Buckley, New York, proposes to provide that, for pension purposes, any female trained nurse who served in Red Cross Auxiliary Numbered 3 in the Philippine Islands during the Spanish-American War shall be considered to have been in the active military service in the United States. H R 4585, introduced by Representative Rogers, Massachusetts, proposes to amend the National Cancer Institute Act so as to authorize an additional appropriation of \$2,300,000 for the fiscal year ending June 30, 1940, and for each fiscal year thereafter such sums as may be necessary, to assist states, counties, cities or other political subdivisions to extend and improve measures through public and private institutions and organizations for the diagnosis, treatment and control of cancer, including the provision of hospital, diagnostic, clinic and other facilities for the diagnosis and treatment of persons suffering from cancer or suspected of suffering from this disease. H R 4639, introduced by Representative Rogers, Massachusetts, proposes to provide prosthetic appliances to certain veterans suffering from non-service connected disabilities. H R 4652, introduced by Representative Voorhis, California, proposes to provide hospitalization and domiciliary care to retired enlisted men of the Army, Navy, Marine Corps and Coast Guard who are war veterans, on parity with other war veterans. H R 4685, introduced (by request) by Representative May, Kentucky, proposes to provide medical treatment, hospitalization and allowances for members of the National Guard, Officers' Reserve Corps and Enlisted Reserve Corps who are injured or become ill while on active duty under proper orders in time of peace. H R 4747, introduced by Representative Tenerowicz, Michigan, proposes that for federal income tax purposes a taxpayer may deduct, up to \$500, all the ordinary and necessary expenses paid or incurred during the taxable year for hospitals, physicians, medicines and expenses incident to burial.

### District of Columbia

*Bills Introduced*—H R 4312, introduced by Representative Hull, Wisconsin, proposes to amend the Code of the District of Columbia to provide for the organization and regulation of cooperative associations. The bill provides "In the case of an association formed hereunder which arranges the rendering to its members of licensed professional services on a nonprofit basis, said association shall not be subject to the insurance laws, shall not be construed as being in violation of any rule against corporate practice of professions, or in violation of statutes regulating licensure of professions." H R 4569, introduced by Representative Shanley, Connecticut, proposes to provide for the issuance of a license to practice naturopathy in the District of Columbia to Edward F. Grillo. H R 4732 and H R 4733, introduced by Representative Short, Missouri, propose, respectively, to provide for the issuance of a license to practice chiropractic in the District of Columbia to George M. Corriveau and to Laura T. Corriveau.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### ALABAMA

**Changes in Health Officers**—Dr John W Dabbs, Geneva, has been appointed health officer of Geneva County, succeeding Dr Walter J Broad who has accepted a position in the division of venereal diseases, state department of health

**Society News**—James L Brakefield, Ph D, head of the department of biology, Howard College, Birmingham, has been elected president of the Alabama Tuberculosis Association—The Jefferson County Medical Society held a gridiron dinner January 6 in Birmingham, a feature of the evening was a history of the society with the introduction of the living past presidents

### CALIFORNIA

**A Special Flea Laboratory**—A two story building is under construction at the University of California Medical Center, San Francisco, to be used for the study of the flea. The new laboratory will play a major part in new investigations into sources of bubonic plague among animals and other problems, according to the state medical journal

**Society News**—At a meeting of the Kern County Medical Society in Bakersfield January 19 Dr James C Negley, Glendale, among others, spoke on treatment of bladder neck obstructions—The Ventura County Medical Society was addressed January 10 by Drs Arthur Elmer Belt and Alvin W Folkenberg, Los Angeles, on "Gonorrhea and Its Complications" and Treatment of Gonorrhea by Sulfanilamide and Heat' respectively

**Personal**—Dr Cornelius Martin Mills, Oakland, has been appointed chief of the crippled children's services of the California State Department of Public Health. He will have charge of the department's activities under the California Crippled Child Act and those for the relief of the physically handicapped made possible through the provision of social security funds—Alfred E Maffly, superintendent of the Berkeley General Hospital, Berkeley, was elected president of the East Bay Hospital Conference January 8. He has been secretary for the past four years. The conference includes the following hospitals: Alameda County, Alameda Sanatorium, Alta Bates, Berkeley General, Children's, Cowell Memorial, East Oakland, Fairmount, Samuel Merritt, Peralta, Providence and Richmond Cottage—Dr Edwin L Bruck has been appointed a member of the advisory council to the San Francisco Department of Health, succeeding Dr William C Voorsanger

### ILLINOIS

**Twenty WPA Laboratories Planned**—Twenty laboratories will be constructed by the WPA for the state department of health, according to a recent announcement. Subject to federal approval the laboratories will be situated where facilities are inadequate and will not compete with or duplicate existing public or private laboratories. They will not be used for treatment, it was said

### Chicago

**Syphilis Course Postponed**—The graduate course in syphilis, sponsored by the department of dermatology of the University of Illinois College of Medicine in cooperation with other departments, has been postponed on account of the epidemic of influenza, according to an announcement from the dean. The course was to begin February 27 but has been postponed to April 4. Details appeared in THE JOURNAL February 18, page 653

**The Christian Fenger Lecture**—Bradley M Patten, Ph D, professor and director of the department of anatomy, University of Michigan Medical School, Ann Arbor, will deliver the third Christian Fenger lecture of the Chicago Pathological Society and the Institute of Medicine of Chicago March 24 at the Palmer House. His subject will be "Microcinematographic and Electrocardiographic Study of the First Heart Beats and the Beginning of the Circulation in Living Embryos," illustrated with micromoving pictures and lantern slides

### IOWA

**Advisory Committee to Board of Health**—Dr Erwin J Gottsch, Shenandoah, was recently appointed by the governor to succeed Dr Charles E Irwin, Woodward, as a member of the state board of health advisory committee. Other members of the committee, who were reappointed, are Drs Walter A Sternberg, Mount Pleasant, Walter J Connell, Dubuque, Edward M Myers, Boone, and Herbert E Stroy, Osceola

**Society News**—A special meeting of the Des Moines Academy of Medicine and the Polk County Medical Society, Des Moines, March 14, will be addressed by Drs Donald R Black and George H Thiele, both of Kansas City, Mo, on "Pathology and Physiology of the Pancreas and Liver as Applied to the Treatment of Diabetes" and "Clinical Manifestations of Anorectal Diseases and Their Treatment" respectively

### KANSAS

**Annual Spring Clinical Assembly**—The Sedgwick County Medical Society will conduct its third annual spring clinical assembly in Wichita March 21-22. The speakers will include

Dr Nathan A Womack, St. Louis, Cancer of the Breast  
Dr Hyman I Spector, St. Louis, Treatment of Pulmonary Tuberculosis with Special Emphasis on Collapse Therapy  
Dr Erastus S Edgerton, Regional Ileitis  
Dr Earl D Carter, The Normal Fundus with Some Variations in Disease  
Dr Edwin H Terrill, Cardiac Enlargement—A Method for Its Determination  
Dr Arthur E Bence, Postreduction Treatment of Fractures  
Dr Abraham E Hiebert, Burns  
Dr Joseph V Van Cleave, Skin Cancer  
Dr Vincent L Scott, Pyloric Spasm and Stenosis  
Dr Vern L Pauley, Comparison of Transurethral Resection with Prostatectomy  
Dr William R Houston, Austin, Texas, Spasm in Plain Muscle.  
Dr Henry N Tihen, Pneumonia—New Concepts in Therapy  
Dr Andrew Allen Olson, Bronchial Asthma  
Dr Howard C Curtis, Murihuana  
Dr Ray A West, Management of Pelvic Infections  
Dr Ralph L Drake, A Case of Multiple Personality (motion picture)

A symposium on sulfanilamide will be presented by Drs Harold W M Palmer, Frank L Menehan, George B Morrison and Ernest M Seydell. At the banquet Dr Spector will speak on Differential Diagnosis of Hemoptysis" and Dr Womack, "Pathology of Cancer of the Lung"

### KENTUCKY

**State Hospital Heads Appointed**—Dr Addie M Lyon, Louisa, recently health officer of Lawrence County and formerly superintendent of the State Institution for the Feeble-minded at Frankfort, has been appointed superintendent of the Western State Hospital, Hopkinsville. Dr Lyon graduated from the University of Louisville School of Medicine in 1912 and practiced in Sandy Hook for fourteen years. From 1926 to 1936 he was in charge of the Institution for the Feeble-minded. Dr William R Summers, acting superintendent of Central State Hospital, Lakeland, since September 1938 has been permanently appointed. Dr Summers has previously served on the staffs of the Western State Hospital at Hopkinsville and at the East Louisiana State Hospital, Jackson, La. All three state hospitals are now under new administrations in accordance with the terms of the Chandler-Wallis law enacted in 1938, with Dr Joseph G Wilson, Frankfort, formerly of the U S Public Health Service, as director of the division of hospitals of the state department of welfare. Dr Floyd K. Foley was recently appointed superintendent of the Eastern State Hospital at Lexington

### MARYLAND

**Ordinance Requires Ratproofing**—An ordinance has been passed in Baltimore as a part of a rat control program providing for the ratproofing of all buildings hereafter erected in the city for the protection of public health and to prevent the introduction or spread of rat-borne diseases

**Personal**—Mrs Margaret Reed Lewis of the department of embryology of the Carnegie Institution at Johns Hopkins University, Baltimore, received the honorary degree of doctor of laws at the recent fiftieth anniversary celebration at Goucher College—Dr Henry E Sigerist, director of the Institute of Medicine, Johns Hopkins University School of Medicine, Baltimore, will lecture during August, September and October in universities of the Union of South Africa, under a visiting lectureship, according to the newspapers—Dr Henry F Buettner, school medical examiner, Baltimore health department has been appointed full time medical health officer in Baltimore bringing the total of such appointments in the city to five. Dr Buettner, a graduate of the University of Mar-

land School of Medicine, was appointed a part time health officer in the department April 1, 1920. He is also a member of the faculty of his alma mater.

### MASSACHUSETTS

**Symposium on Virus and Rickettsial Diseases**—A short course of lectures, clinics and demonstrations on the virus and rickettsial diseases, with special emphasis on their public health significance, will be presented at the Harvard School of Public Health, Boston, June 12-17. Lectures on the etiology, epidemiology and methods of control of these diseases, given by members of the faculties and former students of the Harvard School of Public Health and the medical school, will occupy five mornings. Special clinics and demonstrations will be given each afternoon. In some instances these demonstrations will be continued through the week, so that all the members of the symposium can attend. On the last morning a panel discussion will be held on the three main topics presented in the symposium. The fee for the course will be \$25, payable at any time up to June 12. Enrolment should be arranged before June 1 as facilities for many of the clinics and demonstrations are limited. The lectures will be published later in a single volume, which will be sent to each person who has registered for the course. Further information may be obtained from the secretary of the school of public health, 55 Shattuck Street, Boston.

### MICHIGAN

**Tuberculosis in School Teachers**—After finding a number of unsuspected cases of tuberculosis in school teachers of Jackson, the Jackson County Medical Society January 17 unanimously adopted a recommendation that each school teacher in Jackson County be required to furnish a health certificate from a family doctor before a contract is renewed. The certificate should include a negative Kahn test and either a negative Mantoux test or a negative report on an x-ray examination of the chest, the society recommended. The secretary was instructed to mail a copy of this recommendation to the board of education of the city of Jackson, the state of Michigan Board of Education, the Michigan State Department of Health and the secretary of the Michigan State Medical Society.

### MINNESOTA

**The Clarence M. Jackson Lecture**—Dr. Arthur E. Hertzler, Halstead, Kan., will deliver the sixth annual Clarence M. Jackson Lecture of the Northrop Memorial Auditorium Minneapolis, March 16. His subject will be 'The Morphology of the Thyroid Gland'. The lecture is under the auspices of the Hennepin County Medical Society.

### NEW JERSEY

**Society News**—Dr. Morris A. Weinstein, Philadelphia, addressed the Atlantic County Medical Society, Atlantic City, February 10 on 'Streptococcal Otitic Meningitis'.—Drs. Israel S. Wechsler and Cornelius G. Dyke, New York, and Leo M. Davidoff, Brooklyn, addressed the Academy of Medicine of Northern New Jersey February 16 on 'Modern Viewpoints in the Diagnosis of Brain Tumors'. Dr. Henry E. Sigerist, Baltimore, gave an address to the public at the academy February 18 on 'Medicine as a Social Institution'.—Dr. William Bates, Philadelphia, addressed the Gloucester County Medical Society, Woodbury, February 16 on 'The Pseudosurgical Abdomen'.—Speakers before the Essex County Medical Society in Newark February 9 were Drs. Russell L. Cecil on 'Serum Treatment of Pneumonia', Arthur M. Fishberg 'The Heart in Pneumonia' and Edgar A. Lawrence, 'Chemotherapy of Pneumonia'. All are of New York.

### NEW YORK

**Record Low Mortality Rate**—The lowest general mortality rate ever experienced for New York was revealed in the annual report of health conditions for 1938, issued by the state department of health. The general death rate was 10.8. The birth rate, 14 per thousand of population was the highest in four years. Infant mortality (41 per thousand live births) was 9 per cent less than the minimum reached in 1937. Maternal mortality (36 deaths per 10,000 of total births) indicated a reduction of 41 per cent in only five years. The leading cause of death at all ages was the group of heart diseases with a rate of 350.4, an increase of 1 per cent over the preceding year. Cancer was second in importance with a rate of 148.9, an increase of 2 per cent. Except for these two diseases all other important causes of death had favorable mortality rates. The influenza rate (3.5) was the lowest in the

history of the state, that for pneumonia (61.3) was 27 per cent lower than that of the previous year. Other record low rates were tuberculosis, all forms, 48.2, acute and chronic nephritis, 67.9, typhoid and paratyphoid, 0.4. The death rate from all types of accidents (62.5) has never been lower, according to the report. The most striking reduction took place in automobile accidents, the rate (18) was the lowest in sixteen years and was 21 per cent lower than that for 1937. The September hurricane was responsible for forty-eight deaths. For the first time in eleven years, deaths from diabetes decreased, the rate was 34.9. The appendicitis death rate (11) has not been equally low since 1910.

### New York City

**Sixth Harvey Lecture**—Prof. K. Linderstrom-Lang of the Carlsberg Laboratory, Copenhagen, Denmark, will deliver the sixth Harvey Lecture of the current series at the New York Academy of Medicine March 16, on 'Distribution of Enzymes in Tissue and Cells'.

**Dr. Van Slyke to Receive Gibbs Medal**—Donald Dexter Van Slyke, Ph.D., member of the Rockefeller Institute for Medical Research, is to receive the twenty-eighth Willard Gibbs Medal of the Chicago section of the American Chemical Society in recognition of his work on chemistry of the blood, it was announced February 24. Dr. Van Slyke is 55 years old and received his doctorate at the University of Michigan, Ann Arbor, in 1907, when he joined the staff of the Rockefeller Institute. His work has concerned chemistry and physiology of proteins and amino acids, laws of enzyme action, methods for analysis of blood, gasometric analyses, respiratory and renal functions, physical chemistry of blood, diabetes, nephritis and quantitative clinical chemistry. The medal will be awarded at a meeting in Chicago May 19.

### NORTH CAROLINA

**Syphilis Clinic at Duke University**—A graduate clinic on the diagnosis and treatment of syphilis will be held at Duke University School of Medicine, Durham, March 24-25 under the auspices of the university and the North Carolina State Board of Health. The principal speakers will be Drs. Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C., Joseph Earle Moore, Baltimore, John H. Stokes and Norman R. Ingraham, Philadelphia, Harold N. Cole, Cleveland, Paul A. O'Leary, Rochester, Minn., and Philip C. Jeans, Iowa City.

**Extension Course in Medicine**—A course of lectures sponsored by the University of North Carolina extension division has been presented at Charlotte during recent weeks. The speakers were:

Dr. Paul D. White, Boston, heart disease, January 16.  
Dr. George B. Eusterman, Rochester, Minn., diseases of the liver and gallbladder, January 24.  
Dr. Elliott P. Joslin, Boston, diabetes, January 31.  
Dr. Jonathan C. Meakins, Montreal, Canada, chronic pulmonary diseases, February 7.  
Dr. Francis G. Blake, New Haven, Conn., serum therapy, February 14.  
Dr. Frank H. Lahey, Boston, recent advances in surgery, February 27.  
Dr. Charles F. McKhann, Boston, diseases of children, March 7.

### OKLAHOMA

**Society News**—Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, will address the Pottawatomie County Medical Society, Shawnee, March 14.

**New Members of State Medical Board**—New members of the Oklahoma State Board of Medical Examiners are Drs. Samuel A. McKeel, Ada, Oscar C. Newman, Shattuck, George H. Stagner, Erick, and Samuel B. Leshe, Okmulgee. At a meeting February 3 Dr. McKeel was elected president. Dr. Calvin E. Bradley, Tulsa, vice president and Dr. James D. Osborn, Jr., Frederick, secretary.

### OREGON

**Society News**—A symposium on infection of the middle ear was presented before the Multnomah County Medical Society, Portland, February 1, by Drs. Frank B. Kistner, Ralph A. Fenton and Ralph I. Davis. Drs. Herbert V. H. Thatcher and Matthew C. Riddle addressed the society February 15 on 'Surgery of the Tendons of the Hand' and 'Recent Advances in Knowledge of Bleeding and Coagulation Problems' respectively. At a meeting of the Lane County Medical Society, Eugene, January 20 the speakers were Drs. Fred N. Miller and Marion G. Hayes, Eugene, on 'Streptococcal Pneumonia', Leshe S. Porter, Oregon City, 'Fractures of the Navicular Bone' and Ronald C. Romig, Eugene, 'Treatment of Carbuncle'.

## PENNSYLVANIA

**New State Health Officials**—Dr John J Shaw, Philadelphia, has been appointed state secretary of health to succeed Dr Edith McBride-Dexter. Dr Shaw is 55 years old and graduated from the University of Pennsylvania School of Medicine in 1908. Dr Alexander Hamilton Stewart, Indiana, has been appointed deputy secretary. He is 58 years old and graduated from the University of Pittsburgh School of Medicine in 1907.

## Philadelphia

**Society News**—Dr Foster Kennedy, New York, addressed the Northern Medical Association of Philadelphia February 20 on "The Organic Background of Mind." Dr Hyman I Goldstein, Camden, N. J., was recently elected president of the association. Dr Henry B. Kobler was recently elected president of the Medical Club of Philadelphia and Dr William S. Wray, secretary. Dr Robert A. Moore, New York, addressed the Pathological Society of Philadelphia, February 9, on "Benign Hypertrophy of the Prostate." Drs Abraham Trasoff and David R. Meranze presented a paper on "Mural Endocarditis Following Pulmonary Suppuration." At a meeting of the Philadelphia Pediatric Society February 14 the speakers included Drs Carl C. Fischer and Charles S. Raue on "Control of Contagion Without Formal Quarantine" and Mitchell I. Rubin, "Correlation of Blood and Bone Disturbances in Children."

## RHODE ISLAND

**Personal**—Dr Arthur H. Ruggles, Providence, recently received a silver plaque from the Men's Club of Temple Emanuel in recognition of his "outstanding achievement in the field of civic improvement, human betterment and the advancement of American ideals." Dr Ruggles has been superintendent of Butler Hospital since 1920. He is a former president of the New England Society of Psychiatry and of the National Committee for Mental Hygiene.

**Society News**—Dr Gordon M. Morrison, Boston, addressed the Providence Medical Association February 6 on "Therapeutic Applications of Occupational Therapy." The society has initiated a study of tuberculosis and has developed a long range plan for control of the disease. New legislation is being prepared for introduction in the state assembly relative to reporting of tuberculosis and isolation of positive cases. Dr Alexander M. Burgess, former president of the association, is chairman of a committee to study voluntary health insurance plans.

## TEXAS

**New Foundation for Medical Research**—The Southwest Medical Foundation is to be established under a charter granted by the state January 21 as a nonprofit corporation with no capital stock. The incorporators were Drs Edward H. Cary and Hall Shannon, Mr E. R. Brown and Mr Karl Hobltzelle, all of Dallas. The charter provides for a maximum of fifteen trustees, nine have been named. Besides those named as incorporators the trustees include Herbert Marcus and Rhodes S. Baker, Dallas, Jesse H. Jones and R. C. Fulbright, Houston, and Thomas O. Walton, LL.D., president of Agricultural and Mechanical College of Texas, College Station. The aims of the foundation are, according to a newspaper report, to establish facilities and clinics for the study of the causes, the prevention and the cure of diseases of the minds and bodies of needy persons residing in the Southwestern section of the United States and elsewhere, and to develop and train laboratory workers, physicians and nurses in the treatment of diseased persons, to study individual and community hygiene and to promote public health and medical research. An endowment will be sought, it was said, but the amount has not been determined. The foundation will be nonsectarian and noninstitutional, seeking to spread its benefits where they are most needed. It will finance work at Baylor University, Dallas, as well as elsewhere in the Southwest. Dr Cary has been elected president, Mr Brown and Mr Hobltzelle, vice presidents, Dr Shannon, secretary, and Mr Marcus, treasurer.

## WASHINGTON

**Annual Surgical Meeting**—Dr Kellogg Speed, Chicago, was the guest speaker at the annual dinner and clinic of the Seattle Surgical Society, January 20-21. Clinics were held both days at the King County Hospital (Harborview). Dr Speed also spoke at a dinner January 20 on "Fractures In and Around the Elbow" and at the annual banquet January 21 on "Everyday Injuries of the Knee Joint."

## GENERAL

**Meeting of American College of Physicians**—The twenty-third annual session of the American College of Physicians will be held in New Orleans March 27-31. Lectures, dry clinics at the Municipal Auditorium, special clinics, demonstrations and ward walks at several hospitals and round table conferences will make up the morning programs. General sessions will be held afternoons and evenings. Among the addresses at the general sessions will be:

- Dr Irvin Abell, Louisville, Ky. President of the American Medical Association. Some Professional and Social Trends in American Medicine.
- Drs Jacob C. Geiger, Jacques P. Gray and Albert E. Larsen, San Francisco. The Limitations of Government in Medicine: the San Francisco Experience.
- Drs Alexander E. Brown, Wallace E. Herrell and J. Arnold Barger, Rochester, Minn. Neoprontosil (Oral) in the Treatment of Chronic Ulcerative Colitis.
- Dr Perrin H. Long and Eleanor A. Bliss, Se D, Baltimore. Experimental and Clinical Use of Pyridine Derivatives of Sulfanilamide in the Treatment of Bacterial Infections.
- Howard B. Lewis, Ph.D., Ann Arbor, Mich. Vitamins in Theory and Practice.
- Conrad A. Elvehjem, Ph.D., Madison, Wis. The Nutritional Significance of Nicotinic Acid.
- Dr Tom Douglas Spies, Cincinnati. Recent Advances in the Treatment of Pellagra.
- Dr James P. Leake, U. S. Public Health Service, Washington, D. C. Human and Equine Encephalitis.
- Dr Maxwell Finland, Boston. Specific Serotherapy and Chemotherapy of Pneumococcus Pneumonias.
- Dr Stanley P. Reimann, Philadelphia. Chemical Specificity in Growth and Development.
- Drs Salomon Katzenelbogen, Baltimore, Alexander Simon, Anna R. Coyne and Charles C. Vigue, St. Elizabeths Hospital, Washington, D. C. Pharmacologic Treatment in Schizophrenic Patients.

At the annual convocation Wednesday evening Ernest O. Lawrence, Ph.D., professor of physics and director of the radiation laboratory, University of California, Berkeley, will give the annual address on "The Newer Physics and Medicine." The John Phillips Memorial Medal will be awarded and Dr William J. Kerr, San Francisco, will make his presidential address. The annual banquet will be Thursday evening, with Dr John H. Musser, New Orleans, as toastmaster. Addresses will be made by Mrs E. M. Gilmer (Dorothy Dix) on "A Heart Specialist Diagnoses Love Troubles" and Mr Lyle Saxon, "Strange Stories of Old New Orleans."

## PUERTO RICO

**Cattle Freed from Tuberculosis**—Puerto Rico and the Virgin Islands have been officially designated as modified accredited areas free from bovine tuberculosis, the U. S. Department of Agriculture announces. Tuberculin testing covered seventy-seven municipalities of the island, containing more than a quarter of a million cattle. In the Virgin Islands there were 12,000 cattle and not a single reactor to the test was found, the announcement said.

## FOREIGN

**Gift of Journals**—The American Hellenic Educational and Progressive Association has recently provided funds for subscriptions to *THE JOURNAL* and the *Journal of Pharmacology and Experimental Therapeutics* as a gift to the library of the University of Athens, Greece. It is reported that foreign exchange laws in Greece have made it difficult or impossible for physicians there to obtain foreign medical periodicals.

**Neurological Congress in Copenhagen**—Neurologists, psychiatrists and others interested in the nervous system may present papers before the third International Neurological Congress to be held in Copenhagen, Denmark, August 21-25. To secure a place on the program, a title and abstract must be submitted before April 1. Information may be obtained from the secretary of the committee for the United States, Dr Henry Alsop Riley, 117 East Seventy-Second Street, New York.

**Medical Meetings in Germany**—Announcement is made of various medical meetings to be held in Germany within coming months, as follows:

- German Society of Internal Medicine, Wiesbaden, March 27-30.
- German Society of Surgeons, Berlin, April 12-15.
- Third International Congress of Sanatoriums and Private Hospitals, Baden-Baden, April 23-28.
- Society of German Nose, Throat and Ear Specialists, Vienna, May 25-27.
- German Association of Microbiologists, Vienna, March 27-30.
- International Society of Orthopedics and Traumatology, September 4-8.
- and German Orthopedic Society, September 8-9, both in Berlin.

## CORRECTION

**The Treatment of Infantile Eczema**—Prescription 2 and Prescription 6 in Sulzberger's article on "The Treatment of Infantile Eczema" in *THE JOURNAL*, January 7, beginning on page 38, will be clarified by substituting in them in the last lines "equal parts of each in sufficient quantity to make" in place of the words as published "each in sufficient quantity to make."

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Feb 11, 1939

#### Contributory Schemes for Hospitals

Not long ago all the hospitals were described as 'voluntary' because they were supported by voluntary contributions for the service of the poor, who received free treatment, but in recent years the system of patients' making contributions has been introduced. Speaking at the British Hospital Schemes Association, Lord Horder said that there were at least 400 such schemes in the country, which raise annually more than \$17,500,000. The rates of contribution varied from 2 to 8 cents a week. It was estimated that contributory schemes provided about one third of the annual income of all voluntary hospitals in the provinces. They ranged from the Hospital Saving Association of London with a membership of nearly 2,000,000, to associations in rural communities around small cottage hospitals, with memberships as small as 1,000. In return for his weekly payment the wage earner obtained immunity from investigation into his financial circumstances and immunity from any charge when admitted to a hospital. In most cases he and his dependents also got a variety of auxiliary services free—convalescent home, ambulance, transport and home nursing. The aim should be full cost of maintenance. Whether any payment should be made to the physician out of contributory funds was a moot point. The logic of the position demanded that it should, but the physicians' claims were at present waived. The generosity of the profession, however, should not be too long abused. In recent years the municipal hospitals, which are supported by the local authorities, have greatly developed, so that they now supply a service comparable to that of the voluntary hospitals. Lord Horder thought that the maintenance of the two on parallel lines was wasteful, collaboration between them should be organized regionally.

#### Anorexia Nervosa

Anorexia nervosa is a rare disease which was described first by the celebrated English physician Sir William Gull in the last century. Whether because of increased incidence or because of wider recognition it has recently received increased attention in this country. On the other hand it does not appear to be well understood in other countries, in which it is often confounded with the still rarer Simmonds's disease. At a discussion on anorexia nervosa at the Royal Society of Medicine Prof. J. A. Ryle opened with a paper based on sixty-three private patients, of whom 90 per cent were females, most of them girls and unmarried women under 30. The majority were psychoneurotic and some were psychotic. The etiologic factors included emotional disturbance, overwork and slimming in response to teasing. A perpetuating factor was morbid enjoyment of the illness or of the interest it created. The clinical picture included the effects of starvation with amenorrhea, slow pulse, low blood pressure and hirsuties. The loss of weight might be extreme: in one case the reduction was to 4 stone (25 Kg). The prognosis was good provided diagnosis was not unduly delayed. The treatment was rest in bed, a full diet and removal from the parental sphere.

Dr. J. H. Sheldon said that in American and German literature cases were misreported under the heading Simmonds's disease. That disease, starvation and anorexia nervosa had clinical features in common. Anorexia nervosa arose in response to an emotional or mental need. The lowered food intake set in motion a series of changes which were mediated by diminished pituitary activity, hence the acceptance of cases

abroad as instances of Simmonds's disease. The early onset of the amenorrhea in some cases pointed to diminished pituitary output.

Dr. A. W. Spence said that the initial disturbance was psychologic and that endocrine disturbance was purely secondary. This differentiated the condition from Simmonds's disease. Glandular therapy was disappointing. It was remarkable that the more severe nutritional disorders, such as scurvy or beriberi, never occurred.

Sir Arthur Hurst said that anorexia nervosa had nothing to do with Simmonds's disease. All the symptoms were due to purely psychologic causes or to starvation. It was important that the distinction should be understood, because since the question of Simmonds's disease arose the patients had been worse treated. They need not worry about vitamins or endocrine preparations. What was required was encouragement to eat ordinary food. If the patients were treated by modern psychologic methods they did badly.

### PARIS

(From Our Regular Correspondent)

Feb 4, 1939

#### Pulmonary Tomography

The value of pulmonary tomography, as based on their personal observation of 200 cases, was the subject of a paper read at the Nov. 4, 1938, meeting of the Societe medicale des hopitaux of Paris by Dr. Leon-Kindberg and his co-workers. The underlying principle of tomography, i. e. examination in section, is to eliminate shadows due to the ribs, clavicle and sternum in the X-ray examination of the lungs, so that a single area can be studied in detail. The 200 examinations included 155 on patients with pulmonary tuberculosis and forty-five on patients with cancer, pulmonary abscess, cysts and bronchiectasis.

This recent method has the following advantages: 1. It gives details as to the topography of lesions. 2. It yields information as to obscure or complex foci. 3. It shows some lesions which escape detection by other methods. 4. It permits study of the structure and evolution of lesions. The method has been sufficiently perfected so that no failures were noted in more than 2,000 films. A pitfall observed by others in the form of "false cavities," i. e. defects diagnosed as such but in reality due to faulty interpretation of the films, was not encountered by the authors. As to added expense, this cannot be an objection, because the stratigraphic (tomographic) method permits earlier diagnoses to be made. It has almost completely supplanted the older methods in the service of Dr. Leon-Kindberg at the Hopital Beaujon in Paris. A number of slides illustrating the advantages of tomography were shown.

#### Treatment of Spastic Colitis

The contributions of Prof. Rene Leriche and his associates to the surgery of the sympathetic nervous system are familiar to every one interested in neurosurgery. In the January 7 *Progress medical* Professor Leriche and his two associates Drs. Kunlin and Froehlich report their experience in the treatment of certain forms of spastic colitis by infiltration of the lumbar sympathetic and section of the splanchnic nerve. Nine patients who presented the typical clinical syndrome of chronic spastic colitis were treated in this manner. The diagnosis was based on the occurrence of pain, constipation, emaciation, depression and the roentgenographic finding of either (a) intense spasm of the transverse and descending colon or of the latter alone, with or without associated diverticulosis, or (b) an atonic deformity with massive thickening of the wall of the descending colon. Usually the pain ceases after the first injection, and after a second one the constipation is alleviated to such an extent that there is a daily evacuation without laxatives.



In a few cases a persisting pain on the right side has necessitated an infiltration of the corresponding lumbar sympathetic. In one patient, who was reexamined eighteen months after three infiltrations had been given, the symptoms had entirely disappeared but the x-ray evidence remained the same. The infiltration appeared to have modified the functional element, which is neurogenic, without having any influence on the anatomic changes. The authors were unable to give any physiologic explanation of their results, because the physiology of the colon is very complex.

Four patients are cited who were treated by infiltration of the lumbar sympathetic and one in whom a splanchnic resection was done. In a woman aged 21 the indication for operative intervention was intractable chronic constipation. The left splanchnic nerve and first lumbar ganglion were resected. Daily movements without any laxatives began on the seventh day after operation. There was a rapid gain in weight, with an improvement in the general condition which has continued during the sixteen months since the operation. The authors call attention to the careful study of every case of constipation due to spastic colitis since not all patients can be benefited by infiltration of the lumbar sympathetic or resection of the splanchnic nerve.

### BERLIN

(From Our Regular Correspondent)

Jan 23, 1939

#### New Regulation of Midwives

The German national government, Dec 21, 1938, announced a new "statute of midwives," in which it is stipulated that every woman in the German reich is entitled to the services of a midwife. These services are construed to include advice and assistance during pregnancy, supervision and attendance at births and miscarriages and, in addition, care of lying-in women and newborn babies. A midwife must at any time be prepared on request to attend gravidas, parturients, puerperants and newborn infants, regardless of the patient's social and economic status. Every pregnant woman must engage a midwife in good season to attend her during confinement. If for any reason this has been impossible, the mother must immediately after parturition call in a midwife to care for herself and the baby. It is the duty of every physician to see to it that a midwife assists at every confinement within his practice. If the doctor finds that it has been impossible to have a midwife present at the birth, he must see to it that a midwife is immediately obtained to care for the lying-in woman. Accordingly, in the future a birth which a midwife does not attend will be possible only in exceptional circumstances. For obstetric services (namely supervision from the onset of labor pains and assistance during labor), with the exception of physicians, only those persons who have passed a proper examination and been duly granted the so called residence license are officially recognized as competent practitioners of midwifery in a particular community. Local authorities may fix an age limit beyond which no midwife may remain in practice. The mentioned residence license is designed to effect an equitable national distribution of midwives on the basis of density of population and transportation facilities. Therefore when a midwife receives her residence license she is officially assigned to a certain place of domicile (Jewesses are, needless to say, ineligible for the residence license). Licensed midwives are guaranteed a certain minimal annual income. If a midwife's income falls below the minimum, the difference is paid her by the government. Conversely, the midwife who attends a number of women in excess of a certain quota allotted by the guarantors of her income must turn over a part of her earnings to the proper authorities. The fees to be asked by midwives may be fixed by local regulation. Since the statute fails to stipulate the exact amount of the guaranteed income, this may

differ in various parts of the country. Special measures for the benefit of superannuated midwives are included in the law.

The new statute represents the first uniform, nationwide piece of legislation in this field. Some such measure was all the more necessary in view of the fact that conditions with regard to midwifery have been quite dissimilar in various provinces of Germany and in some places actually unsatisfactory (because of excessive numbers of midwives, superannuation and unequal geographic distribution). Then too, under the new law a mother has the right to be attended by the midwife of her choosing and hence is not compelled to engage a certain person. In addition the midwife has the right to practice beyond the boundaries of her assigned district of residence if she is called on to do so.

#### Prophylaxis of Goiter in Austria

The psychiatrist and authority on goiter Prof. Julius Wagner-Jauregg has recently published a short monograph on the important problem of goiter, long a concern of Austrian scientists. To the article is appended a truly formidable body of statistical data on the incidence of goiter. During the school year 1923-1924, pursuant to an order of the federal health bureau, 686,000 school children, an overwhelming majority of all Austrian school children, were examined for goiter by the school physicians. In order to assure the greatest possible standardization of the examinations, special, carefully prepared forms equipped with illustrations were utilized, patterned after the blanks used by the Swiss worker Bayard. Four stages were differentiated: (1) no goiter, (2) incipient goiter, (3) manifest slight enlargement of the thyroid and (4) prominent well developed goiter.

Gross observations of the survey are shown in the accompanying table. In smaller areas higher rates and lower rates, respectively, were observed.

#### Statistics on Goiter in Austrian Children, 1923-1924

Boys	55.8 per cent	nongoitrous	44.2 per cent	goitrous
Girls	51.8 per cent	nongoitrous	48.1 per cent	goitrous
Morbidity of Goiter				
				%
Lowest regional rate (Burgenland province)				Boys 15.9
				Girls 19.5
Highest regional rate (Vorarlberg province)				Boys 58.9
				Girls 63.6
Vienna				Boys 41.1
				Girls 46.2

The data considered as a whole evidence the high incidence of goiter among the school children of Austria in 1923-1924 but Wagner-Jauregg now believes that these high figures were conditioned by an ephemeral goiter wave which attained its peak in the mentioned year. At that time prophylaxis by the use of iodized salt and iodine tablets was instituted in Austrian schools (although not thoroughly carried out, to be sure). In subsequent years it would have been extremely interesting to compare this survey with other equally extensive surveys in order to study the effectiveness of goiter prophylaxis, but unfortunately this was impossible for financial reasons.

### Marriages

JOSEPH FREDERICK MCCLUGHAN, Newburgh, N. Y., to Miss Annette Manderson Stahl of Haverford, Pa., Nov. 24, 1938.

VALDEMAR CHRONOVSKY, Pendleton, Ore., to Miss Genevieve Renfrow of Wallowa, at Cathlamet, Wash., Oct. 26, 1938.

JAMES W. DOUGHTY, Sedro Woolley, Wash., to Mrs. Ina Rothausen of Seattle, Nov. 2, 1938.

JOHN S. GOLDCAMP, Philadelphia, to Miss Elizabeth C. Hart of Bethlehem, Pa., February 4.

ADAM J. EARNLEY to Miss Ruth Klopp, both of Millersburg, Ohio, Dec. 11, 1938.



## Deaths

**Walter Louis Horn** • New York, Fordham University School of Medicine, New York, 1916, member of the American Academy of Ophthalmology and Oto Laryngology, fellow of the American College of Surgeons on the staffs of the Mount Sinai Hospital, Misericordia Hospital and Manhattan Eye Ear and Throat Hospital honorary police department surgeon, aged 47, died, Dec 29, 1938, of hypertension

**Cyrus Knapp Merriam**, Spokane, Wash. University of the City of New York Medical Department, 1879, from 1880 to 1887 served as medical officer at various army posts of the northwest, member and past president of the Washington State Medical Association formerly secretary of the Spokane County Medical Society, aged 90, died Dec 6 1938, of myocarditis, chronic bronchiectasis and chronic nephritis

**Arthur John McLean**, Portland, Ore. Johns Hopkins University School of Medicine, Baltimore, 1925, fellow of the American College of Surgeons, assistant professor of pathology at the University of Oregon Medical School on the staffs of the Multnomah County Hospital, Good Samaritan Hospital and the Emanuel Hospital, aged 44, was killed Dec 7, 1938, in an automobile accident

**John Emmet Early**, Charlottesville, Va. University of Virginia Department of Medicine Charlottesville, 1893, member of the Medical Society of Virginia formerly member of the city council and city school board aged 71, died Dec 12, 1938, in the Martha Jefferson Hospital of carcinoma of the liver

**John Whitlock Hairgrove**, Salem Ore. Missouri Medical College, St Louis, 1885 fellow of the American College of Surgeons, served for many years on the staffs of the Passavant Memorial Hospital and Our Saviours Hospital, Jacksonville, Ill., aged 82, died Dec 21, 1938, of cerebral hemorrhage

**John Hicks Florence**, Houston Texas, Louisville (Ky.) Medical College, 1889, member of the State Medical Association of Texas, at one time state health officer and city health officer of Dallas formerly member of the state legislature, aged 70 died, Dec 28 1938 of coronary occlusion

**Samuel Holedger Eckles**, Tucson, Ariz., Medico Chirurgical College of Philadelphia, 1913, member of the Arizona State Medical Association served during the World War, aged 58, died Dec 3, 1938 of heart disease, bronchial asthma and acute dilatation of the stomach

**David Robert Lloyd**, Brooklyn University and Bellevue Hospital Medical College New York, 1901 formerly on the staffs of the Brooklyn and Greenpoint hospitals and the House of St Giles the Cripple, aged 67, died suddenly, Dec 25, 1938, of coronary thrombosis

**Charles Odell Petty**, Fullerton, Calif., Gross Medical College, Denver, 1900 member of the California Medical Association, on the staff of the Fullerton Hospital aged 66, died, Nov 17, 1938, of coronary sclerosis with rupture of the heart muscle

**Elmer Williams Weirich**, Angels Camp Calif., Hahnemann Hospital College of San Francisco 1889, member of the California Medical Association, aged 72 died, Nov 20 1938, of arteriosclerotic heart disease and generalized arteriosclerosis

**Marvin Hall** • Topeka, Kan., University of Louisville (Ky.) Medical Department, 1917 served during the World War on the staffs of the Christ Hospital and St Francis Hospital, aged 45, died, Dec 21, 1938, of lymphatic leukemia

**Jesse Wright Eads**, Camp Wood, Texas Fort Worth School of Medicine Medical Department of Fort Worth University 1900, member of the State Medical Association of Texas aged 76 died, Dec 10, 1938, of cancer of the prostate

**Peter Arthur Tobin**, San Francisco Medical Department of the University of Cincinnati 1912, member of the California Medical Association, aged 51 died, Nov 21 1938 of cholelithiasis bronchopneumonia and postoperative peritonitis

**Thomas G Cunningham** Atlanta Ga., Atlanta College of Physicians and Surgeons 1899 aged 66 died Dec 11, 1938 at his home in Decatur of pulmonary tuberculosis bronchial asthma, pleurisy, arteriosclerosis and gallbladder disease

**Jesse Alpha MacDonald**, Collinsville Miss. Tulane University of Louisiana School of Medicine New Orleans 1934 formerly connected with the county health department, aged 28 died, Dec 2, 1938 of a self-inflicted bullet wound

**Louis Milton Mitchell**, Batesburg S. C., University of Maryland School of Medicine Baltimore 1892, member of the

South Carolina Medical Association, aged 80, died, Dec 10, 1938, in the Leesville (S. C.) Infirmary of pneumonia

**Lee Roy Farmer**, Alliance, Neb., National University of Arts and Sciences Medical Department, St. Louis, 1916 served during the World War, city physician, aged 45, died, Dec 20, 1938, of coronary thrombosis and chronic nephritis

**Edwin B. Hatler**, Carlisle, Ky., University of Louisville School of Medicine, 1930, member of the Kentucky State Medical Association, aged 39, died, Dec 23 1938 in the Good Samaritan Hospital, Lexington, of septic kidney

**Arthur Byron Egan**, Muskegon, Mich., Michigan College of Medicine and Surgery, Detroit, 1906, member of the Michigan State Medical Society, served during the World War, aged 55, died, Dec 16, 1938, of cirrhosis of the liver

**Nathaniel Ferdinand Yates**, Cherry Valley, N. Y., Long Island College Hospital Brooklyn, 1892, for many years health officer aged 80, died, Nov 20, 1938, of infection of the genito-urinary tract due to cancer of the prostate

**James D. Middlebrooks**, Powder Springs, Ga. Atlanta Medical College 1882 member of the Medical Association of Georgia, aged 77, died Dec 2, 1938, of arterial hypertension, arteriosclerosis and cerebral hemorrhage

**John Henry Cristler**, Dallas, Texas. Rush Medical College, Chicago, 1873, aged 91, died Dec 10, 1938, in the Baylor Hospital of thrombosis of the left femoral artery, amputation of the left leg and cardiac decompensation

**Henry Powell Rush** • Corpus Christi, Texas, Fort Worth School of Medicine, Medical Department of Texas Christian University, 1905 served during the World War, aged 55, died, Nov 11 1938, of heart disease

**Raymond Alanson Miller** • Newburgh N. Y. University and Bellevue Hospital Medical College, New York, 1911, on the staff of St. Luke's Hospital, aged 61 died, Nov 30, 1938, of coronary occlusion

**Howard Franklin Hoffmeier**, Mauch Chunk, Pa., Medico-Chirurgical College of Philadelphia, 1903, was a member of the board of health aged 63, was found dead, Nov 30, 1938, of coronary thrombosis

**Frank P. Harvey**, Chicago, Bennett College of Eclectic Medicine and Surgery, Chicago, 1900, aged 59, died, Dec 7, 1938, in the Swedish Covenant Hospital of hypertension and arteriosclerosis

**Edward M. Cates**, Wayne City, Ill., Barnes Medical College St. Louis, 1903, member of the Illinois State Medical Society, also a pharmacist, aged 69, died Dec 14 1938, of pneumonia

**Edwin Lethridge Myrick** • Fort Worth, Texas University of Nashville (Tenn.) Medical Department 1897, served during the World War, aged 63, died, Nov 7, 1938, of coronary occlusion

**Byron W. Walling**, Poolesville, Md., College of Physicians and Surgeons, Baltimore, 1875, for several years mayor, aged 86, died, Nov 14, 1938, of cerebral hemorrhage and arteriosclerosis

**Ellsworth E. McPeck**, Rochester Minn., College of Physicians and Surgeons Keokuk, Iowa, 1892, aged 68, died, Nov 18, 1938, of arteriosclerosis with rupture of the aorta and hemorrhage

**Otto M. Reinhardt**, Baltimore, Baltimore University School of Medicine, 1893, coroner of the Southern district for many years, aged 67 died, Nov 19, 1938, of carcinoma of the cervical gland

**Claude Eugene Frazier**, Kansas City, Mo., Eclectic Medical University Kansas City, Mo., 1904, served during the World War, aged 62, died, Dec 1, 1938, of diabetes mellitus

**William Sullivan Howell**, Winnebago Ill., Keokuk (Iowa) Medical College, 1898 aged 63 died, Dec 16, 1938 in the Mercy Hospital, Chicago, of prostatic hypertrophy and urosepsis

**Samuel Everett Gaston**, Meta, Mo. Kansas City Hahnemann Medical College, Kansas City 1910 served during the World War, aged 50, died, Dec 2, 1938, of arteriosclerosis

**George Eugene Kleeman**, Oakland, Calif. College of Physicians and Surgeons, San Francisco 1904 aged 61, died, Nov 17 1938 of arteriosclerosis and coronary disease

**Charles W. Klinetop**, Chicago, Hering Medical College, Chicago 1894, aged 74, died, Nov 8, 1938 in Rancho Los Amigos Calif., of myocarditis and arteriosclerosis

**Luke Melvin Holmes**, Boston College of Physicians and Surgeons, Boston, 1903 died, Nov 18, 1938

**Virgil H. Hendricks**, Jasper Mo., Barnes Medical College, St. Louis, 1897, aged 66, died, Nov 9, 1938

## Correspondence

### INFORMATION, PLEASE, ABOUT DOCTORS WHO ARE LAWYERS OR VICE VERSA

*To the Editor*—I am being impressed with the number of professional men who hold degrees as Doctors of Medicine and who also have received degrees from accredited law schools and are admitted to practice before the several courts of their states and country.

An effort is being made to secure and list all persons who possess the rights to practice medicine and law and who hold unrevoked licenses to engage in these two professional activities. The information is not obtainable from medical or law directories.

An appeal is therefore being made that persons holding the rights to practice medicine and law send their name, address and data pertaining to their education in medicine and law to the undersigned. It will be appreciated also if a statement is included as to whether full time is devoted either to law or to medicine or whether the person engages in the practice of both professions.

FRANK C. WARSHUIS, M.D.,  
137 Newbury Street, Boston

President and Editor in Chief, American  
Medico Legal Association

### AMMONIATED MERCURY IN IMPETIGO

*To the Editor*—In *THE JOURNAL* January 21, page 261, appears a letter from Dr. J. G. Downing of Boston with a note of warning against the use of ammoniated mercury in the treatment of impetigo in the newborn and of its possible effect of causing diarrhea. Without attempting to discuss the latter factor, I should like to suggest the use of a 1 or 2 per cent alcoholic solution of gentian violet in the treatment of impetigo. Some fifteen years ago it occurred to my associates and me that any gram positive organism should be killed by the use of gentian violet. It was also found that the *Sacharomyces albicans* causing thrush was gram positive. For use in the mouth we employed a 1 or 2 per cent aqueous solution of gentian violet. Since adopting these procedures we have had practically no difficulty in curing either thrush or impetigo with reasonable promptness. In fact, thrush will disappear within twenty-four hours. Several years later Dr. Faber wrote an article on the local use of gentian violet but apparently its efficacy has not been generally recognized.

JOHN C. GITTINGS, M.D., Philadelphia

### CHANGES IN CELLS AFTER FRACTIONAL DOSES OF X-RAYS

*To the Editor*—In a recent article in *THE JOURNAL* (Schmitz, Henry, Schmitz, H. E., and Sheehan, J. F. The Action of Measured Doses of Eight Hundred Kilovolt Roentgen Rays, January 7, p. 17) the authors describe, among other changes, the finding of large numbers of degenerating giant tumor cells in squamous cell carcinoma of the uterine cervix treated by fractional doses of x-rays. We reported this finding in tumors in experimental animals at the International Congress of Radiology in 1937 and in the *Archives of Pathology* (23:757 [June] 1937), and we are pleased that the same picture has now been observed in human cancer. One of us (P. J. M.) has also observed the phenomenon in several varieties of irradiated human cancer.

Although occasional giant tumor cells have been seen by a number of workers they develop in abundance only in the later stages of treatment by fractional methods of radiation. After

the radiosensitive tumor cells have been destroyed, the remaining resistant cells appear to become transformed into abnormal cell forms (giant cells), owing to a progressive interference with the mechanism of cell division, by a cumulative action of the fractional doses. This is a different process from simple hydropic swelling of the nuclei due to hydrogen ion changes.

PERRY J. MELNICK, M.D., PH.D.  
ALBERT BACHENI, PH.D.

Chicago

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### AMPHETAMINE (BENZEDRINE) SULFATE FOR ALCOHOLISM

*To the Editor*—The use of the drug benzedrine to cure habitual drunkenness is recommended by Dr. Wilfred Bloomberg of Harvard University. Is it safe? He uses it in pill form. What is the dose? Where obtained?

E. A. THOMPSON, M.D., Breckenridge, Mo.

ANSWER—Benzedrine to cure habitual drunkenness was mentioned in a news report concerning its use in place of liquor for cocktail parties. The final sentence of this press release stated: "Although many of the alcoholics experimented upon were cured, Dr. Bloomberg does not maintain that the treatment is a solution for all addicted to liquor."

The Council on Pharmacy and Chemistry within the last year has published a report, "The Present Status of Benzedrine Sulfate," which has a considerable number of warnings concerning the use of this preparation by the general public, and its use for the purpose of "pepping up" or of getting a "kick" out of its effects is most definitely decried.

There are several other features which Dr. Bloomberg has apparently overlooked, among them the fact that, while alcohol is a dilator of blood vessels, benzedrine is a vasoconstrictor. The difference in effect, for example, of alcohol and benzedrine in potential coronary disease requires serious consideration.

The release of information of this type to the daily papers is always considered objectionable. There have been many releases on the use of benzedrine sulfate by the layman without resort to a physician's prescription. In accepting benzedrine sulfate the Council was careful to point out that no such uses should be made of the drug, and such a stipulation applies most definitely to the recent release on Bloomberg's work.

Since the advent of the press release, Dr. Bloomberg's article has appeared (Wilfred Bloomberg, Treatment of Chronic Alcoholism with Amphetamine [Benzedrine] Sulfate, *New England J. Med.* 4:129 [Jan. 26] 1939) and he states, "It would be oversanguine to assume that amphetamine sulfate can alone solve the problem of alcoholism. In almost all the cases in this series, the patients have gone through a more or less prolonged period of greater accessibility, due to their sobriety. If one assumes that the patients in this group who have been most successful represent those who were really anxious to stop drinking but had been unable to do so without external assistance, the improved rapport between patient and psychiatrist is understandable, when the patients find that they have actually been able to stop drinking. The fact that this has been accomplished without hospitalization is also quite important. Because of the experimental aspect of this study, no attempt has been made to take advantage of the situation. However, it is my belief that the greatest benefit from the use of amphetamine sulfate in alcoholics will arise out of this circumstance. The free interval which amphetamine sulfate appears able to produce should allow time for the institution of more fundamental psychotherapeutic approaches. Probably the real value of the treatment will prove to be just this opportunity to inaugurate psychotherapy on a basis of good rapport and confidence and sobriety, so that the gain made by the treatment may be consolidated by more fundamental modifications of the alcoholic's personality and his attitude toward life."

### SPLENIC EXTRACT IN ALLERGIC DISORDERS

To the Editor—Can you advise me regarding the present status of splenic extract in the treatment of asthma?

J C KERN MD Sanderson Texas

To the Editor—Would you kindly advise me of the status of splenic extract in allergy and acne

W F CANTWELL MD International Falls Minn

ANSWER—A number of articles have been written in which splenic extract was said to have virtue in combating allergic states such as hay fever, vasomotor rhinitis and various allergic skin conditions including eczema and urticaria. Theoretically the use of splenic extracts in the treatment of allergic conditions is based on the usual reduction of the number of eosinophils when splenic extract is injected in an allergic individual. There is a large foreign literature on the effectiveness of splenic extracts, but most observers seem to feel that any action which this method of treatment may have is a nonspecific one.

If splenic extract has been proposed for the treatment of acne, it has received no corroboration and certainly no general acceptance among dermatologists. Its use, therefore, must be considered experimental at the present time, not only for this condition but probably for all others for which it has been proposed. The Council on Pharmacy and Chemistry has not accepted it for inclusion in New and Nonofficial Remedies.

### CHROMOSOMES SEX DETERMINATION AND TWINNING

To the Editor—What factor determines sex in the human embryo? I have always thought that the forty seventh (odd) number of chromosomes in the male germ cell in the process of maturation determined sex. What factor determines the single or multiple births at one lying in? This I have always believed was determined by the female. Something I read recently seemed to hold that the paternal element could influence this matter.

MAUD PARKER MD Richmond Highland Wash

ANSWER—The answer to this query must be broken into several parts.

1 There are forty-eight chromosomes in both male and female human beings. The female has two X-chromosomes of equal size, the male one X-chromosome and a small Y-chromosome.

2 Sex is determined at the time the egg is fertilized by the sperm, not during maturation.

3 The causes of twinning are not surely known. Two egg twinning seems to be slightly hereditary, equally through maternal and paternal lines. One-egg twinning seems to have no hereditary basis.

### OSTEOSCLEROSIS

To the Editor—Two years ago after the football season a 15 year old boy complained of pain in the leg. His school doctor treated him without relief. He then took x-ray films which showed a localized thickening of the tibial cortex. There was no history of bone injury. I operated to obtain a specimen and at the same time leveled off the bone. Since then unexplainable pain has not occurred. I had him in plaster for four weeks. The specimen was said to show simply a bone sclerosis. Now the school doctor reports a complaint of pain in the arm without relief from treatment. x-ray examination shows a similar condition to the tibia. What is this? He has had no fever at any time. MD, New Jersey.

ANSWER—This is evidently a case of localized osteosclerosis, probably of traumatic origin. Either one definite blow or several minimal injuries produced a periostitis or a hematoma which ossified. It may be a case of Garre's sclerosing osteomyelitis. The query does not say which arm bone was involved nor in what part of the bones the lesions occurred. Roentgenograms of other long bones, of the skull, of the ribs and of the pelvis should be taken. The two lesions may not be related. The boy might have had benign osteoma of the tibia but may have a more serious lesion in the other bones.

### CONJUNCTIVITIS FROM CONCRETE

To the Editor—A patient after working for four months at a concrete mixer developed a bilateral conjunctivitis which has cleared up leaving no visible scarring yet he complains of dimness of vision and the eye card reads only 20/80. I should like to know whether the condition could be caused from his illness and how.

MD Mississippi

ANSWER—From the account of the case there seems but little chance that the injury was responsible for the dimness of vision. A careful examination with the slit lamp and corneal microscope would be necessary to make certain that no scar was present, but it seems most probable that there was some visual defect present before the injury of which the patient became conscious only after his attention was called to it by the injury. It is quite possible that he has refractive error which requires attention.

## Council on Medical Education and Hospitals

### ADDITIONAL HOSPITALS APPROVED

The Council on Medical Education and Hospitals of the American Medical Association has given its approval to the following hospitals since the publication of the last previous list in THE JOURNAL, Dec 31, 1938

#### Hospitals Approved for Intern Training

Good Samaritan Hospital Phoenix Ariz  
St Francis Hospital, Wilmington Del  
Belmont Community Hospital Chicago  
Chelsea Memorial Hospital Chelsea Mass  
Haverhill Municipal Hospital Haverhill, Mass  
Holyoke Hospital Holyoke Mass  
Pontiac General Hospital Pontiac Mich  
Lima Memorial Hospital Lima Ohio  
St Rita's Hospital Lima Ohio  
Camden Clark Memorial Hospital, Parkersburg W Va

#### Residencies and Fellowships

Paradise Valley Sanitarium and Hospital, National City Calif  
Mixed  
Greens Eye Hospital San Francisco  
Ophthalmology  
St Luke's Hospital Denver  
Surgery  
Mount Sinai Hospital Chicago  
Obstetrics Gynecology, Surgery  
St Joseph Hospital, Chicago  
Surgery  
St Vincent's Infant and Maternity Hospital Chicago  
Obstetrics Pediatrics  
St Francis Hospital and  
Methodist Hospital of Central Illinois, Peoria  
Pathology  
Louisville City Hospital Louisville Ky  
Obstetrics Gynecology  
Boston City Hospital Boston  
Dermatology and Syphilology  
Boston Lying in Hospital, Boston and  
Free Hospital for Women Brookline Mass  
Pathology  
New England Deaconess Hospital Boston  
Radiology  
Westfield State Sanatorium Westfield Mass  
Malignant Diseases  
Worcester City Hospital Worcester Mass  
Medicine Surgery  
Shur's Hospital Detroit  
Ophthalmology Otolaryngology  
Mayo Foundation Rochester Minn  
Fellowships in Anesthesia Dermatology and Syphilology Medicine  
Neurology and Psychiatry Neurosurgery, Obstetrics and Gynecology  
Ophthalmology, Orthopedic Surgery Otolaryngology  
Pathology Pediatrics Physical Medicine Plastic Surgery Proctology, Radiology, Surgery Urology  
Mary Hitchcock Memorial Hospital Hanover N H  
Radiology  
Elliot Hospital, Manchester N H  
Mixed  
Albany Hospital Albany N Y  
Anesthesia Neurosurgery, Pediatrics Urology  
Auburn City Hospital Auburn N Y  
Mixed  
Cumberland Hospital Brooklyn  
Pathology  
Greenpoint Hospital Brooklyn  
Obstetrics Gynecology  
Jewish Hospital, Brooklyn  
Medicine  
Flower Fifth Avenue Hospital New York City  
Radiology  
New York City Hospital, New York City  
Dermatology and Syphilology Medicine Neurology Obstetrics  
Gynecology Otolaryngology Pediatrics Radiology, Surgery Urology  
New York University College of Medicine Clinic New York City  
Fellowships in Radiology  
Mercy Hospital Canton Ohio  
Medicine, Obstetrics Gynecology  
Cleveland Clinic Foundation Hospital Cleveland  
Fellowships in Radiology  
St Vincent Charity Hospital, Cleveland  
Medicine  
Columbus State Hospital Columbus Ohio  
Psychiatry  
Mansfield General Hospital Mansfield Ohio  
Mixed  
St Anthony Hospital Oklahoma City  
Medicine Orthopedics  
State University and Crippled Children's Hospitals Oklahoma City  
Obstetrics Gynecology  
Emanuel Hospital Portland Ore  
Orthopedics  
Mount Sinai Hospital Philadelphia  
Pathology  
Robert Packer Hospital Sayre Pa  
Radiology  
Parkland Hospital Dallas Texas  
Ophthalmology Otolaryngology, Pathology Urology  
Mary Fletcher Hospital Burlington Vt.  
Radiology  
Eastern State Hospital Medical Lake Wash  
Psychiatry

King County Hospital Unit 1 Seattle  
Medicine Ophthalmology Otolaryngology, Surgery  
King County Tuberculosis Hospital Seattle  
Tuberculosis  
Northern State Hospital Sedro Woolley Wash  
Psychiatry  
Charleston General Hospital Charleston W Va  
Pathology  
Laird Memorial Hospital Montgomery W Va  
Surgery

## Book Notices

**Psychotherapy** By Paul Schilder, M.D. Ph.D. Clinical Director  
Bellevue Hospital Psychiatric Division New York Cloth Price \$3.50  
Pp 344 New York W W Norton & Company Inc 1938

Although the general medical literature is well filled with monographs on treatment, the therapeutic approach to mental disease has been neglected. Except for one publication by Diethelm, which does not stress psychologic treatment, no recent volume attempts to cover the subject. There are, of course, numerous publications dealing with hypnosis, psychoanalysis, progressive relaxation and other forms of therapeutics of mental diseases, but an all inclusive manual on psychotherapy has been lacking up to now. To make such a volume worth while the author needs to be equipped with a deep understanding of the subject based on wide personal experience and thorough training. He should not be pinned down to a narrow field of interest such as psychoanalysis alone but should be psychoanalytically trained, combining such training with a good knowledge of neurology, general psychiatry, hospital care and treatment of the insane and near insane. His experience should be derived from a sufficiently extensive practice so that he not only understands the theory of treating his patients but will have been able to see the results of his treatment. The present author fulfills these requirements of good authorship.

It might be felt that the present volume would be too deep or too detailed for the average psychiatrist, but Schilder has been able to write clearcut, easily understandable English. The first half deals with general principles, treating largely from a modified psychoanalytic standpoint the importance of various symptoms either as a source of satisfaction to the patient or as a source of annoyance to those about him. The significance of organic symptoms, or lack of symptoms, of the affective thinking process and the understanding of the patient are brought out in comprehensive and interesting chapters, and there is given to the therapist who is really anxious to practice his art an understanding of the meaning of symptoms on an easily interpretable basis.

The second half of the book deals with such large topics as the relation of the physician to his patients and of various technics which can be used. It concludes with a brief discussion of the therapeutic procedures to be brought to bear on specific mental disorders. Schilder has never been onesided in his use of the various forms of psychotherapy which are available and he not only discusses conventional psychoanalysis and the theories of Jung and Adler (he considers the former as being artistic and unscientific) but he gives valuable pointers to the properly trained psychiatrist who wishes to use hypnosis and abridged methods of psychoanalysis. One of the most interesting features of the chapters dealing with treatment is a discussion of what the author calls "group treatment" as distinct from the socializing group treatment of the usual state hospital or Burrow's phylo-analytic methods of group analysis. Extensive questionnaires and investigations are used, some of which would seem to be likely to get an inexperienced examiner into some difficulty with a squeamish patient who is wrapped up in his sexual problems or has a puritanical background, but the procedure itself is well worth consideration of the psychiatrist who neither can afford the time nor can provide himself with sufficiently wealthy patients to justify lengthy "real" psychoanalysis.

The final chapter, considering treatment of specific syndromes, is too short. For its common sense point of view, scientific honesty, careful, systematic and useful compilation of technics, this book is unique.

**The Troubled Mind A Study of Nervous and Mental Illnesses** By C S Bluemel M.A. M.D. F.A.C.P. Cloth Price \$3.50 Pp 220  
Baltimore Williams & Wilkins Company 1938

This book consists largely of a textbook-like monograph on neuroses and psychoneuroses. It is different from the usual directive work for psychiatrists in that out of eight parts in the volume only one is devoted to the psychoses. It is not a particularly great contribution to the subject of study and treatment of the psychoneuroses for it neglects dynamisms and deep interpretations, consisting largely of brief, not particularly

## Medical Examinations and Licensure

### COMING EXAMINATIONS

#### STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL March 4 page 873

#### NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II Medical centers having five or more candidates desiring to take the examination May 12 (Part II only—limited to a few centers) June 1921 and Sept 11 13 Ex Sec Mr Everett S Elwood 225 S 15th Street Philadelphia

#### SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY An Affiliate of the American Board of Surgery Oral examinations for all candidates St Louis May 13 14 Applications must be filed by March 13 Written Various places throughout the United States Sept 9 Applications must be filed by July 11 Oral Part II Philadelphia Oct 14 15 Sec Dr Paul M Wood 745 Fifth Ave New York

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Philadelphia Oct 30 Nov 1 Sec Dr C Guy Lane 416 Marlboro St Boston

AMERICAN BOARD OF INTERNAL MEDICINE Written Various parts of the United States Oct 16 Applications must be received by Aug 20 Oral New Orleans March and St Louis May Sec Dr William S Middleton 1301 University Ave Madison Wis

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY General oral clinical and pathological examinations for all candidates Part II examinations (Groups A and B) will be held in St Louis May 15 16 Application for admission to Group A examinations must be on file in the Secretary's office by March 15 Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh (6)

AMERICAN BOARD OF OPHTHALMOLOGY Written Various cities throughout the country March 15 and Aug 5 Oral St Louis May 15 and Chicago Oct 7 Sec Dr John Green 6830 Waterman Ave St Louis

AMERICAN BOARD OF ORTHOPAEDIC SURGERY St Louis May Applications must be filed with the Secretary on or before April 1 Sec Dr Fremont A Chandler 6 N Michigan Ave Chicago

AMERICAN BOARD OF OTOLARYNGOLOGY St Louis May 12 13 and Chicago Oct 6 7 Sec Dr W P Wherry 1500 Medical Arts Bldg Omaha

AMERICAN BOARD OF PATHOLOGY Richmond, Va April 3 4 Sec Dr F W Hartman Henry Ford Hospital Detroit

AMERICAN BOARD OF PEDIATRICS Cincinnati Nov 15 Appointments must be made before July 15 Sec Dr C A Aldrich 723 Elm St Winnetka Ill

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY Chicago May 13 Sec Dr Walter Freeman 1028 Connecticut Ave NW Washington D C

AMERICAN BOARD OF RADIOLOGY St Louis May 11 14 Sec Dr Byrl R Kirkin 102 110 Second Ave SW Rochester Minn

AMERICAN BOARD OF SURGERY Part I Simultaneously in various centers throughout the United States April 3 Part II New York May 8 and May 9 Sec Dr J Stewart Rodman 225 S 15th St Philadelphia

AMERICAN BOARD OF UROLOGY White Sulphur Springs W Va May 26 28 Sec Dr Gilbert J Thomas 1009 Nicollet Ave Minneapolis

### Arkansas November Examination

Dr L J Kosminsky, secretary, State Medical Board of the Arkansas Medical Society, reports the written examination held at Little Rock, Nov 3-4, 1938. One candidate was examined and passed. The following school was represented:

School	PASSED	Year Grad	Per Cent
University of Minnesota Medical School		(1933)	91.5

Twenty-two physicians were licensed by reciprocity from June 7 through December 19. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine		(1937)	Illinois
University of Colorado School of Medicine	(1932)	(1936)	Colorado
Chicago Medical School		(1935)	Illinois
Tulane University of Louisiana School of Medicine		(1935)	Missouri
(1937) (1938) Louisiana			
Johns Hopkins University School of Medicine		(1928)	Maryland
St Louis University School of Medicine		(1937)	Missouri
John A Creighton Medical College		(1906)	Nebraska
University of Oklahoma School of Medicine		(1937)	Oklahoma
Jefferson Medical College of Philadelphia		(1932)	New Jersey
(1936) New York			
Medical College of the State of South Carolina		(1914)	S Carolina
Meharry Medical College	(1933)	(1937)	Tennessee
Memphis Hospital Medical College		(1898)	Louisiana
University of Tennessee College of Medicine		(1937)	Tennessee
Vanderbilt University School of Medicine	(1924)	(1935)	Tennessee
University of Texas School of Medicine		(1935)	Texas
Medical College of Virginia		(1931)	Virginia

thoroughgoing, case studies Each chapter is packed with a number of these short summaries The case histories contain much discussion and exemplification of symptomatic materials and patients' reports of their introspections and their attitudes Many psychiatrists will disagree strongly with the diagnosis given for these cases on a basis of the symptoms listed under each diagnostic category The mechanisms involved in the various types of neuroses are not gone into to any great extent, nor is the discussion of therapy modern or extensive Much of the terminology is old fashioned and certain of the concepts, such as the use of the concept of inhibition of dealing with certain psychoneuroses, such as hysterical paralysis, are of doubtful psychiatric significance The book does not follow modern conventional psychiatric lines to any great extent It offers no contribution to the study and treatment of the psychoneuroses, and because of the fact that it is so unconventional and adheres so much to the older concepts it is of doubtful value for teaching purposes

*Tuberculose et médecine sociale* Par Etienne Bernard professeur agrégé à la Faculté de médecine de Paris Préface de F Bezançon Paper Price 36 francs Pp 159 with 4 illustrations Paris Masson & Cie 1938

This is a complete discussion of the tuberculosis problem in France It contains an unusually fine preface by Professor Bezançon In the first chapter there is a good discussion of the contagiousness of tuberculosis and methods of preventing its spread Attention is called to the fact that in 1938 there were 870 dispensaries and 180 public or private sanatoriums, with 28,000 beds and 7,000 beds in hospitals for patients with pulmonary tuberculosis, together with 11,000 beds in public or private sanatoriums for patients with extrapulmonary tuberculosis In France the mortality from tuberculosis in 1934 was 131 per hundred thousand, while in the United States it was 57 per hundred thousand The author discusses the attempts France is making to control tuberculosis He believes the high mortality is largely due to lack of information of the public concerning this disease and recommends a larger and more intensive educational program In chapter 2 there is a thorough discussion of the prevention of tuberculosis among infants, and a number of cases are cited to prove his points The Grancher method of placing infants and children of tuberculous parents in homes free from tuberculosis is emphasized Chapter 3 is devoted to primary tuberculous infection both in children and in adults Here the author calls attention to the problem of tuberculosis among students of nursing and medicine Chapter 4 is devoted to a discussion of the prevention of tuberculosis in students The remainder of the book contains much information on the treatment and rehabilitation of tuberculous patients Throughout the pages of this book there are statistical data and numerous valuable facts It is a modern presentation The author is an internationally known worker in the field of tuberculosis His work has always been of a high quality, therefore this book can be recommended as an authoritative work

*Fractures of the Jaws* By Robert H Ivy MD DDS FACS Professor of Maxillofacial Surgery School of Medicine and Graduate School of Medicine and of Clinical Maxillofacial Surgery School of Dentistry University of Pennsylvania and Lawrence Curtis AB MD DDS Assistant Professor of Maxillofacial Surgery Graduate School of Medicine and School of Dentistry University of Pennsylvania Second edition Cloth Price \$4.50 Pp 192 with 199 illustrations Philadelphia Lea & Febiger 1938

The second edition of the textbook published in 1931 has required little change in the light of the authors' experience in the interim Twelve pages have been added together with alterations and additions to illustrations The chapter contributed by Leroy M Ennis, DDS, dealing with roentgenographic technic has been carefully revised The final chapter, on dietary management in fractures of the jaws, by Clyde W Scogn, DDS, remains essentially unaltered The material is logically organized A brief summary of clinically significant anatomic features is followed by a short general discussion of etiology, types, signs and symptoms of fractures The greater incidence of fractures of the mandible warrants the more extended space devoted to the lower jaw Statistics with respect to cause and location of fractures are based on a rather limited

number of cases It is interesting to note the increase from 8 to 25 per cent of fractures due to automobile accidents While dental splints are discussed, the exacting and time consuming technic is considered to be unnecessary in the treatment of most fractures Wiring of teeth in the same jaw or segments of both jaws with 24 gage brass wire utilizing the islet method or variation of it is advocated for common practice The use of one half round arch wire combined with the ligature procedure is highly recommended The use of orthodontic bands for attachment of arch wire segments to the teeth is considered of greater efficiency but with less favor because of the more specialized technic demanded The more recent American expositions of this method of fracture management are not included in the text or bibliography A very compact and useful summary of methods of fixation of fractures of the maxilla and mandible is furnished at the end of the respective chapters Management of more complicated fractures is concisely handled in a practical manner The plaster head cap with its adaptability of use is illustrated and the application of this device in retracting the angle of the mandible has clinical significance Similarly the use of the cannula for passing wires about mandibular fragments is deserving of careful attention for reference in the limited number of cases in which it is applicable The text is written in simple and direct style developed from a clinical point of view and should prove useful to dentists and surgeons who deal with this restricted field

## *Bureau of Legal Medicine and Legislation*

### MEDICOLEGAL ABSTRACTS

**Medical Practice Acts** Optometry as the Practice of Medicine—The plaintiff was licensed to practice medicine The board of registration in medicine revoked his license for "acting as principal or assistant in carrying on the practice of medicine with an unlicensed person" The trial court upheld the board and the plaintiff appealed to the Supreme Judicial Court of Massachusetts

The plaintiff and one Getter, a lay person, were associated in the optical business under the firm name of State Opticians and drew weekly equal amounts from the income of the business Advertising was in the firm name and glasses were furnished complete for a single price, there being no special charge for the examination The firm owned all optical instruments and equipment and paid all expenses All examinations were made by the plaintiff He used no drugs and performed no surgical operations but did only such acts as are included in the definition of optometry contained in the optometry practice act of Massachusetts

The single question before the court was whether the plaintiff was "carrying on the practice of medicine" within the meaning of the medical practice act When the legislature of Massachusetts first regulated the practice of optometry, it specifically defined that practice as "the employment of any method or means other than the use of drugs for the measurement of the powers of vision and the adaptation of lenses for the aid thereof" But this act, the court thought, was not an amendment of the law governing the practice of medicine, it set up an entirely new board for the examination and registration of applicants and regulated a field not regarded as already covered by statute Moreover, although the optometry practice act expressly exempted from its provisions physicians and surgeons "entitled to practice medicine in the commonwealth," it allowed them to be examined and registered as optometrists and it contained what to the court was this significant provision, "nor shall this act be construed to authorize any person to administer drugs in any form to practise or claim to practise medicine or surgery in any sense, or to use any title or appellation intended or calculated to indicate the practise of medicine or surgery" It was to the court difficult to believe that the legislature considered optometry, carefully defined in the optom-

etry practice act, as a part of the practice of medicine when in authorizing persons to practice optometry the legislature itself declared that it did not authorize them to practice medicine "in any sense." The exception of physicians from the operation of the act seemed to the court to have been due not to the belief that optometry as there defined was medicine but to the belief that there was no necessity for regulating qualified physicians who practiced in the field of optometry.

The court concluded therefore that the plaintiff, although a licensed physician, was not practicing medicine so far as his activities with the State Opticians were concerned. The decision of the board revoking the plaintiff's license was reversed—*Sachs v. Board of Registration in Medicine (Mass.)*, 15 N E (2d) 473.

## Society Proceedings

### COMING MEETINGS

Alabama Medical Association of the State of Montgomery April 18 20 Dr D L Cannon 519 Dexter Ave Montgomery Secretary  
American Association for the Study of Neoplastic Diseases Detroit April 6 8 Dr Eugene R Whitmore 2139 Wyoming Avenue NW Washington D C Secretary  
American Association of Anatomists Boston Apr 6 8 Dr E R Clark University of Pennsylvania School of Medicine Philadelphia Secretary  
American Association of Pathologists and Bacteriologists Richmond Va Apr 6 7 Dr Howard T Karsner 2085 Adelbert Rd Cleveland Secretary  
American Association of the History of Medicine Atlantic City N J April 30 May 1 Dr Henry E Sigerist 1900 Monument St Baltimore Secretary  
American Association on Mental Deficiency Chicago May 3 6 Dr E Arthur Whitney Washington Road Elwyn Pa Secretary  
American College of Physicians New Orleans March 27 31 Mr E R Loveland 4200 Pine St Philadelphia Executive Secretary  
American Gastro Enterological Association Atlantic City N J May 1 2 Dr Russell S Boles 1901 Walnut St Philadelphia Secretary  
American Pediatric Society Sky Top Pa Apr 27 29 Dr Hugh McCulloch 325 North Euclid Ave St Louis Secretary  
American Physiological Society Toronto Canada Apr 26 29 Dr A C Ivy 303 East Chicago Ave Chicago Secretary  
American Society for Clinical Investigation Atlantic City N J May 1 Dr Isaac Starr University of Pennsylvania Hospital Philadelphia Secretary  
American Society for Experimental Pathology Toronto Canada April 26 29 Dr Paul R Cannon Dept of Pathology University of Chicago Chicago Secretary  
American Society for Pharmacology and Experimental Therapeutics Toronto Canada Apr 26 29 Dr G Philip Grishfield 319 Longwood Ave Boston Secretary  
American Society of Anesthetists New York Apr 14 Dr Paul M Wood 131 Riverside Drive New York Secretary  
American Society of Biological Chemists Toronto Canada Apr 26 29 Dr C G King Univ of Pittsburgh Dept of Chemistry Pittsburgh Secretary  
Arizona State Medical Association Phoenix Apr 13 15 Dr D F Harbridge 15 East Monroe St Phoenix Secretary  
Association of American Physicians Atlantic City N J May 2 3 Dr Hugh J Morgan Vanderbilt University Hospital Nashville Tenn Secretary  
California Medical Association Del Monte May 1 4 Dr George H Kress 450 Sutter St San Francisco Secretary  
District of Columbia Medical Society of the Washington May 3 4 Mr Theodore Wiprud 1718 M St NW Washington Executive Secretary  
Federation of American Societies for Experimental Biology Toronto Canada Apr 26 29 Dr D R Hooker 19 West Chase St Baltimore Secretary  
Florida Medical Association Daytona Beach May 1 3 Dr Shaler Richardson 111 W Adams St Jacksonville Secretary  
Georgia Medical Association of Atlanta Apr 25 28 Dr Edgar D Shanks 478 Peachtree St NE Atlanta Secretary  
Illinois State Medical Society Rockford May 2 4 Dr H M Camp 224 S Main St Monmouth Secretary  
Iowa State Medical Society Des Moines Apr 25 27 Dr Robert L Parker 3510 Sixth Ave Des Moines Secretary  
Kansas Medical Society Topeka May 1 4 Mr C G Munns 112 W 6th St Topeka Executive Secretary  
Louisiana State Medical Society Alexandria Apr 24 26 Dr P T Talbot 1430 Tulane Ave New Orleans Secretary  
Maryland Medical and Chirurgical Faculty of Baltimore Apr 25 26 Dr Walter Dent Wise 1211 Cathedral St Baltimore Secretary  
Missouri State Medical Association Excelsior Springs Apr 10 12 Dr E J Goodwin 634 North Grand Blvd St Louis Secretary  
Nebraska State Medical Association Grand Island May 2 4 Dr R B Adams 414 Federal Securities Bldg Lincoln Secretary  
New York Medical Society of the State of Syracuse April 24 27 Dr Peter Irving 2 East 103d St New York Secretary  
Ohio State Medical Association Toledo May 3 4 Mr C S Nelson 79 E State St Columbus Executive Secretary  
Oklahoma State Medical Association Oklahoma City May 1 3 Dr L S Willour Third and Seminole McAlester Secretary  
Pacific Coast Surgical Association San Francisco Oakland Del Monte March 28 31 Dr H Glenn Bell University of California Hospital San Francisco Secretary  
Society for the Study of Asthma and Allied Conditions Atlantic City N J Apr 29 Dr W C Spain 116 E 53d St New York Secretary  
South Dakota State Medical Association Aberdeen Apr 24 26 Dr Clarence E Sherwood Madison Secretary  
Tennessee State Medical Association Jackson Apr 11 13 Dr H H Shoulders 706 Church St Nashville Secretary

## CENTRAL SOCIETY FOR CLINICAL RESEARCH

*Eleventh Annual Meeting Held in Chicago Nov 4 and 5 1938*

The President, Dr WILLIAM H BUNN, Youngstown, Ohio, in the Chair

(Continued from page 880)

### A Secretary Depressant in Human Gastric Juice

DRS ALEXANDER BRUNSCHWIG, JOHN VAN PROHASKA, T H CLARKE and ERNESTINE KANDLL, Chicago. In dogs with sub total gastric pouches and the nerves and vessels intact, intra venous injection of their own and other dogs' neutralized gastric juices produced no effect on the secretions of the pouch. The injection of gastric juices from nine of twelve patients with pernicious anemia produced periods of achlorhydria in the stimulation pouches. The juices from three of six patients with gastric cancer also produced periods of achlorhydria. Of a series of sixteen patients not having pernicious anemia or gastric cancer, three yielded juice which produced achlorhydria in the dogs. Boiling the "positive" gastric juices for ten minutes destroyed the secretory depressing factor.

### Effect of High Intracranial Venous Pressure on the Cerebral Circulation

DR EUGENE B FERRIS JR, Cincinnati. Five patients with obstruction of the superior vena cava and high venous pressure in the upper part of the body had no symptoms suggestive of cerebral anoxia or of high intracranial pressure, although in at least three the pressure of the cerebrospinal fluid was roughly the same as the venous pressure (from 22 to 50 cm of water). An estimate of the flow of cerebral blood in each of these patients was made by comparing the oxygen content of arterial blood with that obtained from the internal jugular vein. The arteriovenous oxygen differences did not vary appreciably from published normal values. The results indicate that venous hypertension does not diminish the flow of cerebral blood and does not of itself cause orthopnea. It is suggested that in the presence of high intracranial venous pressure the rigid covering of the craniovertebral cavity is the important factor in preventing sufficient venous distention and alteration in exchange of fluid between the blood and tissues of the brain to cause symptoms.

### DISCUSSION

DR JAMES A GREENE Iowa City. I think this work is important in the argument on the cause of cardiac dyspnea. Some of the members are familiar with the work of Dr Harrison, who performed experiments of obstructing the venous flow in the neck and did not produce dyspnea. He concluded from these experiments that increased venous pressure is not the cause of orthopnea. I think this study of Dr Ferris bears this out. It also shows that obstructing the venous flow from the brain does not interfere with cerebral circulation. If it does not interfere with cerebral circulation, one would not expect respiratory difficulty.

### Paroxysmal Auricular Tachycardia with Partial Auriculoventricular Block

DRS PAUL S BARKER, FRANK N WILSON and FRANKLIN D JOHNSTON, Ann Arbor, Mich, and SHELBY W WISHART, Evansville, Ind. Paroxysmal auricular tachycardia can usually be terminated by stimulation of the vagus or certain drugs. Rarely, instead of terminating the attack, stimulation of the vagus or administration of drugs will produce partial auriculoventricular block, slowing the ventricles while the auricular tachycardia persists. Six cases of this unusual manifestation have been studied electrocardiographically, some with precordial or esophageal leads. They are characterized clinically by unusually persistent tachycardia, high grade cardiac disability and the absence of the usual types of organic heart disease. Some patients responded well to digitalis or quinidin, while two died and came to autopsy.

### DISCUSSION

DR LOUIS N KATZ, Chicago. I should like to ask the authors whether they do not agree that the distinction between



auricular flutter and paroxysmal tachycardia in borderline cases is a matter of opinion and that in certain cases the distinction is arbitrary

DR FRANKLIN D JOHNSTON, Ann Arbor, Mich I agree with Dr Katz that in some cases the differentiation between auricular flutter and paroxysmal tachycardia is largely a matter of opinion The rate of auricular oscillation is probably the best guide available In flutter this rate is usually around 300 per minute, while in auricular paroxysmal tachycardia it is ordinarily between 150 and 200 per minute The form of the auricular waves is also helpful

#### Clinical Experience with Mercupurin in the Prevention of Acute Paroxysmal Dyspnea

DR EMMET FIELD HORINE, Louisville, Ky When paroxysmal dyspnea occurs with gross edema, there is no hesitancy on the part of most physicians in using mercurial diuretic preparations Cases of this type have not been included in this study Instead, thirty cases of distressing dyspnea but no manifest edema were selected Digitalization and thereafter administration of a maintenance dose of digitalis were inadequate in preventing recurrences of paroxysmal dyspnea A successful plan consisting of routine intravenous administration of mercupurin (mercurin with theophylline), in addition to diet and restriction of salt is described

#### DISCUSSION

DR WALTER W HAMBURGER, Chicago I should like to ask Dr Horine how he differentiates the results he obtained by mercupurin from those of salyrgan Mercupurin contains a purine derivative—theophylline—which salyrgan does not, and I feel that the theophylline radical rather than the mercurial portion of mercupurin gave these interesting results in paroxysmal dyspnea Both Drs Fred Smith and M H Nathanson obtained similar results with theophylline with ethylenediamine in paroxysmal dyspnea, and the effective agent in that preparation is this same theophylline which is contained in mercupurin

DR EMMET FIELD HORINE, Louisville, Ky In answer to the first question, concerning the difference between salyrgan and mercupurin, both are mercurial diuretic substances, though the latter contains, in addition, a small amount of theophylline I have used theophylline with ethylenediamine alone intravenously in an attempt to control paroxysmal dyspnea, but unsuccessfully That being true I am inclined to think it is the mercury radical and not the purine which accomplishes the results The reason I prefer mercupurin is that it is definitely less toxic, and further, I can repeatedly use the same vein without producing thrombosis I have not been able to do this with either salyrgan or merbaphen With reference to the question concerning loss of weight, the man whose chart was shown here was of large build and during the month under close observation lost over 30 pounds (13.6 Kg) There was undoubtedly considerable retention of fluid without manifest pitting edema of the extremities Apparently in certain persons paroxysmal dyspnea develops, as a result of retention of minimal amounts of edematous fluid—hence the successful results obtained through the use of mercupurin

#### Heart Failure in Subacute Bacterial Endocarditis

DRS WILLIAM C BUCHBINDER and OTTO SAPHIR, Chicago This study was undertaken to determine the frequency, intensity and chronicity of heart failure in subacute bacterial endocarditis Heart failure is frequently regarded as an important negative feature of the disease While we recognize sepsis, toxemia and progressive cachexia as the important clinical features, our observations clearly indicate that heart failure too is to be reckoned with A simple and serviceable explanation for the absence of signs of myocardial weakness is the often encountered general statement that the heart "somehow maintains its integrity in this disease Our observations, however, indicate that not only is heart failure evidenced clinically in a number of patients but morphologic changes in the cardiac muscle are encountered frequently if sought for In our material histologic studies show a high incidence of inflammatory and degenerative

changes in the cardiac muscle and particularly frequently small infarcts These are sufficient to explain the advent of heart failure

#### DISCUSSION

DR HAROLD FEIL, Cleveland Were there any abnormal electrocardiographic observations?

DR WILLIAM C BUCHBINDER, Chicago Most of our patients had electrocardiograms, but serial curves were secured in only a few instances These showed significant changes Rothschild, Sacks and Libman showed that patients with this disease had relatively few and insignificant changes in the electrocardiogram compared to those of patients with rheumatic carditis Serial curves were secured from the rheumatic group of patients, but the authors did not clearly indicate that they were obtained also from patients with subacute bacterial endocarditis From their conclusions, however, one must infer that they were Levy and Turner were careful to state that graphic records of the non-rheumatic group were taken at less frequent intervals They took records of 403 rheumatic patients and of twenty-three with subacute bacterial endocarditis With such a disproportionately large number of rheumatic patients, followed more systematically, a comparison of the two diseases in point of frequency of electrocardiographic alteration does not seem justifiable From the widespread changes occurring in the cardiac muscle as we found them, serial electrocardiographic curves would be expected to show significant alterations

#### Circulatory Disturbances Produced by Mediastinal Lesions

DR H CORWIN HINSHAW, Rochester, Minn A study has been made of the collateral circulation which develops as a result of compression of the great veins of the thorax Photography with infra-red rays has been used for studying and recording these phenomena Studies of venous pressure and of circulation time have also been carried out A wide variety of lesions may produce striking manifestations of circulatory disturbance Cases are illustrated in which such changes are associated with carcinoma of the bronchus, lymphoblastoma, intrathoracic goiter, mediastinal fibrosis, tuberculous lymphadenitis, metastasis from testicular carcinoma, rheumatic heart disease and chronic obstruction of obscure origin Both unilateral and bilateral obstruction are demonstrated

#### DISCUSSION

DR H CORWIN HINSHAW, Rochester, Minn In only one case at autopsy was the lesion definitely below the azygos vein It would appear logical from an anatomic standpoint that unless obstruction were above the level of the azygos vein the presence of collateral channels connecting with the internal mammary vein would be of no value

#### A Modification of the Grollman Method for Determining Cardiac Output

DR WRIGHT ADAMS and IRENE SANDIFORD, PH D, Chicago Grollman's method for determining cardiac output involves the collection of two samples of gas several seconds apart during deep rebreathing, from a lung bag system containing air and acetylene Lung bag equilibrium must be established before the first sample is taken and the second sample drawn before recirculation occurs The time of equilibrium and recirculation varies considerably, and there has been no good way of knowing how much a given determination was influenced by these factors By a technic which allows rapid frequent simultaneous sampling of alveolar gas and bag gas it is possible to obtain a figure for cardiac output with an individual evaluation of the errors in each case

#### DISCUSSION

DR LOUIS N KATZ, Chicago I should like to congratulate the authors on their ingenious modification of the Grollman technic I wonder whether Dr Adams has obtained any data with this method on patients with congestive heart failure and on patients with hyperthyroidism

DR FORD K HICK, Chicago I should like to ask whether this applies to pathologic cases



DR WRIGHT ADAMS, Chicago With regard to Dr Katz's question, we do not have enough observations to make a statement. In the application of the Grollman method to pathologic cases there have been several criticisms. Early recirculation and incomplete mixing are detected by this modification. We have had no experience with patients in heart failure but feel sure that this modification would offer no advantage in determining incomplete saturation of the blood with acetylene, owing to slow diffusion through edematous pulmonary tissue.

#### The Prognostic Significance of Hyperreactibility of the Blood Pressure in Normal Subjects

DR C A HINES JR, Rochester, Minn. A significant correlation was noted in many instances between the "ceiling" or maximum elevation of blood pressure with the cold pressor test and the first routine reading of blood pressure taken in the clinic. As records were available on a large group of patients who had returned to the clinic from ten to twenty years after their original reading of blood pressure I had an unusual opportunity to determine the significance of excessive reaction of the blood pressure to nervous stress in subjects with normal blood pressure. Data have been obtained from 1185 patients who returned to the clinic ten and twenty years after their first visit. Analysis of these data shows that the great majority (from 78 to 90 per cent) of the patients with an elevation of blood pressure on the original reading into the upper ranges of normal (140 to 150 systolic and 85 to 100 diastolic) had hypertension subsequently, whereas a small number (34 per cent) with an original reading within the lower range of normal (below 140 systolic and 85 diastolic) had hypertension subsequently. These observations are strong evidence that a hyperactive vascular system, as shown by excessive rises in blood pressure to stimulation, is the precursor of essential hypertension.

#### Do Eclampsia and Preeclampsia Cause Permanent Vascular and/or Renal Disease?

DRS WILLIAM J DIECKMANN and IRA BROWN, Chicago. Two or more pregnancies have been studied in 340 patients who have or have had toxemia of pregnancy. Analyses of blood and urine were also made. Our purpose was to determine whether eclampsia and preeclampsia caused permanent damage to the vascular-renal system or whether hypertension and/or albuminuria persisting after the puerperium might have been due to a preexistent or latent vascular-renal disease which was aggravated by the pregnancy. A number of patients with eclampsia and severe preeclampsia have been followed through subsequent normal pregnancies. Therefore it seems obvious that when permanent vascular-renal disease exists after these diseases it must have been produced by the pregnancy in a patient with a predisposition to hypertensive arterial disease. The classification of the so called toxemias of pregnancy into eclampsia, preeclampsia, essential hypertension, vascular-renal disease and acute or chronic glomerulonephritis is a satisfactory one.

#### DISCUSSION

DR LOUIS LEITER, Chicago. Those of the members who are confronted with the diagnostic problems connected with hypertension in pregnancy will realize that Drs Dieckmann and Brown have done good work in bringing these back into the realm of internal medicine. It is important to remember that chronic glomerular nephritis is as rare in the pregnant woman as in the nonpregnant woman. Chronic glomerular nephritis is rare, in contrast to essential hypertension. It is of great value to turn one's attention to the "hypertension of pregnancy" instead of the "nephritis of pregnancy." The authors have not gone into the question of the mechanism whereby pregnancy produces convulsive or nonconvulsive toxemia. I should like to hear their views on this point, particularly as to whether they think the disproportion of estrogenic and other hormones has anything to do with it. I should also like to ask whether there is any way of differentiating between women in whom eclampsia will and will not

develop in subsequent pregnancies. The question almost always comes up whether the patient should be allowed to go through another pregnancy, especially if the first or toxemic pregnancy does not result in a living child.

DR WILLIAM J DIECKMANN, Chicago. There are some changes in the estrogenic substances in toxemia of pregnancy, but we do not know whether they are the result or the cause of the toxemia. I believe the convulsions are caused by edema of the brain. The diagnosis of the type of toxemia is based on the history, time of onset in pregnancy, height of blood pressure response to medical treatment and course after delivery. The injection of 2 minims (0.12 cc) of solution of posterior pituitary causes an increase in the systolic blood pressure of more than 20 mm if the patient has preeclampsia. The "cold test" has little or no effect on a patient with this disease but produces an increase of 30 mm or more if the patient has essential hypertension or vascular-renal disease. Thus these two tests seem to be of diagnostic value.

#### Effect of Hypertonic Solutions on the Kidney

DRS HOWARD A LINDBERG, MAURICE H WALD and M HERBERT BARKER, Chicago. The possibility of inducing renal damage by the intravenous administration of hypertonic solutions, now popularly used in the therapy of many conditions, prompted this experimental study in dogs. Comparable doses to those administered clinically were given to the animals, and each experiment was controlled with a preliminary biopsy of the kidneys. Only one of these solutions caused anatomic changes. A single injection of the substance caused transitory renal damage, while repeated injections caused changes of a more enduring nature. The lack of associated urinary disorders or abnormalities of renal function to indicate this damage is discussed.

#### DISCUSSION

DR E P K FINGER, Rochester, Minn. I agree that too enthusiastic administration of hypertonic solution will cause damage to the kidney. However, I believe that if it is given judiciously in the lowest concentration great good can be done. I am in the habit of giving from 20 to 25 per cent and from 200 to 300 cc. I have observed cases in which the excretion of urea has been around 200 Gm a day and has come down without any hematuria or other ill effect. I am afraid there would be bad results from giving 1,000 cc of 50 per cent sucrose. Dextrose is secreted as sucrose, never in the concentrated form.

#### Urinary Specific Gravity

DR MAX MILLER, J W PRICE, PH D, and DR J M HAYMAN JR, Cleveland. Twenty-four hour specimens of urine from three patients with normal renal function on a constant diet and varying fluid intake were analyzed for total nitrogen, urea, ammonia, creatinine, organic acids and the inorganic constituents necessary for an acid base balance, and the effect of each of the constituents on the specific gravity of the urine was calculated. On a low protein (40 or 50 Gm) diet approximately 70 per cent of the observed specific gravity could be accounted for, while with higher protein (100 or 110 Gm) intake these constituents made up 85 per cent. Chloride had approximately the same effect (25 per cent) as sulfates and phosphates combined. Urea contributed more to the specific gravity on the high protein diet. Creatinine had only a negligible effect (from 1 to 2 per cent). The specific gravity unaccounted for was attributed to the organic acids and other organic compounds.

#### Pain, Location, Type and Reference in Primary and Secondary Peptic Ulcer

DR ANDREW B RIVERS, Rochester, Minn. Accuracy in diagnosis, always desirable, is particularly necessary when lesions involve the upper part of the gastrointestinal tract. A diagnosis of peptic ulcer is greatly facilitated if a careful study of pain, its location, type and reference is made. Much regarding the histologic condition of ulcer can be determined if a careful analysis of the location of pain, its type and the sec-

ondary areas of invasion are carefully noted. In the case of duodenal ulcer the pain is usually midepigastria; if the lesion is uncomplicated. In penetrating types of lesions there is usually a shift of pain to the right costal margin and frequently through to the back. In gastric ulcer the location of the pain is epigastric but there is a definite tendency toward a shift of this pain into the left costal margin and over the cardiac area. Occasionally high gastric ulcers have a shift of pain along the phrenic distribution into the neck. Gastrojejunal ulcers produce pain around the umbilical area, which in the case of perforation or deep penetration has a tendency to shift downward. The most likely location of recurring ulcers following surgical procedures is considered. The tendency toward recurrence after V-shaped resections of gastric ulcers, pyloroplasty and Billroth and Polya types of resection is considered, and the location of pain caused by such ulcers is discussed. I have slides indicating the various types of operations, with drawings of the most probable location of recurring ulcers as well as indications on these slides as to where the pain in such instances originates and into which secondary areas it shifts.

#### DISCUSSION

DR WALTER L PALMER, Chicago. May I ask Dr Rivers what his experience has been with regard to the significance of pain in the back? I think it is generally thought that pain in the back indicates perforation through to the pancreas. It seems to me that I have occasionally seen pain in the back when there has been no perforation. Does Dr Rivers feel that the severity of the pain is in direct proportion to or independent of the size of the lesion?

DR ANDREW B RIVERS, Rochester, Minn. If pain which has radiated from the epigastrium to secondary areas anteriorly also begins to be referred through to the back, this is usually indicative of a penetrating lesion. There are instances, however, of pain in the back in which the ulcer does not exhibit histologic evidence of penetration. The severity of the pain is not necessarily an indication of penetrating characteristics. Severe pain intractable to the usual methods of obtaining relief usually suggests invasion of the spinal sensory nervous system and hence assumes penetrative characteristics. However, pain relayed along the splanchnic nerves can be extremely severe.

#### Stabilization of the Diabetic Child

DRS R L JACKSON and J D BOYD, Iowa City. Data are presented to show that prolonged maintenance of aglycosuria is essential in estimating the insulin requirement of the diabetic child. By lengthening the period of observation under strict control, the final dosage level of insulin is materially reduced. Until stability has been established through such prolonged control, regulation is difficult and often ineffective in either the clinic or the home. Such an equilibrated patient serves as a suitable subject for the study of the effect of variations in therapeutic technique. In evaluation of various therapeutic regimens, conclusions often will be erroneous unless preliminary stabilization has been thorough.

#### DISCUSSION

DR SAMUEL SOSKIN, Chicago. The point which the authors make is important from an aspect which they have not stressed, that is, with reference to the experimental therapy of diabetes with substances other than insulin. I ran into the same problem six or seven years ago in adults, and the phenomenon is just as true for adults as for children. This phenomenon, I think, is responsible for many reports in the literature which purport to show that various drugs and the like are efficacious in cases of diabetes and on later study prove not to be so. Any one investigating the treatment of diabetes in adults or children should take note of this spontaneous improvement which invariably takes place in the hospital and should not ascribe the result to some unknown substance which is being tested. Obviously the time to test the unknown product is after the spontaneous improvement has ceased and the patient is stabilized.

DR ELMER L SEVRINGHAUS, Madison, Wis. I agree with the authors and with Dr Soskin that this is a general problem for all age groups. There are adults and children who show a

prolonged gain in tolerance during strict control. This cannot always be expected. Dr Wilder called my attention some ten years ago to the fact that frequently children who became diabetic actually showed an improvement like this, and then some time later, from six months to a year, showed a definite exacerbation of the diabetes without any obvious reason, such as infection or metabolic insult. I wonder whether the authors had opportunity to watch the children for long periods from six months to a year to see whether that happened in the hospital and to see what caused this loss of tolerance.

DR WALTER H NADLER, Chicago. Were these results obtained in any patients using the new insulin?

DR J W MOORE, Louisville, Ky. I should like to know what was done in the matter of diet.

DR RUSSELL M WILDER, Rochester, Minn. I want to congratulate the authors on the beautiful control of the glycemia of these diabetic children. If similar results are actually maintained in these patients after their return to their homes, the results are a challenge to the rest of the members to do better than we have. It will be extraordinarily difficult to persuade parents to leave their diabetic children in hospitals for periods as long as these, but if such great improvement in the stability of the sugar content of the blood can be obtained regularly, it should be insisted on. However, the authors ought to inform us about the duration of the diabetes in the cases they reported, because if they were dealing with early diabetes I should expect corresponding improvement of tolerance even with much less rigid management.

DR R L JACKSON, Iowa City. For the past twelve years, Dr Boyd has advocated the avoidance of glycosuria and the maintenance of normal values for blood sugar in diabetic children. The periods of hospitalization of these children were most frequently too short for the patients to have reached a relatively constant insulin requirement. Home management seldom led to improvement of the level of control at the time of discharge. Insulin shocks were frequent when the parents attempted to avoid glycosuria in these poorly equilibrated patients. Consequently a minority of our patients remained well controlled according to our standards. However, a few patients reached stability and remained stabilized for several years. When protamine zinc insulin entered the picture, we wished to compare its efficacy with that of regular insulin. Before making such comparisons we felt it necessary to attain maximum stability with regular insulin. It was found that several weeks of carefully supervised hospitalization was necessary for each subject to attain such a level of control. In each of the thirty-four patients who have been hospitalized in this manner we have observed the type of response described. In general, the longer the patients' glycosuria has been uncontrolled, the less the ultimate reduction of insulin dosage and the greater the difficulty in obtaining stability. In new patients the response is more prompt, and stabilization has been maintained under home management for many months. In no patients have exacerbations occurred without a demonstrable cause. We were unable to attain satisfactory stability when patients were given protamine zinc insulin before stabilization. However, once stability had been reached with regular insulin, we were able to maintain it on transfer to the protamine product if the total daily dosage had not exceeded 20 units and if the distribution of the diet had been changed. The status of the children under this regimen was less predictable than with regular insulin. Severe insulin shocks occurred occasionally, and in one instance such shock was fatal under home management. Using commercial supplies of zinc insulin crystals, we have found no appreciable prolongation of action over similar doses of regular insulin. By adequate diets we imply that the intake of protein, calories, vitamins and minerals has been prescribed with a view of meeting fully the patient's needs so far as modern nutritional knowledge directs. The child's height is used as a guide in determining his requirements. An immediate fatty acid dextrose ratio is employed, approximately 1 to 1½. The protein allowance provides a gram or more to the pound of theoretical body weight, as determined from the height.

(To be continued)

## Current Medical Literature

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### Archives of Internal Medicine, Chicago

63 1200 (July) 1939

- Simmonds Disease and Anorexia Nervosa H B Richardson New York —p 1
- Spontaneous Pneumothorax Associated with Massive Atelectasis Experimental and Clinical Study L Escudero and W E Adams Chicago —p 29
- \*Endocrine Manifestations in Juvenile Diabetes Priscilla White Boston —p 19
- \*Influence of Liquid Petrolatum on Blood Content of Carotene in Human Beings A C Curtis and E M Kline Ann Arbor Mich —p 54
- Gastric Barrier in Bacillary Dysentery J Felsen and A G Osofsky New York —p 64
- Studies in Exophthalmic Goiter I Its Incidence Throughout the United States J M Reid San Francisco —p 71
- \*Early Manifestations of Primary Carcinoma of the Lung L A Hochberg and M Lederer, Brooklyn —p 80
- Arterioles of the Pancreas Liver Gastrointestinal Tract and Spleen in Hypertension C G Morlock Rochester Minn —p 100
- \*Epinephrine in Oil New Slowly Absorbed Epinephrine Preparation E L Keeney, J A Pierce and L N Gay Baltimore —p 119
- Plasma Protein in Hepatic Disease Study of the Colloid Osmotic Pressure of Blood Serum and of Ascitic Fluid in Various Diseases of the Liver H R Butt A M Snell and A Keys Rochester Minn —p 143
- Effect of Large Doses of Insulin on Proteins and Colloid Osmotic Pressure of Blood Serum H R Butt and A Keys Rochester Minn —p 156
- Filtration Processes in Extremities Due to Standing Osmotic Activity of Plasma Lipoids A Keys and H R Butt Rochester Minn —p 165
- Allergy Review of the Literature of 1938 T M Rackemann Boston —p 173

**Endocrine Manifestations in Juvenile Diabetes**—White presents data on 1,250 patients with juvenile diabetes (onset of the disease before the age of 15 years). In this group there were 177 patients who showed evidence of prolonged pituitary involvement. Of these 177 patients, 176 showed involvement related to the anterior lobe of the hypophysis (nine with signs of hyperactivity and 168 with signs of hypo activity). Among these patients were ninety-four dwarfs, twenty-two with Frohlich's syndrome and fifty-one with signs of infantilism. Only one patient had signs and symptoms related to the posterior lobe of the hypophysis. None of the 1,250 patients showed signs of deficiency of the thyroid gland, three had signs of hyperthyroidism, one had possible adrenal disturbance and twenty-eight had lesions related to the gonads. All presumably showed hypofunction of the pancreas, but two presented signs of hyperinsulinism in addition. Sixty-five had disturbances of the liver which may or may not have been of endocrine origin. In conclusion, the author states that the juvenile patient shows evidence of a disturbed hormone balance. There is striking evidence of hyperactivity of the pituitary body in the prediabetic stage, followed by diminution of activity which in its most extreme form occurs in the diabetic dwarf.

**Blood Carotene in Man**—Curtis and Kline studied the effect in man of various amounts of ingested liquid petrolatum on the absorption of carotene from the gastrointestinal tract, as measured by determinations of blood carotene. It was observed that liquid petrolatum given in amounts of 20 cc three times daily or twice daily before meals, or mixed with carotene dissolved in cottonseed oil prevents complete absorption of carotene from the ingested material. In this respect these experiments compare with those of Dutcher and his colleagues, of Mitchell and of Jackson. The rise of blood carotene is much more rapid when carotene is fed dissolved in vegetable oil than when a diet containing large amounts of carotene is given. The fall in blood carotene is much more rapid when it is mixed with liquid petrolatum than when liquid petrolatum and high carotene foods

are given. The mixture of the carotene in oil with liquid petrolatum must then be responsible for this change. The authors believe that their experiments confirm Jackson's conclusion that a greater depletion of carotene occurs when carotene foods and liquid petrolatum are mixed than when they are fed separately. When the total amount of liquid petrolatum is decreased from 60 cc daily to 40 cc daily but the oil is still given in 20 cc doses before the morning and the night meal, the diversion of carotene seems to be as pronounced as when 20 cc is given three times daily. When a total of 30 cc of liquid petrolatum is given to a patient on an apparently "empty" stomach, there seems to be little if any effect on the absorption of carotene from the gastrointestinal tract, as measured by the blood carotene. Little if any effect on the blood carotene is demonstrated when the liquid petrolatum is given in a single dose of 30 cc at bedtime. The authors believe that if liquid petrolatum is administered at a time of the day when it may be mixed with food in the gastrointestinal tract it interferes with the absorption of carotene.

**Primary Carcinoma of the Lung**—Hochberg and Lederer observed a group of patients with a history of thoracic symptoms of less than one month's duration and a group of patients without thoracic symptoms for whom a final diagnosis of carcinoma of the lung was made. On the basis of these cases the earliest manifestations of the disease are emphasized. Between 1917 and 1936 inclusive there were admitted to the Jewish Hospital of Brooklyn 170 patients with carcinoma of the lung, forty-seven of whom were free from thoracic symptoms until about one month before admission and another thirteen gave no history referable to the thorax. It is this group of sixty patients which forms the basis of the authors' study. There is no doubt that a certain number of cases of carcinoma of the lung will continue to escape recognition until late in the course of the disease, not merely because patients delay medical attention and because the disease produces symptoms mimicking those of other diseases and therefore is not readily recognized but because the first symptoms to attract the patient's attention are due to metastatic deposits. In the present series of cases epigastric distress, nausea, vomiting, pruritus, dysuria and hemorrhoids were not infrequently encountered as the initial complaints. There are no signs or symptoms pathognomonic of early carcinoma of the lung. A change in the habit of coughing or in the character of the expectoration or paroxysmal dyspnea without apparent cause requires a careful examination of the thorax before carcinoma of the lung is ruled out. The accessory means of diagnosis of early carcinoma of the bronchus, in the order of facility and diagnostic importance, are bronchoscopic examination and biopsy of tissue removed bronchoscopically, study of the pleural effusion, puncture of the lung exploratory thoracotomy and biopsy of an accessible metastatic nodule.

**Epinephrine in Oil**—Keeney and his co-workers prepared epinephrine in oil by suspending powdered epinephrine in peanut oil. It is so prepared that 1 cc of oil contains 2 mg of epinephrine. This preparation is absorbed slowly. Ten patients with chronic asthma who had been taking frequent daily injections or inhalations of epinephrine hydrochloride received relief from asthmatic symptoms for from eight to sixteen hours with from 0.65 to 2 cc doses of epinephrine in oil. One patient received no prolonged effect from adequate doses. Eleven patients were treated during one or more acute paroxysms of asthma. Each received from 0.5 to 1.5 cc of epinephrine in oil and remained free from asthma for from nine to sixteen hours, but more generally for twelve hours. For one patient with urticaria and another with serum sickness, epinephrine in oil provided relief from symptoms for twelve hours. The hyperglycemic response to epinephrine in oil was maintained in five cases for at least eight or nine hours, while the response to epinephrine hydrochloride, though more marked, was usually over in three hours. The cardiovascular response to epinephrine in oil in three cases was maintained for eight or nine hours, while with epinephrine hydrochloride it is generally over in from forty-five to ninety minutes. The single injection of epinephrine in oil is preferably made subcutaneously. Consecutive subcutaneous injections are irritating in some cases, but numerous intramuscular injections can usually be made without discomfort.

**Journal of Pharmacology & Exper Therap, Baltimore**

65 1128 (Jan) 1939

- Standardization of Safety Margin R H K Foster, Nutley N J —  
p 1  
Electrical Studies on Pharmacology of Autonomic Synapses I Action  
of Parasympathomimetic Drugs on Sympathetic Ganglions A S  
Marrazzi, New York —p 18  
Vitamin B Fractions and Insulin Tolerance in the Albino Rat A R  
McIntyre and J C Burke Omaha —p 36  
Analysis of Seasonal Influences on Response of Albino Mice to Anes-  
thetics E J deBeer A M Hjort and C A Cook Tuckahoe, N Y  
—p 46  
Analysis of Seasonal Influences on Duration of Anesthesia in Albino  
Mice E J deBeer A M Hjort and C A Cook Tuckahoe N Y  
—p 61  
\*Effect of Giving 2 4 Dinitrophenol on Cardiac Output and on Certain  
Other Objective Measurements of Circulation in Human Beings H J  
Stewart, N F Crane and J E Deitrich, New York —p 70  
Effect of the Diet on Anesthetic Qualities of Some Hypnotics A M  
Hjort E J deBeer and D W Fassett Tuckahoe N Y —p 79  
Comparison of Toxic, Hypnotic and Irritating Properties of Eight  
Organic Solvents A R Latven and H Molitor, Rahway N J —  
p 89  
Studies on Toxicity and Pharmacology of Nicotinic Acid K Unna,  
Rahway N J —p 95  
Gonadotropic and Adrenotropic Hormones of the Chicken Hypophysis  
R K Meyer, C H Mellish and H S Kupperman, Madison Wis —  
p 104  
Hypophysectomized Frog (*Rana Pipiens*) as a Specific Test Object for  
Melanophore Hormone of the Pituitary Body R S Teague R O  
Noojin and E M K Gehling, Chicago —p 115

**Effect of Dinitrophenol on Cardiac Output**—Under careful supervision, Stewart and his associates gave 2 4 dinitrophenol to two obese patients and studied its effect on their circulatory system. The administration of dinitrophenol (varying from 150 to 275 mg daily) in the first case raised a normal basal metabolic rate to +36 per cent and resulted in a slight increase in cardiac output, a greater increase in arteriovenous oxygen difference and essentially no change in the velocity of blood flow. There was no change in the size of the heart, venous pressure and vital capacity. Both systolic and diastolic blood pressures were slightly lowered. In the second case dinitrophenol (from 50 to 300 mg daily) resulted in an increase in oxygen consumption so that the basal metabolic rate rose from 0 and —3 to +22 per cent. The cardiac output and the arteriovenous oxygen difference were increased. The circulation time was decreased. There was no significant change in the size of the heart, venous pressure and vital capacity. The blood pressure was slightly elevated.

**Oklahoma State Medical Assn Journal, McAlester**

32 144 (Jan) 1939

- Delayed and Nonunion in Fractures W A Swedberg Oklahoma City  
—p 1  
Hyperthermic Epidermal Destruction P S Nagle, Oklahoma City —  
p 7  
Gastrointestinal Allergy G J Seibold Oklahoma City —p 15  
Insulin Treatment of Schizophrenia in the Western Oklahoma Hospital  
J L Day and H L Johnson Supply —p 21  
Surgical Treatment of Maxillary Antrum Infections C Gallaher  
Shawnee —p 27  
State Prenatal and Premarital Examination Laws C M Pearce and  
D V Hudson Oklahoma City —p 29

**South Carolina Medical Assn Journal, Greenville**

35 126 (Jan) 1939

- Status of Official Drugs versus Nonofficial W D Strother Columbia  
—p 1  
Some Problems in Conduct of Labor J D Guess Greenville —p 4  
Modern Usage of Digitalis J A Boone Charleston —p 8  
Fractures—Immediate Care—Treatment—After Care—Expected Disa-  
bility A T Moore and J T Green Columbia —p 10

**Tennessee State Medical Assn Journal, Nashville**

32 138 (Jan) 1939

- Sulfanilamide in Meningococcal Meningitis G J Levy Memphis —p 1  
Sulfanilamide in Urology J C Pennington Nashville —p 8  
Sulfanilamide in Otolaryngology E Orr Nashville —p 12  
Pneumothorax Case Reports R Smith Knoxville —p 19

**Wisconsin Medical Journal, Madison**

38 184 (Jan) 1939

- School Health Program and the Physician B S Veeder St. Louis  
—p 17  
Brachial Plexus Block P H Halperin Madison —p 21  
Relationship of the General Practitioner to the Specialist and Group  
D L Dawson Rice Lake —p 24  
The Power of Suggestion W F Lorenz Madison —p 27  
A Layman's View of the Medical Profession E G Doudna Madison  
—p 30

**FOREIGN**

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

**British Journal of Urology, London**

10 323 472 (Dec) 1938

- Staphylococcal Infections of the Kidney G Ball —p 323  
Perinephritis J A Ryle —p 337  
The Significance of Staphylococci in the Development and Treatment  
of Renal and Ureteral Stones J Hellstrom —p 348  
Clinical Pathology of Staphylococcal Infections of Urinary Tract C E  
Dukes —p 373  
Staphylococcal Infections of the Genital Tract in the Male A H  
Harkness and A J King —p 379  
Staphylococcal Infections in the Female Urethra and Genitalia J J  
Abraham —p 392

**East African Medical Journal, Nairobi**

15 277 316 (Dec) 1938

- Heart Disease in the Native Population of Uganda A W Williams —  
p 279  
Investigation into the Value of Sigmoidoscopic Examination as an Aid to  
Diagnosis of Chronic Amebic Infection in Man W Wilkinson —  
p 295  
Acute Funiculitis S M Vassallo —p 299  
Note on Some Native Ecobolic Drugs W D Raymond —p 304  
Treatment of Trophic Ulcers in Leprosy N H Maynard —p 307

**Glasgow Medical Journal**

12 269 332 (Dec) 1938

- \*Acute Phlegmonous Gastritis Report of Seven Cases A Lyall —  
p 269  
Recent Work Concerning the Etiology of Essential Hypertension  
W R Snodgrass —p 284  
Nomogram of Standard Body Weight in Men Note on McKinlay's  
Formula G H Bell and J A C Knox —p 294

**Acute Phlegmonous Gastritis**—Lyall prefers the term acute cellulitis of the stomach to phlegmonous gastritis. He reports seven cases which show that the condition is not always fatal. Recovery occurred in two of his cases and in one reported by Marshall (1935). Such healing may play a part in the etiology of gastric cirrhosis. In the author's two cases the disorder was associated with gastric ulcer. He imagines that a slight degree of this cellulitis is not uncommon in association with peptic ulcer, especially one which has been showing recent acute activity and has perforated. The friability of the gastric wall around certain perforations, making the insertion of the "purse-string" suture difficult, is probably due to spread of infection for some distance round the ulcer. The danger of performing a partial gastrectomy in such cases and thus cutting across infected tissue is obvious. The closure of the perforation by a plug of omentum, as in one of his cases, appears to be the safer procedure. Certain possibilities in the etiology of the condition discussed by the author are infection through a break in the gastric mucosa, poisons and hematogenic infection.

**Journal of Laryngology and Otology, London**

54 160 (Jan) 1939

- Laryngology's Debt to Research (Semon Lecture 1938) W M Mollison  
—p 1  
Foreign Bodies in Air Passages Causing Unilateral Obstructive Emphy-  
sema P G Gerlings —p 23

**Tubercle, London**

20 97 144 (Dec) 1938

- Tuberculosis in Cyprus (Final Report) N D Bardswell —p 97  
Congenital Cystic Disease of the Lung T H Sellers —p 114

**Bull of Health Org, League of Nations, Geneva**

7 683 900 (Oct) 1938

- Report on the Meeting of Serologists of the Permanent Commission on  
Biological Standardization (Paris, Oct 19 to 22, 1938) —p 683  
Assay of Tetanus Antitoxin Results of Investigations Performed in Five  
Institutes —p 713  
Progress Report on the Possibility of Standardizing Anti Snake Venom  
Serums J Ipsen —p 785  
Studies on Perfringens Toxin Communication from Ida A Bengtson  
on work done by Sarah E Stewart and J Marion Clampitt —p 802  
Report on the Adoption of a New International Standard of Vitamin B<sub>1</sub>  
and on Definition of the Existing Unit in Terms of That Standard  
—p 874  
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## Gynécologie et Obstetrique, Paris

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- Cardiopathy and Pregnancy Indications for Surgical Intervention Lantuejoul and Merger—p 401
- Primary Evisceration After Hysterectomy Clinical Etiologic and Therapeutic Considerations J Figarella and A Jean—p 409
- \*Intravenous Injection of Spasmodin in Cases of Cervical Spasm on After Coming Head R Fournier—p 418
- Intestinal Occlusions Following Gynecologic Operations B Y Yovano vitch—p 425
- Primary Mortality of Infants Relations to Weight of Fetus and Etiology H Bjerre—p 438

**Intravenous Antispasmodic in Cervical Spasm of Child-birth**—Fournier describes several cases of breech presentation in which a spasmodic contraction of the cervix incarcerated the after-coming fetal head and in which the spasm did not yield until after the fetus was asphyxiated. These cases raised the problem as to how to overcome this cervical spasm within a relatively short time so as to safeguard the life of the infant without increasing the maternal risks. The author shows that the different therapeutic methods which have been recommended for this purpose, such as chloroform anesthesia, anterior or posterior incision of the cervix or the use of the forceps, are either ineffective or involve dangers for the mother. In order to save the mother, the infant is frequently sacrificed in these cases. It was decided to try antispasmodic medication under these conditions. Since it is essential to exert the antispasmodic action quickly, it is necessary to administer the antispasmodic in comparatively large doses and by way of the blood stream. The author cites some of the cases in which he administered 1 cc of an antispasmodic preparation by intravenous injection and in which it was found that from thirty to sixty seconds later the after-coming head could be extracted and the infant could be revived. This method of antispasmodic medication, which was introduced by Schuckele and his students, proved successful without provoking material lesions and without losing a single child. The author says that in six cases he injected the antispasmodic during general anesthesia and in one case in the absence of anesthesia. In one instance the injection was repeated after an interval of ten minutes.

## Prensa Medica Argentina, Buenos Aires

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- Supernumerary Kidney Case T E Grimaldi—p 81
- Value and Interpretation of Frey's Hysterotonography T A Uranga Imaz—p 96
- \*Hydramnios in the Clinic R Dubrovsky and N O di Fonzo—p 102

**Hydramnios**—Dubrovsky and di Fonzo observed hydramnios in 20 pregnant women out of a group of 38,500 who were cared for at the maternity hospital of Buenos Aires from 1928 to 1936. The condition was of slow evolution in 162 cases and acute or subacute in forty-seven. There was syphilis in thirty-nine cases, twin pregnancy in twenty-two, hydriops in thirty-two, renal toxicosis in ten, heart disease in eight and diabetes in six. Eighty-eight women were normal except for the presence of hydramnios. There was practically the same proportion of chronic hydramnios in primiparas and multiparas (eighty and eighty-two cases respectively). In the majority of cases the clinical and serologic examinations for syphilis gave negative results. In the group of pregnant women with hydramnios of slow evolution, two women were discharged during pregnancy. There were thirteen twin pregnancies, twenty-five women had premature deliveries and 124 carried pregnancy to or near full term. In the group of acute and subacute hydramnios there were eight twin pregnancies. Twenty-six pregnancies were carried to or near full term. In the whole group of 207 cases there were abnormal presentations in thirty-five, disturbances of the dynamics of the uterus in eighty, proclitonia of either the umbilical cord or an arm in five cases, atony for delivery of the afterbirth in twenty-six cases. The mortality was fifty-one fetuses. In fourteen cases there was anencephalus or hydrocephalus. According to the author a careful clinical examination is indicated in the presence of hydramnios for the diagnosis of either twin pregnancy or fetal malformations. If the clinical examination fails an x-ray examination is indicated. The treatment of hydramnios consists in hygiene, a proper diet and rest for the patient. Antisyphilitic treatment has to be resorted to

only after proper indications, as syphilis is a causal factor in only a small proportion of cases. Puncture of the uterus for elimination of hydramnios improves the condition of the mother. However, generally it is followed by spontaneous abortion. The administration of mercurial diuretics is of value in many cases. The administration of intravenous injections of solution of posterior pituitary is of value in the presence of inertia, except when there are contraindications.

## Wiener Archiv fur innere Medizin, Vienna

32 283 335 (Dec 31) 1938

- \*Anacidity of Diabetic Patients E Fenz—p 283
- Differential Diagnosis of Hereditary Thrombopathy D Čicovacki—p 295
- Bechterew's Disease of Vertebral Column R Kienbock—p 311
- Use of Nitrogenic Components of Blood in Diagnosis of Urologic Diseases L Sas—p 317
- Pathogenesis of Acute Thrombopenic Purpura A Vogl—p 325

**Anacidity of Diabetic Patients**—Fenz points out that the relations between the gastric secretion and the diabetic disturbance in the metabolism have been repeatedly investigated in recent years and it was found that, whereas hypoglycemia is usually accompanied by an increase in the hydrochloric acid content, hyperglycemia is accompanied by a decrease. In view of the great significance of the diabetic inhibition of acidity and of its relation to insulinization, the author studied the gastric secretion of 116 unselected cases of diabetes mellitus with the aid of the caffeine test breakfast. He detected anacidity in sixty-five (56.3 per cent), hypo-acidity in twenty (17.2 per cent) and normal acidity or hyperacidity in the others. That insulinization cannot be the cause of the frequent anacidity was proved by the fact that anacidity was more frequent in untreated diabetic patients than in those who had received insulin, even quite new cases often showed complete anacidity. When insulin was administered during the caffeine test breakfast, the acidity curve increased in patients with normal acidity and hypo acidity, especially when a hypoglycemic shock resulted. Diabetic patients who readily respond to insulin are more often subject to anacidity than are those who are resistant to insulin, but the latter show hyperacidity more often than do those who are sensitive to insulin. The severity of the diabetes does not determine the appearance of a diabetic anacidity. It was found that forty-four of the 116 patients had the typical diabetic diarrheas. The fact that 70.5 per cent of those with diarrheas had anacidity and that among those with severe diarrheas the percentage of anacidity reached 78 seems to indicate that the diabetic diarrheas can be regarded and should be treated as gastrogenic diarrheas. Discussing the causes of diabetic anacidity, the author suggests that deviations in the relationship between insulin and counterregulation, to the disadvantage of insulin, probably play a part. It has been suggested by Falta that in those who are resistant to insulin the diabetic disturbance in the metabolism is not so much the result of an insulin deficiency as of an excessive counterregulation. Thus it is understandable that the hypo acidity, which apparently is due chiefly to an insulin deficiency, is less noticeable in these resistant cases than in the diabetic patients who are sensitive to insulin.

## Nederlandsch Tijdschrift v Geneeskunde, Amsterdam

82 6093 6216 (Dec 24) 1938

- Intracranial Glioma F A Verbeek—p 6094
- \*Prevention of Abortion A Looijen—p 6100
- Pasteurellosis in Man J G Plette—p 6106
- Difficulties in Blood Group Determination A Pondman—p 6111

**Prevention of Abortion**—Looijen says that practical observation proves that abortions take place chiefly during the so called menstrual weeks, that is, at the times when menstruation would otherwise have occurred. This seems to indicate that even during pregnancy the female organism is under the influence of the cyclic changes. He cites several cases in which threatened abortion was averted by rest in bed and by the administration of progesterone. In some of the women the difficulties recurred for several months at the time when otherwise menstruation would have taken place. Whenever this was the case, the injections of progesterone were repeated. Abortion was thus prevented and the pregnancy could be brought to term.

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## TREATMENT OF PNEUMOCOCCIC PNEUMONIA WITH SULFANILAMIDE

ALVIN E PRICE M D  
AND  
GORDON B MYERS, M D  
DETROIT

Sulfanilamide has proved bacteriostatic against types I, II, III and XIV pneumococci in vitro and in laboratory animals, according to various authors.<sup>1</sup> While the drug probably has been used widely for human pneumococcal pneumonia, the reports to date are meager. Heintzelman, Hadley and Mellon<sup>2</sup> used it in nine cases of type III pneumonia and obtained seven recoveries, whereas among ten controls there were only two recoveries. Millett<sup>3</sup> reported one case of type III pneumonia in which a crisis occurred after the use of sulfanilamide. Louis<sup>4</sup> added six cases of pneumococcal pneumonia in which recovery occurred with sulfanilamide therapy.

The following report is based on 115 patients treated with sulfanilamide, compared with forty patients receiving serum and ninety-four controls receiving identical symptomatic and supportive measures but no specific therapy. While this series is too small to be statistically significant, it is reported in the hope that an evaluation of the drug in the treatment of pneumonia may eventually be made by combining it with cases studied elsewhere.

### METHOD OF STUDY

**Diagnosis**—The diagnosis was confirmed by roentgenogram in every case. The admission sputum was typed directly by the Neufeld method, and the results

This study was aided in part by a grant from the Commonwealth Fund From the Medical Department of the City of Detroit Receiving Hospital and Wayne University College of Medicine

- 1 These include:
  - Rosenthal S M. Chemotherapy of Experimental Pneumococcus Infections. *Pub Health Rep* 52:48 (Jan 8) 1937.
  - Gross Paul and Cooper F B. P-Aminobenzenesulfonamide and Anti-pneumococcal Serum Therapy in Type I Pneumococcal Infections in Rats. *Proc Soc Exper Biol & Med* 36:535 (May) 1937.
  - Kreidler W A. Treatment of Pneumococcal Infections in Rabbits with Sulfanilamide. *ibid* 37:146 (Oct) 1937.
  - Cooper F B and Gross Paul. Sulfanilamide Antipneumococcus Serum and Vitamin C Therapy in Type II Pneumococcal Pneumonia of Rats. *ibid* 36:774 (June) 1937.
  - Cooper F B, Gross Paul and Lewis M. Chemotherapy of Pneumococcal (Type II) Meningitis in the Rat. *ibid* 38:835 (June) 1938.
  - Cooper F B, Gross Paul and Mellon R R. Action of P-Aminobenzenesulfonamide on Type III Pneumococcus Infections in Mice. *ibid* 36:148 (March) 1937.
  - Cooper F B and Gross Paul. P-Aminobenzenesulfonamide Therapy in Experimental Type III Pneumococcal Pneumonia. *ibid* 36:678 (June) 1937.
  - Schmidt L H. Use of Sulfanilamide in Treatment of Type XIV Pneumococcus Infections in Mice. *ibid* 37:205 (Oct) 1937.
- 2 Heintzelman J H L, Hadley P B and Mellon R R. Use of P-Aminobenzenesulfonamide in Type III Pneumococcus Pneumonia. *Am J M Sc* 193:759 (June) 1937.
- 3 Millett Joseph. Sulfanilamide. Report of a Case. *New York State J Med* 37:1743 (Oct 15) 1937.
- 4 Louis D J. The Treatment of Pneumonia with Sulfanilamide. *Illinois M J* 73:422 (May) 1938.
- 5 The sulfanilamide was furnished by Merck & Co.

were checked either by mouse inoculation or by the direct typing of a second specimen. Typing was repeated in the event of an extension. Blood for culture was taken on admission and cultures were repeated daily if positive. Hemoglobin estimations, white cell counts and differential counts were made daily during sulfanilamide therapy and at frequent intervals for the controls. Red cell counts were made twice weekly. Serum agglutinins were determined during convalescence.

**Selection of Cases**—All patients over 12 years of age with pneumonia due to a single type of pneumococcus who were admitted between Oct 1, 1937, and July 1, 1938, and remained in the hospital at least twenty-four hours were included in this study. Children under 12 were excluded because childhood and adult pneumonias are not strictly comparable. Patients who were moribund on admission and died within twenty-four hours were excluded because it was felt that they did not provide a fair trial of any form of therapy. Eight such patients were treated with sulfanilamide, three with serum and eight as controls. Two other patients treated as controls for three and six days respectively, with sulfanilamide therapy started within eight hours of death, were excluded from the tabulations.

Alternate patients with types I, II and VII pneumonia were treated with sulfanilamide and Felton serum, a few being reserved as controls. With types V and VIII pneumonia, serum was available for only a portion of the patients alternated with those receiving sulfanilamide. With the remaining types, patients receiving sulfanilamide were alternated with controls, who received similar symptomatic and supportive treatment. If for any reason the type could not be determined promptly, the patient was classed tentatively among those having nonpneumococcal pneumonia, who likewise were treated alternately with sulfanilamide. For several of these patients the type of invading pneumococcus was subsequently determined, thus causing discrepancies in the total number of patients treated by the two methods.

**Dosage of Sulfanilamide**—The oral route was used as a routine, subcutaneous injections being substituted with those too ill to take or retain the drug by mouth. An initial massive dose of 15 grains (1 Gm) to 20 pounds (9 Kg) of body weight was given to all patients, those over 160 pounds (73 Kg) receiving the maximum dose of 120 grains (8 Gm). A similar total (15 grains to 20 pounds) was administered during the next twenty-four hours, divided into six equal doses, the first given four hours after the initial massive dose and the remainder at intervals of four hours around the clock. An equal amount of sodium bicarbonate accompanied each dose of sulfanilamide. The blood sulfanilamide

level was determined within the first twenty-four hours and daily thereafter. An attempt was made to keep the blood concentration between 7 and 15 mg per hundred cubic centimeters but preferably above 10 mg. As long as it was within this range, 15 grains to 20 pounds divided into six equal doses was given during each subsequent twenty-four hour period. If the blood level did

changes in the blood picture, treatment with sulfanilamide was discontinued and transfusions were given.

*Treatment of Patients Receiving Serum and of Controls*—This treatment was similar to that described by one of us (A. E. P.) in a previous communication, except that serum was given in larger doses at intervals of two hours. The average total dose for type I pneu-

TABLE 1—Summary of Cases

Patients Treated with Sulfanilamide											Controls and Patients Treated with Serum										
Type	Number of Cases	Average Age	Chronic Alcoholism	Average Duration Before Therapy Hours	Average Number of Lobes Consolidated	Extension	Bacteremia	Good Therapeutic Response	Average Time Until Therapeutic Response Hours	Number of Deaths	Form of Treatment	Number of Cases	Average Age	Chronic Alcoholism	Average Duration Before Therapy Hours	Average Number of Lobes	Extension	Bacteremia	Average Time Until Therapeutic Response Hours	Number of Deaths	
I	11	36	2	90.4	1.5	2	2	9	49	1	C	6	41	2	122	2.3	1	2	152	3	
II	18	47.8	6	100	1.5	3	3	14	33.3	3	C	10	32.3	1	19.3	1.1	3	4	152	0	
III	5	40	1	62.4	1.6	0	1	2	27	3	C	6	35.5	1	166.8	1.1	0	3	36	3	
IV	9	38.3	4	113.1	1.7	4	2	5	55.6	1	C	14	39.4	3	46.2	1.2	2	56	6		
V	11	37	3	74.9	1.1	2	2	11	48.4	0	C	5	50	2	169	1.4	0	1	96	2	
VI	3	53	1	86	1	0	1	2	82	1	Ser	6	47	3	86	1	0	1	201.6	1	
VII	10	38.2	3	126.8	1.3	2	1	5	67.8	1	C	5	41.2	1	80	1	0	0	18.6	0	
VIII	7	33.4	1	77.6	1.4	0	0	6	45	1	C	12	64.5	1	48	3.5	0	0	0	2	
IX	1	31	1	48	3	0	0	1	84	0	Ser	3	32.3	0	38	2.3	0	0	64	0	
X	1	42	0	120	1	0	0	0	0	0	C	9	45.4	3	68.3	1.4	1	3	65.2	5	
XI	0										C	6	47	1	46.5	1.3	0	0	66	0	
XII	5	33.4	0	105.2	2	0	1	5	49.8	0	Ser	2	54	1	40	1	0	0	33	0	
XIII	0										C	4	29.5	1	31	1.7	1	0	96	1	
XIV	4	29	2	138.2	2	0	4	3	64	0	C	1	77	1	0	1	1	0	192	0	
XV	3	34.7	2	64	1.3	0	0	3	56	0	C	1	12	0	0	1	0	0	0	0	
XVI	2	50	0	81	1	0	0	2	24	0	C	4	40	1	24.5	1	0	1	67	0	
XVII	4	39.5	2	87.2	1.5	0	0	3	23	1	C	1	36	0	72	2	0	0	4	0	
XVIII	3	36	2	71	1.7	0	0	2	15	1	C	2	39	0	60	1	1	0	144	1	
XIX	5	35.4	0	109.4	1.2	0	2	4	70	1	C	3	44.7	1	11.3	1	1	0	84	0	
XX	2	48	1	60	1.5	0	0	1	12	1	C	2	37	0	72	2	0	0	72	0	
XXI	1	36	0	24	1	0	0	1	48	0	C	3	53	1	16	2.3	1	0	72	1	
XXII	0										C	6	41	1	68	1.5	0	0	82.8	1	
XXIII	1	12	0	144	1	0	0	1	48	0	C	6	44	0	32	1.8	0	1	165	2	
XXIV	2	45	0	66	3	0	0	2	65.5	0	C	3	50.6	0	52	1.3	0	1	84	1	
XXV	2	48	0	126	3.5	0	1	1	120	1	C	0									
XXVI	2	41	2	31.5	2	0	0	1	11	1	C	2									
XXVII	1	49	1	65	1	0	0	1	25	0	C	4									
XXVIII	1	36	0	48	1	0	0	0	0	0	C	1									
XXIX	1	60	1	168	2	0	1	0	0	1	C	1									
XXX	115	38.7	3.5	92.0	1.5	12	21	85	50.3	18	C	94	45.6	22	71.7	1.51	8	15	98.9	29	
XXXI											Ser	40	39.9	9	50.1	1.16	6	12	42.5	11	

TABLE 2—Effect of Sulfanilamide on Temperature

Blood Sulfanilamide Level at the Time Temperature Level Fell to Normal	Hours Between Commencement of Sulfanilamide Therapy and Defervescence									No Response to Sulfanilamide		
	0-11	12-23	24-35	36-47	48-59	60-71	72-83	84-95	96-120	Maximal Blood Sulfanilamide Level	Recovered	Died
	Totals											
Below 4 mg per 100 cc	0	0	0	2	0	0	0	0	0		0	0
4-6.9 mg per 100 cc	2	0	0	1	0	1	1	1	0		4	1
7-9.9 mg per 100 cc	4	4	0	6	3	1	3	2	3		4	7
10-12.9 mg per 100 cc	3	4	1	2	1	1	3	0	0		3	4
13-15.9 mg per 100 cc	4	3	1	2	0	0	0	0	0		0	3
16-21 mg per 100 cc	0	0	0	0	0	0	0	0	0		1	3
Not determined	0	2	0	0	1	0	0	1	2		0	0
Totals	13	11	9	16	7	3	7	6	11		12	18

not reach 7 mg per hundred cubic centimeters, either the subcutaneous route was substituted or a larger dose was given by mouth. In most instances administration of the drug was discontinued after the temperature had been normal for twenty-four hours. If blood levels were maintained between 7 and 15 mg per hundred cubic centimeters for five days without definite clinical response the case was classed as a therapeutic failure and the drug therapy was stopped. At the advent of serious toxic manifestations, particularly jaundice and

pneumonia was 210,000 units, for type II, 255,000, for type V, 124,000, for type VII, 175,000, and for type VIII, 110,000 units.

## SUMMARY OF CASES

*Race, Sex and Age*—Most of the significant data for the sulfanilamide, serum and control groups have been summarized in table 1. The racial distribution was as follows: sulfanilamide group, white 63.5 per cent and Negro 36.5 per cent; serum group, white 72.5



per cent and Negro 27.5 per cent, controls, white 67 per cent and Negro 33 per cent. The proportion of males in the sulfanilamide group was 80.9 per cent, in the serum-treated group 82.5 per cent and in the controls 77.7 per cent. The age distribution was not as even as desirable, the average for the sulfanilamide group being 38.7 years as compared with 39.9 years for the serum-treated patients and 45.6 years for the controls.

**Associated Diseases**—A history of daily consumption of alcohol was obtained from 30.4 per cent of the patients treated with sulfanilamide, from 22.5 per cent of those treated with serum and from 23.4 per cent of the controls. The Kahn reaction of the blood was positive for 23.5 per cent, 10 per cent and 14.9 per cent respectively. In the sulfanilamide group there was one patient with recent coronary thrombosis and four patients with congestive heart failure. The failure was secondary to hypertension in one, coronary sclerosis in two and syphilitic heart disease in one. There were four additional patients with definite clinical evidence of heart disease which remained compensated throughout their hospital stay. One of the patients treated with serum had failure of the right ventricle secondary to rheumatic mitral stenosis, another had well compensated mitral stenosis. Among the controls there were four patients with congestive heart failure secondary to hypertension and four others with com-

**Duration and Extent of Pneumonia**—The average duration of the pneumonia before treatment was ninety-two hours in the sulfanilamide group, 59.1 hours for the serum-treated patients and 71.7 hours for the controls. The average number of lobes consolidated, as determined from the admission roentgenogram, was

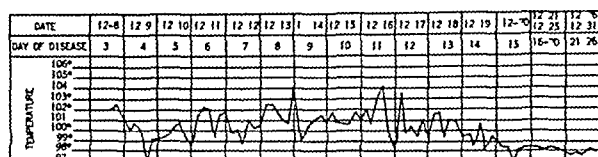


Chart 2—Temperature in case 2

TABLE 4 (case 2)—Sulfanilamide Failure, Type IV Pneumonia with Bacteremia

Patient a Negro aged 36 admission December 8 and discharge Dec 31 1937

Day of Disease	Sulfanilamide Dose in Grains	Blood Level in Mg per 100 Cc	Blood Picture				Blood Culture	Icteric Index	Miscellany
			Hb	R.B.C.	W.B.C.	N.F.F%			
2	120		13 G	4.4	6,800	33.5	IV		X ray, pneumonia L L L
4	120	10.6	11.4	3.70	9,200	86.8	Neg		Liver extract 4 cc 1 m daily Sputum type IV
5	120	9.9	11.8		20,700	84.8			
6	120	11.0	12.2		40,600				
7	80	17.0							
8	40	11.2	11.8		61,400	70-20	Neg	38	X ray pneumonia L L L and R L L Sputum type IV Urobilinogen in urine 1:300
9	30	8.2	10.2	3.34	27,700	70.25			
10	0	4.1	10.6		41,600	71.28			
11	0	0.9					Neg	30	Urobilinogen 1:300
12	0	0							X ray pneumonia R L L R U L resolution L L L
13	0						Neg		Urobilinogen 1:50 X ray slight resolution on right
15	0		10.2		27,400	56.40		16	
21-26	0		9.6		8,000	20-67			

1.53 in the sulfanilamide group, 1.16 in the serum group and 1.51 in the controls. The incidence of bacteremia was 19.1 per cent in the sulfanilamide group, 30 per cent for those treated with serum and 14.7 per cent for the controls. The admission leukocyte count was below 7,000 for four patients of the sulfanilamide group, for three serum-treated patients and for nine controls, and between 7,000 and 10,000 for twelve, four and eighteen patients, respectively.

## RESULTS

**Effect of Sulfanilamide on Temperature**—In table 2 the patients treated with sulfanilamide have been classed according to the number of hours elapsing between the commencement of the drug therapy and defervescence. The temperature fell to normal within twenty-four hours of the onset of sulfanilamide therapy in twenty-six cases (22.6 per cent), within forty-eight hours in fifty-one cases (44.3 per cent) and within 120 hours in eighty-five cases (73.9 per cent). On the other hand, the temperature reached normal within forty-eight



Chart 1—Temperature in case 1

TABLE 3 (case 1)—Prompt Crisis Following the Use of Sulfanilamide Type VII Pneumonia

Patient a white youth aged 17 onset S p in January 10 admission January 11 and discharge Jan 24 1938

Day of Disease	Sulfanilamide Dose in Grains	Blood Level in Mg per 100 Cc	Blood Picture				Blood Culture	Agglutination	Miscellany
			Hb	R.B.C.	W.B.C.	N.F.F%			
1	140	8.7					Neg		X ray consolidation of R M L and portion of R L L
2	190	8.1	17.0	4.99	38,000	63.32			
3	190	8.6	12.0		20,100	61.31			
4	60	8.1							
5	40	4.2	11.0		10,400	37.48		1:10	X ray considerable resolution
9									
14		13.0			8,400	30.52			
		12.0	4.18						

pensated hypertensive or arteriosclerotic heart disease. Two controls and two of the patients treated with sulfanilamide had chronic asthmatic bronchitis. One of the patients treated with sulfanilamide had a compound fracture complicated by osteomyelitis, which was an important contributory factor toward his death. One of those in the control group had a carcinoma of the colon. The remainder had no associated diseases which were likely to affect the prognosis.

hours in only 16 per cent of the control cases. The effect of sulfanilamide on temperature was most striking when administration was started within thirty-six hours of the onset of the pneumonia. In fifteen of twenty-five such cases, the entire duration of the pneumonia, from onset to defervescence, was less than seventy-two hours. An example of an abortive crisis following sulfanilamide therapy is given in chart 1 and table 3 (case 1).

Twelve patients who did not show a temperature response within 120 hours but subsequently recovered from the pneumonia were classed as sulfanilamide failures. An example is given in chart 2 and table 4 (case 2). In this case, the blood culture became negative and a pseudocrisis occurred within twenty-four hours of the commencement of sulfanilamide therapy. In spite of adequate blood levels, the fever returned and the pneumonic process extended. The patient finally recovered, long after administration of the drug had been discontinued. Of the eighteen patients who died, two had had a pseudocrisis, whereas the other sixteen showed no definite temperature response.

three of fifteen controls (20 per cent) and for seven of twelve patients (58.3 per cent) treated with serum. For those responding to sulfanilamide the blood culture usually became negative within twenty-four hours of the onset of therapy. The results were particularly good with type XIV, all four patients recovering. One of the most dramatic results is illustrated in chart 3 and table 6 (case 3). The patient was admitted on the seventh day of illness and was given no specific therapy during the first five days in the hospital. He showed roentgenographic evidence of an extension on the tenth day and positive blood cultures on the seventh, ninth, tenth and eleventh days. He was given a massive dose of sulfanilamide on the twelfth day and eight hours later had a crisis, eventually making a complete recovery. In chart 4 and table 7 (case 4) the course of type II pneumonia and bacteremia in a chronic alcoholic addict is illustrated. Sulfanilamide was started on the second day of illness. The blood culture was negative the following day and the temperature was normal from the fourth day. In chart 5 and table 8 (case 5) the course

TABLE 5—Results in *Pneumococcic Bacteremia*

	Type of <i>Pneumococcic Bacteremia</i>														Total
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	
<b>Sulfanilamide</b>															
Cases in which blood culture was positive	2	3	1	2	2	1	1	1	4	2			1		21
Cases in which blood culture became negative	2	2	0	2	2	0	0	1	4	2			1		14
Number of deaths	0	1	1	0	0	1	1	0	0	1			1		4
<b>Controls</b>															
Cases in which blood culture was positive	2	3	2	1	1			1		1	1	1	1	1	13
Cases in which blood culture became negative	1	0	0	0	0			1		0	0	1	0	0	3
Number of deaths	2	3	2	1	1			0		1	1	0	1	1	13
<b>Serum</b>															
Cases in which blood culture was positive	4						3								7
Cases in which blood culture became negative	4	3					0								7
Number of Deaths	0	3					3								6

In table 2 an attempt was made to correlate the temperature effect with the blood sulfanilamide level at the time of defervescence. No significant difference was noted between the group with blood sulfanilamide concentrations over 10 mg per hundred cubic centimeters and the group with levels between 7 and 9.9 mg. When no therapeutic response occurred at low levels, larger doses were purposely given. One patient was observed who showed no improvement during three days when the blood level fluctuated between 4 and 7 mg per hundred cubic centimeters but had a fairly prompt crisis after it rose to 10 mg. There were no definite examples of therapeutic failures at blood levels of from 7 to 9.9 mg per hundred cubic centimeters followed by responses at higher levels. However, a much larger series will be needed to determine the optimal blood sulfanilamide concentration.

The effect of sulfanilamide on the pulse rate roughly paralleled that on the temperature. In some patients there was an associated symptomatic improvement but in many this was masked by the lassitude produced by the drug.

**Effect of Sulfanilamide on Bacteremia**—The results in the cases of pneumococcic pneumonia complicated by bacteremia are given in table 5. For twenty-one of the patients treated with sulfanilamide the blood culture was positive on admission, and for seventeen (81 per cent) it became negative during treatment. On the other hand, the blood culture became negative for only

of type V pneumonia and bacteremia treated with sulfanilamide is illustrated. The blood was sterilized promptly and the temperature fell by lysis.

Five patients whose blood cultures became negative with treatment subsequently died. Three of these were in the sulfanilamide group, one in the serum group and one among the controls. In one of those whose blood culture became negative with sulfanilamide therapy, hemolytic anemia subsequently developed, making it necessary to discontinue use of the drug. Ten days later the blood culture again showed the same organism and pneumococcic meningitis developed. At autopsy, it was seen that the pneumonia had completely resolved.

**Effect of Sulfanilamide on the Consolidation**—Daily physical examinations were made to detect extensions and complications of the pneumonic process. The physical appearances were checked as often as necessary by x-ray examination. X-ray evidence of extension during sulfanilamide therapy was obtained in twelve cases (10.4 per cent), during serum therapy in six cases (15 per cent) and in eight control cases (8 per cent). Nine of the twelve patients in whom extensions developed during sulfanilamide therapy eventually recovered. The patients were also followed to determine the completeness of resolution. The consolidation cleared up in all but one of the patients classed as recovered. This patient still had evidence of unresolved pneumonia five months after sulfanilamide therapy had been discontinued. The effect of sulfanil

amide on the sputum will be reported by Dr. Arthur W. Frisch in a separate communication.

**Effect of Sulfanilamide on Complications**—The incidence of empyema was 17 per cent in the sulfanilamide group, 10 per cent for the serum-treated patients and

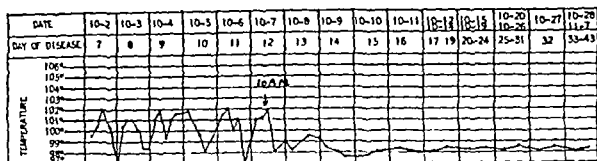


Chart 3—Temperature in case 3

TABLE 6 (case 3)—Crisis Following the Use of Sulfanilamide  
Type IV Pneumonia and Bacteremia

Patient a Negro aged 27 admission October 1 and discharge Nov. 7  
1938, delayed resolution

Day of Disease	Oral Dose Sulfanilamide in Grains	Blood Level in Mg per 100 Cc	Blood Picture					Blood Culture	Miscellany
			Hb	RBC	WBC	DIFF%			
7			12.6	4.4	33,000	84.14		XIV	X-ray consolidation R U L, sputum type XIV
9		17.0		4.17	20,000	80.14		XIV	
10								XIV	X-ray consolidation right lung
11								XIV	Very toxic
12	140	13	11.4	4.1	36,600	84.14			Crisis after sulfanilamide
13	80		11.8		35,600	45.50			Marked cyanosis
14	60	6.6						Neg	
15	20								Symptom free
16		11.6			24,300	65.24			
17-19		10.8	3.6		23,400	51.39			Icteric index 10 massive consolidation still present
20-24		11.8	4.6		17,000	36.55			X-ray consolidation and atelectasis
25-31		10.2	4.19		13,500	23.51			Diathermy right side of chest
32									X-ray considerable resolution
34-36		11.4	4.3		9,200	37.59			Complete resolution

21 per cent for the controls. More frequent than empyema were small pleural effusions, which did not become purulent and eventually disappeared without surgical intervention. The incidence of these in the three groups was 4.3 per cent, 7.5 per cent and 5.3 per cent respectively. None of the patients in this series had lung abscess or pericarditis.

**Effect of Sulfanilamide on Mortality**—The mortality rate for the 115 patients treated with sulfanilamide was 15.7 per cent and for the ninety-four controls was 30.8 per cent. The death rate in fifty-seven cases of types I, II, V, VII and VIII pneumonia treated with sulfanilamide was 10.5 per cent, whereas it was 27.5 per cent in forty cases of the same types treated with serum. While these figures are favorable to sulfanilamide, they are inconclusive because of the small number of cases, unevenly balanced as to type as well as to the following factors. The age distribution favored sulfanilamide. Likewise, the proportion of patients with leukopenia was lower in the sulfanilamide group. These factors were partly balanced by the longer average duration before treatment and the higher incidence of alcoholism, particularly delirium tremens, in the sulfanilamide group. The average extent of the consolidation was nearly equal in the sulfanilamide and control groups

and considerably less in the serum group. The incidence of bacteremia was highest in the serum group and lowest in the controls.

The mortality for pneumonia complicated by bacteremia is given in table 5. The mortality rate was 33 1/3 per cent for the patients treated with sulfanilamide, 50 per cent for those treated with serum and 86.6 per cent for the controls.

The results with type II pneumonia were particularly encouraging. Among eighteen patients treated with sulfanilamide there were 16.6 per cent of deaths, as compared with a mortality of 42.9 per cent for fourteen patients treated with serum. The results with the other types are given in table 1 and will not be discussed further because of the small number of cases of each type.

#### TOXIC MANIFESTATIONS

**Cyanosis**—This developed in practically every patient treated with sulfanilamide. There was no apparent correlation between the depth of the cyanosis and the outcome in the case. Many patients with deep cyanosis made satisfactory recoveries. It has been shown that sulfanilamide cyanosis is usually due to blood pigmen-



Chart 4—Temperature in case 4

TABLE 7 (case 4)—Abortive Course of Type II Pneumonia and Bacteremia Following Sulfanilamide Therapy

Patient a white man aged 47 onset 3 a.m. June 9 admission June 9 and discharge June 23, 1938 chronic alcoholism

Day of Disease	Sulfanilamide Dose in Grains	Blood Level in mg per 100 Cc	Blood Picture					Blood Culture	Sputum	Miscellany
			Hb	RBC	WBC	DIFF%				
1	0	10.0			10,000	15-74		Pos	II	
2	240	10.3	9.5	3.45	17,300	46.43			II	X-ray consolidation R L L
3	120	11.1	9.5		15,100	66.27		Neg		Kline test pos Kahn test pos
4	120									
5	60	13.1	10.5	3.66	9,900	50.38				
6	0									X-ray consolidation with small pleural effusion
9	0	11.0	3.6		8,400	30.47				
12	0	11.0			4,100	12.55				
13-15	0									Consolidation resolving fluid disappearing

tion, less commonly to methemoglobinemia and rarely to sulfhemoglobinemia. King and Leslie<sup>8</sup> were unable to demonstrate any significant reduction in oxygen saturation of the arterial blood during sulfanilamide therapy in eight cases.

We are planning to repeat these studies on a larger scale with pneumonia, since it must be shown that

<sup>7</sup> Marshall E. K. and Walz E. M. On Cyanosis from Sulfanilamide. Bull. Johns Hopkins Hosp. 61: 140 (Aug.) 1937. Ottenberg Reuben and Fox C. L. Explanation for the Cyanosis of Sulfanilamide Therapy. Proc. Soc. Exper. Biol. & Med. 38: 479 (May) 1938.  
<sup>8</sup> King F. H. and Leslie Alan. Oxygen Saturation of Arterial Blood in the Cyanosis from Sulfanilamide. J. A. M. A. 110: 2069 (June 18) 1938.

sulfanilamide does not materially reduce arterial oxygen saturation before it can be recommended as a therapeutic agent

*Gastrointestinal Manifestations*—Anorexia and nausea were frequent but seldom severe enough to interfere with the oral administration of the drug

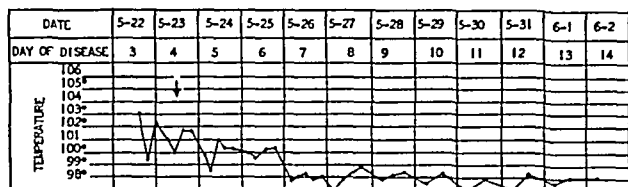


Chart 5—Temperature in case 5

TABLE 8 (case 5)—*Recovery from Type V Pneumonia and Bacteremia Following the Use of Sulfanilamide*

Patient a Negro aged 22 onset and admission May 20 and discharge June 2 1938

Day of Disease	Sulfanilamide Dose in Grains	Blood Level in Mg per 100 Cc	Blood Picture				Blood Culture	Agglutination	Miscellany
			Hb	RBC	WBC	NF F%			
3	0						V		
4	160		13.0	4.97	21,400	73.13	V		X ray dense consolidation RUL
5	120	10.1	13.0		16,600	68.15	Neg		
6	120	9.0	13.5	5.2	17,500	52.20	Neg		
7	120	10.0	12.0	4.22	13,100	51.30			
8	60	9.8	13.5		13,100	64.19			
9	0							1.90	
12	0		13.0	5.32					X ray resolution nearly complete

Vomiting and diarrhea were rare. Jaundice was present in the six patients in whom hemolytic anemia developed. In one other (chart 2 and table 4) toxic hepatitis developed. Since there was a coincidental extension of the pneumonia, the hepatitis may have been due to the pneumococcal infection.

*Cerebral Manifestations*—Lassitude, headache and drowsiness were common toxic manifestations. Delirium developed in fourteen patients treated with sulfanilamide. With nine of these a history of chronic alcoholism was elicited and the clinical picture was typical of delirium tremens. With the other five it could not be definitely determined whether sulfanilamide or the pneumonia itself was responsible for the delirium.

*Fever and Rash*—While it was frequently difficult to distinguish between fever due to sulfanilamide and that due to the disease itself, there were seven instances in which the fever continued in spite of apparent clinical improvement. In these cases the temperature tended to reach a peak in the early morning and fell in the afternoon. The fever subsided in all seven cases soon after administration of the drug was stopped. In two of the cases a morbilliform rash accompanied the fever.

*Anemia*—In six of the patients treated with sulfanilamide acute hemolytic anemia developed, an incidence of 52 per cent. The total fall in hemoglobin content exceeded 4 Gm per hundred cubic centimeters and the total fall in red cells was in excess of 1,500,000 per cubic millimeter in each case. The anemia developed abruptly in every case, appearing on the second day of

sulfanilamide therapy in one case, on the third day in four and on the fifth day in one. In every case the hemoglobin content and red cell count continued to fall for two to three days after the drug therapy was discontinued. One patient had pneumococcal meningitis ten days after the onset of the anemia and died. The other five patients made a complete recovery with the aid of blood transfusions. Four returned for check counts some time after discharge. In one there was no appreciable change in the blood picture two months afterward. In the other three the check blood count was normal.

An example of acute hemolytic anemia developing after 170 grains (11 Gm) of sulfanilamide is given in chart 6 and table 9 (case 6). The patient had type XIV pneumonia with bacteremia and leukopenia and was considered moribund at the time use of the drug was started. Within two days marked leukocytosis developed and the blood culture became sterile. A complete recovery eventually occurred. A similar abrupt neutrophilic leukocytosis accompanied the hemolytic anemia in four of the five remaining cases. This may prove a valuable warning sign.

In twenty-one additional cases (182 per cent) a more gradual and moderate fall in the hemoglobin con-

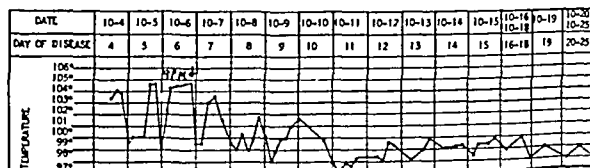


Chart 6—Temperature in case 6

TABLE 9 (case 6)—*Acute Hemolytic Anemia Following the Use of Sulfanilamide*

Patient a Negro woman aged 31 onset September 30 admission October 4 and discharge Oct. 20 1937 tertiary syphilis

Day of Disease	Oral Sulfanilamide Dose in Grains	Blood Level in Mg per 100 Cc	Blood Picture				Blood Culture	Miscellany
			Hb	RBC	WBC	NF F%		
4					5,700	20.56		X ray consolidation RUL
6	90		10.6	4.00	5,700	81.15	XIV	Sputum type XIV Very toxic cyanotic delirious
7	80	7.3						X ray consolidation right lung
8		7.5	8.4		48,000	64.32	Neg	Icteric index 60 much less toxic
9			3.8		32,000	50.33		Pulse 160-180 transfusion 600 cc
10			8.4		29,400	61.34		
11			7.2	2.58	32,400	50.33		Clinical evidence of resolution
12			5.6	2.85	29,600	60.24		
13			6.6	2.30	19,400	49.40		Transfusion 500 cc
15			7.4	2.60	8,100	21.45		X ray resolution nearly complete
19			9.4	3.30				Icteric index 6
20								Clinical recovery

tent (between 2 and 4 Gm per hundred cubic centimeters), with a comparable fall in the number of red cells (between 500,000 and 1,500,000 per cubic millimeter) occurred. In twelve of these the anemia appeared during the administration of sulfanilamide, and in the other nine it developed after the drug therapy was discontinued. Nine of the twenty-one patients had check blood

counts some time after discharge. One, who returned in two weeks, showed no change whereas the other eight, who returned after longer intervals, showed a satisfactory response. Thirty of the sulfanilamide group in whom anemia did not develop while they were in the hospital also returned for check blood counts after discharge. In every instance the blood count was as high as or higher than at discharge.

Acute hemolytic anemia was not observed among the control patients or serum-treated patients. Moderate secondary anemia developed in 11.6 per cent of such patients for whom adequate hematologic records were kept.

**Leukocytosis**—In none of the patients treated with sulfanilamide did granulocytopenia develop. In all four of the patients with an initial white cell count below 7,000 leukocytosis developed during sulfanilamide therapy, whereas six of the twelve whose initial count was between 7,000 and 10,000 showed a distinct rise after the drug therapy was started. The leukocytosis may have been due either to the infection or to liver extract, which was administered simultaneously to some of the patients, rather than to sulfanilamide. The abrupt leukocytosis which accompanied hemolytic anemia, however, was probably due to sulfanilamide.

#### COMMENT

While the results with sulfanilamide are encouraging, its place in the treatment of pneumonia has not been definitely determined. The future trend will probably be toward a combination of serotherapy and chemotherapy, particularly with types II and III. Osgood<sup>9</sup> found that a combination of sulfanilamide and serum was more effective against pneumococci in human bone marrow cultures than either preparation alone. We have used the two simultaneously in two cases of type I, in one case of type V and in two cases of type VII pneumonia without a fatality and in five cases of type II with one death.

Concerted efforts are being made to prepare derivatives that are more effective than sulfanilamide against the pneumococcus. Whitby<sup>10</sup> recently reported that sulfapyridine (2-[p-aminobenzene-sulfonamido] pyridine) will protect against minimum lethal doses of 10,000 pneumococci of types I, VII and VIII and against slightly smaller numbers of pneumococci of types II, III and V. Evans and Gaisford<sup>11</sup> reported a mortality rate of 8 per cent for 100 patients treated with this drug as compared with 27 per cent for 100 controls. Their results are unconvincing, however, since they are not analyzed from the standpoint of type, duration before treatment, extent of consolidation and incidence of bacteremia. Good results have been obtained in the laboratory with various sulfones.<sup>12</sup>

#### SUMMARY

This preliminary report is based on 115 cases of pneumococcic pneumonia treated with uniform doses of sulfanilamide and alternated with forty cases treated with Felton serum and ninety-four controls who

received no specific therapy. The results were analyzed from the standpoint of the type of pneumococcus, average age of the patients, duration of the pneumonia before treatment, extent of the consolidation, blood culture, initial white cell count, duration after the onset of treatment, associated diseases and complications. The mortality rate was 15.7 per cent for the entire sulfanilamide group and 30.8 per cent for the controls. The death rate for fifty-seven patients with types I, II, V, VII and VIII pneumonia treated with sulfanilamide was 10.5 per cent, whereas it was 27.5 per cent for forty patients with the same types treated with serum. Of twenty-one patients with pneumococcic bacteremia treated with sulfanilamide seven died, of twelve treated with serum six died and of fifteen controls thirteen died. The most important toxic manifestation was anemia. In 5.2 per cent of the patients treated with sulfanilamide a severe hemolytic anemia developed and in an additional 18.2 per cent moderate secondary anemia developed.

#### PNEUMOCOCCIC PNEUMONIAS COMPLICATING PREGNANCY AND THE PUERPERIUM

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It has long been recognized that pneumonia is a serious complication of pregnancy with a considerably higher death rate than for nonpregnant women.<sup>1</sup> Some of the factors pertaining to pregnancy have received limited attention in the past,<sup>2</sup> but data concerning the pneumonias are scarce. From the practical possibilities of reducing mortality, recent developments in the fields of specific serum therapy and of chemotherapy have focused attention on the etiologic agents in infectious diseases, and this has been true particularly in the case of the pneumonias. References to the bacterial incitants of the pneumonias of pregnancy are very scarce and, until the recent reports of Bullowa<sup>3</sup> and of Rogers and Gooch,<sup>4</sup> have been limited to individual case reports.

There is at present a widespread interest among physicians and public health workers in the control of the mortality from pneumonia. Much of this attention is focused on etiologic diagnosis, particularly pneumococcus typing, and on the specific serum treatment of some of the pneumococcic pneumonias. It is appropriate therefore to present a series of 212 cases of "typed" pneumococcic pneumonia complicating preg-

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Owing to lack of space this article has been abbreviated for publication in THE JOURNAL by the omission of tables 1, 3, 4, 7, 10 and 11. The complete article appears in the authors' reprints.

Dr. Alexander W. Winkler assisted in the collection of the data in the earlier part of this study and Dr. John W. Brown assisted with the more recent cases. Dr. Frederick C. Irving gave us permission to use the data from the Boston Lying-in Hospital, and Dr. K. Jefferson Thompson, former research fellow in obstetrics, carried out the serum treatment of a number of the patients there. The members of the staff of the obstetrics service of the Boston City Hospital cooperated.

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nancy and the puerperium from the Boston City Hospital and the Boston Lying-in Hospital. The chief interest in this study concerns the classification of these cases according to the type of the pneumococcus and the influence of specific serum treatment on the mortality of the pneumonias due to some of these types. However, the effect on mortality of some of the other important factors concerning both the pneumonia and the pregnancy will be considered.

Only those patients have been included who had definite symptoms and physical and/or x-ray signs of pneumonia and from whose sputum, lung or pleural fluid or blood cultures pneumococci were identified and typed before July 1, 1938. About one third of the cases occurred before 1929, when typing was carried out only for types I, II and III. In almost all the remaining cases the pneumococci were classified with the aid of serums for the higher types.<sup>5</sup> Most of the serum treated patients received concentrated antipneumococcus horse serums. A few of the cases of type I pneumonia occurred between 1919 and 1922 and the patients were treated with unconcentrated type I antipneumococcus horse serum,<sup>6</sup> and in some of the recent cases homologous type-specific concentrated rabbit

TABLE 2—*Pneumococic Pneumonias Complicating Pregnancy and the Puerperium, Character of the Pulmonary Lesion in Relation to Delivery and Maternal Mortality*

	Lobar Pneumonia				Atypical Pneumonia			
	Num ber of Patients	Num ber Died	Per cent age Died	Per centage Bacte remic	Num ber of Patients	Num ber Died	Per cent age Died	Per centage Bacte remic
Prepartum pneumonia	106	30	28	36	36	17	47	39
Postpartum pneumonia	35	7	18	40	32	13	41	17
All cases	144	37	26	37	68	30	44	28

\* Including patients with lobar pneumonia in some other parts of the lung

serums were given.<sup>7</sup> Five patients were treated non-specifically with serums containing no antibodies for the homologous type of pneumococcus. These have been included among the non-serum treated patients. The pneumococcus typings were carried out by standard methods.<sup>8</sup> The Neufeld method<sup>9</sup> applied directly to sputum or to the peritoneal exudate of mice inoculated with sputum has been relied on for most of the rapid typing in the recent cases. At the Boston City Hospital, most of the prepartum pneumonia was treated in the medical services with the cooperation of the obstetrics staff. The postpartum pneumonias and those occurring late in pregnancy were usually treated in the obstetrics service with the cooperation of the staff of the medical services. Thirty of the cases are from the Boston Lying-in Hospital.

5 Cooper, Georgia, Edwards, Marguerite and Rosenstein, Carolyn. The Separation of Types Among the Pneumococci Hitherto Called Group IV and the Development of Therapeutic Antiserums for These Types. *J. Exper. Med.* 49: 461 (March) 1929. Cooper, Georgia, Rosenstein, Carolyn, Walter, Annabel and Peizer, Lenore. The Further Separation of Types Among the Pneumococci Hitherto Included in Group IV and the Development of Antisera for These Types. *ibid.* 55: 531 (April) 1932.

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9 Sabin, A. B. Immediate Pneumococcus Typing Directly from the Sputum by the Neufeld Reaction. *J. A. M. A.* 100: 1584 (May 20) 1933.

## INCIDENCE

Since bacteriologic studies of cases of pneumonia have been made as a routine in very few clinics, the available figures concern all the pneumonias irrespective of cause and there are scant reliable data concerning the incidence of pneumococcal pneumonias associated with pregnancy. Norris and Farley<sup>10</sup> collected 13,611 cases of pregnancy, among which pneumonia was diagnosed in 120, or 0.8 per cent. Jurgensen<sup>1</sup> reported pneumonia among 2.3 per cent of 1,842 pregnant women. Wessinger<sup>2</sup> quoted figures from Vienna indicating that forty-seven, or 1.9 per cent, of 2,475 women with pneumonia were pregnant. Nuckels and Hertig<sup>11</sup> found twenty-three women with pneumococcal infections (probably all had pneumonia) among 20,364 delivered at the Boston Lying-in Hospital, an incidence of one case to 855 deliveries. They stated the general belief that pneumococcal infections are less common in pregnant than in nonpregnant women because of the comparatively sheltered existence of the former. Rogers and Gooch,<sup>1</sup> on the other hand, found the pregnancy rate (where the duration of pregnancy is six months or more) to be 6.6 per cent for their serum treated women of child-bearing age with type I pneumonia, as compared to an estimated 2.1 per cent rate of pregnancy in a similar age group in the general female population.

The data concerning the incidence of pneumonia at the Boston City Hospital for the arbitrarily chosen period 1931-1937, inclusive, were reviewed (table 1). All patients admitted during pregnancy or the puerperium and all those for whom a diagnosis of pneumonia was made irrespective of cause were included. Among the 13,446 patients with pneumonia, 1,277, or 9.5 per cent, were between 18 and 45 years of age. These included 164 pregnant or recently parturient women, constituting 1.2 per cent of all those with pneumonia, or 12.8 per cent of the women with pneumonia who were between 18 and 45 years of age. Among the 25,891 patients admitted to the hospital in the same period during pregnancy or the puerperium, the incidence of all pneumonias was 0.63 per cent, or one case of pneumonia in 158 cases. It is interesting to note that while lobar pneumonia was more frequent than the atypical pneumonias (bronchopneumonias) in all women between 18 and 45 (12.4 and 7.5 per cent respectively) the reverse was true of the pneumonias complicating pregnancy. With women of this age group, 10.4 per cent of the cases of lobar pneumonia occurred in association with pregnancy, as compared with 15.7 per cent of the cases of bronchopneumonia. This is consistent with previous observations to the effect that lobar pneumonia is usually a primary disease and that the atypical pneumonias are more often secondary to other serious conditions except in infants and in aged persons.<sup>12</sup>

## CHARACTER OF THE PULMONARY LESIONS

Other features bearing on the character of the pulmonary lesions were brought out in an analysis of the cases of pneumococcal pneumonia under consideration, in 142 of which the condition occurred during preg-

10 Norris, G. W. and Farley, D. L. in Osler, William and McCrath, Thoma. *Modern Medicine*. Philadelphia: Lea & Febiger, 1913, vol. 1, p. 264.

11 Nuckels, H. H. and Hertig, A. T. Pneumococcus Infections of the Genital Tract in Women, Especially During Pregnancy and the Puerperium. *Am. J. Obst. & Gynec.* 35: 782 (May) 1938.

12 Finland, Maxwell. The Significance of Specific Pneumococcus Types in Disease. Including Types IV to VIII (Cooper). *Ann. Int. Med.* 10: 1531 (April) 1937.

nancy and in seventy of which it began after delivery. In approximately one in every four cases of pneumonia occurring during pregnancy the pneumonia was "atypical" or bronchopneumonia, whereas in about one half of the cases of pneumonia observed post partum the condition was atypical. The mortality for the atypical pneumonias was higher in each instance, in spite of a lower incidence of bacteremia (table 2). This, again, is in accord with the observations previously recorded for all pneumococcal pneumonias.<sup>1-</sup>

#### TYPES OF PNEUMOCOCCI

The incidence of the various types among the 212 cases of pneumococcal pneumonia complicating pregnancy and the puerperium was similar to that found among 2,484 cases previously reported from the Boston City Hospital<sup>12</sup> (table 3). Type I was the most frequent type and accounted for about one fourth of the cases in each series. Among the other common types, types V and XIV had a somewhat higher incidence; type VII had the same incidence, and types II, III and VIII were somewhat less frequent in the cases of pneumonia complicating pregnancy. Since the mortality for the pneumonias caused by some of these types of pneumococci has been favorably influenced by treatment with type-specific antisera<sup>13</sup> it is of interest to note the results in the cases of pneumonia complicating pregnancy.

#### MORTALITY AND BACTEREMIC INCIDENCE

It is necessary first to consider the general mortality in the present cases in comparison with all cases of pneumococcal pneumonia. Since age and bacteremia are the two most important factors influencing mortality, their effect was analyzed. In each decade the death rate was found to be higher for pneumonia complicating pregnancy and the puerperium than for all the pneumonias. This higher death rate was constantly associated with a higher incidence of bacteremia (table 4).

#### EFFECT OF SPECIFIC SERUM TREATMENT ON MORTALITY

Serum treatment for types other than I and II was available during the last three years of the study and was used mostly for pneumonia due to types V and VII pneumococci. The mortality rates for the serum treated and non-serum treated patients are listed by type in table 5. The death rate for all the fifty-four patients treated with specific serum was 20 per cent as compared with 35 per cent for those who did not receive specific serum. These figures do not convey the complete picture, however, even when the bacteremic incidence is taken into account for it is necessary to consider the various factors contributing to the death in each of the fatal cases. Some of these factors in most of the cases from the Boston City Hospital have been noted in previous reports concerning serum therapy<sup>14</sup> and need not be reviewed here in detail. Briefly, in almost every one of the patients who died after specific treatment, one or more of the fol-

lowing conditions contributed to the failure of serum therapy: (1) delayed treatment, that is, treatment begun after the fifth day of the pneumonia, (2) grossly inadequate amounts of specific antibody, (3) treatment undertaken when the patient was in poor general condition, death occurring within a few hours, (4) mixed infections, notably hemolytic streptococcus sepsis, (5) focal complications, including vegetative endocarditis and (6) general systemic complications, such as decompensated heart disease or eclampsia.

It is of interest that Rogers and Gooch<sup>4</sup> had the same death rate, 19 per cent, for their forty-two serum treated pregnant patients with type I pneumonia, as compared with 11 per cent for serum treated nonpregnant patients aged from 15 to 45 with type I pneumonia. Bullock's<sup>4</sup> nineteen serum treated pregnant patients with type I pneumonia included six with bacteremia. There were five deaths, all associated with bacteremia. His entire series included fifty-nine patients with pneumococcal pneumonia complicating pregnancy, twenty-

TABLE 5—*Pneumococcal Pneumonias Complicating Pregnancy and the Puerperium: Death Rates in Relation to Bacteremia and to Specific Serum Treatment*

Type		Blood Culture								All Patients	
		Positive		Negative		Not Done					
		Number of Patients	Number Died	Number of Patients	Number Died	Number of Patients	Number Died	Number of Patients	Number Died	Percentage Bacteremic	Percentage Bacteremic
I	Serum	14	2	15	2	3	2	32	6	19	48
	No serum	9	5	8	0	6	2	23	7	30	43
II	Serum	1	1	2	0	0	1	4	1	14	71
	No serum	0	0	0	0	4	1	7	1	14	0
V	Serum	3	1	5	2	0	2	8	3	38	37
	No serum	7	3	2	2	2	2	12	9	70	70
VII	Serum	1	0	0	0	1	0	1	0	0	23
	No serum	1	1	0	0	2	0	6	1	17	23
All types	Serum	23	4	24	5	4	2	54	11	20	46
	No serum	28	21	10	16	19	18	55	36	35	29

\* Including patients treated with heterologous serum.

† Including one patient with type XIV pneumonia who died and one with type IX who recovered.

nine were serum treated with ten deaths (34 per cent), and thirty were not serum treated with seven deaths (23 per cent). However, there were seven bacteremic patients among the ten serum treated patients who died and only two among the seven non-serum treated patients, indicating that the patients with severest involvement were chosen for treatment with serum. In Ramsdell's<sup>1</sup> 352 collected cases of pneumonia in pregnancy (without respect to cause), there were ninety-six deaths or 27.3 per cent, as compared with a general mortality for pneumonia of 20 per cent.

#### COMPLICATIONS

Focal purulent complications were frequent among these patients, as may be expected from the high incidence of bacteremia.<sup>15</sup> They occurred in both the serum treated and the non-serum treated patients. Only the more common ones need be mentioned.

Empyema was the most frequent and occurred in ten serum treated and in fourteen non-serum treated patients, four of the former and eight of the latter died. This complication occurred predominantly with type I pneumonia: eight of the serum treated and five of the non-serum treated patients with empyema having

13 Bullock's<sup>4</sup> Finland and Brown.  
14 Sutcliffe W. D. and Finland Maxwell. Type I Pneumococcal Infections with Special Reference to Specific Serum Treatment. *New England J. Med.* 210: 237-245 (Feb. 1) 1934. The Specific Serum Treatment of Pneumococcus Type II Pneumonia. *J. A. M. A.* 100: 560-566 (Feb. 25) 1933. Finland Maxwell and Tilghman R. C. Clinical and Immunologic Observations in Cases of Pneumococcus Type V Pneumonia Treated with Specific Antibody. *New England J. Med.* 215: 1211-1221 (Dec. 24) 1936. Finland and Brown. Finland Maxwell Tilghman R. C. Rueggesser J. M. and Dowling H. F. Clinical and Immunological Observations in Cases of Pneumococcus Type VII Pneumonia Treated with Concentrated Type Specific Antibody. *Am. J. M. Sc.* 193: 59 (Jan.) 1937.

15 Tilghman R. C. and Finland Maxwell. Clinical Significance of Bacteremia in Pneumococcal Pneumonia. *Arch. Int. Med.* 59: 602-619 (April) 1937.



this type Subcutaneous pneumococcic abscess occurred in five of the bacteremic patients who recovered, three were serum treated and two were not Pneumococcic otitis media occurred in one serum treated and in three non-serum treated patients who recovered Hemolytic streptococcus sepsis, including pleural and puerperal infections, occurred in four of the serum treated and in seven of the non-serum treated patients, and only one of the latter recovered Endometritis with pneumococci cultured from the uterus or lochia occurred in the following five cases a fatal case of non-serum treated type I pneumonia with bacteremia following a forceps delivery, a case of serum treated type II pneumonia with bacteremia following normal delivery, with subcutaneous pneumococcic abscesses in addition, with recovery, a fatal case of non-serum treated type I pneumonia following cesarean section, a case of non-serum treated type XXIII pneumonia following cesarean section, and a fatal case of non-serum treated type II pneumonia following a septic induced abortion In addition, three non-serum treated patients had pneumococcic peritonitis limited mostly to the pelvis, these included

TABLE 6—Mortality of Pneumococcic Pneumonia in Relation to Duration of Pregnancy

	Number of Patients	Died	Percentage Died
First trimester	20	6	30
Second trimester	54	12	22
Before seventh month	74	18	24
Third trimester	51	24	47
At term	17	5	30
Seventh month and later	68	29	43
Post partum	70	20	29
Pre partum serum	38	8	21
no serum	104	39	38
Post partum serum	16	3	19
no serum	54	17	31

one patient with type II, one with type III and one with type V pneumonia In all cases the pneumonia followed an induced abortion The patient with type III survived, and the other two patients died One of the non-serum treated patients with type VIII died with meningitis, and a serum treated patient with type V died with rheumatic heart disease and vegetative endocarditis Lung abscesses occurred in four non-serum treated patients, two of whom died

#### EFFECT OF THE DURATION OF PREGNANCY ON MATERNAL MORTALITY

Death rates have usually been found to be higher for pneumonia occurring in the late months of pregnancy than for pneumonia occurring in the earlier months In Ramsdell's<sup>1</sup> cases there were thirty-two deaths (22 per cent) among 144 cases of pneumonia occurring in the first six months of pregnancy, as compared with fifty deaths (30.5 per cent) among the 164 cases of pneumonia occurring after the sixth month Harris<sup>16</sup> found a steadily increasing mortality up to 61 per cent in the last month of pregnancy for his collected cases of influenza with pneumonia Among Rogers and Gooch's<sup>4</sup> serum treated patients with type I there was one death among fourteen women less than six months pregnant (7.1 per cent), as compared with seven deaths among twenty-seven women who had been pregnant six months or longer (25.9 per cent) In the present series there are almost equal numbers of cases of postpartum pneumonia, cases of pneumonia complicating pregnancy

of six months' duration or less and cases of pneumonia complicating pregnancy of more than six months' duration The death rates in each of these groups are listed in table 6 The highest death rate was for the women in the third trimester of pregnancy The cases of pneumonia occurring at term or post partum have a somewhat lower mortality The serum treated patients had an appreciably lower death rate than the non-serum treated patients This was true for both the cases of prepartum and the cases of postpartum pneumonia This will be referred to again in relation to the interruption of pregnancy

#### PARITY AND MATERNAL MORTALITY

There were twelve deaths among forty-five primiparas (27 per cent) and fifty-three deaths among 165 multiparas (37 per cent) With the non-serum treated patients the death rate was appreciably lower for the primiparas than for the multiparas (26 and 38 per cent respectively) The death rate for forty-eight multiparous serum treated patients was 19 per cent, in contrast with a 38 per cent mortality for 117 similar non-serum treated patients There were two deaths among the six primiparous serum treated patients but one of these deaths was associated with eclampsia and the other with rheumatic heart disease and vegetative endocarditis In Ramsdell's<sup>1</sup> series there were eight deaths among eighty-nine multiparas (20 per cent) and four deaths among thirteen primiparas (31 per cent) The effect of age in the present series has already been noted (table 4) In Ramsdell's cases the death rate for patients under 25 was 13.3 per cent, for those from 25 to 35 it was 23.3 per cent and for those over 35 it was 22 per cent

#### TERMINATION OF PREGNANCY DURING THE PNEUMONIA

Pregnancy was terminated in more than one half of all the cases (55 per cent) (table 8) It was terminated more frequently in the fatal cases than in those of recovery, 70 per cent of the patients who died and 48 per cent of those who recovered aborting in the course of the infection Likewise, abortion was less frequent in the first six months of pregnancy (43 per cent) than after the sixth month (69 per cent) However, the lower incidence of abortions before the sixth month was limited to the cases of recovery The pregnancy was terminated in about one third of the women who were pregnant six months or less and recovered, whereas about two thirds of all the other patients were delivered The frequency of delivery was similar for the serum treated and the non-serum treated patients (table 9) In Ramsdell's cases 52 per cent of those in the first six months aborted, as compared with 70 per cent of those pregnant more than six months Of his patients who died, 85.4 per cent were delivered

#### EFFECT OF DELIVERY ON MATERNAL MORTALITY

In Ramsdell's cases there were seventy deaths among 190 patients with pneumonia who aborted, or 36.7 per cent, as compared with twelve deaths, or 10.7 per cent, among 118 patients who did not abort In Harris's<sup>16</sup> cases of influenza with pneumonia complicating pregnancy, there were 41 per cent of deaths among 383 cases in which pregnancy was uninterrupted as compared with 63 per cent of deaths among 395 cases in which pregnancy was ended In the present series (table 9) the lower death rate was limited to the women who were pregnant less than six months and were not delivered None of the nine serum treated patients in

<sup>16</sup> Harris J W Influenza Occurring in Pregnant Women J A M A 72 978 980 (April 5) 1919

this group died, and five, or 15 per cent, of the thirty-two non-serum treated patients died. For all the patients delivered and for those who were more than six months pregnant and were not delivered, the death rate was between 45 and 50 per cent without serum therapy and between 25 and 30 per cent with such therapy. The combined death rate for serum treated and non-serum treated patients was 22 per cent for the undelivered patients and 42 per cent for those who were delivered.

The termination of pregnancy took place at almost any time during the course of the pneumonia (table 10). About one half of the patients were delivered during the first five days of the disease. Among the forty-one patients delivered during the first five days of the pneumonia, nineteen, or 46 per cent, died, as compared with fourteen, or 39 per cent, among the thirty-six patients delivered after the fourth day. In Ramsdell's series 40 per cent of those who aborted before the third day died, as compared with 28 per cent of the sixty-nine who aborted after the third day.

#### RELATION OF SERUM TREATMENT, DELIVERY AND MATERNAL DEATHS

There were thirty-eight serum treated patients among those who had pneumonia before parturition. Of the sixteen who were not delivered, two died. Treatment with serum was begun before delivery with eleven patients, of whom two died, and serum was given to eight other patients after delivery and two of these patients died. In the three remaining cases, delivery took place on the day treatment was begun and two of the patients died after treatment.

#### DURATION OF THE PNEUMONIA

The number of days from the onset of the acute symptoms of pneumonia to death or to recovery by crisis or lysis was also analyzed (table 11). The numbers of cases are too few to indicate anything more than the trend. In the undelivered patients death

TABLE 8—Frequency of Delivery During Pneumococcic Pneumonia Complicating Pregnancy

Duration of Pregnancy	Recovered			Died			All Patients		
	Number of Patients	Delivered	Percentage Delivered	Number of Patients	Delivered	Percentage Delivered	Number of Patients	Delivered	Percentage Delivered
First three months	14	5	36	6	5	83	20	10	50
Second three months	42	14	33	12	8	67	54	22	41
Six months or less	56	19	34	18	13	72	74	32	43
Third three months	2	17	65	24	17	71	51	34	67
At term	12	10	83	0	3	60	17	13	76
Seven months or more	20	27	69	20	20	69	68	47	69
Total	90	46	48	47	33	70	142	79	55

tended to occur early, that is between the third and the sixth day, in those who were pregnant more than six months and was delayed until the seventh day or later in those who were in the first two trimesters of pregnancy. In the patients who were delivered, death occurred a week or more after the onset in most of the cases, except for about one third of those in late pregnancy, who died on or before the sixth day. Of the patients who recovered, crisis tended to occur somewhat earlier in the undelivered ones. Thus about two thirds of the undelivered patients had a crisis within seven days, while only one third of the delivered patients reached the crisis by the end of the seventh day.

#### RATE OF THE FETUS

Among the seventy-nine patients with pneumococcic pneumonia who were delivered during pregnancy thirty-one (39 per cent) had living babies, thirteen (16 per cent) had babies who died soon after birth and thirty-five (44 per cent) had stillbirths. Of the thirty-one mothers who were delivered of living babies nine (29 per cent) died, whereas about one half of the remaining mothers died. The death rate was about the same for those with stillbirths and for those whose babies died

TABLE 9—Maternal Mortality of Prepartum Pneumococcic Pneumonias in Relation to the Fate of Pregnancy

	Not Delivered			Delivered		
	Number of Patients	Number Died	Percentage Died	Number of Patients	Number Died	Percentage Delivered
Sixth month or before						
Serum treated	0	0	0	10	3	30
Non serum treated	33	6	15	22	10	46
Seventh month or later						
Serum treated	7	2	29	12	3	25
Non serum treated	14	7	50	35	17	49
All patients with prepartum pneumonia						
Serum treated	16	2	13	22	6	27
Non serum treated	47	12	26	57	27	47

soon after delivery. In almost all the cases the labor was very brief and in many it was followed by varying degrees of peripheral vascular collapse (shock).

As shown in table 12 there was no marked predominance of any particular type of delivery in the cases of postpartum pneumonia. In about one fourth of the cases the pneumonia occurred after cesarean section and in a similar number it followed abortion, either spontaneous or self induced. In the remaining cases the delivery was either entirely normal or some anesthesia (usually nitrous oxide, oxygen and ether) was used during a difficult labor or during the application of forceps. The maternal death rate was lowest for the women who were delivered spontaneously or who had a brief anesthesia during the application of forceps.

The fate of the fetus in the cases of postpartum pneumonia is also shown in table 12. In all the cases of abortion the abortion occurred before the seventh month, and only one of the sixteen babies lived for a short time after delivery. Of the fifty-four mothers who were delivered at term and later had pneumonia, forty-six had normal living babies and twelve (26 per cent) of the mothers died of the pneumonia. Four of the remaining eight mothers had stillbirths and the other four had babies who lived for a short time after delivery. One of the latter mothers died of her pneumonia.

#### TIME OF ONSET OF POSTPARTUM PNEUMONIA

In almost all of the cases of postpartum pneumonia the condition began within the first two weeks after delivery (table 13). In slightly more than one third of the cases, the pneumonia began on the second day post partum, and three fourths of all the patients had their initial symptom during the first three days post partum.

#### COMMENT

Pneumonia complicating pregnancy has a double interest. It concerns the obstetrician because of the high maternal and fetal mortality which it entails, and it concerns the internist because it carries with it a considerably higher death rate than pneumonia in nonpregnant women. It accounts for about one death in every

5,000 deliveries<sup>17</sup> and is the cause of about one half of the maternal deaths that are due to nonobstetric causes<sup>18</sup>. There can be little doubt that pneumonia complicating pregnancy warrants every possible consideration in an attempt to curtail the death rate. Now that effective specific serums are available for the large majority of the pneumococcal pneumonias, it is important to use the diagnostic procedures necessary for identification of the etiologic agent and to type the pneumococci as soon as the diagnosis of pneumonia is suspected. Early and adequate treatment with the homologous type-specific antipneumococcus serums can be expected to reduce materially the high death rate from the pneumonias when they complicate pregnancy, as demonstrated in the cases presented.

The dosage of serum in the treatment of pneumococcal pneumonia has been considered elsewhere.<sup>7</sup> The higher death rate and particularly the higher incidence of bacteremia in the cases of pneumonia complicating pregnancy are definite indications for larger doses than

of severe pneumococcal pneumonias, such as those considered here. Other derivatives, such as sulfapyridine, may prove to be very useful, but there are good reasons for the belief that the greatest benefits from these drugs in the treatment of pneumococcal pneumonias will be obtained from their use in conjunction with specific antipneumococcus serums. The pneumonias of pregnancy are sufficiently serious to warrant the use of every available means of treatment, and the proved efficacy of specific serum therapy warrants primary consideration in those cases in which it is applicable.

## SUMMARY

Data were studied concerning the incidence of pneumonia in pregnancy at the Boston City Hospital. About one of every eight women of child-bearing age who had pneumonia was pregnant, 0.63 per cent of all women admitted during pregnancy or parturition had pneumonia and in 1.2 per cent of all the cases of pneumonia the condition was complicated by pregnancy.

TABLE 12—*Pneumococcal Pneumonia Complicating Pregnancy and the Puerperium. Maternal Mortality in Relation to the Fate of the Fetus*

	Delivered Patients									Undelivered Patients		
	Living Baby		Stillborn		Baby Died After Delivery		Total Delivered					
	Number	Died	Number	Died	Number	Died	Number	died	Percent-age Died	Number	Died	Percent-age Died
Before seventh month	3	1	26	11	3	1	32	13	41	42	5	12
Seventh month or later	28	8	9	7	10	5	47	20	43	21	9	43
Total cases of prepartum pneumonia	31	9	35	18	13	6	79	33	42	63	14	22
Postpartum Pneumonia												
Normal spontaneous delivery	12	2	2	0	0		14	2	14			
Anesthesia only	10	4	0		0		10	4	40			
Instruments and anesthesia	11	1	0		2	0	13	1	8			
Cesarean section and anesthesia	13	5	2	0	2	1	17	6	35			
Spontaneous or induced abortion			15	5	1	0	16	5	31			
Total cases of postpartum pneumonia	46	12	19	5	3	1	70	20	29			

are used for nonpregnant patients. These larger doses have been recommended in the Massachusetts pneumonia control program<sup>19</sup> and were used in the present cases. As much as 1,400 cc of unconcentrated type I serum was given in some of the earlier cases in this series. The average dose in the recent cases was more than 250,000 units, which is higher than that used in other patients of the same age groups.

It is too soon to evaluate the place of chemotherapy in the treatment of pneumonia. There is no doubt that the use of sulfanilamide has materially reduced the death rate from hemolytic streptococcus infections, which are responsible for most puerperal sepsis. That this drug may favorably influence streptococcal pneumonia is to be anticipated, although there is no convincing evidence so far that it does. The drug is known to enter the fetal circulation and the mother's breast milk,<sup>20</sup> but its influence on the baby or the fetus has not yet been determined. There is no good evidence that sulfanilamide itself has curative value in the treatment

A series of 212 cases of typed pneumococcal pneumonia complicating pregnancy and the puerperium which occurred at the Boston City Hospital and the Boston Lying-in Hospital were analyzed with respect to the more important features concerning both the pneumonia and the pregnancy.

The incidence of pneumococcal types in these cases was similar to that found in all cases of pneumonia in adults. The types for which specific antipneumococcus serum has proved effective were the most frequent.

TABLE 13—*Interval Between Delivery and Onset of Postpartum Pneumonia*

Days	1	2	3	4	5	6	7	8	15	16+	Total
Number of cases	15	24	12	2	4	1	2	6	2	63	

Bacteremia was more frequent than in all cases for the same age groups and the death rates were higher than in corresponding cases for the same age group.

The death rates were highest for late pregnancy and for women whose pregnancy was terminated during the disease.

The death rate for all the serum treated patients was almost one half of that for the corresponding non-serum treated patients. The lower death rates were for pneumonia complicating both early and late pregnancy, for postpartum pneumonia, for women who were delivered and those whose pregnancy was unaffected.

The frequency with which pregnancy was terminated did not seem to be influenced by serum treatment.

17 Fox, P. C. Maternal and Fetal Mortality in a General Hospital. *Am J Obst & Gynec.* 35: 1074 (June) 1938. Hauch, C. D. Analysis of Obstetrical Material of the Evangelic Hospital of Chicago. *ibid.* 35: 1081 (June) 1938.

18 Peckham, C. H. A Survey of 447 Maternal Deaths Occurring in the Counties of Maryland During the Years 1930-1936. *Am J Obst & Gynec.* 36: 312 (Aug.) 1938.

19 Lord, F. T. and Heffron, Roderick. Pneumonia and Serum Therapy. New York: The Commonwealth Fund, 1938.

20 Stewart, H. L. Jr. and Pratt, J. P. Sulfanilamide Excretion in Human Breast Milk and the Effect on Breast Fed Babies. *J. A. M. A.* 111: 1455 (Oct. 15) 1938. Barker, R. H. The Placental Transfer of Sulfanilamide. *New England J. Med.* 219: 41 (July 14) 1938. Pinto, S. S. The Excretion of Sulfanilamide and Acetylsulfanilamide in Human Milk. *J. A. M. A.* 111: 1914 (Nov. 19) 1938. Speert, Harold. Passage of Sulfanilamide Through the Human Placenta. *Bull. Johns Hopkins Hosp.* 63: 337 (Nov.) 1938.

# THE TREATMENT OF PNEUMOCOCCIC MENINGITIS WITH SULFANILAMIDE

REVIEW OF THE LITERATURE AND REPORT OF SIX ADDITIONAL CASES

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In a review of the literature to the year 1927 the Goldsteins<sup>1</sup> collected 150 authentic recoveries from pneumococcic meningitis and there are listed in the *Quarterly Cumulative Index Medicus* approximately thirty additional recoveries during the years 1927 to 1937. Most of these favorable outcomes have been attributed to spinal drainage and the administration of antipneumococcus serum or ethylhydrocupreine (optochin), but in general results with these therapeutic measures have been unsuccessful.

In the ten years preceding 1937 there were in the Children's Hospital of Cincinnati and in the pediatric service of the Cincinnati General Hospital twenty-three

## REPORT OF CASES

**CASE 1—Pneumococcic meningitis (type V) following otitis media and mastoiditis.** C. M., aged 9 years, had had otitis media with drainage from the right ear for five days and meningeal signs for twenty-four hours. Antimeniugococcus serum was given intraspinally prior to admission. Cultures of material from the ears and of the spinal fluid were positive for pneumococcus type V and of material from the mastoid region were negative. Roentgenograms of the mastoid regions showed cloudiness of the cells on the right, at operation pus was found in the right mastoid region. Blood cultures on the first and second days were negative. Cultures of the spinal fluid were negative on the third day and thereafter. The clinical course was mild. The patient received a total of 27 Gm of sulfanilamide by mouth and an equal amount of sodium bicarbonate, ethylhydrocupreine hydrochloride (27 Gm) was also given. There were no toxic effects. Recovery was complete.

**CASE 2—Pneumococcic meningitis (type III) following otitis media and mastoiditis.** A. M., aged 10 years, had had bilateral otitis media for one week and headache, drowsiness and stiffness of the neck for twelve hours. Cultures of material from the ears showed an intermediate type of streptococcus, of material from the mastoid region a hemolytic *Streptococcus aureus* and of the spinal fluid pneumococcus type III. Roentgenograms of the mastoid regions showed cloudiness of the cells on the left at operation pus and sclerotic cells were found in the left

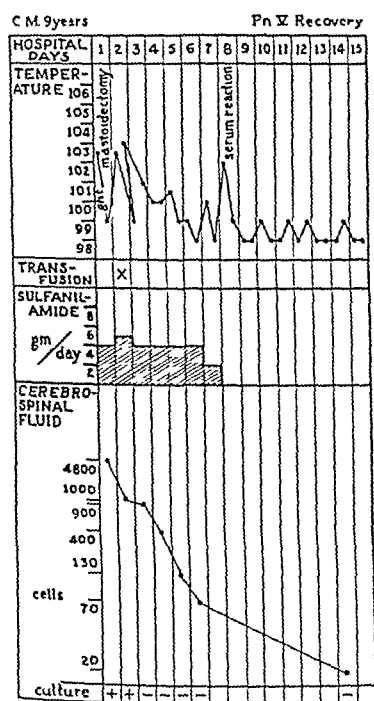


Chart 1—Observations in case 1

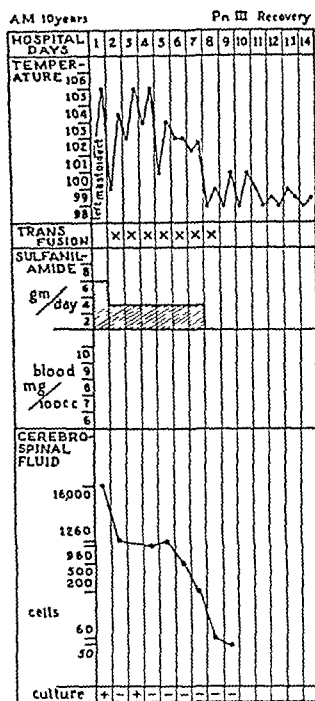


Chart 2—Observations in case 2

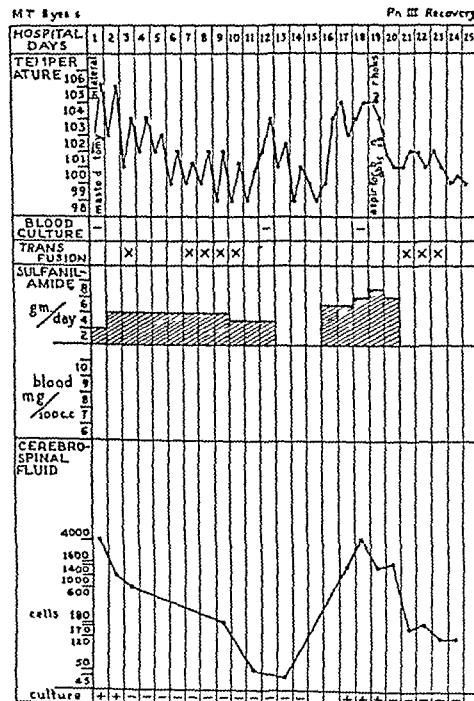


Chart 3—Observations in case 3

children suffering from pneumococcic meningitis, the mortality in this group being 100 per cent. Since the use of sulfanilamide three patients with the condition have recovered of a total of six treated. The histories of these six patients are summarized.

In table 1 are listed thirty cases of recovery from pneumococcic meningitis in which the treatment consisted in part of the administration of sulfanilamide or related compounds.

In table 2 are listed the reports of eight cases of pneumococcic meningitis treated with sulfanilamide or related compounds in which death occurred.

mastoid region. Four blood cultures were negative. Cultures of the spinal fluid were negative on the fourth day and thereafter. The patient received a total of 24 Gm of sulfanilamide and an equal amount of sodium bicarbonate by mouth and small amounts of 0.8 per cent sulfanilamide intraspinally and intravenously daily for seven days, ethylhydrocupreine hydrochloride (0.7 Gm) was also given. There were no toxic effects. Recovery was complete.

**CASE 3—Pneumococcic meningitis (type III) following otitis media and mastoiditis.** M. T., aged 8 years, had had bilateral otitis media one month before, but recovery was apparently complete. On admission the complaints were chill, frontal headache and photophobia. There was bilateral bulging of the ear drums. Cultures of material from the ears after myringotomy showed *Staphylococcus aureus*, of material from the mastoid regions an unidentified diphtheroid and of the spinal fluid pneumococcus type III. Roentgenograms of the mastoid regions showed slight clouding of the cells on both sides more

From the Children's Hospital Research Foundation and the Department of Pediatrics, University of Cincinnati College of Medicine.  
1. Goldstein H. I. and Goldstein H. Z. Pneumococcus Meningitis and Endocarditis. Report of Twenty Cases of Pneumococcus Meningitis With and Without Pneumococcus Endocarditis. Consideration of Treatment and Review of Literature. Internat. Clin. 3: 155-219 (Sept.) 1927.

marked on the left, at operation pus was found in both mastoid regions. Blood cultures on the first, twelfth and eighteenth days were negative. Cultures of the spinal fluid were negative on the third day. Some clinical improvement was noted at this time. On the twelfth day slight dyspnea developed and the heart was markedly enlarged, as demonstrated by physical examination and roentgenogram. The patient became worse on the sixteenth and seventeenth days, when there was increased pressure of the spinal fluid and when also the spinal fluid cultures were again positive. There were no localizing signs of brain abscess until the eighteenth day, when a definite left homonymous hemianopia and weakness of the left arm and left leg were present. Trepanation was performed and burr holes

made in the skull, 16 cc of pus was aspirated from the right temporal region. Ventricular and lumbar punctures were performed every eight hours from the nineteenth to the twenty-first day. There was slow improvement. The patient received a total of 64 Gm of sulfanilamide with an equal amount of sodium bicarbonate, ethylhydrocupreine hydrochloride (16 Gm) was also given. Recovery was complete.

CASE 4—*Pneumococcus meningitis (type III) following otitis media and mastoiditis*. W. L., aged 9 years, had had bilateral otitis media with a high fever for one week and swelling in front of the right ear for two days. Cultures of material from the ears showed *Staphylococcus albus*, from the right mastoid no growth and from the left mastoid a gram positive spore

TABLE 1—*Recoveries from Pneumococcus Meningitis in Patients Treated with Sulfanilamide Compounds*

Reference	Age Years	Probable Source of Infection	Type of Pneumo- coccus in Spinal Fluid	Treatment	Drug Admin- istered Total, Gm	Free Sulfanilamide in Blood, Mg per 100 Cc	Comment
Latto C Brit M J 1 566 (March 12) 1933	26	No focus? primary? blood culture not noted	I	PRONTOSIL 3 lumbar punctures large doses of prontosil amounts not shown	Large amount		Spinal fluid culture sterile twelfth day
Landon, J Brit M J 1 844 (April 16) 1938	5	Infection of upper part of respiratory tract blood culture not noted		2 lumbar punctures prontosil intramuscularly 80 cc in 4 days	20		Hematuria and purpuric rash developed
Caldwell J R, and Byrne P S Brit M J 1 1204 (June 12) 1937	16	Sore throat blood cul- ture not noted	I	Prontosil by mouth and intra- muscularly amounts not shown			
Mertins P S and Mer- tins P S Jr Arch Oto- laryng 25 637 (June) 1937	13	Mastoiditis blood culture negative	IV	PRONTOSIL AND SULFANILAMIDE Mastoidectomy prontosil (2.5%) 40 cc a day for 6 days sulfanilamide by mouth total 6 Gm in 3 days	170		
Neal J B, and Appel- baum, L Am J M Sc 195 175 (Feb.) 1935		After tonsillectomy and ethmoid sinus operation blood culture not noted After submucous resection and turbinate operation blood culture not noted Otitis media and mastoi- ditis blood culture not noted	XXXI XXX IV	Prontosil and sulfanilamide by mouth amounts not shown Prontosil and sulfanilamide amounts not shown Mastoidectomy prontosil and sulfanilamide amounts not shown			
Basman J and Perley A M J Pediat 11 212 (Aug.) 1937	9	Otitis media and mastoi- ditis blood culture negative	V	SULFANILAMIDE Antimeningococcus serum intra- spinally once transfusions sulfanilamide intravenously intramuscularly intraspinally and subcutaneously total 82 Gm in 18 days mastoidectomy a weeks after admission	820	4.11	Spinal fluid culture sterile ninth day
Allan W B Mayer S Jr and Williams R Am J M Sc 196 9 (July) 1938	16	Skull fracture through frontal and ethmoid sinuses blood culture negative	XIV	Frequent lumbar punctures sulfanilamide by mouth total 35.6 Gm in 8 days	30.6	5-7	Spinal fluid culture sterile second day
	42	Infection of upper part of respiratory tract blood culture negative	XXIX	Sulfanilamide by mouth total 46.5 Gm in 10 days	46.5	8-10	Spinal fluid culture sterile second day dramatic recovery
	13	Frontal sinusitis blood culture negative	XX	Frequent lumbar punctures radical frontal sinus opera- tion continuous spinal drain age 4 transfusions sulfani- lamide by mouth intraspinally and subcutaneously total 35 Gm in 5 days	30.0	5.10	Spinal fluid culture nega- tive fourth day anemia and jaundice developed
Finland M Brown J W, and Raub A L New En- gland J Med 218 1033 (June 23) 1938	19	After removal of brain tumor 3 negative blood cultures	XVII	Frequent lumbar punctures transfusion sulfanilamide by mouth total 32.5 Gm in 9 weeks	32.0	5-10	Spinal fluid culture sterile fifth week anemia developed
Young F Brit M J 2 286 (Aug 6) 1938	5	Otitis media blood culture not noted		Antimeningococcus serum intra- spinally once sulfanilamide by mouth total 10.5 Gm in 4 days with recurrence 12.5 Gm in 13 days mastoidectomy not done	23.0		Spinal fluid culture sterile seventh day
Gubner, J Arch Oto- laryng 28 241 (Aug) 1938	5½	10 days after mastoid ectomy blood culture not noted	III	Frequent lumbar punctures exploration of mastoid wound transfusions sulfanilamide total 75 Gm in 26 days	70.0	6-14	Spinal fluid culture sterile thirteenth day
Tixier L Eck M, and Crossard Bull Soc pediat de Paris 36 118 (March) 1938	11	Primary? blood culture not noted	I	Frequent lumbar punctures sulfanilamide by mouth total 19 Gm in 12 days	19.0		Spinal fluid culture sterile third day dramatic recovery
Hubert C Rev de laryng 79 365 (April) 1933	17	Otitis media blood culture not noted	III	Mastoidectomy frequent lum- bar punctures sulfanilamide by mouth total 100 Gm 1 Gm intraspinally (0.5% sulfanil- amide) in 11 injections	101.0		Spinal fluid culture sterile fourth day
Hewell and Mitchell case 1 (chart 1)	9	Otitis media and mas- toiditis blood culture negative	V	Mastoidectomy frequent lum- bar punctures transfusions sulfanilamide by mouth total 27 Gm in 7 days ethylhydro- cupreine 2.7 Gm	27.0		Spinal fluid culture sterile third day
Case 2 (chart 2)	10	Otitis media and mas- toiditis blood culture negative	III	Mastoidectomy frequent lum- bar punctures sulfanilamide by mouth intravenously and intraspinally total 24 Gm in 7 days ethylhydrocupreine 0.7 Gm	24.0	10	Spinal fluid culture sterile fourth day

TABLE 1—*Reactions from Pneumococcus Meningitis in Patients Treated with Sulfanilamide Compounds—Continued*

Reference Case	Age, Years	Probable Source of Infection	Type of Pneumococcus in Spinal Fluid	Treatment	Drug, Approximate Total Gm	Free Sulfanilamide in Blood, M, per 100 Cc	Comment
Case 3 (chart 3)	5	Otitis media and mastoiditis; blood culture negative	III	Mastoidectomy; operation for brain abscess; frequent lumbar punctures; sulfanilamide by mouth total 61 Gm in 17 days; ethylhydrocupreine 1.6 Gm	61.0	8.12	Spinal fluid culture sterile third day
Finland, Brown and Rauh	5	Fracture of skull meninges following debris; negative blood cultures	VII	Frequent lumbar punctures; sulfanilamide by mouth total 10 Gm in 20 days; specific antipneumococcus serum intravenously and intraspinally; autogenous serum intraspinally	70.0	10.12	Spinal fluid culture sterile fifth day
	7	Fracture of skull; 3 negative blood cultures	VII	Transfusion; sulfanilamide by mouth total 51 Gm in 8 days; specific antipneumococcus serum intravenously; autogenous serum intraspinally	51.0	10.20	Spinal fluid culture sterile in 48 hours; anemia developed
	13	Infection of upper part of respiratory tract; negative blood cultures	VIII	Sulfanilamide by mouth total 106 Gm in 14 days; specific antipneumococcus serum (rabbit) intravenously; autogenous serum and specific serum intraspinally	106.0	15	Spinal fluid culture sterile third day
Finland, Brown and Rauh	17	Fracture of skull; 3 negative blood cultures	VIII	Frequent lumbar punctures; transfusions; sulfanilamide by mouth total 189 Gm in 25 days; autogenous serum intraspinally	189.0	10.12	Spinal fluid culture sterile thirteenth day; anemia developed
	10	Otitis media; 1 negative blood culture	III	Mastoidectomy; sulfanilamide by mouth total 84 Gm in 15 days; autogenous serum intraspinally	84.0	8-10	Spinal fluid culture sterile eleventh day
Query R Z J A M 111 1373 (Oct 5) 1938	33	Pneumonia; empyema; blood culture positive	OR VII	PRONTOFIL + ANTIPNEUMOCOCCUS SERUM Sulfanilamide total 200 Gm in 14 days; specific antipneumococcus serum intravenously and intraspinally	200.0	20-25	
Boyd L J Baron B and Schlachman M New York V Coll & Flower Hosp Bull 1 99 (June) 1938	43	Primary? 1 negative blood culture	II	Frequent lumbar punctures; 90,000 units of meningococcus antitoxin intravenously; 117 cc of antimeningococcus serum intraspinally; antipneumococcus serum (II) intraspinally and intravenously for 3 days; 10 cc of prontosil (2.5%) intravenously and 40 cc intramuscularly in 4 days	1.25		Note small amount of drug used
	14	Primary? 1 negative blood culture	II	Frequent lumbar punctures; antimeningococcus serum intraspinally and intravenously; antipneumococcus serum intraspinally; 5 cc of 0.5% ethylhydrocupreine intraspinally; 20 cc of prontosil (2.5%) subcutaneously; 20 cc of 0.8% sulfanilamide intraspinally	0.66		Note small amount of drug used
Reid G C K and Dyke S C Lancet 2 519 (Sept 10) 1938	7	Acute pharyngitis; blood culture not noted		SULFAPYRIDINE Sulfapyridine by mouth total 22.5 Gm in 6 days	22.5		Spinal fluid culture sterile in 24 hours
Robertson Kenneth Lancet 2 128 (Sept 24) 1938	14	Primary? blood culture not noted		Felton's serum (I and II) intravenously; soluseptazine (a sulfanilamide compound), 20 cc intraspinally and intramuscularly; sulfapyridine total 27 Gm in 3 days and 6 Gm in 2 days	Solu-septazine 20 cc sulfapyridine, 33 Gm		Spinal fluid culture sterile in 48 hours; hematuria developed
Cunningham A A Lancet 1 1114 (Nov 12) 1935	47	Sinusitis; blood culture not noted	I	Sulfanilamide by mouth total 1 Gm in 36 hours; sulfapyridine total 50 Gm in 7½ days	Sulfanilamide 15 sulfapyridine 50	15	

bearing rod. Cultures of the spinal fluid were positive for *Streptococcus viridans* until the tenth day at which time pneumococcus type III was observed. Spinal fluid cultures remained positive for pneumococci throughout despite a fall in the cell count. Roentgenograms of the mastoid regions showed haziness of the cells on the right, at operation pus was found in both mastoid regions. The patient became increasingly drowsy and was comatose for forty-eight hours before death on the seventeenth hospital day. Necropsy showed purulent meningitis with no evidence of sinus thrombosis or brain abscess. The patient received a total of 64 Gm of sulfanilamide with an equal amount of sodium bicarbonate by mouth, a small amount of 0.8 per cent sulfanilamide intraspinally on eight occasions and prontosil intravenously (20 cc on three occasions).

CASE 5—*Pneumococcus meningitis (type III) following otitis media and mastoiditis*. M Y, aged 7 years, had had bilateral otitis media for two weeks, frontal headache for five days and

stiffness of the neck for three days. On admission there was slight stiffness of the neck, Brudzinski's sign and photophobia were present, the reactions of the pupils to light were sluggish, there were bilateral nystagmus and bilateral papilledema, the deep reflexes were hypo active and there was dulness of the ear drums. Cultures of material from the right ear after myringotomy were positive for pneumococcus type III and from the left ear were negative. Roentgenograms of the mastoid regions were negative on two occasions. Trepanation was performed on the third day as a safeguard for lumbar punctures. A blood culture on the second day was positive for pneumococcus type III. Spinal fluid cultures were negative until the fifth day, when pneumococcus type III was found. Bilateral mastoidectomy was performed on the sixth day, on the right there were necrotic cells and pus, and on the left the cells were apparently normal. Cultures of material from the mastoid regions were negative. There was no clinical improvement. No localizing signs of brain abscess were present. The pres-

TABLE 2—Deaths from Pneumococcal Meningitis in Patients Treated with Sulfanilamide Compounds

Reference	Age Years	Probable Source of Infection	Type of Pneumo- coccus in Spinal fluid	Treatment	Drug Admin- istered Total Gm	Free Sulfanilamide in Blood Mg per 100 Cc	Comment
Millett J J A M A 109 2138 (Dec 25) 1937	53	Sinusitis blood culture positive	III	Turbidectomy and sinus drain- age frequent lumbar punc- tures prontosil intraspinally and intramuscularly total 12 cc (2%)	3		Necropsy purulent menin- gitis pituitary tumor no damage to central nervous system from prontosil intraspinally (no drug by mouth)
Finland M Brown J W, and Rauh A L New England J Med 215 1033 (June 23) 1938	19	Primary? blood culture positive	XI	Frequent lumbar punctures transfusions sulfanilamide total 105 Gm by mouth 3 Gm subcutaneously 2.5 Gm intra- spinally fresh human serum intraspinally	110		Progressive anemia devel- oped necropsy purulent meningitis frontal cortical abscess bronchopneu- monia
	47	After sinus operation blood culture positive	XVI	Frequent lumbar punctures transfusions sulfanilamide by mouth total 92 Gm in 22 days	92		No necropsy
	43	4 weeks after pneumonia blood culture positive	VII	Frequent lumbar punctures sulfanilamide by mouth total 42 Gm in 6 days specific anti pneumococcus serum intrave- nously normal serum intra- spinally	42	4.5	Necropsy purulent menin- gitis lobar pneumonia vegetative endocarditis
	3	Otitis media blood culture positive	IV	Frequent lumbar punctures sulfanilamide by mouth total 12 Gm in 2 days antipneumo- coccus serum intravenously (rabbit) antiserum and human serum intraspinally mas- toidectomy not done	12		Moribund died in 36 hours necropsy purulent menin- gitis congestion of lungs
Hewell and Mitchell case 5 (chart 5)	7	Otitis media mastoiditis blood culture positive	III	Mastoidectomy frequent lum- bar punctures ventricular puncture trepanation sulfanil- amide by mouth total 30 Gm in 10 days and in 0.8% solution intraspinally and intraven- ously	36+		Jaundice developed necropsy purulent menin- gitis occipital and cere- bellar abscesses sinus thrombosis
Case 6 2 mo	2 mo	Probably otitis media and mastoiditis blood culture positive	VII	Sulfanilamide by mouth total 6 Gm ethylhydrocupreine in large doses specific serum intramuscularly	6		No necropsy
Case 4 (chart 4)	9	Otitis media mastoiditis blood culture negative	III	Mastoidectomy frequent lum- bar punctures transfusions sulfanilamide by mouth total 6 Gm in 13 days and in 0.8% solution intravenously pron- tosil (60 cc) at first anti- streptococcus serum because Streptococcus viridans then in spinal fluid	64+	7.9	Necropsy purulent menin- gitis no abscess or sinus thrombosis

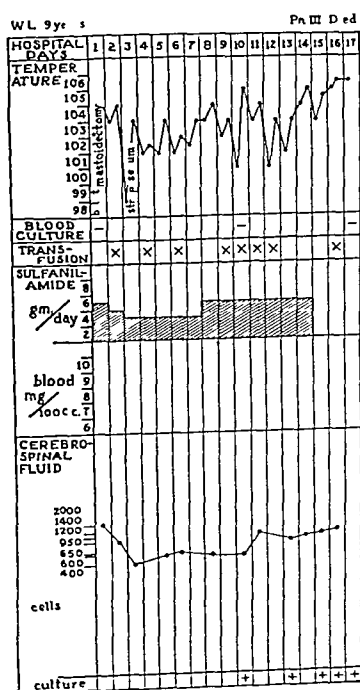


Chart 4—Observations in case 4

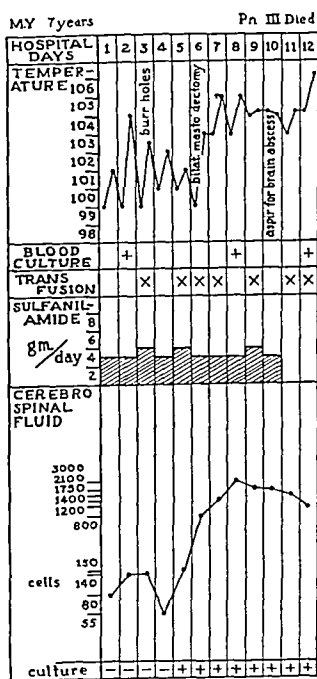


Chart 5—Observations in case 5

sure of the spinal fluid increased. Ventricular punctures and aspiration for brain abscess were performed on the tenth day. 10 cc of pus was obtained through burr holes made in the right cerebellar region and no abscess cavity was found. Icterus developed on the sixth day, and the patient died on

the twelfth hospital day. Necropsy showed extensive destruction of the mastoid bone, epidural pus over the cerebellar hemisphere, extensive cerebral leptomeningitis, abscess of the left occipital lobe (small and early), thrombosis of all the meningeal sinuses and early lobar pneumonia. The patient received 36 Gm of sulfanilamide with an equal amount of sodium bicarbonate by mouth and small amounts of 0.8 per cent sulfanilamide intraspinally and intravenously on six occasions.

**CASE 6—Pneumococcal meningitis (type VII).** H C, a white girl aged 2 months was seen only casually by us and only a brief history is possible. She had had fever and been irritable for one week and had a convulsion on the day of admission. The fontanel was bulging, the ear drums were slightly dull, there was stiffness of the neck and Brudzinski's sign was present. The patient was in coma on admission. The spinal fluid showed 22,400 cells, a positive Pandy reaction and pneumococcus type VII. The blood culture was positive for pneumococcus type VII. The patient received a total of only 6 Gm of sulfanilamide. She also received ethyl hydrocupreine hydrochloride in rather large doses and specific serum intramuscularly. She died on the sixth day after admission.

#### SUMMARY

There are at least thirty reported cases of recovery from pneumococcal meningitis, including three observed by us, in which part of the treatment consisted in the use of sulfanilamide or related compounds. It appears reasonable to conclude that sulfanilamide compounds were responsible for these recoveries in most instances since the mortality

2 This is not a complete list since a few reports were not available to us.



rate was so high with other forms of treatment. In a few instances the dose was so small that the effect of the drug must be considered doubtful. It is to be noted that recovery occurred with the use of different compounds, such as prontosil, sulfanilamide and sulfapyridine, that is to say, the data now available do not permit conclusions concerning the relative merit of these different compounds in the treatment of pneumococcal meningitis.

There are at least eight cases of pneumococcal meningitis, including three observed by us, in which sulfanilamide was given and in which recovery did not follow.

It could not be shown statistically that the age of the patient, the dose of sulfanilamide employed or the type of pneumococcus had any relation to recovery.

Of the patients receiving sulfanilamide who recovered, only one showed pneumococci in the blood culture; sixteen other patients had negative blood cultures, and for thirteen cultures were not reported. Of the eight patients receiving sulfanilamide who died, the blood cultures were positive for seven. This indicates that even with the use of sulfanilamide a blood stream infection with pneumococci is a factor in mortality and perhaps also that with such infection large doses of sulfanilamide should be tried.<sup>3</sup>

## TREATMENT OF TESTICULAR DEFICIENCY WITH TESTOSTERONE PROPIONATE

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Testicular function is known to be intimately connected with the growth of the penis and its erectile power, the growth and maintenance of the secondary sex glands, the maturation of the skeleton and the growth, and in some species the maintenance, of the secondary sexual characteristics. Chemical substances which have pharmacologic properties similar to those of testicular extracts have been isolated from human urine and animal adrenals, and they have been demonstrated in other tissues. Such substances are called androgens. Many androgens, some of which are known to occur in nature, have been produced artificially from sterols. Koch<sup>1</sup> has recently published a comprehensive review of the literature dealing with these facts.

Moore's<sup>2</sup> experiments showed that testis extracts produced evidence of damage to spermatogenesis, and he stated that testis hormones could not be used clinically without probable harm to the production of sperm. Walsh, Cuyler and McCullagh<sup>3</sup> in 1933 demonstrated that androgenic urinary extracts maintained spermatogenesis in hypophysectomized rats. More

recently this has been confirmed in the laboratories of the Cleveland Clinic and also by Nelson and Gallagher.<sup>4</sup> Although they appear to be opposed, both of these observations seem to be factual. Their clinical significance has not yet been made clear.

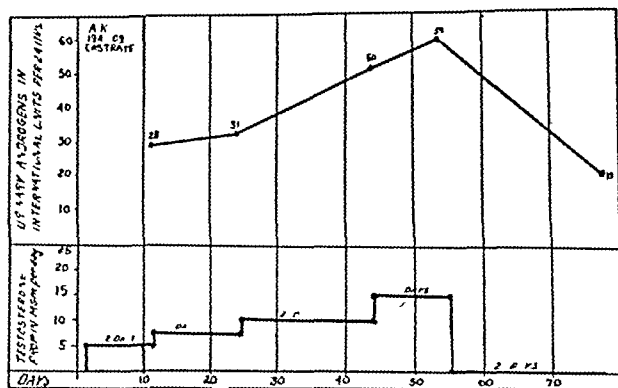


Fig. 3—Excretion curve of a castrate aged 48

The only androgen which has been isolated from testes is testosterone,<sup>5</sup> although it has not been proved that this is the only hormone of the testes or that it will completely replace the endocrine activity of that gland.

This study is concerned with the urinary excretion of androgens in the normal male, in cases of testicular deficiency and after injections of androgens. The data indicate in some degree to what extent testosterone propionate will develop and maintain the sexual organs and characteristics in the human male.

In the cases studied, particular attention has been paid to penile growth and function, the production of secondary sex characteristics, prostatic growth, production of semen, spermatogenesis, epiphyseal closure and the rate of urinary excretion of injected androgens. Since only persons with definite evidence of hypogonadism have been treated, many of the patients have been impotent and it has been impossible to study the production of semen until after therapy has been instituted. For similar reasons the data regarding production of sperm are scanty.

### BIO-ASSAYS FOR URINARY ANDROGENS

The most useful method of studying the hormonal activity of the testis is bio-assay based on capon comb growth. A highly accurate method and the one used in these studies is a modification of the one devised by Gallagher and Koch.<sup>6</sup> Brown or white leghorn capons may be used. After the urine to be extracted has been hydrolyzed by boiling with hydrochloric acid, it is extracted in a special apparatus by having benzene passed through it at a rate of from 6 to 8 liters an hour for two hours. Subsequently the benzene is distilled off, the acid neutralized and the extract dissolved in oil. The oil is injected into the breasts of five capons, and their comb growth forms the basis for computation. At the same time, for the purpose of comparison, a group of controls are given injections of standard amounts of crystalline androsterone. It has been shown

<sup>3</sup> Since this paper was submitted we have observed another patient with pneumococcal meningitis to whom both sulfanilamide and sulfapyridine were administered. Recovery followed within a period of about three weeks. Thus we have now treated seven patients with sulfanilamide or related compounds of whom four have recovered.

From the Cleveland Clinic.  
Mr. W. Kenneth Cuyler conducted all the assays reported in this paper.

Read before the Section on Urology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

Owing to lack of space this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the author's reprints.

<sup>1</sup> Koch, F. C. Male Sex Hormones. *Physiol. Rev.* **17**: 153, 238 (April) 1937.

<sup>2</sup> Moore, C. R. Testis Hormone. *J. A. M. A.* **104**: 1405, 1411 (April 20) 1935.

<sup>3</sup> Walsh, E. L., Cuyler, W. A., and McCullagh, D. R. Effect of Testicular Hormone on Hypophysectomized Rats. *Proc. Soc. Exper. Biol. & Med.* **30**: 848, 850 (April) 1933.

<sup>4</sup> Nelson, W. O., and Gallagher, T. F. Some Effects of Androgenic Substances in the Rat. *Science* **84**: 230, 232 (Sept. 4) 1936.

<sup>5</sup> Laqueur, E., David, K., Dingemans, E., and Freud, J. Ueber mannliches Hormon. Unterschied von Androsteron aus Harn und Testosteron aus Testes. *Acta brev. Neerland.* **5**: 84, 1935.

<sup>6</sup> Gallagher, T. F., and Koch, F. C. Quantitative Assay for Testicular Hormone by Comb Growth Reaction. *J. Pharmacol. & Exper. Therap.* **55**: 97, 117 (Sept.) 1935.

<sup>7</sup> Gallagher, T. F., Koch, F. C., and Dorfman, F. I. Procedures for Quantitative Extraction of Sex Hormones from Urine. *Proc. Soc. Exper. Biol. & Med.* **55**: 440, 444 (Dec.) 1935.

recently by D Roy McCullagh and McLin<sup>7</sup> that dibutyl ether is an excellent extracting solvent for androgenic substances and may be utilized with less complex equipment than benzene. Essentially the same results are obtained with the two methods.

#### NORMAL EXCRETION OF ANDROGENS

Normal levels of excretion of androgens are shown in table 1. The wide range of normal values both for different persons and for the same person is apparent.

The urinary excretion of androgens in normal men has been reported by Koch.<sup>8</sup> In twenty assays on men between 24 and 34 years of age the average number of bird units was 30, the lowest 16 and the highest 72.

The figures in table 2 demonstrate the range of androgen excretion of persons with distinct clinical evidence of hypogonadism as compared with that for normal persons. Such an assay as the one which yielded 16 units of androgens in the twenty-four hour urine of a castrate is interesting. It demonstrates clearly that not all androgens arise in the testes.

#### THE EXCRETION OF INJECTED ANDROGENS

The injection of testosterone propionate is followed by an increased excretion of androgens in the urine. By the use of available methods, however, it is not possible to determine what chemical substance is excreted. Such studies indicate in a general way the

TABLE 1—Urinary Androgens per Twenty-Four Hours in Normal Men

Subject	Age	International Units	
		Benzene Extraction	Dibutyl Ether Extraction
1	24	25	35
2	29	38	
3	37	42	76
		43	
4	28	51	24
			35
			18
5	30	21	
6	33	32	22
		16	22
7	33	46	54
8	23	34	23
			42
			77
9	32	41	
10	23	61	33
			55
			45
			18
11	28		
12	29	20	
13	25	3	
14	29	50	33
15	25	37	
16	29		23
			38
17	32		24
18	27		25
19	27		44
20	26		18
			19
Average		40.5	30.1

frequency with which injections must be given and the doses necessary to maintain normal androgen excretion. If doses of 10 mg of testosterone propionate are injected, urinary androgens may fall to their original low levels within about three days. For example, a castrate 64 years old had had four preliminary assays, none of which showed any measurable androgen. He

was given 10 mg of testosterone propionate as Oreton,<sup>9</sup> and twenty-four hour specimens of urine were collected, beginning from the moment of injection. The first day 16 international units was excreted, the second day 2 and the third day none. A 33 year old patient with severe hypogonadism without treatment excreted 2

TABLE 2—Excretion of Androgens in Hypogonadism

	Age	International Units Excreted in 24 Hours
Prepuberal hypogonadism with out other signs of primary disease	20	9
	21	16 13
	22	0 1 2
	30	23
	26	7 14
	33	2 8 11, 7 2
	34	2 0
	31	0 0 0 2 1 0
	23	2 6 5
Froehlich's syndrome	23	10
	23	34
	13	3
	14	4
	14	0
	19	0 0
	13	8
Dwarfism and hypogonadism	19	0 9
	20	10
Clunatism and hypogonadism	20	5
Adult castrates	64	0 0 0 0
	52	7
	42	16 0 10

units in twenty-four hours. On three days following the injection of 10 mg of testosterone propionate he excreted 11, 7 and 2 units respectively.

If large doses are injected, the complete excretion apparently takes a longer time. A man 27 years of age had severe hypogonadism and had excreted 6.6 and 7 units of androgen per twenty-four hours before therapy. Assays indicated the excretion of 100 mg of testosterone propionate within six days.<sup>10</sup>

It is instructive to note the amounts of testosterone which must be injected in cases of hypogonadism to bring the urinary excretion to within normal range. Such doses as produce normal excretion have in the patients treated been adequate to overcome most of the evidences of testicular deficiency, symptoms have disappeared in a few days, anatomic changes requiring weeks or, in the case of severe prepuberal hypogonadism, many months. It has not been shown definitely that it is necessary to keep the urinary excretion normal in order to obtain desirable clinical effects. A male castrate 48 years of age without treatment repeatedly excreted quantities of androgens at about the lower range of normal. Figure 3 shows the consistent elevation in levels of urinary androgens with increasing doses of testosterone propionate.

#### RESULTS OF THERAPY FOR SEVERE PREPUBERAL TESTICULAR DEFICIENCY

Koch<sup>8</sup> has cited the results of Kenyon in the treatment of hypogonadism with synthetic androgens, and Hamilton<sup>10</sup> has reported the production of penile erections by the use of such androgens.

The most severe clinical test of the value of testicular hormone is the test of its ability to produce the ex-

<sup>9</sup> Oreton is the trade name of a solution of testosterone propionate in oil produced by the Schering Corporation and supplied for these studies through the courtesy of Dr. Irwin Schwenk and Dr. Max Gilbert.

<sup>10</sup> This work is being reported in greater detail in *Endocrinology* (to be published).

<sup>11</sup> Hamilton J. B. Induction of Penile Erection by Male Hormone Substances. *Endocrinology* 21: 744-749 (Nov.) 1937.

<sup>7</sup> McCullagh D. R. and McLin T. R. Extraction of Androgens from Urine. *Endocrinology* 22: 120-121 (Jan.) 1938.  
<sup>8</sup> Koch F. C. Biochemistry and Physiological Significance of Male Sex Hormone. *J. Urol.* 35: 382-388 (March) 1936.

dences of normal function of testis hormone in persons who have had severe hypogonadism from before puberty to well into adult years. Six cases of such hypogonadism have been selected for this report, together with one case illustrative of what I believe to be functional hypogonadism and one case illustrating the effect of testicular hormone in an adult castrate. All of the patients with prepubertal hypogonadism received gonadotropic hormone therapy for several months with pregnancy urine extracts, pituitary extracts or a combination of these. In these cases the effect of the gonadotropic substances ranged from no observed change to mild symptomatic and very slight anatomic changes. In other instances such therapy has produced good results, and it is possible that larger doses might have been followed by better results in some of these cases, depending on the amount of reactive testis tissue present. In all instances, when testosterone propionate therapy was begun it was the only androgenic substance used. Thyroid therapy was used in two cases (3 and 5). Two of the cases are reported in some detail and illustrate well the type of change seen in the others, the more important data of which are reported.

CASE 1 (fig 4)—A man aged 23 complained in 1934 of lack of normal development. At the age of 15 because of cryptorchidism and pain, bilateral orchiopexy had been attempted, after which both testes atrophied. He had been less active

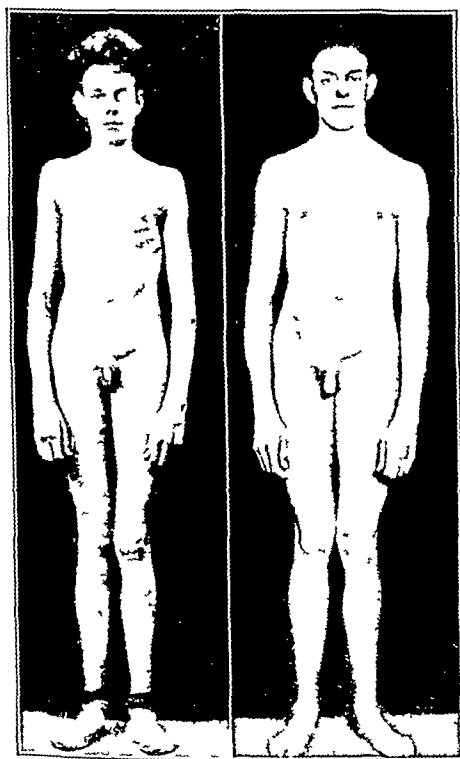


Fig 4—Patient 1 at 23 years and at 27 years. The development, including an increase in maturity of the facial expression, an increase in the breadth of the shoulders and development of the genitalia is apparent. This patient had received 3,220 mg. of testosterone propionate in the fifteen months before the second photograph was taken.

than the average youth. The sexual libido was minimal, masturbation, however, was practiced about monthly, apparently with orgasm but no ejaculate. The teeth had been well formed, but some cavities developed. He had grown 3 inches (7.6 cm) in height between the ages of 20 and 23 years.

Examination showed a person with the facial expression of a boy of 14 years. His voice was puerile. He was slender, with

long hands and feet. His height was 65¾ inches (167 cm) and his weight was 107 pounds (48 Kg). His span (both arms extended) was 70½ inches (179 cm) and the symphyseal height was 36¼ inches (92 cm). The skin was normal in texture, and the trunk and limbs were almost hairless except for about fifteen pubic hairs. The penis was preadolescent in type, measuring less than 4 cm from as close as the finger could be

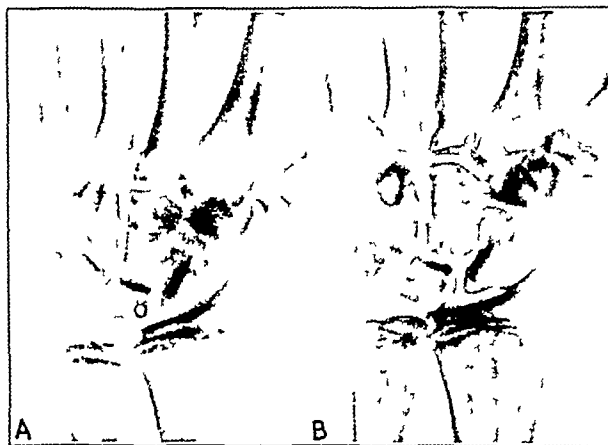


Fig 5 (case 1)—A shows an epiphysal age of 16 years, the chronologic age being 23 years. B, chronologic age 27 years, after marked pubertal changes following treatment, the epiphysal maturity is unchanged.

pressed to the pubis to the end of the prepuce. The prostate was minute and flat, and it was questionable whether its borders could be defined by palpation. The small, pale scrotum contained two very soft pea-sized testes.

During 1934 and 1935, seven assays showed measurable traces of urinary androgens. No gonadotropic substance was demonstrated in the urine by the modified Friedman test. Six metabolism tests in 1934 and 1935 averaged —9 per cent. Blood counts, apart from showing a slightly low red cell count gave

TABLE 3—Therapy in Case 1

1935	July to January 1936	Prephysin	1 cc, 6 doses a week
1936	January to March	Prephysin plus antuitrin S	1 cc } 6 doses
			0.25 cc } a week
	March 18 to May 6	Androsterone	2.5 mg, every 2d day
	May 8 to November 30	Testosterone (plain)	2.5 mg daily
	December 16 to Feb 10 1937	Testosterone propionate	5 mg 3 times weekly
1937	Feb 10 to April	Testosterone propionate	10 mg 3 times weekly
	August to May 17 1938	Testosterone propionate	20 mg 3 times weekly

normal results. Urinalyses and examination of the blood sugar and blood cholesterol gave normal results. A trace of creatine was excreted on one of four occasions. The creatinine excretion was normal.

The sella turcica was normal to roentgen examination. The skeletal age estimated from the development of the epiphyses was just over 16 years.

The therapy is shown in table 3. The total dose of testosterone has been 3,715 mg.

While gonadotropic substance was being administered, repeated assays failed to show any rise in the level of excreted androgens and no symptomatic or anatomic change was noted. After the patient had received testosterone until August 1936 there were some penile growth (6 cm) and a questionable increase in the axillary and pubic hair, and erections were more frequent. This therapy also failed to raise the level of excreted androgens.

Immediately after the institution of testosterone propionate therapy, a twenty-four hour excretion of 28 units of androgen was found. Erections occurred daily or oftener. By February 10 a small ejaculate had occurred. With 10 mg every second day, 26 and 27 units of androgen were excreted. By

April the penis was 8 cm in length, the prostate was enlarging and the scrotum was more pendulous. In July nocturnal emissions began to appear about every three weeks.

The voice became decidedly deeper, and the appearance and demeanor were more mature. The patient has continued to grow in height, and the shoulders are broader. His present height is 69 inches (175 cm), his span 75 inches (190 cm), his symphysial height 38 inches (96 cm) and his weight 133 pounds (60 Kg). A light beard has appeared, and a puberal type of facial acne is present. The axillary hair is still sparse. The pubic hair approaches the normal amount, and there is obvious hair on the arms and legs. The penis is 10 cm in length and the scrotum larger, thicker and darker. The testes have not enlarged. The prostate is about 3 cm in width and from 2 to 3 cm in height. Erections and nocturnal emissions

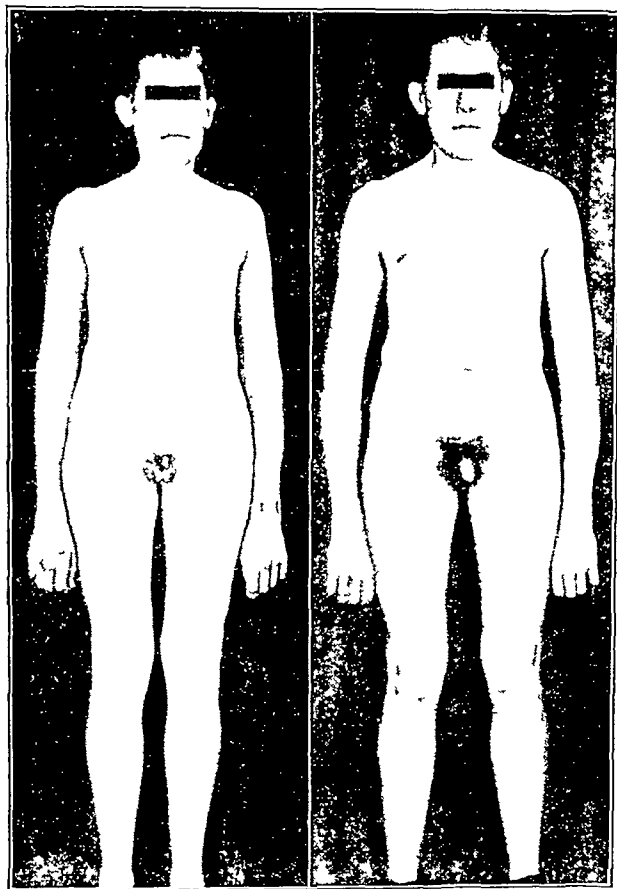


Fig. 6—Patient 2 Dec 24 1936 and April 16 1938. He had received 3 560 mg of testosterone propionate in the intervening sixteen months.

occur normally. The ejaculate contains no sperm, is highly mucoid and has a volume of 15 cc. The blood count is unchanged; the blood sugar, calcium and phosphorus levels remain normal and unchanged, and the blood cholesterol content is 120 mg per hundred cubic centimeters. The basal metabolic rate is -9 and -13 per cent. An extremely interesting feature is that the epiphysal development has remained unchanged; the epiphysal lines, for instance at the lower end of the radius and ulna and at the proximal end of the first metacarpal, are as widely open as in 1934 (fig 5). This demonstrates that testosterone propionate, capable of producing most of the evidences of puberty, is alone not the substance which causes epiphysal closure, ordinarily considered an integral part of puberal maturity, or that larger doses are required to affect this function. It should be noted that the patient received no thyroid therapy.

CASE 2 (fig 6)—A white man aged 30 who complained Dec 19 1936, of failure of genital development had had mumps at the age of 8 years. His appearance was typical of eunuchism; his height was 68½ inches (174 cm) and his span

was 75½ inches (192 cm). The voice was high, there was a slight down on the cheeks and the axillary and pubic hair was very scant. The penis and prostate were infantile, and pea-sized testes were palpable. Erections occurred at about monthly intervals. There were no clinical evidences otherwise of pituitary or thyroid disease.

He had mild microcytic anemia. The basal metabolic rate was -21 per cent, and the blood cholesterol content was 190 mg per hundred cubic centimeters. Examination of the visual fields and roentgen examination of the sella turcica gave normal results. The epiphyses at the lower end of the radius and ulna and the crest of the ilium were incompletely closed. There was well developed hypertrophy of the radial epiphysis (the patient was a sign painter).

The Friedman test showed no evidence of gonadotropic substance. A urinary androgen content as high as 23 units per twenty-four hours was found before treatment. Between Feb 6 and April 10, 1937, he was given 6,200 units of gonadotropic substance. February 27 the urinary androgen content was 21 units. There was slight increase in testicular size and some improvement in the sense of well being.

April 10 the administration of testosterone propionate 10 mg every second day was begun. This was increased to 20 mg every second day August 1 and to 30 mg at the same intervals August 21 and has been 25 mg three times weekly since November 1937. The total dose of testosterone propionate has been approximately 3,900 mg.

When this therapy was begun, erections occurred promptly and appeared three or four times daily. In August the first nocturnal emission occurred, the voice was lower, the scrotum was more pendulous and the prostate was distinctly larger. In September facial acne appeared. The urinary androgen content was 74 units in August, 64 units in October and 40 units in March 1938.

Semen specimens measured 0.8 cc in August 1937, 27 cc in February 1938 and 17 cc in April 1938. There were no sperms.

By April 1938 the facial appearance was more mature, the beard had increased visibly, requiring shaving every third day, the body hair had increased considerably and the axillary and pubic hair approached normal. The voice had become much lower. The shoulder breadth appeared to have increased. The penis was 8 cm in length and erections were occurring several times a day and nocturnal emissions every few weeks. The prostate had grown to a size approximating normal for the age of 18 or 19 years, the median sulcus still being well marked. The testes were distinctly smaller than at the end of the gonadotropic substance therapy.

In May the basal metabolic rate was -5 per cent. The epiphysal line at the end of the ulna was closed and that of the radius appeared to be closed but the line could be distinctly seen. The epiphysis of the iliac crest was still ununited. It would appear that in this case the rate of epiphysal closure was hastened somewhat during therapy.

CASE 3 (fig 7)—A man aged 27 who in May 1936 complained of arrested sexual development was rather obese and showed all the evidences of severe prepuberal hypogonadism. There was no history suggestive of testicular injury. He had the appearance of a boy of 16. His height was 67½ inches (171 cm) and his span 71¾ inches (182 cm). He weighed 156 pounds (71 Kg). The voice was high. There were a few pubic and axillary hairs but no beard. The penis was 1 inch (2.5 cm) in length and the small scrotum held no palpable testes. The prostate was not palpable.

The sella turcica was normal to roentgen examination and the visual fields and dextrose tolerance were normal. There was slight microcytic anemia. The blood cholesterol content varied between 128 and 150 mg per hundred cubic centimeters. Four basal metabolic rates averaged -10 per cent. The epiphysal age was approximately 18½ years, the phalangeal epiphyses being closed. The Friedman test gave a negative reaction, and the urinary androgens measured 6 international units in twenty-four hours.

In 1934 three basal metabolic rates had averaged -5 per cent and the blood cholesterol content was 126 mg per hundred cubic centimeters. At that time the epiphysal lines of the

phalanges were incompletely closed. The bone age had been estimated to be  $16\frac{1}{2}$  years by Dr T W Todd and a diagnosis of hypothyroidism arrived at from roentgen evidence alone.

From October 1934 to August 1935 the patient had received 100 units of gonadotropic substance three times weekly with no benefit. Thyroid in varying doses was used from January to August 1935. The therapy since June 1936 is outlined in table 4. The total dose of testosterone propionate has been 5260 mg in seventeen months.

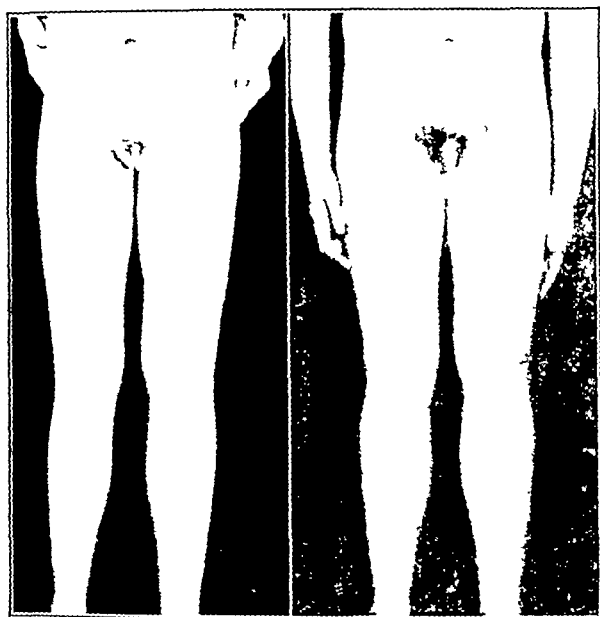


Fig 7—Patient 3 May 14 1936 and May 4 1938. He had received testosterone propionate for sixteen months before the second photograph was taken.

While the patient was taking androsterone and testosterone, the urinary androgen content varied from 3 to 4 units and erections increased slightly. A slight glairy secretion was seen at the urethral meatus, and the only anatomic change noted was slight penile growth.

TABLE 4—Therapy from June 1936 in Case 3

1936	June 12 to Aug 1	Androsterone 2 mg every second day
	Aug. 19 to Nov 2	Testosterone 2 mg every second day
	Nov 26 to Dec 16	Testosterone 3 mg every second day
	Dec 17 to Jan 9 1937	Testosterone propionate 3 mg 6 doses a week
1937	January 11	Testosterone propionate 10 mg 6 doses a week
	February 11	Testosterone propionate 10 mg 3 doses a week
	May 2 to May 24	No therapy
	May 24 to July 27	Testosterone propionate 10 mg 3 doses a week
	July 27 to Aug 18	No therapy
	Aug 18 to Oct 18	Testosterone propionate 20 mg 3 doses a week
1938	Oct 18 to May 1938	Testosterone propionate 30 mg 3 doses a week

With the patient receiving testosterone propionate, an androgen assay in December 1936 showed 21 units. By January 1937 assays showed a content as high as 119 units. Erections occurred three or four times daily. A small ejaculate was present. The penis had increased to 3 inches (7.6 cm) in length, and axillary and pubic hair had increased. When treatment was discontinued, the number of erections and the amount of ejaculate diminished markedly within ten days.

By April the ejaculate had increased further, axillary and pubic hair were increasing visibly, the scrotum was larger and darker and the penis measured  $3\frac{1}{2}$  inches (9 cm) from pubis to tip of prepuce. In August the voice was decidedly lower.

In October 1937 the ejaculate measured 0.4 cc. In November 1937, 0.8 cc, and in January 1938 0.5 cc. Nocturnal emissions occurred every two or three weeks. The results of blood

counts, the serum calcium, phosphorus and cholesterol contents and the metabolic rates have not changed. In May 1938 the epiphyseal age had advanced to 21 years. The epiphyseal development has therefore advanced at about a normal rate during the past four years but has apparently not exceeded the normal rate in spite of the large doses of testis hormone given. The testes have not become palpable.

At the present time axillary and pubic hair approach normal. The beard has increased slightly, and hair is appearing on the arms and legs. The voice is decidedly lower. The penis is  $3\frac{1}{4}$  inches (9.5 cm) long. The prostate has increased little if at all in size.

CASE 4 (fig 8)—A man aged 31 who in May complained of underdeveloped genitalia had no history suggesting testicular damage. The libido was minimal, there were no nocturnal emissions and erections were rare.

TABLE 5—Therapy in Case 4

Date	Medication	Assay
1936	May 12 to June 10	Testosterone 2 mg 3 times a week
	June 16	Dihydroandrosterone 25 mg 3 times a week
	July 20	Testosterone 2 mg 3 times a week
	October 6	Testosterone 3 mg 3 times a week
	November 1	
	November 15	
	December 1	Testosterone propionate 3 mg daily
	December 16	
1937	January	
	April	
	September 21	Testosterone propionate 10 mg daily
	December 6	

At the age of 20 years his height was  $65\frac{1}{2}$  inches (166 cm), and at the time of my examination ten years later it was  $67\frac{1}{4}$  inches (171 cm). The weight was 162 pounds (73 Kg), the span  $71\frac{1}{2}$  inches (182 cm) and the symphyseal height 36 inches

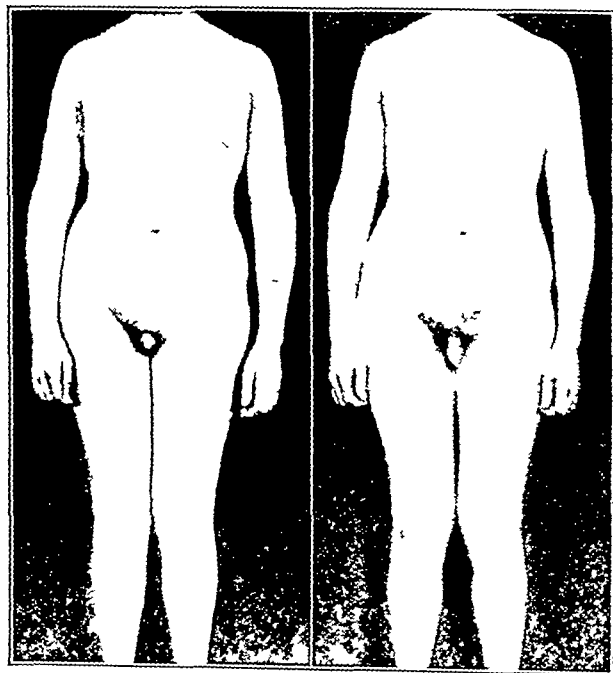


Fig 8—Patient 4 Dec 7 1936 and March 28 1938. He had received 2845 mg of testosterone propionate in the fifteen months before the second photograph was taken.

(91 cm). The voice was high and the face and body were hairless, but there was sparse axillary and pubic hair. The penis was very small, appearing 1 inch in length though actually it was  $2\frac{1}{4}$  inches (5.7 cm) when measured by pressing the rule against the pubis. The prostate was minute. The scrotum was very small, and the testes were the size of small peas.

The basal metabolic rate was  $-27$  per cent, but there were no clinical evidences of hypothyroidism. The blood cholesterol content was 176 mg per hundred cubic centimeters and later varied between 120 and 145 mg on several occasions. The epiphyseal age was 20 years. Assays for urinary androgens showed none. Roentgen examination of the sella turcica had given normal results repeatedly, and the visual fields showed no evidence of suprasellar lesions.

Treatment previously had included from 1 to 2 cc of gonadotropic substance in the form of antuitrin-S three times weekly for five months, with slight improvement. The treatment with testis hormones is outlined in table 5. The total dose of testosterone propionate was 2,845 mg in seventeen months.

Within a few days of the beginning of therapy erections increased, and by July they were occurring several times daily. In October 1936 the penis had increased  $2\frac{1}{4}$  inches (7.3 cm) in length and there was a slight viscid secretion at the meatus. In January 1937 facial acne of the puberal type was present, the voice had become decidedly lower and there was distinct though slight increase in the beard. The prostate was palpably larger but still smaller than normal. The penis measured  $3\frac{3}{4}$  inches (9.9 cm) in length and coitus was normal. The rate of progress was obviously faster with testosterone propionate than with other types of treatment used.

Cessation of injections for two and one-half weeks led to disappearance of the facial acne, lessening of the libido and potency and a slight decrease in the number of erections. By March 1938 the voice was distinctly low, the beard had increased visibly and the axillary and pubic hair were about normal. The scrotum was still small. The penis had increased to  $4\frac{1}{4}$  inches (10.8 cm) from pubis to tip. Frequent erections persisted. The prostate measured about  $1\frac{1}{2}$  by  $\frac{3}{4}$  inches (3.8 by 1.9 cm) as judged by palpation. The testes were unchanged in size. The epiphyseal age had just reached 21 years. The ejaculate was sperm free and had a volume of 4 cc.

#### THE QUESTION OF FUNCTIONAL HYPOGONADISM IN THE ADULT MALE (MALE CLIMACTERIC)

It is clear that testicular deficiency of severe degree does not always cause many symptoms, since some castrates have mild complaints. Impotence in itself cannot be considered evidence of hypogonadism, since in some of the cases studied high levels of urinary androgens have been found and large doses of testosterone propionate have not relieved the condition. In addition, a very low androgen content may be associated with general ill health with or without impotence. Arterial hypertension, for example, may be associated with a very low content, and even though this is raised to the normal range the associated excitability, irritability and impotence may remain unchanged. In some adult males, however, there may be symptoms suggestive of hypogonadism, a low androgen content being associated or unassociated with testis atrophy, and the use of testosterone propionate alone may be followed by complete symptomatic relief. The following is an example of such a case.

**CASE 7**—A man aged 58, first seen in February 1934 complaining of irritability, excitability and melancholia, was almost completely impotent. There was slight diffuse thyroid enlargement. The blood pressure was 110 systolic and 70 diastolic. The prostate was mildly enlarged. The testes were rather small, quite soft and associated with bilateral hydrocele. Blood counts, Wassermann tests and the sugar and cholesterol values were normal on repeated examinations. Four basal metabolic rates ranged from  $+5$  to  $-12$  per cent. A positive Friedman reaction was found on three of eight occasions. In August 1936 there were no urinary androgens and in October the content was 3 units. Throughout 1934 and 1935, treatment including the use of desiccated testis tissue and injections of hembreol, a urinary androgenic extract, did not improve his symptoms. From December 1935 to December 1936 mild improvement was noted while he was using dihydroandrosterone or testosterone

25 mg every second day. The nervous symptoms were less and erections occurred occasionally. In December 1936 he began to take testosterone propionate 25 mg every second day. In approximately two weeks he found himself sexually normal with great diminution in the sense of melancholy and irritability. With 25 mg doses of testosterone propionate, assay showed 10 units of urinary androgens, with 5 mg doses 18 units, with 10 mg doses 22 units and with 20 mg doses 80 units in twenty-four hours. Treatment was continued for sixteen months and during this period there was only the slightest possible suggestion of depression at times. Sexual potency has remained normal. At the date of writing, placebo substitution has been used for seven weeks without recurrence of symptoms.

#### CASTRATION

The symptoms of castration in the male may be completely relieved by injections of testosterone propionate if given in sufficient doses.

**CASE 8**—A man aged 64 presented himself in November 1936 complaining of extreme "nervousness, hot spells and loss of sexual power." In May 1934 he had complained to a surgeon of bilateral testicular pain. Bilateral orchidectomy was advised and the patient was led to believe implicitly that his potency would be unchanged and that no other symptoms would occur. Within a week hot flashes identical with those seen in the female

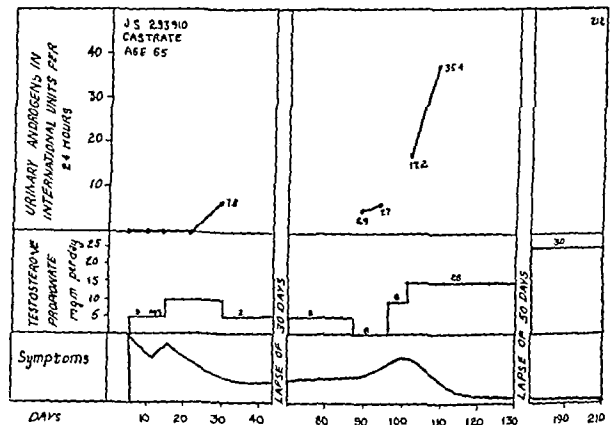


Fig 9—Data in case 8

climacteric began to appear together with a sense of oppression in the chest and head, melancholia and a sense of trembling. Within a month the ejaculate was less and in two months the libido was diminished and the potency lost. Since that time there had been a constant sense of excitement, tension and giddiness. Hot flashes increased to between twelve and thirty a day, and insomnia occurred. Prostatectomy was performed in September 1934, although apparently no symptoms of obstruction were present.

Physical examination revealed a well preserved man of 64. He appeared apprehensive and excited. As he sat in the examining room, he would suddenly become restless and marked redness of the face would appear, last for about a minute and be followed by profuse perspiration. The systolic blood pressure varied from 144 to 173 and the diastolic from 80 to 100.

There was evidence of mild arteriosclerosis. The fact that the prostate felt small was probably insignificant. The vibratory sense was diminished bilaterally below the knees, other sensations and the reflexes were normal. Blood counts, urea, calcium, phosphorus and blood protein values and Wassermann tests were normal. Urinalysis showed a little albumin and a few hyaline casts. The urea clearance was normal. The blood cholesterol content was 288 and 285 mg per hundred cubic centimeters. Dextrose tolerance following the ingestion of 100 mg of dextrose was as follows: fasting 102, one half hour 230, one hour 265, two hours 207, three hours 98 and four hours 68 mg. The sella turcica was normal to roentgen examination, the basal metabolic rate was  $\pm 0$  per cent. Friedman tests were done on five occasions, one reaction was

positive. Figure 9 indicates the levels of urinary androgens, the doses of testosterone propionate and, in a general way, the symptomatic improvement.

November 23 the daily administration of 5 mg of testosterone propionate was begun. For five days there was no change, after which a reduction in hot flashes was noted. No rise in urinary androgens was measured until December 18, in spite of increased doses. An erection occurred after one week of therapy. An acute infection of the respiratory tract caused a temporary increase in symptoms. By December 9 hot flashes were occurring only about four times daily. In February the mental unrest and melancholia were much diminished. Normal coitus was possible once or twice a week. There was a normal orgasm but no ejaculate. At the end of February, treatment was omitted for a week, toward the end of this time all symptoms were returning, and they continued to increase for several days after the resumption of 10 mg of testosterone propionate a day. By March sleep was normal and no sedation was necessary.

An increase in the dose produced an interesting effect, reported in July 23, 1937, by the patient's physician, Dr E C McDonald. "Mr S was given 25 mg of testosterone propionate June 17, and since that time he has received three ampules weekly. He has improved materially, both subjectively and objectively, with larger doses. Objectively, I am impressed by the fact that he is more alert mentally, in fact, I believe he is entirely without his former tendency to melancholia and complaints of nothing which is unusual for him. Subjectively, his libido is normal and he is able to perform sexual intercourse satisfactorily. The hot flashes gradually diminish from an average of four or five in twenty-four hours to a present level of not over two and usually one in the same length of time, these being milder and of shorter duration." He remained almost symptom free with 10 mg doses three times a week until about March 1, 1938, when impotence recurred. Between April 4 and May 4 injections of oil were given and care was taken not to place leading questions. The impotence persisted, but little complaint of general symptoms was made. May 4, 25 mg of testosterone propionate was given and between then and May 18 a total of 95 mg. May 6 polyuria was noted, and May 9 the first erection for two months occurred and the patient volunteered that the hot flashes had again become less severe and the "nerves steady." Subsequently, with doses of 10 mg three times weekly potency has been maintained.

#### SUMMARY

In cases of severe prepuberal hypogonadism, injections of testosterone propionate in the doses indicated have been followed by symptomatic and anatomic changes in approximately the following order. Penile erections occur promptly, and there is an increase in the pubic and axillary hair. The penis grows rather markedly and the scrotum less so, and the prostate growth appears to lag perceptibly in proportion. There has been no consistent evidence of increased testicular size, although the testes appeared to be larger after treatment in case 5. Nocturnal emissions occur and the quantity of semen increases. No diminution in sperm count or inhibition of sperm production has been obvious where sperms are present, though this may not be so in cases in which there is a normal number of spermatozoa before therapy. The larynx grows and the voice becomes lower. Facial acne appears and the beard grows. Epiphysal closure has not exceeded its expected normal rate in cases in which testosterone propionate alone was used and in one case has not increased in four years in spite of marked advance in puberty. No constant change in basal metabolism has been observed. In cases of functional hypogonadism in the adult this treatment has been followed by complete relief of nervous and sexual symptoms. In castrates, nervous and vasomotor symptoms and impotence can be abolished by sufficient doses.

#### ABSTRACT OF DISCUSSION

DR H L KRITSCHMFR, Chicago. I was interested in the results of the assay by the two methods that Dr McCullagh mentioned and to know just what takes place when these extracts are given. His results are very striking, and if this method can be used to stimulate the growth of the external genitalia it may have a definite field of usefulness. However, I think it might be desirable at this time to know what the effect of these drugs is on spermatogenesis. I believe that one may be justified in calling attention to the possible inherent dangers in some of these drugs. The point I wish to raise is that, while this drug has a certain field of usefulness, its indiscriminate use might possibly be attended by some undesirable consequences. Interesting in his experience is the fact that all the changes which occurred following the use of this drug were external, resulting in changes in the external genitalia, the growth of hair and the like. This subject, as Dr McCullagh stated, is still a debatable one. Koch called attention to the fact that this drug may have a deleterious effect on the spermatogenic function, and this it seems to me is an important point to bear in mind. I believe that the indiscriminate use of this drug should be discouraged until its effect on spermatogenesis has been definitely established. If, for example, this drug does have a deleterious effect on spermatogenesis, undesirable results may follow its use. I think it should be emphasized that this drug should be used under careful supervision in well selected cases. Some of the undesirable effects of the treatment of undescended testes with various endocrine preparations are beautifully illustrated in the exhibit of Drs Thompson and Heckel at the Scientific Assembly. I believe it would be most unfortunate if the indiscriminate use of this drug should be followed by interference with spermatogenesis.

DR GEORGE G REINLE, Oakland, Calif. This is a subject that we still do not know a great deal about, also there is danger in its being used promiscuously. Dr McCullagh's study has been gaged by the excretion of androgen. He has defined androgen as a chemical substance which can be found in human urine and which has pharmacologic properties similar to testicular extract. At present there is too little evidence for one to state definitely what cells in the body secrete the substances. That these substances may be found in the urine of a patient without testicular tissue has been exemplified by the case of castration cited in which these substances were found in the urine in quantities equal to those found in normal persons. Since early Biblical times it has been known that testicular functions are related to what are termed secondary sex characteristics. In spite of exhaustive research toward ascertaining the exact nature of this relationship, the problem is by no means solved. Today there is much dispute among certain workers regarding the function and secretion elaborated by such testicular cells as the cells of Leydig and of Sertoli. It has been shown quite convincingly that testosterone propionate given to young male chicks markedly increases the growth of the comb and markedly accelerates the time at which the young roosters exhibit definite signs of masculinity. Hamilton, in a recent talk to the Western Branch of the American Urological Association, showed a movie which exhibited evidence to the effect that testosterone propionate stimulated penile growth, pubic hair and erectile power in young persons with subnormal sex characteristics. Reports of studies with the injection of substances such as testosterone have been followed by the clinical use of this substance by many physicians for such complaints as impotence and cryptorchidism. The results in cryptorchidism are very difficult to evaluate because many retained testicles descend of their own accord as the patient grows older. As Dr McCullagh has pointed out, impotence cannot be considered evidence of hypogonadism. Although impotence may be due to the pathologic physiology of certain endocrine glands, it is often functional. Necessarily, any experimental work which is of value in increasing our knowledge of these subjects necessitates very diligent and thorough observation and a most careful analysis of the results found by the investigators. For these reasons I am particularly indebted to Dr McCullagh for his study of the treatment of testicular deficiency with testosterone propionate. He is to be complimented for his splendid work.



DR R V DAY, Los Angeles Testosterone is a potent drug. If one is to get physiologic results, one usually gets them fairly promptly. The cases that Dr McCullagh reported, of course, are examples of substitution therapy, and whether or not one obtains spermatogenesis or whether one produces erections or in some way relieves the impotence, I don't think matters very much, but there must be some metabolic phenomena. Perhaps they have something to do with the creatine anabolism. Certainly the patients experience a sense of well-being, that is in the cases of nervous exhaustion, asthenias and depressed energy states, and in those cases it is very useful if one does not expect too much from it. In artificial menopause in which there were severe symptoms there have been quite a number of patients who did not respond to estrogenic substances but did respond promptly to testosterone propionate. One of the advantages of the propionate salt is that it is slowly absorbed over a period of days so that larger doses may be given and need not be administered so often. I have sometimes given 100 mg a week. Its use is so recent that there is not yet enough clinical background for a thorough evaluation of its usefulness, and there will not be for perhaps the next ten or twenty years. It is very useful in early prostatism to relieve the irritability when infection has not yet occurred and the residual urine is of no great consequence. In such cases it does not make much difference what is done as regards its effect on the spermatogenic cells for the reason that in the case of these old men it is simply a replacement therapy. In the case of impotence one should use caution and not administer the drug over a considerable period, because in animals it has been demonstrated that degeneration of the spermatogenic cells in the tubules follows the intensive administration of testosterone if it has been continued too long.

DR L F HAWKINSON, Brainerd, Minn. After considerable experience with the use of androgen during the past three years, I can confirm what Dr McCullagh has said. It is becoming increasingly evident that the doses formerly used were inadequate. The original doses of 1 mg produced no results, 5 mg ampules produced some fairly good results. Since I have increased my doses to 25 mg two or more times a week my patients are responding with more regularity, and I want to call particular attention to the fact that Dr McCullagh used from 2,800 to 3,250 mg in treating these patients. Many so-called androgenic preparations in my experience have been of no value. Two years ago I tested nine so called androgenic preparations on white leghorn capons. Some of these products were labeled in capon units. It is noteworthy that the capon test proved seven of them to be worthless. Two preparations of testosterone propionate, made synthetically, were very potent. Concerning impotence, only about 20 per cent of my patients have obtained relief after injections of androgen. It is possible that I am using inadequate doses, this is suggested by Dr McCullagh's report. I have treated more than 100 patients with androgenic substance for prostatic hypertrophy. Although I am not prepared to report the results at this time, I have this much to say. Excluding two or three patients, there was a definite increase in well-being in these older men. They not only feel better but they are more active physically, more alert mentally and the nervous symptoms are usually ameliorated.

DR E PERRY McCULLAGH, Cleveland. I agree with Dr Kretschmer that caution should be employed in the use of these materials in patients in whom any spermatozoa are present or in whom spermatogenesis is normal. There are already some data which suggest that injected androgens do not harm spermatogenesis in the rat, whether or not this will be borne out for man remains to be established. It was shown by Dr Roy McCullagh in 1933 that in hypophysectomized rats the injection of urinary androgens extracted from male urine would maintain not only the prostate, vesicles and Cowper's glands but also the testes and spermatogenesis. At that time this work was not generally accepted. Later, however, it was adequately corroborated for testosterone propionate and other artificial androgens. This work was done in our own laboratory as well as by other workers, notably Nelson, who recently corroborated fully that these materials given in large enough quantities to animals having no pituitary glands to maintain their testes will not only do no damage but will actually maintain the spermatogenic elements. The exact mode of action of androgens under these

circumstances is not entirely clear. Cutuly favors the idea that scrotal maintenance may be of primary importance, but Nelson feels that the degree of maintenance of spermatogenesis and of the scrotum do not parallel each other and are probably not interdependent. Whether or not androgens will prove valuable clinically in producing spermatogenesis must remain for future work to determine. The treatment of impotence is difficult. Certain patients who have been impotent with no signs of hypogonadism and quite high levels of urinary androgens have been treated in spite of the high androgen levels, but with no improvement. On the other hand, certain patients with impotence and low levels of urinary androgens, which we believe are the result of poor general health have not been consistently improved even when urinary excretion has been raised to high levels. There is a group of patients with impotence, however, as I indicated, who have testicular deficiency as judged from the low level of urinary androgens, and in this group treatment with testosterone propionate brings about more consistent and more pronounced improvement.

## SULFANILAMIDE TREATMENT OF ERYSIPELAS

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Bellevue Hospital annually treats about 600 patients with erysipelas. Prior to 1937 the treatment of this disease was varied and not particularly effective. Erysipelas antitoxin, ultraviolet rays and local treatment of various kinds had all proved to be more or less ineffectual.

With the advent of sulfanilamide (prontylm and its related compound prontosil [the disodium salt of 4-sulfamidophenyl-2'-azo-7'-acetyl amino-1'-hydroxy-naphthalene-3,6'-disulfonic acid]) new hope was held for controlling this disease. Enough has been said and written about these drugs to preclude any detailed discussion of their action here. Their effect on hemolytic streptococci and other bacteria is by now well known.

TABLE 1—Patients Treated with Sulfanilamide

	Adult		Children	Average
	Male	Female		
Total cases treated	219	94	31	
Days of hospitalization	69	69	33	68
Days of fever	42	44	29	41
Deaths	4	1	4	
Mortality	1.8%	1.06%	12.9%	2.6%

Beginning Jan 1, 1937, all patients with erysipelas entering Bellevue Hospital were treated with sulfanilamide (prontylm and its derivative prontosil, prontylm in tablet form for oral use and prontosil for intramuscular injection). At first dosage was a problem, but in a short time a definite plan of treatment was formulated and has been adhered to in almost all cases. This is as follows:

1 For children up to 2 years of age two or three 5 gram (0.3 Gm) prontylm tablets are given every day and continued daily until the temperature reaches normal. The tablets are usually crushed and given with food or fluids.

2 For children from 2 to 5 years of age two 5 gram prontylm tablets are given three times a day (a total of 2 Gm) and discontinued forty-eight hours after the temperature has reached normal.

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3 For children from 6 to 12 years of age, three 5 gram tablets of prontosil are given three times a day (a total of 3 Gm) and continued daily until the temperature has been normal for forty-eight hours

4 Patients 12 years of age and over receive the following dosage

First twenty-four hours, 100 grams (65 Gm) of prontosil in divided doses

Second twenty-four hours, 80 grams (5 Gm) of prontosil in divided doses

Third twenty-four hours, 60 grams (4 Gm) of prontosil in divided doses

Fourth twenty-four hours, 40 grams (26 Gm) of prontosil in divided doses

Small doses may be continued for two or three days after the temperature has reached normal, and the dosage may be subject to change at any time, depending on the condition of the patient. When any gastric distress resulted from the use of the drug sodium bicarbonate in 10 gram (0.65 Gm) doses was given with each dose of prontosil with excellent results. Antipyretics and magnesium sulfate should not be given in conjunction with prontosil or prontosil.

Prontosil was used in only a few adult cases at the beginning of the study. It was used as a routine in infants too young to take tablets and in those adults who were unable to take oral treatment. One 5 cc ampule was given every four hours in adult cases. Infants received two 5 cc injections a day.

From January 1 to July 1, 1937, 344 patients with erysipelas were treated by this method. These patients all received the same nursing care, the same dressings (boric acid solution or cottonseed oil) and the same diet. Cathartics were used freely, magnesium sulfate being avoided. Of the 344 patients treated in this manner thirty-one were children under 12 years of age, 219 were men and ninety-four were women.

The average hospitalization was 69 days for adults and 55 days for children. The total average was 68 days for all patients treated. On the fifth day 13.6 per cent of the patients left the hospital.

TABLE 2—Patients Treated with Erysipelas Antitoxin

	Adults	Children
Cases treated	382	24
Days of hospitalization	11.1	12.8
Days of fever	6.8	10.0
Deaths	3.0	9
Mortality	9.2%	37.5%

TABLE 3—Patients Treated with Serum, Ultraviolet Rays, Roentgen Rays and Local Treatment with Dressings

	Adults		Children	Total
	Male	Female		
Total cases	2532	1484	437	4473
Average days stay	11.26	11.09	10.77	11.11
Deaths	197	93	86	376
Mortality	7.7%	6.3%	19.7%	8.4%

The average number of days for the temperature to reach normal was 4.1 days for men, 4.4 days for women and 2.9 days for children. The total average was 4.1 days for all patients treated, 44 per cent reached a normal temperature on the third day.

Complications of erysipelas in adults treated with prontosil were as follows: spread of the lesion, three cases, abscess formation either at the site of the lesion or elsewhere, five cases, pustular folliculitis, two cases, acute infectious arthritis, two cases, pneumonia, one case, and cardiac arrhythmia, one case.

Certain reactions were observed and attributed to the drug. Twenty-seven patients became cyanotic, but this was not considered a contraindication, and usual dosage was continued. Nausea and dizziness were observed frequently and vomiting occurred in four women. In one patient slight jaundice developed which disappeared four days after medication was discontinued. This patient was a chronic alcoholic addict with an enlarged liver. Another patient who entered with a history and preexisting diagnosis of alcoholism and cirrhosis of the liver died with jaundice and cholemia during the course of the erysipelas and sulfanilamide medication. Autopsy was not permitted. In these two cases we did not attribute the cause of the jaundice to sulfanilamide. One patient showed slight hematuria. After injections of prontosil seven children showed a pink tinge to the skin due to the color of the dye (prontosil).

There were five deaths of adults, or 1.5 per cent, and four of children, or 12.9 per cent.

In an evaluation, this series (table 1) may be compared with 406 cases treated with erysipelas antitoxin during the winter of 1935-1936 (table 2).

The summaries of these tables may be compared with the results of 4,473 cases from Jan. 1, 1930, to Jan. 1, 1937, in which various methods of treatment were utilized—serum, ultraviolet rays, x-rays and local treatment with dressings of different kinds (table 3).

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## THE PRODUCTION OF BREAST GROWTH IN THE HUMAN FEMALE

BY THE LOCAL APPLICATION OF ESTROGENIC OINTMENT

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The growth of the mammary glands in experimental animals has been extensively investigated and has been found to depend primarily on the estrogenic hormones.<sup>1</sup> Complete development in most mammals is dependent on the simultaneous action of estrogenic and corpus luteum hormones.<sup>2</sup> In spite of the excellent experimental background, I have been unable to find records of carefully controlled studies of human breast growth. I therefore performed studies on three women lacking mammary development and exhibiting signs of marked hypogonadism. In the first part of the study the hormones were administered by subcutaneous injection. I was able to demonstrate that, by the injection of from 150,000 to 350,000 international units of estrone or of estradiol benzoate per week, active mammary growth could be produced in patients who previously had no visible or palpable breast tissue. The results were recorded by frequent caliper measurements and photographs. During the treatment vaginal smears were changed from the inactive type to the active estrous state, there was enlargement of the

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<sup>1</sup> Turner C. W. The Mammary Glands. Chapter VII. Sex and Internal Secretions, edited by Edgar Allen, Baltimore: Williams & Wilkins Company, 1932. Gardner W. U. and Van Wagenen G. Experimental Development of the Mammary Gland of the Monkey. *Endocrinology*, 22: 164-172 (Feb.) 1938.

<sup>2</sup> Turner C. W. and Frank A. H. The Relation Between the Estrous Producing Hormone and a Corpus Luteum Extract in the Growth of the Mammary Glands. *Science*, 73: 295 (March 13) 1931.

uterus, the vagina became deeper and the vaginal walls, previously thin, smooth and atrophic, became rugated, thick and soft. There was considerable psychic improvement, the outlook changing from that of abnormal, almost asexual individuals to one approximating that of normal women. This was especially true after artificial menstrual periods had been produced one or more times. Hypogonadal symptoms such as hot flashes and emotional instability were relieved, the basal metabolism rose, the appetite improved and there was considerable weight gain in these previously very thin patients.

Although I was also able to produce breast growth with injections of ketohydroxyestrin (estrone), estradiol benzoate was, unit for unit, much more effective.

Corpus luteum extract, 5 international units daily for a period of thirty days, when given alone produced no detectable change in the breasts. This is in accord with the experimental observations on animals of Turner,<sup>2</sup> Corner<sup>3</sup> and others. When, however, patients were given alternate daily injections of 1 international unit of progesterone and from 20,000 to 50,000 international units of estrone or of estradiol benzoate, breast growth was more rapid than that produced by the estrogenic hormones alone. The simultaneous use of the corpus luteum and estrogenic therapy definitely produced a much firmer breast growth, which was distinctly lobular to palpation, whereas the growth produced by the estrogenic hormones alone was smooth and the borders of the glandular tissue were difficult to define. Rapid regression in the size of the breasts followed the omission of the hormone injections, but the regression was less rapid when the combined therapy had been used.

TABLE 1—Breast Growth Produced with Estradiol Benzoate Injections (Case 1)

Date	Therapy	Breast Measurements (in Centimeters)			
		Horizontal	Vertical	Depth	Areola
1/8/36		No breast tissue			
1/23/36	50,000 i u daily	R 5.4	5.4	2.0	1.6
		L 5.3	5.4	2.1	1.7
2/1/36	50,000 i u daily	R 6.0	6.0	2.4	1.9
		L 6.1	6.0	2.3	1.9
2/21/36	50,000 i u 3 times weekly	R 6.0	5.9	2.4	2.0
		L 6.0	5.8	2.4	1.8
3/10/36	No treatment	R 5.0	5.2	2.0	1.6
		L 5.1	5.0	2.1	1.8
4/21/36	50,000 i u 3 times weekly	R 7.5	7.0	3.5	2.5
		L 7.8	7.0	3.5	2.5
5/13/36	50,000 i u daily	R 8.8	8.0	4.2	2.5
		L 9.0	8.1	4.2	2.6
7/24/37	50,000 to 50,000 i u per week	R 11.5	10.5	5.4	3.2
		L 11.7	10.8	5.6	3.3

So far as was possible by clinical criteria alone, I was thus able to confirm in the human female what had been suggested by previous studies on breast growth of experimental animals. Table 1 includes some of these results and the details of the studies are given in the case reports.

The second part of the investigation concerned the production of human breast growth by local injection

with estrogenic ointments. In the literature there is considerable evidence that estrogen is well absorbed through the skin and mucous membranes. The application of estrogens to the vaginal mucosa of animals has been demonstrated as more effective than injections in producing typical vaginal estrous changes.<sup>4</sup> The treatment of gonorrheal vaginitis in children, which is

TABLE 2—Breast Growth Produced by Local Application of Estrogenic Ointment (Case 1)

Date	Therapy	Breast Measurements (in Centimeters)			
		Horizontal	Vertical	Depth	Areola
5/13/38	Size after omission of treatment	R 4.8	4.8	2.0	1.6
		L 4.8	4.8	2.1	1.7
5/28/38	Left breast treated, right breast control	R 5.4	5.4	2.1	2.0
		L 7.0	7.0	3.1	2.5
6/8/38	Left breast treated, right breast control	R 5.4	5.4	2.7	2.0
		L 8.2	8.2	4.0	2.6
6/17/38	Right breast treated, left breast control	R 7.2	7.0	3.3	2.9
		L 8.2	8.2	4.0	2.9
7/17/38	Both breasts treated	R 11.8	10.8	5.3	3.1
		L 11.8	10.7	5.6	3.1

based on the vaginal changes produced by estrogenic hormones, is best accomplished by the use of vaginal suppositories containing the active material.<sup>5</sup> Excellent results in the treatment of pruritus vulvae and kraurosis vulvae have been reported with local estrogenic therapy.<sup>6</sup> Certain dermatoses associated with hypogonadism are said to respond to local hormone treatment.<sup>7</sup> Kun<sup>8</sup> demonstrated that, in rats, percutaneous estrogen acts locally to improve cutaneous nutrition and stimulate hair growth. Burrows, Ito and Moore<sup>9</sup> have shown that enough estrogenic material can be absorbed through the intact skin of animals to elicit the characteristic general effects of the hormone, including estrus and breast growth. When an ointment containing estrogen is applied to the breast region of guinea pigs, nipple growth is produced, and, when the application is unilateral, nipple growth is greater on the treated side.<sup>10</sup> DeFremery<sup>11</sup> found that treatment of virgin goats with pituitary lactogenic hormone caused

4 Loewe S. and Voss E. H. V. Eine placentäre Inkretdrüse. Spenderin örtliche wirksamen Hormone? Klin. Wchnschr. 5 1083 1085 (June 11) 1926. Powers H. H. Varley J. R. and Morrell J. A. Preliminary Note on Assay of Follicular Hormone by Vaginal Administration. Endocrinology 13 395 398 (July Aug.) 1929. Berger M. Besonders hohe Wirksamkeit des Follikelhormons bei vaginaler Instillation. Klin. Wchnschr. 14 1601 1602 (Nov. 9) 1935.

5 Te Linde R. W. and Brawner J. N. Jr. Experiences with Amniotin in the Treatment of Gonococcal Vaginitis in Children. Am. J. Obst. & Gynec. 30 512 523 (Oct.) 1935. Lewis R. M. and Adler E. L. Endocrine Treatment of Vaginitis of Children and of Women After Menopause. J. A. M. A. 109 1873 1875 (Dec. 4) 1937.

6 Tscherne E. Ueber den histologischen Nachweis der Wirkung percutan zugeführten Follikelhormons bei der Kraurosis Vulvae. Zentralbl. f. Gynak. 62 169 172 (Jan. 15) 1938. Jaffe K. Percutane Behandlung von Dermatosen mit Follikelhormon. Schweiz. med. Wchnschr. 67 471 478 (May 22) 1937. Klaffen E. Zur Behandlung des Pruritus vulvae und bestimmter Formen von Dermatitiden. Zentralbl. f. Gynak. 61 972 981 (April 24) 1937.

7 Jaffe K. Klaffen E. Wirkungen der Follikelhormone auf die Haut bei percutaner Verabreichung. Wien. klin. Wchnschr. 50 408 411 (March 26) 1937.

8 Kun H. On Some Effects Produced by Applying Oestrin to the Skin of Mice. Am. J. Cancer 20 48 57 (Jan.) 1934. Ito M. Hayazu S. and Kon T. Die percutane Wirkung der Sexualhormone. Zentralbl. f. Gynak. 61 1094 1098 (May 8) 1937. Moore C. R. Lamar J. K. and Beck Naomi. Cutaneous Absorption of Sex Hormones. J. A. M. A. 111 1114 (Jul. 2) 1938.

9 Jadassohn W. Uehlinger E. und Zuercher W. Zur Vergrößerung der Meerschweinchenbrustwarze durch Hormone der Lokale Folliculäreffekt. Klin. Wchnschr. 16 313 314 (Feb. 27) 1937. Muscio Fournier J. Albrieux A. and Buno W. Action locale de la folliculine sur la mamelle du cobaye male. Bull. Acad. de med. Paris 117 64 66 (Jan. 12) 1937.

11 DeFremery P. On the Influence of Different Hormones on Lactation. J. Physiol. 87 50 51 P. (May 16) 1936.

3 Corner G. W. The Hormone Control of Lactation. Am. J. Physiol. 95 45 55 (Oct.) 1930.

the secretion of only a few drops of milk. If, however, the udder was first treated withunctions of estradiol benzoate there was considerable mammary development with changes of the preparturient type. Injections of lactogenic hormone at this stage induced lactation which was as abundant as that observed after parturition.

Loeser and Salmon<sup>12</sup> each found that the symptoms of castrate women could be relieved by percutaneous estrogenic therapy, and the latter demonstrated that a total cutaneous dose of from 160,000 to 300,000 i.u. units given over a period of from three to four weeks was necessary to produce a full estrogenic effect as determined by vaginal smears.

No studies have as yet appeared on the local effect of estrogen when applied directly to the human breast. I therefore omitted the injection therapy in my patients until the major part of the artificially produced growth had disappeared. An ointment of hydrous wool fat and petrolatum containing 5,000 international units per gram of estradiol or of estradiol benzoate was then applied directly to the breast region over a circular area approximately 10 cm in diameter with the nipple as the center. Each day 5 Gm., containing 25,000 international units, was applied, by the patient, to the breast region on one side rubbed in for five minutes, and allowed to remain on over night. The breast of the other side was used as a control and received the same amount of ointment base, without the estrogen, and the same amount of massage.

Definite breast growth of considerable degree was produced by the estrogenic substance absorbed through the skin directly into the breast tissue. Evidence of absorption of the estrogen into the systemic circulation was found in the change of the vaginal smears from the inactive type to the active estrous state, by change in the vaginal mucosa, by enlargement of the uterus, by relief of the patients' hypogonadal symptoms and by slight effects on the opposite breast.

I found little or no difference in the effectiveness of the estradiol and estradiol benzoate ointments.

The ointments, unit for unit, were more effective in producing breast growth than injections of estradiol benzoate or of ketohydroxyestrin (estrone). Ointments containing estrone were less effective, unit for unit, than those containing estradiol.

When breast growth was produced by injections of estrogenic material, there was diminishing effectiveness of the injected hormones. When the hormones were applied to the skin, however, there was a steady progressive growth.

Caliper measurements were made at frequent intervals and a photographic record was kept of the changes produced. The accompanying tables and photographs are abstracted from these records at salient points in the studies.<sup>13</sup>

#### REPORT OF CASES

**CASE 1**—An unmarried woman aged 24, first seen Dec. 3, 1935, complaining of lack of development of sex characteristics, nervous instability and hot flashes, had never menstruated. Many kinds of glandular treatment had been tried without success. Small doses of estrogen by injection had perhaps relieved slightly the subjective symptoms.

<sup>12</sup> Loeser, A. A. Resorption and Action of Follicular Hormone Rubbed Into the Skin. *J. Obst. & Gynaec. Brit. Emp.* 44: 710-714 (Aug.) 1937. Salmon, V. J. Skin Absorption of Dihydroxyestrin in Humans. *Proc. Soc. Exper. Biol. & Med.* 38: 481-484 (May) 1938.

<sup>13</sup> Estradiol benzoate (progynon B) corpus luteum hormone (proluton) and estrogenic ointments were supplied for these studies by Dr. Max Gilbert and Dr. Gregory Stragnell of the Schering Corporation. Estrone (aminotin) was supplied through Dr. J. A. Morrell of E. R. Squibb and Sons.

She was 5 feet 8¾ inches (175 cm) tall and very thin, weighing only 111 pounds (50 Kg). The arms and legs were long in proportion to the length of the trunk. From soles to symphysis pubis she measured 37¾ inches from symphysis pubis to vertex 31½ inches. The span with the arms outspread exceeded her height by 4½ inches. The face and manner were very feminine but there was no sign of breast tissue, the hips were narrow, the external genitalia and vagina were infantile and the uterus could not be palpated. Hair growth was normal except that it was very scanty in the pubic region. The skin was smooth, clear and delicate. Laboratory studies were within normal limits, except for the following: the basal metabolism was minus 15 per cent, the sugar tolerance curve was flat, roentgenograms showed that epiphyseal union had been delayed and had not yet occurred in the phalanges or at the distal end of the radius and ulna, and the vaginal smears were of the inactive or "castrate" type.

Substitution therapy with large doses of estrogenic hormone was advised. It was thought that the patient's ovaries were either absent or so atrophic that little or no effect could be expected with pituitary gonadotropic substance.

Treatment was started Jan. 8, 1936, with daily subcutaneous doses of 50,000 international units of estradiol benzoate. Within

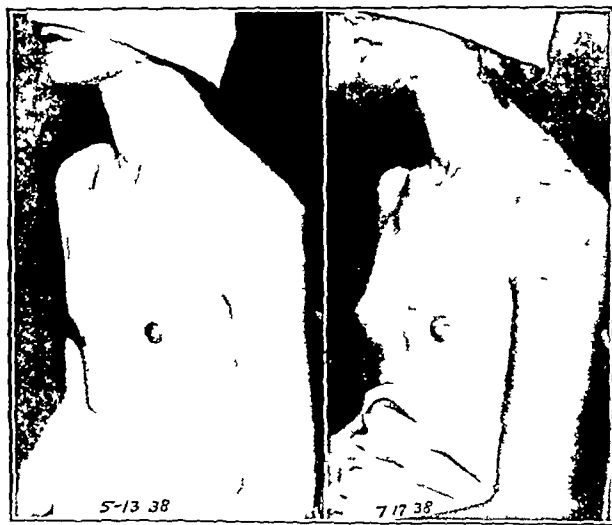


Fig. 1 (case 1).—Breast growth produced after eight weeks application of ointment to the mammary region.

twelve hours after the first injection the patient noticed a clear vaginal secretion, never before present. There were also some lower abdominal pains which suggested uterine cramps. These results became more definite after the second injection. After six injections there was tenderness and enlargement of the nipples and areolae, and a darkening in color of the latter. At this time a disk of firm tissue about 4.5 cm in diameter was noted under each areola. The labia were very sensitive. After ten injections the breasts measured 4.7 cm in diameter and the uterus was palpable for the first time. The vaginal walls were turgid and rugated. February 1, after twenty-four daily injections, the breasts were 6.0 cm in diameter and 2.4 cm deep and the uterus was larger, although still much smaller than normal. At this time the dose was diminished to 50,000 international units three times weekly. The breast growth was maintained with this dose but did not increase during the next three weeks. All treatment was stopped for a control period of two weeks and there was rapid regression in the size of the breasts. Four days after cessation of treatment rather profuse vaginal bleeding occurred, lasting six days. The psychic effect of this was considerable. The patient said that now she had menstruated for the first time she felt like a normal woman. Treatment was resumed with 50,000 international units three times weekly and there was slow growth. Resumption of 50,000 international units daily brought a rapid increase in size of the breasts, nipples and areolae. During the next thirteen months the patient received from 30,000 to 350,000 international units a week. Definite breast regression occurred with less

than 100,000 international units a week. A maximum point of growth was attained with 350,000 international units a week. Continuation of this dosage accomplished no further increase in the breast size. Table 1 shows the breast measurements at various stages of the treatment. On estrogen therapy alone the patient gained weight from 111 to 130 pounds (50 to 59 Kg) and the basal metabolic rate rose from minus 15 to plus 4 per cent.

All treatment was omitted for a period of thirty days. The left breast only was then treated daily with 5 Gm of the ointment containing 25,000 international units of estradiol benzoate. The right breast was treated with the ointment base without the estrogen. The left breast increased in size while the right one showed little change. This was evident in ten days, and the unilateral treatment and growth continued for twenty-three days. Treatment of the right breast alone brought them to equal size, then bilateral treatment was given for twenty-eight days. The skin received a total dose of 50,000 international units daily. The rate of growth and total growth produced by this dose to the skin were slightly in excess of that produced by subcutaneous injections of 50,000 international units daily (table 2). Omission of the ointment treatment was followed by vaginal bleeding and rapid regression in breast size. The ointment treatment was then resumed with estradiol, the free hormone, as the active ingredient instead of the benzoate ester. Approximately the same results followed as with the estradiol benzoate ointment. Table 2 shows the breast measurements at various stages of the ointment treatment and figure 1 shows the patient before and after the treatment of the breast with estrogen injections.

**CASE 2**—An unmarried woman aged 24, first seen March 8, 1938 complained of lack of development of sex characteristics, anorexia, underweight and nervousness. She had never menstruated. With desiccated thyroid one-half grain (0.03 Gm) once daily and thelin 10,000 international units once weekly she had improved slightly. The basal metabolic rate had risen from minus 15 per cent to plus 1 and she had gained a little weight. There had never been any breast development, either before or after the injections.

She was 60 inches (152 cm) tall and weighed 89½ pounds (40.6 Kg). She had the general appearance of a girl of

injections) there were abdominal cramps, presumably uterine, and the vaginal smears showed active estrous changes. The nipples became erect and the areolae larger and darker by the end of the first week's treatment. The labia minora and majora enlarged, and after three weeks of treatment a small uterus was palpable by rectum. A disk of breast tissue was palpable at the end of the first week, and there was progressive breast growth at approximately the same rate as that obtained in

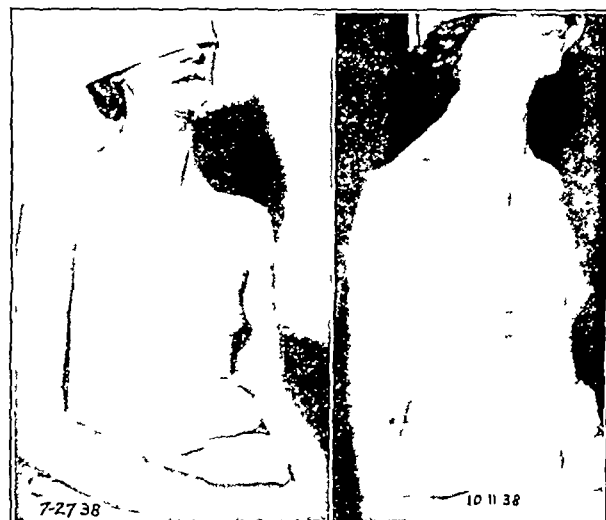


Fig 3 (case 3)—Breast growth produced after treatment only of right breast for twelve weeks with ointment.

case 1. When the estrogen injections were omitted, vaginal bleeding occurred for the first time in the patient's life and lasted four days. Breast growth regressed on omission of therapy but was resumed when injections were resumed. After three months of treatment the breast diameters were approximately 10.5 by 8.0 cm, their depths 4.5 cm, the areolae measured 2.8 cm. Treatment with 50,000 international units daily except Sundays (300,000 international units a week) was continued and no further increase in breast size occurred. Treatment was then omitted for two weeks and the breasts became smaller, the diameters being approximately 6.1 by 5.8 cm and depths 2.5 cm.

TABLE 3—Breast Growth Produced by Local Applications of Estrogenic Ointment 25,000 International Units Daily to Right Breast Only (Case 3)

Date		Breast Measurements (in Centimeters)			
		Horizontal	Vertical	Depth	Areola
7/27/38	R	5.0	5.0	2.5	1.6
	L	6.8	6.6	3.7	2.9
8/ 5/38	R	5.8	5.8	2.9	2.1
	L	6.8	6.6	3.9	2.9
9/ 5/38	R	7.8	7.5	4.0	2.5
	L	7.5	7.9	4.1	2.6
10/19/38	R	9.8	9.5	5.8	3.2
	L	8.1	8.3	4.8	2.9

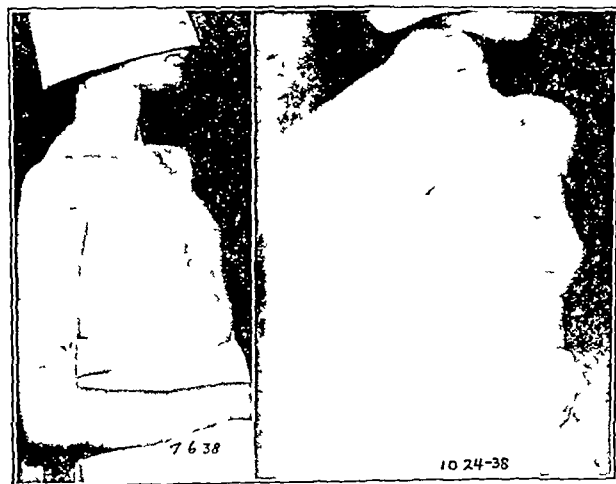


Fig 2 (case 2)—Breast growth produced after three and one half months' use of estrogenic ointment.

approximately 12 years. The manner was entirely feminine, the hair and skin were normal. There was no visible or palpable breast tissue. The areolae were very small. Their color was that of the surrounding skin. The very small nipples were inverted. The external genitalia and vagina were infantile and the uterus was impalpable by rectal examination. Vaginal smears were of the inactive type.

Treatment was started with 100,000 international units of estradiol benzoate subcutaneously three times weekly. The first notable effect was the appearance of a vaginal secretion at the end of forty-eight hours. After ninety-six hours (two

Estradiol benzoate ointment was then applied to the right breast only, and the left breast was used as a control, receiving the ointment base without the estrogen. The right breast definitely increased in size during a two weeks' period, while the left gland showed little change. The ointment was changed to estradiol, the unesterified form, and growth continued at the same rate. After nine weeks' treatment the right breast measured 9.8 by 9.0 cm, depth 4.4 cm, areolae 2.5 cm. The left breast measured 7.1 by 7.0 cm, depth 3.5 cm, areola 2.2 cm. The left breast was then brought up to the size of the right by treating it alone for three weeks. Then both breasts were treated, each receiving 25,000 international units of the estradiol ointment a total of 50,000 international units daily to the skin. After five weeks of the bilateral treatment

each breast measured approximately 10.4 by 10.3 cm, depth 5.1 cm, areola 2.7 cm and the areolae were large and dark, nipples large and erect. Figure 2 shows this patient before and after the ointment therapy.

**CASE 3**—A married woman aged 28 complained of nervousness long periods of amenorrhea and breast atrophy. Her breasts and menses had been approximately normal until after the birth of a child. Thereafter her periods were scanty, were of very short duration, and occurred at intervals of from six to twelve weeks. Both breasts had become very small but the right one had atrophied to such an extent that it was only half the size of the left. Vaginal smears showed variations from slight to moderate estrous activity. The vagina was normal, the uterus small.

Ketohydroxyestram injections were started in doses of 30,000 international units three times weekly. Slight breast growth on both sides resulted, but after six weeks of this therapy a level was reached beyond which no further growth was evident. The right breast remained much smaller than the left. Ketohydroxyestram 50,000 international units three times a week was given and there was some increase in breast size with the larger dosage. All treatment was then omitted. It was thought that this patient whose right breast was considerably smaller than the left, presented an excellent opportunity for study of the local ointment effect. The breasts became much smaller after the injections were discontinued for twenty-six days.

Beginning July 27, 1938, 5 Gm of the estradiol ointment containing 25,000 international units was applied to the right breast daily. The left breast received the control treatment with hydrous wool fat-petroleum ointment base without the estrogen. There was a gradual increase in the measurements of the right breast until after twelve weeks treatment. October 19 the right breast actually was larger than the left (table 3 fig 3). Systemic absorption was manifested by relief of nervousness, marked increase in vaginal secretion, enlargement of the uterus, the constant presence of vaginal smears showing marked estrous activity, and some increase in the size of the left breast.

#### COMMENT

These studies demonstrate that estrogens can be absorbed through the skin of the human female directly into the breast tissue and by this route can produce their characteristic stimulation of mammary growth. It is definitely not recommended that this method be adopted in general practice until further studies can be done and the limitations and possible dangers of the cutaneous application of concentrated estrogens can be defined.

From the strictly histogenic standpoint, the mammary glands should be considered as appendages of the skin and may be regarded as modified sweat glands. The glandular elements of the breasts are derived from the ectoderm. When local action of administered hormones is desired, it seems as logical to use the percutaneous treatment to the breasts as to use estrogenic substances on the vulva and in the vagina to relieve kraurosis or vaginitis. For the many patients in whom only a general effect is desired, the method of choice will no doubt continue to be subcutaneous or intramuscular injection. As we learn more about the local action of hormones, however, it may be necessary to choose between routes which involve the entrance of hormones into the general circulation and those which depend on local action on organs or tissues accessible from the exterior.

#### CONCLUSIONS

Estrogenic hormones applied to the skin of the mammary region of the human female will act locally to produce breast growth. Systemic effects such as are obtained by the injection of large doses of estrogen were produced by percutaneous absorption of the administered hormones.

600 South Kingshighway

## Clinical Notes, Suggestions and New Instruments

### GIOMUS TUMOR (GLOMANGIOMA)

CLAREMONT PAUL DOANE, M.D. FRESNO CALIF

Glomus tumors of the digits of the upper extremities have been recognized since they were first described by Masson<sup>1</sup> and Barre and Masson<sup>2</sup> in the French literature in 1924. These tumors are comparatively rare and are probably frequently overlooked clinically. Bailey<sup>3</sup> reports that in the eleven years following Masson's description of the tumor only fifty-eight instances of glomus tumor were recorded. If they are not overlooked, their exact nature may not be clear. It is my purpose in this report to call attention to them briefly and to record a typical case.

Glomus tumors may occur anywhere over the cutaneous surface of the body, but they occur most frequently in the extremities,<sup>3</sup> and especially in the digits of the upper extremities. The histologic structure is now well known, and the histogenesis of the glomus tumor was readily established.<sup>4</sup> Those interested in the histology of the tumors are referred to Bailey's<sup>3</sup> detailed report.



Fig 1—Section from specimen obtained in case reported. Note irregular vascular lumens surrounded by glomus cells. The vessels are separated from one another by homogeneous material. Reduced from a photomicrograph under low power.

The tumor is solitary and small and is a rose or purplish blue. It varies in diameter from 4 mm to 10 mm.<sup>5</sup> The tumor may be raised so that it is easily seen, or it may extend into the subcutaneous tissues and be neither visible nor palpable.<sup>6</sup> These tumors are exquisitely tender and pressure on one produces lancinating pain of a severe variety. External cold may produce paroxysms of pain. It is described as a burning stabbing pain, which radiates up the extremity (if the tumor occurs in a digit). Cases have been reported in which these

- 1 Masson Paul. *Lyon chir* 24: 257 (May-June) 1924.
- 2 Barre J. A., and Masson P. *Bull Soc franç de dermat et syph. (Reunion de Strasbourg)* 31: 148, 1924.
- 3 Bailey O. T. *Am J Path* 11: 915 (Nov.) 1935.
- 4 Masson<sup>1</sup>, Barre and Masson<sup>2</sup>, Bailey<sup>3</sup>.
- 5 Christopher Frederick. *Textbook of Surgery*, ed 3 Philadelphia, W. B. Saunders Company 1936, p. 159.
- 6 Kolodny Anatole. *Ann Surg* 107: 128 (Jan.) 1938.

painful tumors have been present for as long as thirty years Kolodny<sup>6</sup> in a recent report calls attention to a case in which sweating of the finger on irritation of the nodule was noticed. He feels that this phenomenon adds to our knowledge concerning the physiology of sweating.

In four of Adair's<sup>7</sup> cases the tumor was associated with the bed of the nail. Masson's patients had subungual tumors. My case is that of a subungual tumor.

#### REPORT OF CASE

Mrs. D. R. C., aged 31, white housewife, was referred to me by Dr. R. J. van Wagenen March 8, 1938. For years she had suffered from pain in the tip of the middle finger of her

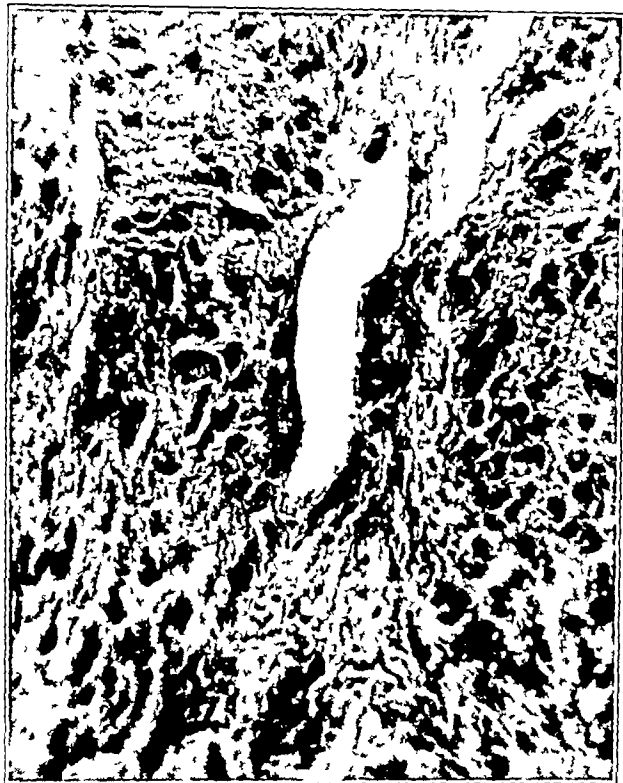


Fig. 2—Showing the numerous irregular vessels and clusters of glomus cells. Reduced from a photomicrograph under high power.

left hand. She could not remember when she first began to have this pain, but she associated its onset with a severe contusion of the ring finger of the same hand when she was about 10 years old. The middle finger was not involved in this accident. For a year or two after she first began to notice it the pain gradually became worse and the tip of her finger became more sensitive. During the next eighteen years there was little change in the character of the pain or of the tenderness. She was observed occasionally by various physicians who offered no treatment that gave her relief.

About two years ago she began to notice an increase in the tenderness and in the amount of pain that she experienced. Whereas formerly radiating pain was not severe it now became quite marked. At times pain, which originated in the tip of her finger, radiated well up into the arm and was of an intense nature. Thinking she was suffering from some inflammatory lesion, and on the advice of a physician, she had roentgenograms made of the painful digit. The roentgenograms were reported negative. About this time amputation of the finger was advised as being the only solution for her problem.

For two years she postponed doing anything about the proposed treatment, hoping that her finger would eventually cease to be painful. Recently, however, the pain became so bad that 'all (her) fingers ache' and she was becoming desperate enough to submit to any treatment which could offer her relief.

Examination of the finger revealed that it looked normal, apparently no different from any of the other fingers. The patient localized the source of the pain in a small area beneath the nail, at the margin of the lunula. She insisted that she could notice a "bluish" discoloration at the point which, when touched, gave rise to the pain. When the finger was observed in direct sunlight an area could be seen which seemed to have a slightly deeper color than the rest of the nail bed. The difference in shade was so slight as to make one wonder whether it was actually present. Pressure over this area gave rise to pain which was almost intolerable. No other areas of abnormal sensation were found on this or any of the other fingers.

A diagnosis of subungual glomangioma was made, and removal was advised. A tourniquet was applied, and under local anesthesia the nail was removed. The matrix was incised over the point of tenderness noted previously. When the matrix was spread a mass of what appeared to be fat tissue protruded. A small soft encapsulated tumor about 5 mm in diameter was removed. The tumor resembled a small lipoma. The bed of the tumor was smooth and extended inward to the terminal phalanx. Hemorrhage from the tumor bed after release of the tourniquet, was quite profuse but was readily controlled by the application of pressure for a few minutes.

The specimen obtained was submitted for pathologic examination and the pathologist's report confirmed the clinical diagnosis of glomangioma.

Convalescence was uneventful. The patient experienced none of the former pain. Two months after surgery the nail had grown normally and was nearly as long as the other nails. There was no tenderness, and the patient was completely free from pain.

#### SUMMARY

Glomangiomas, though rare, are worthy of attention because when they do occur they are extremely painful and quite disabling. As in the case presented, the true nature of the condition may be overlooked clinically.

510 San Joaquin Light and Power Building

#### CONGENITAL ABSENCE OF BONES OF THE LOWER LIMB

JAMES A. BRUSSEL, M.D., BRENTWOOD, ILLINOIS

While anomalous conditions present at birth of the bones of the leg and foreleg are not rare, they are sufficiently unusual to be reported and should be recorded to maintain accurate statistics in these cases. Unfortunately the figures of the early years, particularly those prior to use of the roentgenogram, have been inaccurate chiefly because of the paucity of clinical means to ascertain definite pathologic conditions and, as a result, some of these observations have since been revised. For example in 1846 Proudfoot (quoted by Cotton and Clute)

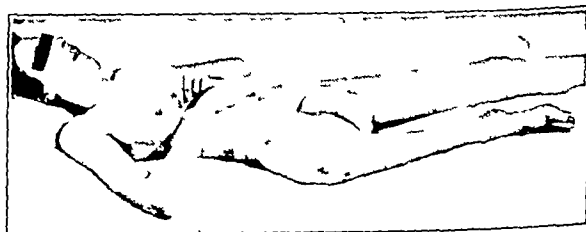


Fig. 1—Patient in supine position after narcotization administered because she would not cooperate in conscious state. The deformed limb appears bent at the knee but is perfectly straight, outstretched and parallel to the normal left leg.

reported a case of congenital absence of the fibula in which he stated that 'the tibia of the same limb seemed to have a compound fracture at the middle.'

Freund<sup>1</sup> regards the figures of Nilsson<sup>2</sup> as the most conservative in the review of congenital absence of the femur.

From the Female Reception Service of the Pilgrim State Hospital.  
1. Freund, Ernst. Congenital Defects of Femur, Fibula and Tibia. Arch. Surg. 23: 349-391 (Sept.) 1936.  
2. Nilsson, H. Ueber den kongenitalen Femurdefekt. Arch. f. Orthop. 26: 138, 1923.



The latter collected seventy two cases up to 1928 and added ten of his own. Since then the literature has disclosed twenty-one additional cases,<sup>3</sup> which with the one about to be reported represent a total of 104 cases. This number is to be regarded as small for a period of almost a century. Dankmeijer<sup>1</sup> uncovered seventy-seven cases of congenital absence of the tibia of which twenty one were bilateral, up to 1935 and added one case of his own. Since then sixteen others have appeared,<sup>6</sup> bringing the total up to ninety-four. For the fibula Nutt<sup>6</sup> reduced Handek's figure to ninety-eight and since then sixteen more have been added<sup>8</sup> bringing the total to 114.

To recapitulate, congenital absence of the bones of the lower limb reveals the following totals: (a) femur 104, (b) tibia ninety four and (c) fibula 114.

The etiology of the absence of a bone or bones at birth has not been definitely established though several interesting ideas have been suggested. Most writers have discarded the primitive fin theory<sup>7</sup> advanced by Gegenbauer, and lean to the amniotic theory as probably more correct. Cotton and Chute have explained the lesion on this basis, as have Tubby, Taylor and others. As early as 1910, Whitman<sup>9</sup> felt that the deformity is associated with absence of bone due either to an original defect in the germ or to interference with its development. However he did believe that amniotic adhesions might be one

of the predisposing causes. Reimer states that the first cause of the condition is due to external pressure on the embryo from the amniotic bands, and the second a faulty development of the embryonic tissue and cartilage. More recently, Ollerenshaw<sup>10</sup> has written that the predominant cause is undoubtedly a cessation of growth in one or the other set of embryonic cells at a period he places between the fourth and the sixth week of fetal life.

The psychologic implication of such a condition becomes quite apparent especially when a frank psychosis develops in a person born with this defect which might, on first glance, be attributed to the birth defect. The report of such a case follows.

**History**—H. G. a white woman aged 34, married, was native born of Irish descent.

The family history was negative for mental or nervous disorders for at least two generations.

The patient was the ninth child in a family of eleven, born in Pennsylvania July 14 1903. The congenital absence of the right femur was noted at birth but never created a great disability since the patient learned to get about quite well with a

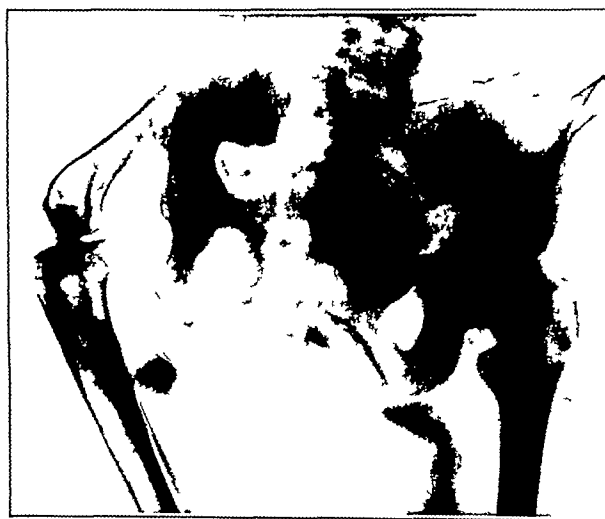


Fig. 2.—Appearance of the hips. The right limb shows rudimentary remains of an immature lower end of the femur.

crutch nor did she ever openly express any inferiority because of this infirmity. She completed two years of high school education by the time she was 15 and following this worked as a typist and telephone operator without experiencing any difficulty. Otherwise her medical and surgical history is negative. She married at the age of 24 she has one child but no other pregnancies. She is described as having been friendly, sociable, alert, active and particularly fond of music. While her husband states that marital life has been quite satisfactory, a sister of the patient insists that this is not true and that many quarrels have taken place at the home and on one occasion the husband left the patient.

**Psychosis**—The patient's sister feels that the psychosis is the culmination of a long series of marital difficulties, while the husband associates it with the death of the patient's mother in November 1936. Shortly after this death the patient began to pray a great deal showed little interest in what went on about her and finally began to refuse food. She was not very communicative but finally expressed a fear that her husband and others were trying to poison her. Her actions became increasingly strange and bizarre. She would open doors and peer out as if looking for some one or something but never expressed her thoughts freely in words. She finally became mute and withdrawn, she would lie on her bed totally inactive but would eat if food was left in her room and she was entirely alone. Jan. 22 1937, she was admitted to the psychopathic ward of Bellevue Hospital, where physical examination corroborated the foregoing observations. Mentally she was mute, negativistic and passively resistive.

<sup>10</sup> Ollerenshaw, R. Congenital Defects of the Long Bones of the Lower Limb. *J. Bone & Joint Surg.* 7: 528-552 (July) 1925.

- <sup>3</sup> These include  
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<sup>4</sup> Dankmeijer J. Congenital Absence of Tibia. *Anat. Rec.* 62: 179-194 (May 25) 1935.  
<sup>5</sup> These include  
del Torto P. Congenital Absence of Tibia and Fibula. *Arch. di pat. e clin. pediat.* 7: 219-242 1928.  
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Lopez Fernandez A. Total Congenital Absence of Tibia. *Cron. med. Valencia* 39: 476-480 (May 15) 1935.  
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<sup>6</sup> Nutt J. J. Congenital Fibular Defects. *Surg. Gynec. & Obst.* 37: 475 (Oct.) 1923.  
<sup>7</sup> Handek M. Ueber kongenitalen Defekt der Fibula und dessen Verhalten zur sogenannten intra-uterinen Fraktur der Tibia. *Ztschr. f. orthop.* 4: 326 1896.  
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<sup>9</sup> Whitman Royal. Orthopedic Surgery. Philadelphia: Lea & Febiger 1910.

She was admitted to Pilgrim State Hospital January 29 on a regular order of commitment. During the admission routine she was entirely mute. Physical examination revealed malnutrition, an asthenic habitus and absence of the right femur, subsequently corroborated by roentgenographic studies. The roentgenograms (figs 2 and 3) show that the head of the tibia is attached to a rudimentary union of approximately the lower eighth of what would have been a femur, but even the lower end of this femur shows poorly demarked condylar processes. Figure 1 was taken of the patient in the supine position after she had been narcotized with sodium amytal, since she would not cooperate for a photograph in her conscious state. The deformed leg appears as a bent knee, but this is not the fact. The leg is in its normal outstretched position and parallel to the normal leg. There were retroversion of the uterus and lacerations of the cervix. The Wassermann reaction of the



Fig 3—Appearance of right hip showing knee joint in right pelvis

blood and routine laboratory examinations were all negative. Mentally the patient was passively resistive, kept her eyes closed, was entirely mute and showed no emotional display of any sort. She lay on the examining bed with a blank expression on her face, occasionally relieved by a weak smile. The musculature was relaxed and atonic. She has subsequently remained essentially the same though sometimes she is observed laughing to herself as though in response to hallucinatory experiences. She is completely withdrawn from her environment showing little spontaneous interest or activity but seemingly preoccupied

with her fantasies or hallucinations. Her condition was diagnosed as schizophrenia (dementia praecox), catatonic type.

Regarding the psychologic implications in this case adherents of Adler's theory of organic defect will find admirable substantiation of their belief, as is not unusual in any functional condition such as a catatonic state in which muscular and postural phenomena are noted. However, opponents to this idea will claim that the patient adjusted more than satisfactorily to the demands of society despite this defect and that only with the advent of an unhappy marriage did the psychosis develop, the unfavorable union being interpreted by the ego as a threat to its integrity with the need for withdrawal from reality for its preservation. Of course adlerians may argue that the patient felt that her failure at marriage was due to her deformity appearing as a disagreeable entity to her husband. While such arguments pro and con could continue ad infinitum it is not my purpose in this paper to favor one side or the other. Suffice it to say that in this case the prognosis is definitely poor. Hypoglycemic shock therapy was not attempted because, at the time, insulin and/or metrazol therapy had not yet been employed in this country with the widespread use it is now accorded.

**The Length of Life**—In the sixteenth century the average length of life in western Europe is said to have been nineteen years, in the seventeenth century, twenty-five years, in the eighteenth century, thirty-two years. In the nineteenth century in this country life averaged about forty years, but by the end of the first quarter of the twentieth century the life expectancy at birth had increased to about fifty-seven years for boys and to about sixty years for girls.—Diehl, Harold S. *Healthful Living*, New York Whittlesey House 1935

## Special Clinical Article

### THE OPHTHALMOSCOPIC SIGNS OF CONSTITUTIONAL DISEASE

A SUMMARY OF THE SALIENT POINTS MADE IN A LANTERN SLIDE DEMONSTRATION OF COLOR PHOTOGRAPHS OF LIVING HUMAN EYES

CLINICAL LECTURE AT SAN FRANCISCO SESSION

ARTHUR J. BEDELL, M.D.

ALBANY, N. Y.

The background of the eye is the stage on which many of the tragedies of life are enacted. By careful, repeated examination, early changes can be detected and steps taken to eradicate or diminish the ravages of destructive forces.

By the use of a simple ophthalmoscope and the expenditure of a little time and concentration every physician will be able to recognize the fundus signs of the major vascular changes and the alterations from diabetes, hypertension, nephritis, syphilis, tuberculosis, intracranial pressure and optic nerve inflammations.

Obviously, before any one attempts to diagnose fundus lesions he must be well grounded in the great number of physiologic variations. For that reason, a careful analysis must be made of every case, and a detailed, orderly inspection should be followed by a judicial review of the possibilities before one arrives at a prognosis.

The normal disk may be comparatively small or rather large. It is paler than the surrounding fundus and may be outlined with a white or pigmented arc or ring. In the center of the disk there is a depression which varies much in diameter and depth, this, the central excavation, is an important landmark.

The retinal vessels course over the disk and the entire visible fundus. The arteries are easily distinguished from the veins by their lighter color and rounder form.

The number of branches and the method of distribution from straight to very tortuous are never the same, so that each fundus is a distinct entity. The dark region of the macula is usually two disk diameters beyond the temporal edge of the disk and slightly below the horizontal level. Overlying its deepest part is a bright spot, to which the name foveal reflex has been given. In

reality the shining dot comes from the vitreous and not the retina. The color of the background may be a uniform pink or almost white, through which the choroidal channels are easily seen and distinguished from the regularly arranged pattern of the retinal tree, or it may be mottled with dark and light markings.

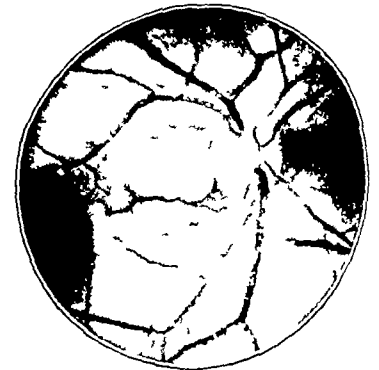


Fig 1—A normal fundus. The bright figure eight is the image of the carbon arc which supplies the illumination. The pale oval center is the nerve head from which the vessels diverge. The dark region to the left is the macula. The veins are wide and darker than the arteries.

Read in the General Scientific Meetings at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 13, 1938.

During the course of embryologic life certain anomalies may develop. The border of the nerve head may fade into a pale arc or a depressed crescent, or, in the extreme case, the end of the optic nerve may lie in a cup of undeveloped choroid, the macular region may be an oval white hole, a coloboma, or a large portion of the choroid may be absent in the lower segment of the fundus. The sheath of Schwann may pass beyond the lamina cribrosa and appear as glistening white, small

The macula is dark red. After several days the pallor lessens, but the blindness persists. Eventually, if it was caused by an embolus one or more sclerotic patches form in the wall of the artery or arteries.

When the closure follows a chronic disease of the blood vessels the terminal shutting off of circulation produces a white zone similar to but sometimes less intense than that found in embolism. Retinal hemorrhages and white exudates are probably always present

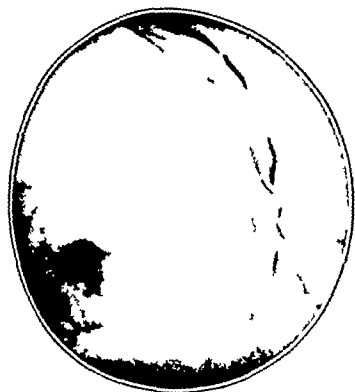


Fig 2—Embolism of the central retinal artery, right eye of a man aged 51 a few hours after sudden and complete blindness. white edema, pink nerve head and red macula.

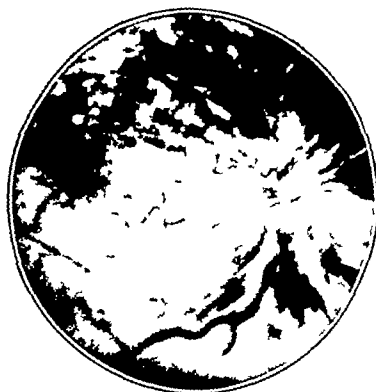


Fig 3—Thrombosis, endarteritis obliterans of the central retinal vein, right eye of a man aged 48. blood distributed over and between the arcuate nerve fibers of the retina.



Fig 4—Arteriosclerosis, right eye of a man aged 51. narrow arteries with white sclerotic patches and visible walls.

or large masses about the disk or in remote portions of the fundus. The teased, shredded, fibrillated structure is diagnostic and should never be confused with exudate. Bright glistening yellowish dots lying beneath the retinal vessels are called druse. They never interfere with vision and may be isolated or confluent even to the extent of forming a thick, dappled sheet.

When sufficiently trained every physician should be able to recognize pathologic signs. The correct interpretation of all of them is a life study, and yet every one can become proficient enough to recognize gross

Occlusion of an isolated artery branch may produce a localized whiteness corresponding to the region nourished by it. An oval central zone may receive its blood supply through the chorioretinal system, and in that way central vision is retained even when the major retinal artery is imperforate.

In sharp contrast to a closed artery is a plugged vein. When the central retinal vein is thrombosed the distal branches become immensely engorged, appearing as tortuous red loops which dip into the swollen retina and are lost to view. There are many hemorrhages and



Fig 5—Hypertensive retinitis, early stage, left eye of a man aged 50. blood pressure 224/108. increased artery reflex, edema of retina, gray white cloudy patches.



Fig 6—Hypertensive retinitis of twelve years duration, left eye of a man aged 62. blood pressure 220/160. artery wall reflex, increased veins, indented, many hemorrhages in the retina.

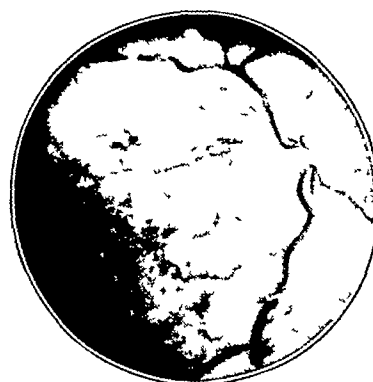


Fig 7—Hypertensive retinitis, right eye of a man aged 59 fourteen months before death. widespread retinal edema, irregular caliber arteries, many fresh and old retinal hemorrhages. blood pressure 182/100.

changes and by constant daily application steadily improve his diagnostic capacity.

The easiest way to begin the study of fundus diseases is by examination of the changes in the retinal blood vessels.

Sudden occlusion of the central retinal artery presents a characteristic appearance, the back of the fundus turns white. This is seen a few minutes after the patient complains of sudden blindness, which comes on unaccompanied by pain or congestion of the eyeball

often white exudate flecks. Thin linear hemorrhages follow the course of the arcuately distributed retinal fibers. Closure of a branch may, when the blood seeps down and covers the macula, materially interfere with vision. The blood may absorb, leaving little or much residual damage, or there may be a sudden, sharp pain with congestion of the eyeball, a dilated pupil and an increase in intra-ocular tension, hemorrhagic glaucoma, which does not respond to treatment and almost invariably leads to enucleation.

Gross retinal arteriosclerosis should be a common disease of the fundus, but actually it does not often reach the great white atherosclerotic stage. White patches in the artery may be observed through their advancing stages until occasionally the walls become white cords similar to the pipestem radials of far advanced general arteriosclerosis. Care must be taken not to confuse the increased visibility of vessels on or

While these fundus manifestations pass through their cycle (and incidentally, this may take twenty or more years) the vessels have undergone the changes which make it practically impossible to distinguish sharply arteriosclerosis from hypertension. Early signs of both are vein displacement, vein indentation, sometimes a dilatation of the vein between the artery constrictions, an increasing visibility of the artery wall and a coppery



Fig. 8—Senile macular degeneration retinitis circinata type left eye of a woman aged 72. A crown of whitish retinal exudates surrounds a gray edematous degenerating macular region.



Fig. 9—Malignant hypertension nephrosclerosis left eye of a man aged 44 who had had hypertension for years and who died of uremia four weeks after photograph was taken. Extreme artery changes with sclerosis, irregular caliber and stiff walls indenting full veins, retinal edema and hemorrhages, new vessels on disk.



Fig. 10—Nephritic neuroretinitis left eye of a woman aged 23, fourteen months before death. Great hemorrhages on the sides of the swollen nerve head, waxy exudate with suggestion of a star.

close to the disk as an indication of arteriosclerosis, for in this region the vessel sheath is often visible and yet devoid of pathologic significance. In syphilis white artery walls are not uncommon.

Arteriosclerosis and retinal hypertension are so often combined that the association deserves careful attention because of the increasing prominence it is receiving and will continue to merit. If the presence of edema is considered a requisite of hypertensive retinitis, then the characteristics of the disease can be defined as edema, greatest where the retina is thickest, usually the nasal

reflex, which later becomes a silvery gray and still later a white streak, or, and clinically this is easily demonstrable, the entire artery tree straightens and contracts or the reverse happens and the arteries become more tortuous.

To complicate the picture of arteriosclerosis and hypertension further, exudates appear. Some are irregularly placed yellowish ones, others form a circle, and when the macula is included within its boundaries it is called retinitis circinata. A similar exudate crown may be remote from the macula, three distinct rings



Fig. 11—Renal retinitis right eye of a man aged 33 who had had nephritis for three years and who died in coma three months later. Gray retina, macular star exudate.



Fig. 12—Retinitis in diabetes left eye of a woman aged 62, blood sugar content 157 mg. Extensive glistening yellow white exudates, many retinal hemorrhages.

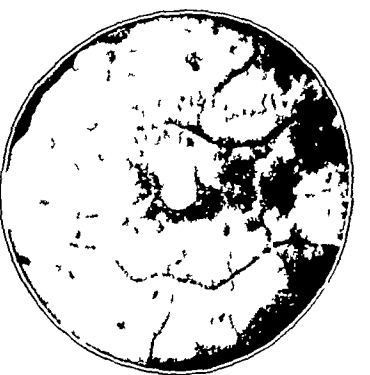


Fig. 13—Retinitis in diabetes, the same case as that represented in figure 12. The photograph having been taken six months later, extension of retinal change even when the diabetes was seemingly under control.

side of the disk, and a few or many hemorrhages, combined with whitish, gray, soft masses usually near the major vessels. These signs will ultimately become more dominant with more hemorrhages, more and larger snowbank masses and greater nerve head swelling. If the patient does not die at this time, the edema, the hemorrhages and the exudates often subside until only a mere trace remains. Then or shortly thereafter dark chocolate brown spots appear near the posterior pole. These are of serious import and are one of the more certain signs of impending dissolution.

have been seen in the same eye and two are frequently found. If this does not afford sufficient confusion, the modern treatment of diabetes has so prolonged the life of thousands that they enter the arteriosclerotic time of life.

Before leaving the subject of changes in the retinal blood vessels, I wish to place special emphasis on three correlated and yet sometimes separate conditions. One is malignant hypertension characterized by progressive edema of the disk and an increasingly high blood pressure which does not respond to treatment, frequently

leads to early death and occurs in young males more often than in females. The second is the toxemia of pregnancy with which the retinal expression follows a rather narrow, prescribed course, starting with an isolated spasm of one of the secondary or tertiary branches of the retinal artery. If the underlying cause is not removed, the spasms involve more branches and become more frequent, they become fixed, the hyper-

the fundus of a patient with diabetes can be duplicated in a nondiabetic person, I admit that the picture of yellow exudates arranged without order and not of uniform size, associated with hemorrhage without marked vessel changes, most strongly suggests diabetes. My photographic observations, however, do not warrant the conclusion that this pattern is always and not only caused by diabetes.



Fig. 14—Brain tumor, left acoustic neuroma, right eye of a woman aged 37. swollen disk and surrounding retina full of veins with paralleling exudate. Papilledema.



Fig. 15—Papilledema (choked disk) left eye of a woman aged 60 with left acoustic neuroma. swollen pale elevated nerve head.

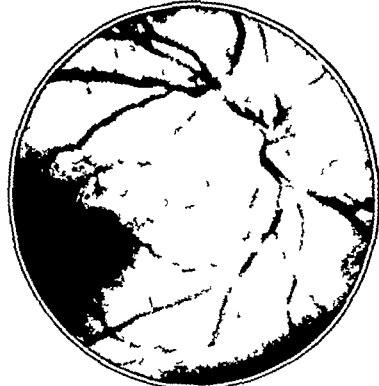


Fig. 16—Syphilitic optic neuritis, right eye of a man aged 41. elevated gray disk, marked visual loss and field constriction. prompt response to mercury and iodide.

tension increases and the usual and ordinary signs of retinal hypertension become manifest. It is therefore imperative that in all cases of toxemia of pregnancy the fundus be examined by a competent ophthalmoscopist who has the requisite knowledge to give advice regarding the management of the patient and to decide when the uterus should be emptied.

The third particular fundus picture is that which develops in the course of malignant endocarditis. It is characterized by flame-shaped hemorrhages usually with white borders or white centers. These are of considerable diagnostic import, for the patient usually dies shortly after they appear.

Furthermore, it is a matter of substantiated, reliable observations that high blood pressure and subsequent arteriosclerosis are concomitant with or even caused by the diabetes. Surely enough has been said to prove the necessity of complete physical and laboratory examinations whenever exudates and hemorrhages are found in the fundus.

Papilledema, or choked disk, is a prominent swelling confined to the disk and immediately contiguous parts of the retina. The central excavation is always demonstrable on stereoscopic examination. In cases of recent involvement the surface is vascular, while in cases of old involvement it is capped with a gray wool-like mem-



Fig. 17—Retinochoroiditis disseminata, right eye of a woman aged 62. depigmented rounded areas of choroidal absorption.



Fig. 18—Retinochoroiditis, left eye of a man aged 50. apical abscesses, teeth removed, large choroidal scar.



Fig. 19—Tuberculous choroiditis, right eye of a man aged 35. two attacks of central choroiditis; the older lesion is the more heavily pigmented.

Diabetes may be severe, last for years and finally cause the death of the patient without producing retinitis. This is a very important point for all physicians to remember. On the other hand, the fundus picture of hard, yellow deposits near the disk or macula combined with small striate or globular hemorrhages may be the first visible evidence of something abnormal and lead to the investigations which disclose the correct diagnosis. There is considerable controversy regarding true pathognomonic infallible diabetic retinitis, and, while inclined to believe that all the changes found in

brane. Papilledema should be considered a sign of intracranial pressure, caused by either an excess of fluid or a tumor, until proved otherwise. If a brain tumor is the first thing suspected, lives will be saved and vision preserved by the prompt recognition and treatment or exclusion of a neoplasm. Choked disk can usually be distinguished from optic neuritis if a careful history is taken, for in neuritis loss of vision is the first complaint and then field restriction and finally the ophthalmoscopic changes are uncovered, whereas choked disk is often discovered in the routine search

for the cause of general symptoms such as headache, and the field changes and visual loss are then revealed.

Syphilis has been sufficiently publicized to need little in the way of further remarks, but there are two special fundus manifestations worthy of comment. 1 Retinochoroiditis as it progresses through a period of an indefinitely outlined swelling to one of paling and flattening to end as a pigmented choroidal white scar.

Many of the blood dyscrasias produce fundus hemorrhages with or without exudate.

Vitamins are widely advertised, and suggestive theoretical indications are often dogmatically expressed as therapeutic realities. A recent phase of this expanding work has led some physicians and many laymen to believe that night blindness is dependent on absence of vitamins and that the administration of the deficient



Fig. 20—Retinitis in pernicious anemia right eye of a woman aged 47 who was seriously ill. The rounded, thick retinal hemorrhages are most suggestive of the blood state.

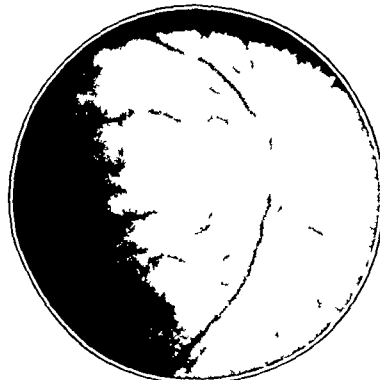


Fig. 21—Retinitis pigmentosa with night blindness right eye of a man aged 30. Marked contraction of the visual field, retinal reflex greenish disk of a waxy pallor, constricted arteries and veins. The pigmentation is just beyond the limits of photograph.



Fig. 22—Glaucoma right eye of a man aged 55 who was blind. A complete glaucomatous undermining cup of the nerve head.

This is evidence of a severe secondary stage. A patient who has had syphilitic retinochoroiditis seems immune to neurologic syphilis, for I have never seen such a patient have cerebrospinal symptoms. 2 Atrophy of the optic nerve usually of the locomotor ataxic type in which in a most unrelenting manner sight is destroyed by the steady decrease in the size of the visual field. There is a ray of hope for the patient if the modern treatment is administered, but the majority of the afflicted are doomed to darkness after the process is once inaugurated.

Somewhat similar to syphilitic choroiditis is that caused by tuberculosis, which strangely enough fre-

quently attacks those who are considered to be in the full bloom of perfect health. The isolated lesion starts as a small pale area often adjacent to a blood vessel, other tubercles may form, coalesce, heal and recur, or a large conglobate tubercle may be present from the beginning of the fundus disease. Two facts confirmed by repeated observations assist in the diagnosis, one is the relatively slight pigmentation about the lesion and the other is a curious light reflection, a faint phosphorescence, from the thick vitreous opacities.

Finally the routine ophthalmoscopic inspection of every patient will lead to the earlier detection of glau-



Fig. 23—Traumatic atrophy of optic nerve left eye of a man aged 24 sixteen years after automobile accident. The white nerve head is distinctly outlined. Arteries and veins maintain their normal size and relationship.



Fig. 24—Senile macular degeneration left eye of a woman aged 70. Large yellow elevated circumscribed mass in the macula.



Fig. 25—Senile macular degeneration left eye of a woman aged 70. Large whitish yellow irregularly pigmented macular scar.

quently attacks those who are considered to be in the full bloom of perfect health. The isolated lesion starts as a small pale area often adjacent to a blood vessel, other tubercles may form, coalesce, heal and recur, or a large conglobate tubercle may be present from the beginning of the fundus disease. Two facts confirmed by repeated observations assist in the diagnosis, one is the relatively slight pigmentation about the lesion and the other is a curious light reflection, a faint phosphorescence, from the thick vitreous opacities.

comia, which is one of the most serious of all eye diseases. Some day a campaign to prevent glaucoma by the early recognition of field defects and disk changes will be started. The time is opportune, and the need of public instruction far surpasses many of the over-worked fads which take energy and money.

Every physician knows that in glaucoma the central depression in the disk increases in size until in the far advanced stage the entire nerve head is a sunken white cup and the patient incurably blind.

Elderly patients frequently complain of inability to read, this is often correctly ascribed to faint lens opacities or partial atrophy of the optic nerve, but sometimes it is caused by a degeneration in the macular region. The earliest signs are recurring perimacular hemorrhages in one eye and then after months or years in the other. This eventuates in the destruction of the central retina and although the patient is unable to do close work, he never goes blind. A most consoling fact. The seriousness of this situation calls for the mobilization of all physicians in an attempt to understand the method of production, the various stages and, if possible, combat the underlying factors, which at this time seem to be vascular and beyond the range of therapeutic agents.

This article was conceived as a review of actualities to stimulate every physician to use his ophthalmoscope, to recognize his limitations, to call for consultations and by cooperation to continue to uphold the high standard of American medicine, which is second to none because it combines individualistic enthusiasm with scientific accomplishments. When the individual is suppressed productive research always suffers, and this in turn adversely affects the health of the people.

Furthermore, it was intended to concentrate attention on the ocular fundus as one of the most available regions in the entire human body for the recognition of incipient, advancing and destructive processes.

To the initiated examination of the fundus discloses important clinical signs, which, when gathered together, form part of the life record of the patient. From the knowledge gained by the study of thousands of such reports, accurate prognostic as well as diagnostic conclusions can be drawn.

344 State Street

## Special Article

### CONFERENCES ON THERAPY

#### TREATMENT OF SECONDARY SHOCK

NOTE.—These are actual reports slightly edited of conferences by the members of the Departments of Pharmacology and of Medicine of Cornell University Medical College and the New York Hospital. The questions and discussions involve participation by members of the college staff, students and visitors.

DR McKEEN CATTELL. In any consideration of the management of secondary shock, a knowledge of the signs and symptoms is an essential prerequisite. Theories of the causation of shock are numerous and diverse. Many of the characteristic changes associated with this condition have been satisfactorily explained. In general, these changes are progressive and serve as a guide to treatment and a measure of the severity of the condition.

The syndrome of secondary shock when fully developed is characterized by the following features: low blood pressure, decreased blood flow, decreased blood volume, lowered temperature and lowered metabolism. Hemoconcentration is an important feature and results in high hemoglobin values. The blood sugar and non-protein nitrogen are increased, chlorides are decreased and the carbon dioxide combining power is low.

These changes are not all present in the beginning and for that reason the condition has commonly been

divided into primary and secondary stages. The syndrome of secondary shock supervenes whenever a low blood pressure or inadequate circulation is allowed to persist. It is important to recognize that there are many causes of low blood pressure, and the end result is much the same whether the low pressure is due to hemorrhage, traumatic injury, burns, nervous manifestations, adrenal insufficiency, diabetic coma, cardiac failure, acute abdominal conditions or the action of toxins such as histamine and many others. All result in a lowering of the blood pressure, and in the initial stages of circulatory collapse there is a condition which is called primary shock. The changes characteristic of secondary shock are undoubtedly initiated at this time, but they develop gradually, usually over a period of several hours. The serious feature of any condition causing a fall in blood pressure is the reduction in the blood supply to the tissues, the patients consequently suffer from an inadequate supply of oxygen and further damage is done to the circulation. A vicious circle is thus set up. Through various secondary readjustments the body tends to maintain blood pressure in the face of blood loss or other damage, so that when it falls below normal limits we may be certain that the safety factor is exceeded and that there is danger of a serious deficiency in the circulation. It has been shown experimentally that when the blood pressure has fallen to about 80 mm of mercury it is not adequate to maintain the normal functions of the tissues. Active therapeutic measures should be instituted before such levels are reached.

The evaluation of therapeutic measures requires a consideration of the mechanism by which the changes characteristic of secondary shock are brought about, and we need especially to know which of the various factors responsible for maintaining the blood pressure are at fault.

There is no evidence whatever that in this condition the heart is in any way inadequate to meet the demands made on it. If it is given fluid it will effectively pump that fluid against even a very high pressure, and thus there is no reason to administer cardiac stimulants.

The vasomotor center continues to act in a normal manner, in fact, it has been shown experimentally that the center is usually in a state of heightened activity, thus tending to compensate for the lost blood and maintain a normal blood pressure. It is true that in advanced shock the vasomotor center along with the other centers does fail, but this occurs only after the pressure has been low for a long period and represents a terminal condition.

An outstanding feature is a diminution of circulating fluid. The blood vessels contain less than the normal quantity of blood, and the amount returning to the heart is much reduced. Where is the lost blood? In the case of hemorrhage the answer is obvious, but an essentially similar condition occurs in shock without hemorrhage. There is general agreement among physiologists that a reduced circulation results in damage to the capillaries. They are dilated and they apparently become more permeable, at any rate, filtration is abnormally rapid and the blood vessels are unable to retain fluid. The changes are similar to those occurring locally in the formation of a wheal.

Gradually the blood volume is reduced, and the signs and symptoms of secondary shock become increasingly



prominent. The pressure falls and the various compensation mechanisms are brought into action. The fall in blood pressure stimulates the afferent endings in the carotid sinus and elsewhere and the heart rate is thus reflexly increased and the arterioles are constricted. The fluid loss brings about an increased concentration of cellular elements, kidney function is reduced because of the decreased blood flow and low pressure with a resulting increase in blood urea. In addition to increased cardiac rate and vasomotor tone there is other evidence of increased sympathetic activity in the increased blood sugar and sweat secretion. The latter promotes heat loss and, along with the lowered metabolism, explains the drop in temperature. There is general agreement that acidosis is a consequence of decreased oxidation due to circulation deficiency.

Moon, in his recent book on shock, has defined the condition as a circulation deficiency, not cardiac or vasomotor in origin, characterized by a decreased volume of blood, reduced cardiac output (volume flow of blood) and hemoconcentration. The points of attack on this problem from a therapeutic standpoint would appear to be two. The first is to increase the circulating volume of fluid, and the second is to prevent the fluid loss from the peripheral vessels. There is very little basis for the employment of the so-called circulation stimulants. General measures directed toward the conservation of heat and fluids, and also for the promotion of rest, are of the utmost importance and should be given first place in any regimen for treatment and prevention of secondary shock.

#### THE MANAGEMENT OF SHOCK

DR. JOHN E. DEITRICK. The clinical picture of the fully developed case of secondary shock is unmistakable. It is essentially the same irrespective of the underlying cause of the shock. As has been indicated, the disintegration of circulatory function which goes under the name of shock does not have only one cause but many causes. We do not know what these primary disorders possess in common which leads to the same ultimate outcome, namely shock, if indeed there is any such common factor. The significant fact is this: regardless of the clinical condition in the course of which secondary shock occurs, the clinical signs and symptoms, as well as the physiologic derangements of the circulation, appear to be essentially identical in all of them when the state of shock is present.

I may speak briefly, therefore, concerning the outstanding clinical characteristics of shock, especially concerning those which have a direct bearing on the objectives of our treatment. These are: 1. Diminished blood volume. There is of course a diminished blood flow but it is primarily due to the diminished blood volume. 2. Decrease in sodium chloride of the blood. 3. Diminished carbon dioxide carrying capacity of the blood (diminished alkali reserve). 4. Paralysis of the capillaries and extreme degrees of constriction of the arterioles. Dehydration with loss of salts and blood proteins are outstanding phenomena in shock. The abnormal permeability of the capillaries appears to be such that the injection of fluid disappears from the circulating blood with extreme rapidity, even though the blood is concentrated and is greatly in need of the injected fluid.

The appearance of the patient is that of one who is desperately ill. There is extreme prostration. There

is apathy or restlessness and anxiety. The facial expression is often pinched. The skin is very pale and often shows a grayish cyanosis. It feels cold, clammy and moist. There is sweating. The peripheral veins are collapsed. Rather marked thirst is often present. The pulse is rapid and thready. The temperature is subnormal and the blood pressure is extremely low, sometimes almost impossible to record. As the condition progresses the respiration begins to suffer, it becomes shallow and feeble. Respiratory failure seems to be commonly the immediate cause of death. I have seen the heart continue to beat for five or ten minutes thereafter, and even longer when artificial respiration was administered.

The treatment of secondary shock, for the most part, is independent of its immediate cause. Since the blood is stagnating in the periphery and is cooling off rapidly, measures are taken immediately to maintain the body temperature. We wrap the patients in warm blankets and we apply hot water bottles and the electric pad for that purpose. In order to promote better circulation in the brain we raise the foot of the bed above the level of the patient's head.

A large blood transfusion is the most satisfactory way of restoring the blood volume. The restoration of the blood volume is the most important single measure. Most patients will fail to recover in shock if their blood volume has been reduced by as much as one half of their normal. Substitutes for blood transfusion are not as satisfactory. A useful emergency agent which can often be obtained sooner than the blood transfusion is dextrose. An injection of 50 cc. of a 50 per cent solution sometimes produces a beneficial though fleeting effect on the circulation. It may be followed by larger amounts of saline and 5 per cent dextrose solution given as a continuous intravenous drip at the rate of from 1 to 10 cc. per minute. These infusions all lack the protein which helps to keep them in the circulating blood. There is danger in their use in that the large quantities of rapidly diffusible fluid with low osmotic pressure promote pulmonary edema.

A 6 per cent solution of acacia was used during the war to combat the shock of war wounds. This solution produces more lasting increase in the blood volume. I do not favor it particularly, however. I hope the pharmacologists will discuss this substance.

The respiration in patients with shock is very shallow. The carbon dioxide combining power of the blood is low, namely 20 or 30. Because of the acidosis the Boston group has recommended and reported beneficial results from the use of a 5 per cent solution of sodium bicarbonate intravenously. They have also recommended the inhalation of carbon dioxide for periods of five minutes at intervals of five minutes. Both of these measures tend to increase the depth of respiration and promote the return of blood to the right side of the heart.

Morphine sulfate is indicated only when the patient is restless or in pain. The danger of depressing the respiratory center by morphine during shock is considerable. I have seen one patient die of morphine during shock. It should not be used for the patient who lies quiet.

Drugs are generally of questionable value in shock. Digitalis is distinctly contraindicated. Epinephrine is of no value and may be dangerous because it constricts

the arterioles which are already constricted in shock. Caffene is widely used as a stimulant in shock and it apparently exerts some beneficial effect. Strychnine has been employed but the pharmacology of strychnine leaves little to justify its application in the treatment of shock.

It cannot be emphasized too strongly that early treatment holds out the only hope of success in patients with shock. When a patient begins to show peripheral circulatory disturbances which are known to terminate in shock, that is the time to begin treatment. Treatment should be started when the falling blood pressure has fallen only to 90 rather than to 60 or 70. It is preferable to begin treatment in the stage of the primary shock, namely the stage in which the blood pressure has fallen, but before paralysis of the capillary bed has taken place. In the case of severe hemorrhage showing some of the symptoms of shock an intravenous infusion of physiologic solution of sodium chloride may cause marked improvement, but if the low blood pressure has been allowed to continue for a long time with the consequent secondary increase in the permeability of the capillaries the infusion of saline solution may be of no value at all. As has been stated, there is a stage in shock when the capillary permeability is so great that proteins pass readily out of the blood stream, the resulting change of the osmotic pressure of the blood makes it impossible for the blood to hold the injected fluid. In a sense it may be said that measures applied to the prevention of secondary shock in case of failing circulation provide the best outlook. When the patient is seen in a later stage, however, that is, in a stage in which secondary shock is already present, the sooner the treatment the better the results, for the longer the state of shock is permitted to exist the more difficult it becomes to correct it and the higher is the mortality.

#### PHARMACOLOGY

DR CATTELL. Dr Deitrick has mentioned a number of drugs which have been commonly employed in the treatment of shock, but he has left the impression, quite correctly I think, that they represent a comparatively unimportant part of the management of the condition. I had hoped he would commit himself in favor of the use of some of those substances so that I should have had the opportunity of pointing out the lack of a sound experimental basis for their employment.

Of the many drugs which have been used in shock I have time to consider only one or two. A substance of special interest in the treatment of this condition is acacia, because that is a substance which has been very extensively employed in the replacement of lost blood, particularly during the war, when it was often impossible to undertake the more elaborate procedure of blood transfusion.

From a theoretical standpoint acacia appears to be an almost ideal substitute for lost blood because it has a large colloidal molecule which is retained in the blood stream and gives the desired increase in osmotic pressure. Its use was considered at one of our recent conferences in connection with the matter of raising the osmotic pressure of the blood for the removal of edema in nephrosis. It has been successfully employed in many other conditions, particularly in shock and hemorrhage, but severe reactions have been frequent and the question arises as to its suitability for routine use.

Particularly during the war, numerous severe reactions were experienced and there is no doubt that many injured men were killed by the use of acacia. I have seen many that appeared to come under that classification. On the other hand, dramatic results were often achieved in raising of the blood pressure and no bad effects followed. The question of untoward reactions has received much attention, and at the time of the war it was noted that there was a good deal of variation in the effects of different lots of acacia. It was assumed that impurities played an important part in the reactions, and I believe that nowadays when much more highly purified preparations are available bad results are not nearly as common.

But animal experimentation has emphasized the existence of certain drawbacks in the use of acacia, and I would like to mention one or two recent publications on this subject. In the first place, the matter of elimination is important. It has long been known that the elimination of acacia is slow, and this is one of the reasons for its therapeutic value. Acacia is retained in the blood stream for several days and is only gradually eliminated from the body. But small amounts of the total injected can be recovered from the urine and it is not oxidized.

The elimination of acacia was recently studied by Andersch and Gibson of the University of Iowa. In a series of eight rabbits they examined various organs to find out where this material was stored and were able to recover from the liver on the average about 50 per cent of the total amount of acacia injected. Analyses made several months after the injection of the acacia showed a large percentage of the total amount injected to be still present. They also made histologic studies and got evidence indicating that this was not entirely an innocuous condition. The cells were full of vacuoles, presumably containing the acacia, and there was definite interference with the formation of bile. The same thing was true in rats and dogs and in one human being whom they examined. This patient had received acacia over a period of several months, and more than 40 per cent of the total acacia injected during that period was recovered from the liver. Further, in regard to the manner of excretion it is of interest that acacia was found to be eliminated in the bile and thus gradually excreted.

There is the further fact that in using acacia rather than whole blood one is not using the most favorable possible substance, because the oxygen-carrying capacity of the blood is not thereby increased. This point has been emphasized by Yandell Henderson, who carried out experiments on dogs bled a certain standard amount, causing approximately 50 per cent of them to die if not treated. In those animals, all of which recovered if blood was reintroduced, the chances of survival were not improved by the use of acacia. For that reason Henderson emphasized the importance of the red blood corpuscles in the treatment of shock and he thought that they constitute an essential part of any procedure for replacing lost blood.

Perhaps it will be just as well to leave the remainder of the period for discussion, and if there are points that come up in connection with the other substances mentioned by Dr Deitrick I think several of us are prepared to say something about them.

DR HENRY B RICHARDSON If a dog receives acacia and nothing else, what is the effect on its longevity?

DR CATTELL That was not studied in the experiments referred to. However, I think no bad results have been reported from the injection of acacia into animals other than the type of finding reported by Andersch and Gibson. Those animals were not killed by the acacia.

STUDENT I wondered if there was any experimental evidence supporting the use of caffeine as a cardiac stimulant.

DR CATTELL I think that the use of caffeine rests on a very unsound experimental basis. I am not familiar with the clinical experience in the use of caffeine, but from a pharmacologic standpoint it can be said with a good deal of emphasis that it has no value as a circulatory stimulant. The actions are rather mixed, there being a central action which tends to cause constriction of the peripheral vessels and a slowing of the heart, and a direct action on the musculature of the arterioles causing them to relax. The net effect on blood pressure is very slight. I believe that in therapeutic doses no appreciable action could be expected from the use of caffeine. Its use as a respiratory stimulant might be considered. I feel that in shock there is very little indication for the use of respiratory stimulants because in general there is no evidence that the circulating blood contains less than the normal saturation of oxygen on leaving the lungs, and the slow respiration is probably to a considerable extent secondary to the general depression of bodily functions.

STUDENT Is the profound psychic depression due to anoxemia and low pressure or is there any experimental evidence showing that there is edema in the central nervous system causing a depression in shock?

DR CATTELL I think there is an adequate basis for the depression in the generally reduced level at which activities are carried on under the circumstances of a deficient circulation.

STUDENT I should like to ask Dr Cattell, in line with what he said about caffeine, whether the diuretic action of caffeine, by increasing the dehydration, is contraindicated.

DR CATTELL I think not. In a condition of this sort where there is dehydration a diuretic is usually ineffective, and while I cannot speak from experience, I should feel that that would not be an important consideration.

DR DEITRICK I have seen caffeine and epinephrine given by intracardiac injection when the patient's respiratory center had ceased functioning for ten minutes and the patient's respiratory rhythm was reestablished for another half hour. Dr Wolff saw the patient with me along with several others. There was no doubt that the respirations had absolutely ceased. We were giving artificial respiration while the nurse was getting the caffeine and epinephrine ready. The respiratory rhythm came back after injection but the result was only temporary and we could not maintain it.

DR HARRY GOLD The stimulant action of the xanthines on the respiratory and the higher centers is really very striking sometimes. In patients with uremic coma and patients with Cheyne-Stokes respiration as a

result of advanced heart failure, consciousness is restored and Cheyne-Stokes respiration is abolished. Consciousness is sometimes restored for a period long enough to enable the patient to sign his will.

DR BRUCE HUNT, Perth, Australia What preparation is used?

DR GOLD Caffeine with sodium benzoate in a dose of about 1 Gm intravenously, but injected slowly, taking two or three minutes for the injection, or aminophylline in a dose of about 0.25 or 0.5 Gm injected intravenously. A contraindication to the use of caffeine one might possibly find in the observation of Grollman, namely that the cardiac output is increased by large doses of caffeine but the oxygen requirements are increased to about the same degree, about 20 per cent increase in oxygen uptake, associated with an increase in cardiac output. The drug is therefore imposing an added load on the heart rather than relieving it.

STUDENT I should like to ask Dr Deitrick whether there is a toxic substance liberated in an injured limb and how effective a tourniquet might be.

DR DEITRICK Work has been done on that. If you crush a limb tying the artery first, the animal will not go into shock. If you tie the vein leaving the artery intact and crush the limb, the animal will go into shock. That is important. The best observers have been unable, however, to demonstrate a substance which is carried in the blood and which will produce shock or even a drop in blood pressure, such as histamine-like substances in the blood of the femoral vein of a crushed leg. Histamine shock at autopsy gives quite a different appearance from that of a patient dying from shock following blood loss.

DR EUGENE F DU BOIS Dr Cattell, have you any comments to make on that? I want to introduce a little divergence of opinion in this discussion.

DR CATTELL I feel that that possibility would be very difficult to rule out. It is of interest that recently there have been reported by Feldberg experimental studies in which an increase in histamine has been demonstrated in shock produced by snake venom and by certain bacterial toxins. The amounts of histamine are extremely small. However, large amounts may not be required to produce damaging effects when liberated over a period of several hours. I believe that our methods of determining histamine are so crude at the present time that it would be extremely unlikely that such a demonstration could be made. It is important, nevertheless, that in cross transfusion experiments this type of reaction cannot be easily demonstrated, an observation which would seem to imply at least that under favorable circumstances the animal will be able to cope with whatever quantities of histamine may be formed.

DR DU BOIS Do you think histamine is an important factor in medical and surgical shock?

DR CATTELL In experimental shock Dr Cannon and I thought that histamine might play a part, but I think the proof for that is yet to be obtained.

DR DEITRICK Histamine can be detected if injected into an animal in small amounts, that is in an animal that has a crushed leg. If the venous blood returning from that leg is injected into another animal a fall in blood pressure occurs, but no similar effect has been demonstrated in blood from the crushed leg itself. I

think that Dale agrees there is very little evidence that histamine has any real effect in traumatic shock.

DR CATTIL: It is interesting that the liberation of potassium has been recently considered as a cause of shock. At Columbia Scudder and his associates feel that potassium set free in tissue damage is important. As you know, potassium is present in relatively high concentrations inside the cell, a matter of 300 or 400 mg per hundred grams of tissue as compared with only about 20 mg per hundred in the blood and therefore the release of a relatively small proportion of that present would bring about a toxic concentration in the blood stream.

DR RICHARDSON: Is there a change in the concentration of sodium chloride analogous to that in Addison's disease?

DR GOLD: There is a fall in the sodium content of the blood serum in shock. Isn't salt useful in the treatment of shock?

DR DEITRICK: We prefer to use sodium bicarbonate in order to supply the sodium ion. The carbonate may be lost through the lungs as carbon dioxide. Its use would tend to increase the alkali reserve.

DR DU BOIS: Dr Deitrick, I should like to ask a few questions about the amount and strength of dextrose or saline solution that you give whether or not you give them in combination, and also the method of preparing relatively sterile solutions of sodium bicarbonate.

DR DEITRICK: I will answer the last question first. I have had to prepare sodium bicarbonate solutions on several occasions. I don't know how the Boston group prepared their solution. We use sterile doubly distilled water and simply add the sodium bicarbonate to it to make a 5 per cent solution. You cannot add the sodium bicarbonate and then sterilize it for if you do the salt is broken down.

As to the dextrose or saline solution, you can use either. I would use 5 per cent dextrose or physiologic solution of sodium chloride or sometimes even a mixture of the two. Their action is very transitory so I think they ought to be used only until you can get blood or acacia. I would not have any objection to using acacia to tide the patient over, but I would not want to keep on giving acacia. It comes in large sealed ampules, and I have given it to patients in cases in which I think there is urgency in the face of a falling blood pressure. Blood banks may make it simpler to treat these patients in the future.

DR DU BOIS: I presume you all know what a blood bank is. It is an accumulation of many varieties of blood in an icebox so that almost any need can be supplied.

Before leaving this subject I presume that in preparing the bicarbonate you put into it the cooled water, so that there would be no danger of its changing into a carbonate, and that you ladle it out from a clean container.

DR HUNT: Do you find any practical justification for the use of the hypertonic saline in preference to the regular saline solution?

DR DU BOIS: I was going to ask that question and also about hypertonic dextrose. Can you withdraw some of the fluid from the tissues by using the stronger concentration of dextrose?

DR DEITRICK: Yes, there is experimental work indicating that you can. As concerns hypertonic saline solution I think it can be shown that it will increase blood volume for a period of perhaps fifteen or twenty minutes, and then the effect is lost. Some change seems to occur, however, so that the loss of fluid from the blood from then on becomes more rapid. I don't understand why but this has been shown by careful work.

DR DU BOIS: There is also the possibility that in using the too concentrated solution of dextrose you might produce a glycosuria and diuresis.

DR GOLD: What about the thrombophlebitis caused by concentrated solutions of dextrose, the 50 per cent solutions?

DR DEITRICK: I have seen thrombosis produced after only one injection of a concentrated solution of dextrose and if you repeat the injections in the same vein it almost always occurs.

STUDENT: What concentration of saline solution and of dextrose would be given?

DR DEITRICK: We usually use 5 or 10 per cent dextrose. Large amounts of this fluid are not without danger. In experiments on dogs large injections of dextrose and saline solution have caused death with pulmonary edema. Physiologic solution of sodium chloride (from 0.85 to 0.9 per cent) is the one we commonly use.

DR HUNT: What is the routine on this procedure in the emergency ward?

DR DEITRICK: We have saline and dextrose solutions which we can get within five minutes. I don't believe there is any acacia available in the accident room now, is there?

INTERN: Not that I know of.

DR GOLD: I should like to ask Dr Deitrick when he considers or by what signs he considers the patient in whom the blood pressure has fallen to be in a state of secondary shock. Where does one draw the line?

DR DEITRICK: I think that in the interest of good therapy we ought to define shock as existing before the typical picture develops. Shock, to me, already exists when the blood pressure has dropped to 70 and when the blood volume reaches 50 or 60 per cent of normal. The hemoglobin determination proves misleading because it may be high as the result of concentration of the blood. I don't believe a patient should be allowed to remain with a systolic pressure of 90 without something being done to increase it. How one proceeds depends on the rate of the fall of the blood pressure. If you are watching a patient who is bleeding and the blood pressure is 100/60 and an hour later it is 100/50 and in twenty minutes later it is 90/50, I think it is now time to intervene. It is not so serious if blood pressure falls more slowly to 90 over a period of six or eight hours and then begins to level off. One ought to keep a very accurate graph of what is happening to the blood pressure and pulse, so that one may see how rapidly the circulation is changing. If it is changing rapidly, I wish to step in much sooner than if it is changing slowly. In a case of internal hemorrhage, the body should be given a chance to compensate for a hemorrhage and to stop it. When to interfere is a matter which requires considerable judgment and as full a knowledge as possible of the course of events in the individual case.

## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION  
OF THE FOLLOWING REPORTS

HOWARD A CARTER Secretary

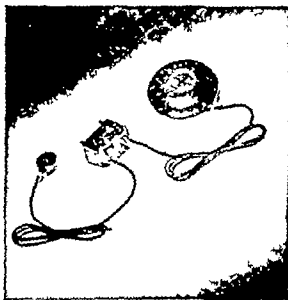
### WESTERN ELECTRIC AUDIPHONE ORTHO-TECHNIC MODEL ACCEPTABLE

Manufacturer Western Electric Company, 195 Broadway,  
New York

The Western Electric Audiphone, Ortho-Technic Model, is a carbon microphone hearing aid. It is assembled from parts designed to provide different frequency response characteristics. After the individual's hearing loss has been measured the parts are selected which will best meet his requirements. The equipment consists of microphone, air and bone conduction receivers, amplifier, batteries (supplying 3 and 4½ volts), head band, cords and receiver tips. The parts are finished in polished black.

The unit was tested by a competent investigator and the following report made:

**Microphones**—Two carbon particle barrier type microphones, lentil shaped with disk diameter of 3 inches and thickness of three-fourths inch, were submitted. The carbon chamber in these units is filled full of carbon particles instead of three-fourths full as in the ordinary and earlier types. A four-spoked current control rheostat adjustment is on the front. An attachment slip is on the back while a jack for a connecting cord is placed at the bottom.



Western Electric Ortho-Technic  
Model Audiphone

To test the frequency response characteristics of a microphone, it was included in a series circuit with a 45 volt dry battery and a 30 ohm resistor, since it had been previously established that the hearing aid circuit in which the microphone is normally used had a resistance of

30 ohms. Then the transmitter was placed in a sound chamber which was free from reflections and subjected to pure tones of constant intensity and varying frequency. The voltage across the resistor is a measure of the electrical output of the microphone, and this voltage was impressed on the input terminals of a cathode ray oscilloscope and measured as the frequency was varied. The results for the two microphones in question are shown on graph 1.

It will be observed on studying these curves that the principal difference between the two response characteristics is that 637A-3 has a larger output than 637B-3. The general trends of the two curves, however, are quite similar, certain characteristic peaks and valleys being present in both. It may be said, that, on the whole, the response is relatively well sustained over a frequency band of from 250 to 4,500 cycles per second, without the presence of extreme response peaks.

It was also possible to observe the wave form of the electrical output of the microphones on the oscilloscope screen and it was observed that the output was for the most part fairly free from harmonic distortion.

**Air Conduction Receivers**—Three air conduction receivers were supplied. All are of the permanent magnet miniature type, furnished with a hard rubber tip which snaps onto the receiver and is intended to conform to the inner contours of the outer ear. The receivers are about seven-eighths inch in diameter and one-half inch deep with connecting cord jack at the bottom. The jack accommodates one large and one small pin so arranged that the polarizing current cannot flow in the wrong direction.

The receivers were tested individually as to frequency response by supplying them with current of varying frequency and at constant terminal voltage. The acoustic output of the receivers was impressed on an artificial ear. The electrical output of the artificial ear was then observed on a cathode ray oscilloscope. The results are shown on graph 2.

It will be observed by referring to the curves that receiver WE 709A-3 (marked with two dots) peaks at about 1,200 cycles and that receivers WE 709B-3 (marked with one dot) and WE 709C-3 (no marks) have response characteristics similar to A but with main resonant peaks shifted up in frequency by 400 and 1,400 cycles respectively. In the main it would be true to say that the B and C curves are similar to the A curve but are referred to different frequency scales.

#### Carbon Particle

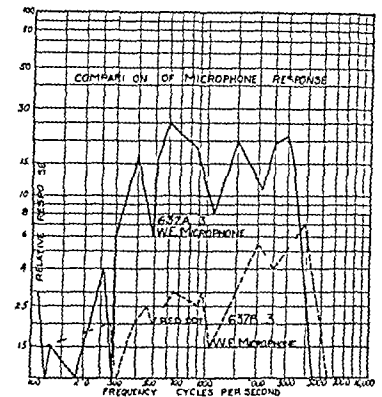
**Amplifier**—The amplifier was made of molded bakelite approximately 1¾ by 1¾ by 1 inch in size. Through the bottom projected four split pins fitting into corresponding jacks in the battery. Receiver and microphone cords plug into poled jacks situated on the top of the amplifier, and at one end is an on-off switch. The amplifier was found to operate equally well in all positions and accordingly it is assumed to be a carbon particle barrier microphone magnetically operated. The battery used with the amplifier consisted of two separate 45 volt batteries held in one container and terminating in two separate jacks. The microphone circuit and the receiver circuit are entirely separate electrically, being coupled only in a mechanical sense in the magnetically operated microphone. The double battery arrangement eliminates the defect of singing due to electrical coupling entirely.

**Battery Consumption**—When the amplifier and the two 45 volt batteries of the GB-45 battery unit were used, the current in the amplifier-receiver circuit was approximately 20 mls and in the microphone amplifier circuit the current varied from 20 to 23 mls with rheostat full on. For the lowest rheostat setting the latter current was found to be 6 mls.

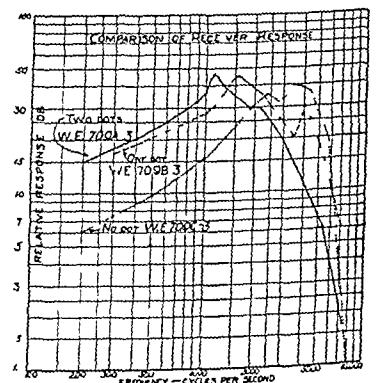
The measurements were repeated, the 3 volt GB-3 battery unit being used. A current of 9 mls was measured in the receiver circuit, and 14 mls and 4 mls in the microphone circuit for maximum and minimum rheostat settings respectively.

**Intelligibility and Articulation Tests**—The measure of actual usefulness of a hearing aid depends largely on the faithfulness with which sounds are amplified. Consequently a controlling element in any judgment of its merit must be its actual performance. Tests were accordingly conducted.

One departure from the usual test method was made in that the output of the hearing aid, instead of being reduced in volume by an artificial ear circuit, was reduced in its own electrical circuit by a resistance pad so designed that the microphone operated with its rated current. The hearing aid receiver under these circumstances was not subjected to full speech current amplitudes, but it had been previously determined that the distortion introduced by the receiver was inconsiderable. The amount of speech volume loss introduced by the resistance pad in order to produce sounds in the ear of the same loudness as when directly listened to was taken as the measure of the hearing aid amplification. It is believed that this method of test is superior for the purpose to the one employing additional



Graph 1



Graph 2

transmission links with the necessary acoustic coupling devices. Experience indicates that the results obtained are consistent.

Both discrete sentence intelligibility and articulation tests were conducted, as well as an amplification determination. Owing to the number of receivers and microphones available, a rather large number of combinations is possible. From the response characteristics of the individual items a combination was selected which represented the one most favorable for normal hearing. It was later found, however, that the most extreme combination possible did not materially affect the conclusion. The results obtained are given in the table.

As an additional test a list of difficult, unfamiliar, telephone directory names with two initials was transmitted over the hearing aid. The results are given in the 5th column of the table. Also, in order to determine how much loss in articulation was produced by the room itself and the manual listening method, a test was conducted as follows. The

Summary of Results

Hearing Aid Combination	Sentence Intelligibility	Con Vow Con Articulation			Difficult Telephone Directory Names with 2 wo. S. initials	Intensity Gain in Decibels Rheostat Maximum
		Con	Vow	Syllable		
No amplifier microphone 674-3 battery 4.5 volts	89.0%	87%	90%	70%	80%	4-10
Amplifier microphone 674-3 receiver 700B-3 battery 4.5 volts	99.5%	70%	90%	60%	10%	20-24
Test room only direct conversation one ear covered		92.7%	95%	85%		

observer tightly covered one ear with a jar stuffed with cotton and listened to con-vow con syllables spoken in a normal tone on the side of his covered ear. The results of this test are given in the last line of the table. It will be observed that there is a considerable loss, 15 per cent, in syllable articulation.

**Bone Conduction Transmission**—Similar tests were conducted with the same items as shown in the second line of the table except that the receiver was replaced by the 710A-3 bone oscillator. The results obtained as to sentence intelligibility and articulation were almost identical with those in line 2.

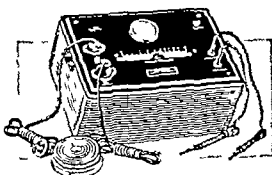
In view of the foregoing report, the Council on Physical Therapy voted to include the Western Electric Audiphone, Ortho Technic Model, in its list of accepted devices.

### BURDICK SURGICAL DIATHERMY, MODEL D-3, ACCEPTABLE

Manufacturer: The Burdick Corporation, Milton, Wis.

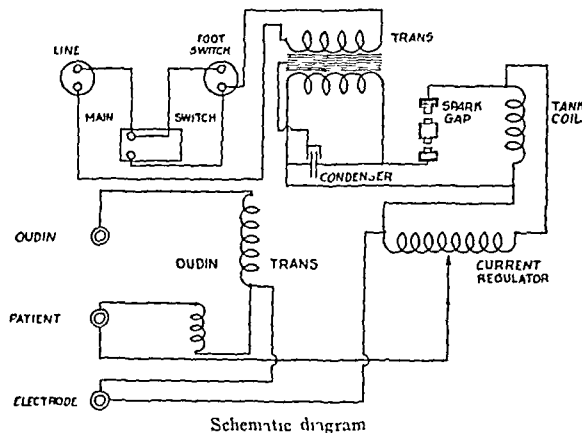
The Burdick Surgical Diathermy Unit, Model D-3, is recommended for surgical and for limited medical purposes. It is primarily a surgical unit producing currents for electrocoagulation and desiccation. It is adaptable for moderate diathermy use. This portable unit comes in a leatherette covered cabinet with carrying handle on top. The dimensions are 14½ inches long by 10 inches wide by 6¾ inches high or 9½ inches high with cover. It weighs 25 pounds. There is a compartment in the cover for foot-switch, cords and electrodes. The standard equipment includes foot-switch and cords. Surgical electrodes are optional.

Designed to provide a low voltage and high amperage current for electrocoagulation purposes and to produce an Oudin high voltage current for desiccation and fulguration, the unit operates by spark gap. Four three eighths inch tungsten points mounted on radiators turned from solid stock have gaps in fixed position. The transformer is the low voltage, air-cooled type. Data submitted by the firm on temperatures observed for spark gap, transformer and cabinet interior taken after six hour runs at full load, were within the limits of safety. The condenser is made of mica and copper plates. According to the firm, minimum high frequency losses occur with this resonator wound on bakelite tubing.



Burdick Surgical Diathermy Model D-3

The intensity is regulated by means of a single control, the micro inductive switch. This provides minute regulation of current from zero to the full range of the apparatus. The firm states that this precision control enables the operator to duplicate dosage by recording the settings used for a given size of electrode and certain type of work.



Schematic diagram

The unit was investigated clinically by a qualified physician and reported to give satisfactory service. However, it was pointed out that because of the length of the electrode handle, 14 inches, it is often necessary in performing fine work to slide the hand down over this insulated section to gain control of workmanship. The soft rubber insulation of the electrode tips does not prevent heating when a strong current is used.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Burdick Surgical Diathermy, Model D-3, for inclusion in its list of accepted devices.

### WAPPLER SHORT WAVE DIATHERMY MACHINE, MODEL C-507, ACCEPTABLE

Manufacturer: American Cystoscope Makers, Inc., Compression Division, 450 Whitlock Avenue, New York.

The Wappler Short Wave Diathermy Machine, Model C-507, is recommended for medical and surgical diathermy, including hyperpyrexia treatments. It is similar to the Compex Short Wave Diathermy previously accepted by the Council (THE JOURNAL, April 25, 1936, p. 1468) except for the addition of the inductance coil technique. The former model was investigated with pad and cuff electrodes. Due to the merging of the Compex Oscillator Corporation with the American Cystoscope Makers, Inc., the name of the Compex Short Wave Diathermy has been changed to Wappler Short Wave unit to conform with the established trade name "Wappler" covering all of the products of the American Cystoscope Makers, Inc. Storage space is provided by means of a drawer. The complete unit weighs 125 pounds.

According to the firm, the circuit employed is identical in all respects with the two tube type used in the Compex Short Wave Diathermy and has, in addition, an impedance matching circuit permitting inductance cable appliances. Both units have a 15 meter wavelength. The



Wappler Short Wave Diathermy Machine, Model C-507

### Average Temperatures with Inductance Coil Technique

Deep Muscle		Oral	
Initial	Final	Initial	Final
98.1	105.3	99.6	99.0

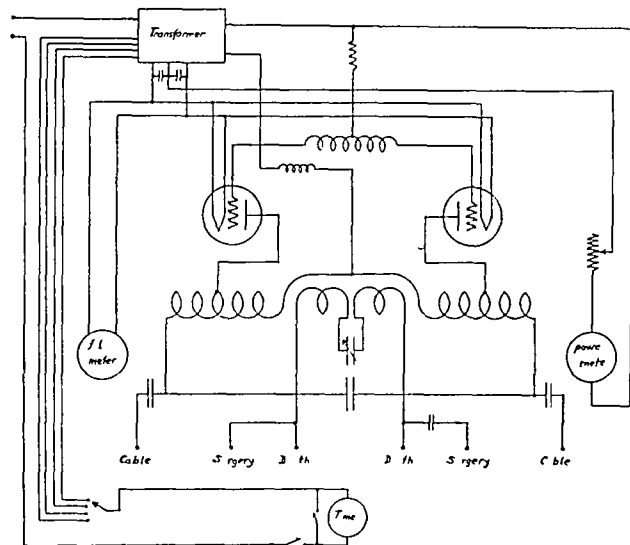
transformer temperature rise and the rise at various levels within the cabinet after a two hour run at full load, were low enough to satisfy the requirements for fire hazard. When the unit is



used with pad and cuff electrodes, it is claimed to perform exactly as the accepted model on the basis of the tests made on the circuit similar to that employed in the Compres machine

As evidence of the ability of the unit to produce deep heating, the firm submitted six tests performed with the thermocouple technic recommended by the Council

Average temperatures for six observations with the inductance coil technic are given in the accompanying table



Schematic diagram

The unit was tried out in a clinic acceptable to the Council and performed satisfactorily

In view of the foregoing report, the Council voted to accept the Wappler Short Wave Diathermy Machine for inclusion in its list of accepted devices

## Council on Pharmacy and Chemistry

### REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT  
PAUL NICHOLAS LEECH Secretary

### THE PRESENT STATUS OF CYCLOPROPANE

The Council stated in a preliminary report on cyclopropane<sup>1</sup> that the anesthetic could not be properly evaluated because adequate evidence was not available. Since then much clinical and pharmacologic evidence has become available. The evidence is considered in this report.

Seevers and Waters,<sup>2</sup> in their review of the pharmacology of anesthetic gases, note that when an attempt is made to list the qualities which are expected in the "ideal" anesthetic gas "the desires of four individuals must be considered." The patient desires a rapid induction without irritation or unpleasant odor and comfortable recovery, the surgeon wants a nonexplosive agent which effects complete muscular relaxation and does not increase the capillary bleeding, the anesthetist desires a good margin of safety with a minimum of functional or organic injury, adequate potency for high oxygen mixtures and elimination of the unchanged chemical and "moment to moment" control of the depth of anesthesia resulting from rapid interchange of this gas between the atmosphere and the tissues, and the manufacturer hopes for an agent which can be produced simply and inexpensively, is easily purified and remains chemically unchanged during storage.

There is no known gas which meets all the requirements specified, but the experimental and clinical evidence for cyclo-

propane is considered herewith on the basis of these standards set by Seevers and Waters. Lucas and Henderson<sup>3</sup> introduced cyclopropane for clinical use in 1929 after a preliminary pharmacologic study. Later a preliminary report of 447 clinical cases was published by Stiles, Neff, Rovenstine and Waters<sup>4</sup> in 1934. Other early workers included Griffith,<sup>5</sup> Bourne<sup>6</sup> and Wood.<sup>7</sup> A complete bibliography to date would include more than a hundred references to the use of this agent. The following information is designed to include the pertinent contributions of the many authors who have published reports on this anesthetic gas.

#### CHEMICAL AND PHYSICAL PROPERTIES

Cyclopropane ( $C_3H_6$ ),  $\begin{array}{c} H \\ | \\ H-C-\Delta-CH \\ | \\ H \end{array}$  described by von Freund<sup>8</sup>

as trimethylene in 1882, is a colorless gas with a characteristic, not unpleasant odor. Its molecular weight is 42.1, its density at 0°C and 760 mm of mercury is 1.46. The boiling point of cyclopropane is  $-32.89^\circ C$ <sup>8a</sup> and the freezing point  $-126^\circ C$  [Unpublished data from the laboratories of the Ohio Chemical & Manufacturing Co., Cleveland, Ohio, indicate a boiling point of  $-32.2^\circ C$ , and a freezing point of  $-127^\circ C$  for cyclopropane.] It is inflammable and explosive.<sup>9</sup> The lower limits of explosibility are the same as for ether, but the upper limits are much less.<sup>10</sup> The range in air of explosibility is from 3 to 8.5 per cent and in oxygen from 2.5 to 50 per cent.<sup>11</sup> The olive oil to water solubility of an impure cyclopropane gas is 64.4 to 1 as compared with 13.2 to 1 for ethylene and 25.5 to 1 for ether.<sup>3</sup> The oil-water coefficient of pure cyclopropane at  $37.5^\circ C$  is  $34.31$ .<sup>12</sup> Many authors have reported on its solubility<sup>13</sup> in water, in blood (both human and animal), in various oils by saturation and extraction and in iodine pentoxide. According to Orcutt and Seevers<sup>12</sup> who used the extraction method, it has at body temperature a solubility in water of about 20.4 volumes per cent and in human oxalated blood 45.7 volumes per cent. The solubility in cod liver oil and paraffin oils is approximately the same as for olive oil, which is 699.0 volumes per cent. According to Robbins,<sup>14</sup> its solubility in blood varies with changes in cell volume as well as in the lipid content of the blood and, therefore, is increased after a fat meal.

#### PREPARATION OF VARIOUS BRANDS

The Ohio Chemical & Manufacturing Co. presented its brand of cyclopropane to the Council three years ago. Presumably this product, as well as two other brands—E. R. Squibb & Sons and Imperial Chemical Industries, Ltd.—is manufactured after the method of von Freund.<sup>8</sup> Subsequently, Haas<sup>15</sup> described a new method of preparing the chemical. This method was

- 3 Lucas G. H. W. and Henderson V. E. New Anesthetic Gas Cyclopropane. *Canad. M. A. J.* **21**: 173 (Aug.) 1929. Henderson and Lucas. Cyclopropane. A New Anesthetic Anesth. & Analg. **9**: 1 (Jan. Feb.) 1930. Lucas and Henderson. Effect of Cyclopropane on Metabolism. *Arch. internat. de pharmacodyn. et de therap.* **37** (II): 155 (1930).
- 4 Stiles J. A., Neff W. B., Rovenstine E. A. and Waters R. M. Cyclopropane as an Anesthetic Agent. *Anesth. & Analg.* **12**: 56 (March-April) 1934.
- 5 Griffith H. R. Cyclopropane Anesthesia. *Canad. M. A. J.* **31**: 157 (Aug.) 1934.
- 6 Bourne Wesley. Cyclopropane Anesthesia in Obstetrics. *Lancet* **2**: 20 (July 7) 1934.
- 7 Wood P. M. Clinical Use of Cyclopropane and Tribromethanol in Amylene Hydrate. *J. A. M. A.* **106**: 275 (Jan. 25) 1936.
- 8 von Freund August. Ueber Trimethylene. *Monatsh. f. Chemie* **2**: 625 (July 13) 1882.
- 8a Haas H. B., McBee E. T., Hinds G. E. and Gluesenkamp E. W. Synthesis of Cyclopropane. *Ind. & Eng. Chem.* **28**: 1178 (Oct.) 1936.
- 9 Sise L. F. Anesthesia for Thyroid Surgery. *J. Indiana M. A.* **30**: 180 (April 1) 1937.
- 10 Sise L. F., Woodbridge P. D. and Eversole U. H. Cyclopropane—A New and Valuable Gas Anesthetic. *New England J. Med.* **213**: 303 (Aug. 15) 1935.
- 11 Buchman M. A. and Wardell C. H. The Inflammability of Anesthetic Gases and Vapors Including Cyclopropane. The Ohio Chemical & Manufacturing Co., Cleveland.
- 12 Orcutt F. S. and Seevers M. H. The Solubility Coefficient of Cyclopropane for Water Oils and Human Blood. *J. Pharmacol. & Exper. Therap.* **59**: 206 (Feb.) 1937.
- 13 Kochmann. *Heffter's Handbuch der experimentelle Pharmacologie*. Berlin Julius Springer 1936. Vol. 2. Orcutt and Seevers.<sup>12</sup> Robbins.<sup>14</sup>
- 14 Robbins B. H. Studies on Cyclopropane. I. The Quantitative Determination of Cyclopropane in Air, Water and Blood by Means of Iodine Pentoxide. *J. Pharmacol. & Exper. Therap.* **58**: 243 (Nov.) 1936.
- 15 Haas H. B., McBee E. T., Hinds G. E. and Gluesenkamp E. W. New Method for Preparing Anesthetic Cyclopropane. *Anesth. & Analg.* **16**: 31 (Jan. Feb.) 1937.

1 Cyclopropane for Anesthesia (Ohio Chemical & Manufacturing Co.) Preliminary Report by the Council on Pharmacy and Chemistry. *J. A. M. A.* **106**: 292 (Jan. 25) 1936.  
2 Seevers M. H. and Waters R. M. Pharmacology of the Anesthetic Gases. *Physiol. Rev.* **18**: 447 (July) 1938.



patented by Purdue University and subsequently sold to the Mallinckrodt Chemical Works, makers of the latest and third American brand

## IMPURITIES

Burger<sup>16</sup> studied the impurities in all three American brands, referring to them as brands A, B and C. He logically predetermined the likely impurities and noted that the manufacture of the gas required ring closure (ringschluss) and that the "chloride" method was apt to result in the formation of propylene. Wolkow and Menschutkin<sup>17</sup> had noted this previously and Wilstaetter and Bruce<sup>18</sup> had described methods for eliminating propylene. Ipatjew<sup>19</sup> changed 50 to 70 per cent cyclopropane to propylene by passing it over iron filings at 100 C. Burger believed that not only propylene but cyclohexane was likely to be present. It is difficult to detect either, since the two have the same composition (the same empiric but not the same structural formula) as cyclopropane. Burger employed the Wagner<sup>20</sup> cold permanganate method and the Gustavson<sup>21</sup> iodine absorption procedure and found that by the former, brand A contained 285 per cent propylene, brand B 256 per cent and brand C 0.12 per cent. Results by the latter method checked closely—brand A contained 280 per cent, B 250 per cent and C 0.14 per cent of propylene. Burger did not claim that these tests were positive but merely that propylene was the most likely compound to give positive results of these tests. He could devise no test for the presence of cyclohexane but was suspicious of its presence because of the similarity of odor to that of chloroform, even though the test for haloids was negative. In his opinion cyclohexane was more undesirable than propylene, but he also believed that it could be eliminated by careful fractional distillation. Buchman and Wardell<sup>11</sup> have stated that propylene, propane, higher hydrocarbons, ethers, alcohols, alkyl halides and nitrogen are the impurities which are most likely to be encountered in cyclopropane.

## CONCENTRATION, SATURATION AND DIFFUSION

Cyclopropane differs from other gaseous anesthetic agents in that the anesthetic-oxygen ratio is reversed—15 per cent of cyclopropane to 85 per cent of oxygen up to the rarely and briefly used 40 per cent of cyclopropane and 60 per cent of oxygen.<sup>22</sup> Robbins<sup>23</sup> found in seventeen dogs that abdominal relaxation required 168 mg per hundred cubic centimeters of blood that loss of the wink or lid reflex required 206 mg in 100 cc, and that costal paralysis ensued when 255 mg of the anesthetic was present and respiratory arrest occurred when 100 cc contained 282 mg of cyclopropane. Seevers notes that this gas possesses analgesic properties in subanesthetic concentrations of from 3 to 5 per cent if continuously inhaled.<sup>24</sup> Most normal persons will lose consciousness following prolonged inhalation of 6 per cent or less although effective concentrations vary widely with the person.<sup>25</sup>

Romberger<sup>25</sup> points out, however, that nothing could be farther from reasonable physiologic truth than that set percentage mixtures of cyclopropane-oxygen are indicative of definite places or levels of anesthesia. Furthermore, he points out that the exact percentages are indeterminate unless minute to minute samples are taken. He concludes that since the use of ether and the open mask gives no index of percentages, it is necessary to use signs, the same index should be used with cyclopropane.

Barbour<sup>26</sup> stated that "the amount taken up by the blood is directly proportional to the partial pressure of the gas existing in the alveolar air and to the solubility coefficient for that particular anesthetic." According to Robbins,<sup>27</sup> blood cells absorb about two and one-half times as much cyclopropane as blood plasma. He found the distribution coefficient (blood concentration/air concentration) in the dog to be 0.492 in vivo and 0.513 in vitro—a good agreement. Concentration of cyclopropane in the blood of the right side of the heart is practically equal to that in the arterial blood after fifteen minutes of anesthesia.<sup>27</sup> That complete body saturation does not occur at this time (but several hours later), is indicated by Seevers' data<sup>28</sup> on the dog and rabbit by the gas depot method. Similar data have been obtained on man by the same method.<sup>29</sup> Appreciable quantities of the gas are lost to the tissues throughout an ordinary anesthesia.<sup>30</sup>

When the pressure gradients are diminished as saturation or desaturation is approached, the diffusion rate is much prolonged, as indicated by Robbins' data showing that the venous blood still retained some cyclopropane after from two to three hours of cyclopropane. The rate of diffusion of cyclopropane appears to be about twice that of ethylene.<sup>31</sup> That ethylene is eliminated more rapidly than cyclopropane may be inferred from the difference in potency and the fact that induction and recovery are slower with the latter agent. Romberger, using Ronzoni's<sup>32</sup> data for ether, found that cyclopropane was eliminated much faster than ether.

## PHARMACOLOGIC EFFECTS

**Heart and Circulation**—Waters notes that the entire effect of this agent on the vascular system, coronary vessels and myocardium is not established, but nevertheless certain facts are available. Waters and his associates<sup>33</sup> and Sise<sup>34</sup> have both warned that if bradycardia, arrhythmias or tachycardia developed during cyclopropane anesthesia the concentration must be lessened at once. Lucas, Henderson and Waters noted that high concentrations of cyclopropane produced cardiac arrhythmia in experimental work on animals and man. Seevers and his associates<sup>35</sup> observed these arrhythmias just prior to or following respiratory arrest in concentrations of over 35 per cent in dogs. Robbins and Baxter<sup>36</sup> concluded that the arrhythmias occurring after respiratory arrest in the dog are due to anoxemia and not to cyclopropane per se, since they occurred when the arterial blood contained only 28 per cent oxygen, and that vagal section did not prevent them, although it did prevent the increase in the PR interval and the more severe type of auriculoventricular block which occurs earlier in anesthesia. Seevers and his associates thought that early arrhythmia was of vagal origin, since it was prevented by atropine and was not entirely due to anoxemia, even though this was a factor and plays a major role in the arrhythmia occurring later. Waters<sup>30</sup> studied the incidence of arrhythmia clinically and found that it increased with deepening cyclopropane anesthesia and lessened with deepening ether anesthesia. Kurtz, Bennett and Shapiro<sup>36</sup> encountered four cases of multiple focus ventricular tachycardia in a series of forty-one clinical administrations purposely carried to the

16 Burger O K. Tests for Impurities in Cyclopropane Anesth & Analg 16 207 (July Aug.) 1917

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26 Barbour H G. Pharmacological Action of Inhalation Anesthetics Am J Surg 34 435 (Dec.) 1936

27 Robbins B H. Quantitating Cyclopropane in Air and Blood, Anesth & Analg 16 93 (March April) 1937

28 Seevers M H, DeFazio S F and Evans S M. A Comparative Study of Cyclopropane and Ethylene with Reference to Body Saturation and Desaturation J Pharmacol & Exper Therap 53 90 (Jan.) 1935

29 Seevers Stormont and Hathaway. Unpublished experiments

30 Waters R M. Present Status of Cyclopropane Brit. M J 2: 1013 (Nov. 21) 1916

31 Seevers M H, DeFazio S F and Evans S M. Comparative Study of Cyclopropane and Ethylene with Reference to Body Saturation and Desaturation J Pharmacol & Exper Therap 53 295 (March) 1935

32 Ronzoni E. J Biol Chem 57 761 (Oct.) 1923

33 Waters R M and Schmidt E R. Cyclopropane Anesthesia, J A M A 103 975 (Sept. 29) 1934. Waters<sup>30</sup> Seevers Meek Rovenstine and Stiles<sup>31</sup> Kurtz Pennett and Shapiro<sup>31</sup>

34 Seevers M H, Meek W J, Rovenstine E A and Stiles J A. A Study of Cyclopropane Anesthesia with Especial Reference to Gas Concentrations, Respiratory and Electrocardiographic Changes J Pharmacol & Exper Therap 51 1 (May) 1934

35 Robbins B H and Baxter J H Jr. Studies on Cyclopropane III. The Relation of Electrocardiographic Changes to the Arterial Concentrations of Oxygen, Carbon Dioxide and Cyclopropane in Dogs Anesthetized with Cyclopropane J Pharmacol & Exper Therap 61 162 (Oct.) 1937

36 Kurtz C M, Bennett J H and Shapiro H H. Electrocardiographic Studies During Surgical Anesthesia J A M A 106 434 (Feb. 8) 1936

fourth plane, which indicates, as do certain animal experiments, that since the irregularities are of ventricular origin there is increased irritability of the automatic tissue of the heart. The work of Moffitt<sup>37</sup> indicates that bradycardia occurred most frequently with cyclopropane majors followed in order by ethylene minors, ether majors and nitrous oxide majors.

Eversole<sup>38</sup> studied cardiac irregularities in 109 patients receiving 113 anesthetics and encountered cardiac irregularities in 79 per cent of the cyclopropane cases, 90 per cent of the ether cases and 100 per cent of the chloroform cases. The disturbances were frequently pacemaker displacement or sinus arrhythmias. Thirty one of the group had cardiac irregularities preoperatively. Tachycardia occurred in four of the cyclopropane cases. Marshall<sup>39</sup> believed that arrhythmia, bradycardia, and tachycardia were closely related to increased concentrations. In 7,200 administrations with which Waters was familiar there were three deaths, one of which was a preanesthetic circulatory failure and the other two were probably due to ventricular fibrillation. They were attributed to technical errors of administration, for although fine concentrations were used for induction it was increased rapidly through respiratory depression. Simmons<sup>40</sup> reported one death in ventricular fibrillation.

Some interesting light is thrown on the subject of the relationship of cyclopropane to these rare disturbances by the use of epinephrine during anesthesia. Meek and his associates<sup>41</sup> concluded from their experiments that cyclopropane affects the automatic tissue of the heart in dogs to a greater extent than ether or chloroform. They state in part:

"In the adrenalin controls A-V blocks were common and the ventricular rhythms were slow in nature. When the heart was under the influence of cyclopropane, however, the ventricular specialized tissue was so heightened in its irritability that when adrenalin reached it an automatic rate appeared that was dominant over the sinus. The ventricular tachycardias were almost always at the rate of 300 a minute."

They<sup>41</sup> also showed that the predisposing effect of cyclopropane for ventricular tachycardia seemed to be directly related to the concentration of the anesthetic agent. With epinephrine tachycardia developed in fewer animals under light anesthesia than under deep. Even more significant than the numerical occurrence of the tachycardia was the length to which it persisted. Under light cyclopropane, the tachycardia lasted less than half as long as under deep anesthesia.

The significance of these observations, however, is difficult to evaluate from a practical standpoint, in the opinion of Seevers and Waters,<sup>2</sup> since irregularities are a common clinical occurrence with all types of anesthesia including procaine blocks. In Kurtz's series,<sup>36</sup> of 109 cases with all agents, only 21 per cent failed to show some disturbance of cardiac rhythm.

Cyclopropane in anesthetic concentrations relaxes the peripheral blood vessels, according to Seevers and Waters,<sup>2</sup> and venous blood becomes arterialized even when the inspired oxygen is 21 per cent. Capillary bleeding seems to be increased,<sup>2</sup> according to Marshall,<sup>39</sup> this is due in part to the absence of compensatory sympathicotonia and hyperadrenia.

The blood pressure may rise during cyclopropane anesthesia, and this is believed to be due to the accompanying retention of carbon dioxide, anoxemia or pressor reflexes which rise from the sensory stimulation of light anesthesia rather than from the anesthetic agent per se, since if care is taken to eliminate these factors a rise is seldom seen. Rowbotham<sup>42</sup> found that systolic blood pressure was increased 10, 20 and 30 mm at the start of anesthesia and that this rise was followed by a rise in the diastolic, both rises in his opinion being proportional to the depth of anesthesia. Contrarily, he used anesthesia in a case of hypotension in which there was no change in the blood pressure.

Moffitt<sup>37</sup> noted lowering of blood pressure with nitrous oxide majors, cyclopropane minors and ethylene majors in the order of incidence. Sise<sup>10</sup> states that the blood pressure drops or rises slightly in cyclopropane anesthesia and Bogan<sup>43</sup> claimed a rise of blood pressure of from 10 to 20 mg.

Experimental and clinical evidence indicates that electrocardiographic change encountered during cyclopropane anesthesia is transient rather than permanent, but there are as yet no functional or pathologic studies determining definitely the absence of permanent effects. Tucker<sup>44</sup> reported one case of shock in a patient who had received 750 cc of cyclopropane. The patient recovered, but Tucker recommended watching closely for shock and poor operative risks. Moffitt<sup>37</sup> did not believe that there was any great difference in the circulatory depression seen in cyclopropane as compared with those following nitrous oxide ether anesthesia. As a matter of fact, he found shock more frequent in both nitrous oxide majors and ether majors than he did in cyclopropane majors. Although the early experimental work on dogs and man indicated that the heart rate is usually reduced below the resting level,<sup>45</sup> Waters does not believe that further work will confirm this finding.

In the opinion of Romberger,<sup>22</sup> untoward effects on the heart in the cardiovascular system should not occur under reasonably normal circumstances. Sanders<sup>46</sup> believes that cyclopropane is less dangerous to the heart than other agents, and Marshall postulates that apart from minor disturbances of rate and rhythm in deep anesthesia cyclopropane has little toxicity for the circulatory system, since he believes that the compensatory sympathicotonia and hyperadrenia of ether and chloroform are absent.

It can be definitely stated, however, that deep concentrations of cyclopropane are inexcusable, both because they are unnecessary and because they are potentially dangerous to cardiac tissue. The combination of epinephrine and other sympathotonic drugs or any drugs that increase the irregularities of the automatic tissue of the heart should be avoided. It is essential to watch the pulse carefully and continually during cyclopropane anesthesia, especially if anesthesia is deepened to the point of beginning respiratory depression.<sup>47</sup> Sise notes that high concentrations are toxic to the heart but that they should never be used clinically, while Waters warns that rapid induction should be avoided. Waters and his associates are continuing their studies of the effects of cyclopropane on the cardiovascular rhythm as well as of cardiac damage and other circulatory effects.

Robbins and Baxter<sup>48</sup> found in dogs that cardiac output was increased under surgical anesthesia and remained unchanged or was decreased under very deep anesthesia.

**Respiratory System.**—Cyclopropane is an anesthetic gas which has a characteristic, not unpleasant odor and which, according to Romberger<sup>22</sup> is practically nonirritating in concentrations less than 50 per cent used clinically.<sup>10</sup> The Imperial Chemical Industries, Ltd., brand is claimed by the Englishman Rowbotham<sup>42</sup> to be less pungent and more pleasant to breathe than the Ohio Chemical & Manufacturing Co. brand.

Waters<sup>30</sup> points out that the irritant property of ether vapor precludes the temptation to use high concentrations, while cyclopropane is devoid of that irritation. Because of this and the abundant oxygen present there is little to discourage the careless anesthetist from using too much of this potent anesthetic agent. Authorities differ as to whether laryngospasm is more frequent or less frequent with cyclopropane than with other anesthetic agents. The respiratory stimulation so commonly seen in the initial and lighter stages of ether anesthesia is absent in cyclopropane except when preliminary medication is also employed or there is accumulation of carbon dioxide in the closed system.<sup>22</sup> Other factors contributing to the ease with which this agent may be administered without indication of dangerous-

37 Moffitt J A and Mechling G S. A Comparison of Cyclopropane with Other Anesthetics. *Anesth. & Analg.* 15: 225 (Sept. Oct.) 1936.

38 Eversole U H. Sise L F and Woodbridge P D. Clinical Use of Cyclopropane. *Surg. Gynec. & Obst.* 64: 156 (Feb. 1) 1937.

39 Marshall S V. Cyclopropane Anesthesia. A Preliminary Survey. *M. J. Australia* 2: 138 (July 24) 1937.

40 Simmons H J A. in discussion on paper by Waters<sup>30</sup>.

41 Meek W J. Hathaway Hubert and Orth O S. The Effects of Ether, Chloroform and Cyclopropane on Cardiac Automaticity. *J. Pharmacol. & Exper. Therap.* 61: 240 (Nov.) 1937.

42 Rowbotham Stanley. Cyclopropane Anesthesia. *Lancet* 2: 1110 (Nov. 16) 1935.

43 Bogan J B. A Clinical Evaluation of Cyclopropane After Its Use in 300 Surgical Anesthetics. *Anesth. & Analg.* 15: 275 (Nov. Dec.) 1936.

44 Tucker E B. Observation on the Use of the Newer Anesthetics. *Vinethene and Cyclopropane. Anesth. & Analg.* 16: 55 (Jan. Feb.) 1937.

45 Seevers and Waters<sup>2</sup>. Seevers Meek. Rowenstone and Stiles<sup>41</sup>. Bogan<sup>43</sup>.

46 Sanders R L and Fink J C. Cyclopropane Anesthesia. *Clinical Observations in 100 Cases. Memphis M. J.* 11: 8 (Aug.) 1936.

47 Waters<sup>30</sup>. Sise Woodbridge and Eversole<sup>38</sup>.

48 Robbins B H and Baxter J H Jr. Studies of Cyclopropane. *IV. Cardiac Output in Dogs Under Cyclopropane Anesthesia. J. Pharmacol. & Exper. Therap.* 62: 179 (Feb.) 1938.

concentration is the smooth induction, which usually occurs without excitement, and the fact that it is essentially a respiratory depressant, especially when premedication is employed.

Waters<sup>30</sup> made a thorough study of the effect on the respiratory system and found that there was no stimulation during inhalation, slight depression during the first and second planes and very slight depression in the third plane down to the point at which respiratory arrest began to approach. In this respect it differs from all other anesthetic gases.<sup>10</sup> Even the increasing rate, which usually occurs with other agents just prior to respiratory arrest, is very slight or absent. The decrease in minute volume respiration is accompanied by an increase in the carbon dioxide content in the arterial blood<sup>30</sup> and the tissues.<sup>28</sup> Bourne has been reported to have suggested that the oxygen-rich atmosphere used with cyclopropane may be responsible for the retention of carbon dioxide by the muscles and other tissues and that this carbon dioxide toxicity may be responsible for the postoperative collapse seen occasionally with this anesthetic. In increasing concentrations to the point of respiratory arrest, it is seen that respiration invariably fails before circulation and, therefore, that recovery occurs readily if artificial respiration is instituted and the concentration diminished.

Moffitt<sup>3</sup> in his studies of various anesthetics noted the incidence of pharyngitis decreasing in the following order: ethylene majors, ethylene minors, nitrous oxide majors and cyclopropane majors, but on the other hand cough was most frequent in cyclopropane majors and ethylene majors. Pneumonias occurred most frequently in nitrous oxide majors, nausea in ethylene minors and emesis in ether majors, ether minors and ethylene majors in order. The early work reported on the lowered incidence of pulmonary complication in anesthesia with this agent by the Wisconsin workers has been confirmed by Bonham.<sup>50</sup> Knight and Urner<sup>51</sup> did not encounter any respiratory complications in thirty-two cases in which they used cyclopropane in a self-administering device for obstetric analgesia. However, pulmonary complications are not common in obstetric analgesia and anesthesia.

Mechling and Moffitt<sup>52</sup> found the incidence of pneumonia increased in the following order: spinal nitrous oxide, cyclopropane, ether and ethylene, for bronchitis and pharyngitis ethylene cyclopropane, nitrous oxide, spinal and ether.

The clinical anesthesia results in relatively slight salivation. Waters believes that it is much less than that obtained with ether and chloroform and more than that obtained with nitrous oxide and ethylene. Seevers and Waters note that little is known concerning the secretion of mucus resulting from these various anesthetic agents and that the mucus rather than the serous secretion is more troublesome during anesthesia.

Burford<sup>53</sup> reported an incidence of 0.97 per cent of pulmonary complications in his series of 1,333 administrations and noted that Taylor and his associates<sup>54</sup> reported an incidence of 0.95 per cent in a series of 5,889 administrations. Griffith<sup>55</sup> in a series of 300 cases, reported pulmonary complications of 0.67 per cent while Moffitt and Mechling<sup>50</sup> reported none in 315 cases.

Burford,<sup>53</sup> however, had a pulmonary complication incidence of 2.07 per cent in his 626 abdominal cases and Griffith<sup>55</sup> 1.8 per cent in 109 abdominal cases. Burford and Jones<sup>57</sup> reported four deaths due to massive atelectasis and discussed their possible cause—quiet respiration and high alveolar oxygen and prevention by the addition of helium to the anesthetic mixture. Griffith<sup>58</sup> reported a case of acute pulmonary edema following cyclopropane with recovery.

**Gastrointestinal Tract**—Raginsky and Bourne<sup>59</sup> found no liver injuries in dogs after repeated daily administrations for periods of one hour, as judged by the capacity to eliminate bromsulphalein and by histologic examination. Neither did cyclopropane have an adverse effect on the rate of recovery from hepatic injury produced by chloroform, as judged by the same criteria. These authors, according to Seevers and Waters, could find no evidence of additional hepatic injury to eclamptic patients who gave evidence of such injuries by retention of dye.

Peoples and Phatak<sup>60</sup> reported an increased tone of isolated rabbit jejunum when exposed to from 10 to 25 per cent cyclopropane in oxygen. Meek's associates Weisel, Youmans and Cassels<sup>61</sup> have found that both the circular contractions and propulsive phenomena are inhibited or arrested in normal dogs with Thyry or Thyry-Vella fistulas during deep cyclopropane anesthesia. Prompt return to normal or increased activity occurred when anesthesia was terminated. Peoples and Phatak<sup>60</sup> believed that these results indicated that there would probably be less postoperative intestinal stasis and distention in the clinical use of cyclopropane than there was with ether. Seevers<sup>62</sup> observed that the ten minute inhalation of 6 per cent cyclopropane inhibited hunger contractions in man without affecting gastric tone. These contractions returned in full strength when inhalation ceased and progressed to the usual tetanic contraction.

Waters reports that in a series of 10,638 cases, nausea and vomiting occurred in 56.5 per cent of the ether cases, 39 per cent of the cyclopropane cases, 33 per cent of the ethylene cases, and 23 per cent of the nitrous oxide cases.

Mechling and Moffitt<sup>52</sup> found the incidence of nausea and vomiting to decrease in the following order: ether, ethylene, cyclopropane, nitrous oxide and spinal anesthesia. Romberger<sup>2</sup> believed that cyclopropane-oxygen compares favorably with ethylene-oxygen as far as the incidence of postoperative nausea and vomiting are concerned. Gould<sup>63</sup> noted postoperative nausea.

Tucker,<sup>44</sup> Morgan,<sup>64</sup> Griffith<sup>65</sup>, Knight and Urner<sup>51</sup> and Romberger<sup>22</sup> noted that nausea and vomiting were lessened with cyclopropane, especially if there had been premedication, and that cyclopropane produces less nausea and vomiting than ether but more than nitrous oxide.

In the series of 10,638 cases referred to, distention occurred in 16% per cent of the 2,400 ether cases, 13 per cent of the 5,800 cyclopropane cases, 7 per cent of the 1,000 ethylene cases, and 3 per cent of the 1,300 nitrous oxide-oxygen cases. In this series nitrous oxide or ethylene were seldom used for abdominal operations or the incidence of distention with these agents would have been higher. Morgan<sup>64</sup> and Griffith<sup>65</sup> encountered less distention than with other agents.

**Genito Urinary Tract**—Burger<sup>16</sup> notes that the effect of cyclopropane on kidney function and bladder musculature remains to be studied, but Sanders and Fink<sup>40</sup> pointed out that Waters and Schmidt noted that the kidney output was occasionally depressed during cyclopropane anesthesia and that it was followed by a compensatory increase several hours later such as occurs with ether and ethylene. They<sup>40</sup> believed that bladder function was less affected, since fewer catheterizations were required following cyclopropane anesthesia. They<sup>40</sup> also believed that distention was reduced and diminished.

Waters gives the incidence of urinary retention in his series as 7.5 per cent of cyclopropane cases, 5.4 per cent of ether, 2 per cent of ethylene and 2.8 per cent of nitrous oxide. In general, however, he believes that retentions are not related to the anesthetic per se but rather to the type of operation performed. Mechling and Moffitt<sup>52</sup> found the incidence of reten-

49 Seevers, Meek, Roventine and Stiles<sup>34</sup>, Waters<sup>30</sup>  
50 Bonham, R. F., Cyclopropane Anesthesia, Texas State J. Med.  
33 306 (Aug.) 1937

51 Knight, R. T. and Urner, J. A., Obstetrical Analgesia, Journal  
Lancet 56 608 (Dec.) 1936

52 Mechling, G. S. and Moffitt, J. A., Cyclopropane in Comparison  
with Other Anesthetics, Agents J. Oklahoma M. A. 29 204 (June) 1936

53 Burford, G. E., Pulmonary Complications Following 1,333 Adminis-  
trations of Cyclopropane, J. A. M. A. 110 1087 (April) 1938

54 Taylor, I. B., Bennett, J. H. and Waters, R. M., Anesthesia at  
the Wisconsin General Hospital, Anesthesia Methods and Postoperative  
Respiratory Complications, Anesth. & Analg. 16 198 (July-Aug.) 1937

55 Griffith, H. R., Cyclopropane Anesthesia, Anesth. & Analg. 14  
253 (Nov-Dec) 1935

56 Moffitt, J. A. and Mechling, G. S., A Comparison of Cyclopropane  
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57 Jones, O. R. and Burford, G. E., Massive Atelectasis Following  
Cyclopropane Anesthesia, J. A. M. A. 110 1092 (April 2) 1938

58 Griffith, H. R., Two Unusual Complications in Patients Under  
Cyclopropane Anesthesia, Anesth. & Analg. 17 298 (Sept-Oct) 1938

59 Raginsky, B. B. and Bourne, Wesley, Effects of Cyclopropane on  
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60 Peoples, S. A. and Phatak, N. M., Effect of Cyclopropane on  
Isolated Intestinal Muscle, Proc. Soc. Exper. Biol. & Med. 33 287  
(Nov.) 1935

61 Weisel, Wilson, Youmans, W. B. and Cassels, W. H., Effect on  
Intestinal Motility of Cyclopropane Anesthesia Alone and After Morphine,  
Scopolamine, Premedication, J. Pharmacol. & Exper. Therap. 63 391  
(Aug.) 1938

62 Seevers, Unpublished experiments  
63 Gould, R. B., in discussion on paper by Waters<sup>30</sup>

64 Morgan, G. S., Eaman, S. C., and Griffith, H. R., Cyclopropane  
Anesthesia for Cesarean Section, Anesth. & Analg. 16 113 (March  
April) 1937

65 Griffith, H. R., Cyclopropane Anesthesia, Anesth. & Analg. 14  
253 (Nov-Dec) 1935

tion to increase in the following order: spinal, cyclopropane, nitrous oxide, ethylene and ether. Nephritis occurred most frequently in nitrous oxide majors, ether majors and cyclopropane majors, in that order.<sup>87</sup>

**Central Nervous System**—Tucker<sup>44</sup> reported a few cases of headache with cyclopropane and one case in which there was no headache with ethylene. Knight and Urner<sup>41</sup> found no mental dulness following prolonged administrations. Challis<sup>66</sup> complained that headache was encountered in those occupying the amphitheater during cyclopropane anesthesia. Mechling and Moffitt<sup>52</sup> found that the incidence of headache decreased in the following order: spinal, cyclopropane, nitrous oxide, ethylene and ether. Griffith<sup>58</sup> reported a case of convulsions under cyclopropane and nupercaine, apparently due to an idiosyncrasy to the nupercaine.

**Other Pharmacologic Effects**—Henderson and Lucas noted but little rise in the blood sugar of cats and rabbits during cyclopropane anesthesia. Eversole<sup>38</sup> notes that there is a temporary slight rise in blood sugar but no change in the acid base balance. Henderson and Lucas found that there was little effect on the hydrogen ion concentration and carbon dioxide combining power of the blood. Seevers and Waters note that there is a 10 per cent rise in blood sugar. A 75 per cent elevation in blood phosphorus occurred. According to Seevers and Waters, Neff and Stiles<sup>6</sup> observed an 8 to 30 per cent rise in the blood sugar of twenty-five patients. Schmidt and Waters noted that the nonprotein nitrogen and carbon dioxide combining power of blood were not significantly affected in twenty-one clinical administrations. There was a constant lowering of carbon dioxide combining power by from 2 to 7 volumes per cent but no change in the nonprotein nitrogen. They did not observe any change in the carbon dioxide combining power of thirty controlled diabetic patients anesthetized with cyclopropane.

Taylor and Waters<sup>65</sup> found that cyclopropane like other agents—nitrous oxide, ethylene and ether—produced an absolute and relative increase of the leukocytes of peripheral blood which persisted several days after anesthesia. That this rise was not due to trauma was indicated by the fact that unoperated dogs show slight changes. No consistent changes in red cell volume or coagulation time were reported by Seevers and Waters.<sup>2</sup>

There is no evidence that cyclopropane undergoes any chemical alteration in the body or that it is isomerized to propylene<sup>28</sup> (see under impurities). There is no clear-cut histologic evidence of parenchymatous injury by cyclopropane, but the question is not settled, particularly in view of the evidence of functional alteration of cardiac automaticity.<sup>2</sup> Such a study is desirable, but in order to be convincing the evidence must be obtained on animals living under controlled dietary conditions.

#### CLINICAL ANESTHETIZATIONS

**Signs of Anesthesia**—One of the most important points to consider in the administration of cyclopropane is that it is not a respiratory stimulant. Of equal importance is the fact that the color of the patient cannot be used as an index of the plane or depth of anesthesia. It is Bonham's opinion<sup>50</sup> that the pulse gives the best index of the patient's condition and that either a marked slowing to 50 or a definite increase indicates overdosage. The signs of Guedel<sup>61</sup> are not applicable to anesthesia under cyclopropane. Romberger made a special study of the signs of the various planes of cyclopropane anesthesia. The first sign to observe according to his plan is the lid reflex. It gradually lessens during induction and becomes absent when the patient enters early sleep. This is the first plane of anesthesia and, according to Waters and Schmidt,<sup>70</sup> represents a concentration of about 74 per cent. Romberger's index for the second plane of anesthesia is the eyeball movement, which lessens as anesthesia develops and serves as an index of the depth of anesthesia during the second plane which, according to Schmidt and

Waters, occurs approximately at 131 per cent concentration. The third plane begins when the movement of the eyeball ceases and thereafter deep anesthesia is being approached rapidly and caution is necessary. The concentration at this point of the anesthesia ranges around 23.3 per cent, according to Schmidt and Waters. Anesthesia is maintained at the desired level—some where in the second plane—by cutting off the cyclopropane and continuing the oxygen until the depth is lessened. In deep anesthesia—third plane—the respiratory rate and amplitude is the only safe sign to follow, according to Romberger,<sup>7</sup> and it is quick. To maintain anesthesia it may be necessary to supply a trickle of cyclopropane (from 25 to 100 cc per minute) for from six to ten minutes to compensate for leakage, diffusion and usage. There is no cyanosis with cyclopropane oxygen anesthesia, and it should never be permitted to ensue and hence is not a practical sign of the depth of anesthesia. When it does occur in cyclopropane anesthesia it indicates anoxemia with excessive carbon dioxide.

Passage through the first two stages described is usually very rapid and, as noted, the ordinary signs of anesthesia are missing. There is always a potential danger unless proper caution is used of encountering overdosage, which along with high concentrations and accumulated effects produces a fall in the rate of respiration and a lessening in tidal exchange. Both of these are indicated by the excursions of a breathing bag, and it is important to note that they may occur even in the presence of a very pink color of the patient.

#### ADMINISTRATION METHODS

Of primary consideration in the administration of this anesthetic is the fact that it is an explosive agent. For this as well as for other reasons the closed technic is preferable. Waters has stated that the carbon dioxide absorption setup attached to a completely closed machine was the best safeguard against explosion, but that, nevertheless, cyclopropane must always be considered to have the same potential danger as ether and ethylene. Bonham,<sup>50</sup> using this technic, starts with a bag two thirds full of oxygen and permits a flow of cyclopropane and oxygen, each 500 cc per minute for from three to five minutes. He then temporarily discontinues the cyclopropane, allowing the patient to breathe the mixture in the bag. He adds it gradually in small amounts as needed. Griffith<sup>58</sup> fills the bag with oxygen and then adds cyclopropane at the rate of from 500 to 600 cc per minute until anesthesia is established and then maintains it at the required plane with a mixture of oxygen and cyclopropane.

Romberger fills the bag partly or completely with oxygen and then permits the patient to breathe into the closed circuit, at which time a small stream of cyclopropane is started, ranging from 250 to 750 cc per minute. Anesthesia is maintained at the desired level, as indicated by the signs and not by estimates of percentages,<sup>28</sup> by cutting off the cyclopropane and continuing the oxygen, supplying as necessary a trickle of cyclopropane from 25 to 100 cc per minute for from six to ten minutes to compensate for leakage, diffusion and usage.

Sise, Woodbridge and Eversole fill the breathing bag with sufficient oxygen for tidal breathing, place a mask on the face and increase the flow of anesthetic to from 200 to 300 cc per minute until the loss of the lid reflex, when it is reduced to one third this amount or discontinued, the remainder of anesthesia consists of basal oxygen with occasional additions of cyclopropane necessary to maintain anesthesia.

#### PREMEDICATION

The addition of various agents used in premedication must be carefully considered when cyclopropane anesthesia is to be employed. The principal reason for precautionary use of such agents is the fact that the gas is not a respiratory stimulant. Sise and his co-workers<sup>10</sup> note that the signs of anesthesia under cyclopropane are much clearer without premedication and are difficult to determine, important as they are, if much premedication has been administered. It has been noted<sup>7</sup> that if premedication is employed lower concentrations of the gas produce satisfactory anesthesia in man. It has been stated that premedication is contraindicated with cyclopropane because it is not a respiratory stimulant, and such medication should be limited to allaying apprehension.

66 Challis J. in discussion on paper by Waters.

67 Neff W. B. and Stiles J. A. Some Experiences with Cyclopropane as an Anesthetic with Special Reference to the Diabetic Patient. *Canad. M. A. J.* 35: 56 (July) 1936.

68 Taylor I. B. and Waters R. M. Leucocytosis Following Inhalation Anesthesia. *Anesth. & Analg.* 14: 276 (Nov-Dec) 1935.

69 Guedel A. L. Stages of Anesthesia and Reclassification of the Signs of Anesthesia. *Anesth. & Analg.* 6: 157 (Aug.) 1927.

70 Waters R. M. and Schmidt E. R. Cyclopropane Anesthesia Postoperative Morbidity in 2200 Cases. *Anesth. & Analg.* 14: 1 (Jan-Feb) 1935.

Griffith<sup>67</sup> has used 3 grains (0.2 Gm) of pentobarbital sodium and  $\frac{1}{10}$  grain (0.0004 Gm) of atropine preoperatively but has avoided the use of morphine. Rowbotham<sup>46</sup> who incidentally encountered many difficulties which at least in part were due to overuse of premedication employed omopon (prantopium hydrochloride)  $\frac{1}{50}$  grain (0.002 Gm) per stone<sup>1</sup> or pentobarbital sodium intravenously or evipal in addition to prantopium hydrochloride and scopolamine. Mechling and Moffitt<sup>47</sup> recommend premedication with scopolamine but not with the opiates or atropine while Marshall<sup>39</sup> recommends atropine or scopolamine to restrict salivation.

Sanders and Fink<sup>48</sup> believe that premedication is contraindicated as a general rule but nevertheless use one-sixth grain (0.01 Gm) of pantopon (prantopium hydrochloride) two hours preoperatively and repeat the dose with the addition of  $\frac{1}{4}$  grain of atropine sulfate one hour preoperatively. Bonham<sup>9</sup> believes that premedication should be employed cautiously and used  $\frac{1}{2}$  grains (0.1 Gm) of pentobarbital sodium one and one-half hours preoperatively and pantopon, one third grain (0.02 Gm) with atropine,  $\frac{1}{4}$  grain one-half hour preoperatively. Seevers and Waters determined that the use of ordinary doses of morphine preoperatively reduced by from 10 to 12 per cent the amount of cyclopropane required to effect a given level of anesthesia.

Sise<sup>8</sup> believes that premedication is an individual problem. He uses 3 grains of pentobarbital sodium one and one-half hours preoperatively and the usual one eighth grain (0.008 Gm) of morphine sulfate and from  $\frac{1}{500}$  to  $\frac{1}{2}$  grain (0.3 to 0.25 mg) of scopolamine subcutaneously forty-five minutes preoperatively. He believes that premedication is especially valuable in "activated hyperthyroidism," in which he generally employs  $4\frac{1}{2}$  grains (0.3 Gm) of pentobarbital, one-fourth grain (0.016 Gm) of morphine sulfate and  $\frac{1}{500}$  grain of scopolamine. On the other hand, in "apathetic hyperthyroidism" he used less than the usual amount of premedication, i. e., one-tenth grain (0.006 Gm) of morphine sulfate.

#### INDUCTION, MAINTENANCE AND RECOVERY

Induction with cyclopropane is pleasant, and this fact becomes one more reason for its careful administration. Patients who have been given various anesthetic agents have expressed a preference for cyclopropane. Anesthesia generally ensues in from one to two minutes and, as already noted, premedication has the effect of flattening out each stage of anesthesia.<sup>22</sup> There is generally no choking<sup>42</sup> and seldom any struggling—Bogan's series showed excitement in only 3 per cent.<sup>43</sup> Nevertheless, as Marshall pointed out, it is necessary to allow sufficient time to elapse before surgical procedures are instituted for otherwise troublesome and sometimes persistent laryngeal spasm occurs, necessitating the introduction of a Magill endotracheal tube for its correction and control.

It is noted under the general discussion of administration methods that, once established, cyclopropane anesthesia is not difficult to maintain. In fact it is sometimes only necessary to replace quantities lost or absorbed. At any rate the addition of small amounts of cyclopropane to the breathing mixture from time to time, as indicated by the condition of the patient and the plane of anesthesia produces a satisfactory maintenance. Sise, Woodbridge and Eversole<sup>10</sup> believe that 4 liters of cyclopropane an hour should produce adequate anesthesia for the average case. Marshall<sup>39</sup> noted that 4 or at most 8 liters of cyclopropane should suffice and that oxygen is used at the rate of about 20 liters an hour. Marshall pointed out the advantages of the closed circuit method—definite concentrations of cyclopropane and oxygen were presented to the patient because oxygen is supplied continuously in sufficient amounts to meet the patient's basal requirements, because a carbon dioxide soda-lime absorption device can be thrown in or out of the circuit at will, and finally because the enclosed gases so rapidly become saturated with water vapor that the danger of ignition is reduced and irritation diminished.

Recovery from cyclopropane anesthesia is relatively rapid in spite of the fact that desaturation takes place over a period of several hours, as has been noted. Mechling and Moffitt believe that these patients as a rule are a little slower in recovering than are patients to whom other gases have been administered alone, not in combination with another agent.

#### RELAXATION AND OOZING

There has been some difficulty with cyclopropane in connection with the degree of abdominal relaxation obtainable at low anesthetic levels. Those who have had the most experience with the agent, however, have not found it necessary to add other ingredients to the anesthetic mixture to obtain satisfactory relaxation. In Römberger's opinion<sup>22</sup> relaxation is less satisfactory than with ether but more satisfactory than with ethylene or nitrous oxide. Marshall<sup>39</sup> believed that relaxation was usually adequate. Sanders and Fink<sup>48</sup> went so far as to state that muscular relaxation was in many cases even better than with ether. It is granted that third plane anesthesia may be required to effect complete abdominal relaxation, but it must be remembered that third plane anesthesia occurs at a concentration of approximately 23 per cent, which still leaves more than 70 per cent of oxygen in the anesthetic mixture. In dogs it was obtainable in concentrations of from 22 to 24 per cent.<sup>11</sup> Griffith was able to obtain adequate relaxation without the addition of ether in 90 per cent of his cases.

Griffith<sup>67</sup> notes that surgeons observed an increased capillary oozing but believes it is more apparent than real because of the bright red color of the blood under cyclopropane anesthesia. He believes also that it is superficial rather than deep because it continues only as long as the tissue is handled.

#### GAS MACHINES AND SPECIAL DEVICES

Only the most modernly constructed or adapted gas oxygen machines should be used in cyclopropane anesthesia.<sup>22</sup> The anesthetist then has the advantage of having two or three gas anesthetics available plus oxygen plus carbon dioxide and an ether vaporizer, as well as a closed circuit or breathing device with a soda-lime attachment. Of considerable help is the use of exceedingly fine flow meters so that rates as low as 100 cc or less may be accurately registered.<sup>72</sup> Leech<sup>73</sup> described a special pharyngeal bulb gas way for use with this system.

Knight and Urner<sup>41</sup> described a special device for self administration of cyclopropane in obstetrical analgesia, which consists of a mask, an inhalation bag, a one-way exhalation valve and a two gallon supply bag three-fourths full of cyclopropane, a gas regulator and a pressure bulb—all attached by rubber tubing. With this apparatus no gas is given until the bulb is pressed at the onset of pain, when it is rapidly operated and the patient takes deep breaths until relief is obtained. Deep analgesia or early anesthesia supervenes and prevents further operation of the bulb and hence there is automatic cessation of cyclopropane. The patient recovers rapidly and waits in full consciousness for the next pain. The procedure is generally not instituted until the pains have become severe and the cervix dilated about 4 cm. It is said to aid full contraction, and it is thought that with its use labor progresses more rapidly. It is necessary to have the room well ventilated, and to be certain that there is no pressure on the reservoir, which is never left attached to a tank of cyclopropane.

#### TYPES OF CASES

Bogan<sup>43</sup> reported on the use of cyclopropane in 300 surgical anesthetics in patients ranging in age from 5 to 84 years. He believed that the high oxygen concentration was especially useful in the young and old. In this series, 145 patients were given cyclopropane, sixty cyclopropane and ether and 100 cyclopropane and avertin with amylene hydrate with either morphine or pentobarbital sodium.

Griffith<sup>65</sup> reported the use of cyclopropane in 1,108 cases of which 592 were abdominal procedures. Tucker<sup>44</sup> employed cyclopropane in 139 major operations, including the case of one 6 year old child given six satisfactory cyclopropane anesthetics in connection with an appendectomy complicated by pleurisy and peritonitis. One of his patients was desperately ill with diabetes and required amputation of the leg, with blood pressure of 240 systolic 100 diastolic. The anesthesia was satisfactory, but death ensued from a cerebral hemorrhage.

Burford<sup>74</sup> employed cyclopropane in 475 cases and obtained satisfactory anesthesia in "desperate surgical risks" without

<sup>72</sup> Römberger<sup>22</sup> Sanders and Fink<sup>48</sup>  
<sup>73</sup> Leech<sup>73</sup> B. C. Pharyngeal Bulb Gasway for Cyclopropane Anesthesia & Analg. 16: 22 (Jan Feb) 1937  
<sup>74</sup> Burford<sup>74</sup> G. E. Continuous Flow Administration of Cyclopropane Anesth. & Analg. 15: 254 (Sept Oct) 1937

<sup>71</sup> One stone equals 14 pounds (6.4 Kg)

death or accidents Morgan,<sup>64</sup> Griffith and others analyzed 100 cases of cesarean section under cyclopropane Bonham<sup>60</sup> reported its use in 732 cases Griffith used it in patients whose ages ranged from 10 days to 85 years

#### OBSTETRICS, THYROID SURGERY AND THORACIC SURGERY

Knight discussed the use of cyclopropane in obstetrics—by filling the bag with a 10 per cent mixture and with each pain instructing the patient to exhale and then take two inhalations of the mixture while bearing down He believes that the anesthetic does not retard the pains, although it abolishes them and probably hastens delivery For episiotomy the gas flow is increased to about 10 gallons an hour for three or four inhalations The same mixture is used for the delivery proper and the Crede expression of the placenta In many cases relaxation was sufficient to preclude episiotomy and to aid instrumental delivery He does not believe that oozing is increased and is certain that uterine bleeding is not increased Morgan believes that there is less blood lost from the uterus in cyclopropane anesthesia and did not encounter any maternal deaths He compared these results with a series of ethylene-ether anesthetics in which there were two deaths in seven cases of dynamic ileus Bonham<sup>60</sup> believes that the use of cyclopropane is especially indicated in obstetrics because of the marked contractions of the uterus which occur under cyclopropane anesthesia

Sise<sup>9</sup> considers cyclopropane useful in meeting the problems of thyroid surgery anesthesia Goetsch<sup>75</sup> compared cyclopropane with other anesthetics in a series of thyroidectomies in which nitrous oxide was used in thirty-three cases, cyclopropane in fourteen cases, ethylene in eight cases and cyclopropane and procaine hydrochloride in one case In spite of the fact that the cyclopropane series included complications consisting of one pulmonary embolism with infarction, one typical shock, one moderately severe shock and one fatal thyroid crisis, the author believes that cyclopropane will replace nitrous oxide-ether for thyroidectomy It is reported that he has stated that he encountered 50 per cent arrhythmias during thyroidectomy with cyclopropane unless nitrous oxide was combined with it<sup>76</sup> He warned about the danger of hyperventilation and noted that the apnea, which is sometimes seen, may be due to hyperoxidation and suggested the use of carbon dioxide and artificial respiration when apnea occurred

Eversole and Overholt<sup>77</sup> discuss the difficulties of anesthesia in thoracic procedures The principal difficulties encountered, of course, arise from the fact that the pathologic condition exists in the organs of the respiratory system, which are also employed for anesthesia Specifically, the difficulties are 1 The absorption area is reduced and abnormal amounts of mucus and secretions are formed 2 There is an increased tendency to cough and the good lung, if any, is in a dependent position and may become contaminated during anesthesia and surgery Pneumothorax presents the additional problem of embarrassing both the respiratory and the circulatory system, and it is, therefore, especially important to employ the closed system of anesthesia because of the control of interpulmonary pressure, which is obtainable in no other way Using an anesthetic mixture of 20 per cent cyclopropane and 80 per cent oxygen these authors found the mixture to be a fairly satisfactory anesthetic agent in these cases Little absorptive area is necessary, in fact, they believe that one quarter of the area of the normal lung is adequate for maintaining quiet, shallow respirations under cyclopropane anesthesia Using other agents, they encountered anoxemia, cyanosis, accumulation of carbon dioxide, stimulation of the respiratory movements and rising pulse Roventine<sup>78</sup> also reported the use of cyclopropane in thoracic surgery He pointed out that because it is not a respiratory stimulant the excursions of the chest are lessened considerably He did not encounter laryngeal spasm and stated that its advantages include rapid induction, abundant oxygen, abol-

ishment of laryngeal reflexes and ease of endotracheal intubation It has no disagreeable odor, is nonirritant and hence does not produce mucus Roventine's experience comprises 4,000 clinical cases, but this report refers to 160 cases of thoracic surgery There was an 8 per cent mortality one case during operation, one during the first day, five more during the first week and six more than five weeks later With the exception of the first two cases, which were circulatory in nature, they all presented postoperatively pathologic changes in the lungs, although it is granted that poor anesthetic technique would certainly increase the morbidity in such cases as these

#### HOMOLOGUES OF CYCLOPROPANE

Henderson and MacDonald<sup>79</sup> experimented with the methyl cyclopropanes—1,2 dimethyl and 1,2,3 trimethyl—and found them unsuitable for anesthesia, producing more cardiac irregularities than cyclopropane, producing low blood pressure and deleterious effects on cardiac contractility as well as more marked tonic effects

Lott, Christiansen and Shackell<sup>80</sup> found effective concentrations and lethal concentrations about equal for 1 methyl cyclopropane and cyclopropane but found more undesirable side effects with the methyl compound

#### SUMMARY

A brief review and analysis of this material follows

From the chemical and physical properties it is seen that cyclopropane has the same potential danger of explosibility as the more commonly used ethyl ether There are several brands available, one of which is made by a different process than the others There is the possibility that there may be impurities present in the commercial brands There appears to be an unusual effect on the heart, since arrhythmias have been encountered that are not ordinarily seen with ether anesthesia Experience has indicated that epinephrine or other sympathomimetic amines should not be administered during anesthesia with cyclopropane For this reason, as well as because the ordinary signs of anesthesia are not useful, it is necessary to watch the pulse very closely during administration of cyclopropane The gas has a not unpleasant odor and is not ordinarily considered to be irritant The question of whether laryngospasm is more frequent with other agents remains to be settled The incidence of pulmonary complications seems to be no greater than or not as great as the incidence following ether anesthesia In anesthetic concentrations there does not seem to be a deleterious effect on the liver The kidney output is similar to that seen with ether and ethylene Headache may occur more often than with ether anesthetics The other pharmacologic effects of the drug are discussed The signs of the various stages of anesthesia are described It is important to note that it is recommended that no one attempt to administer this gas who is not thoroughly familiar with its properties and with the signs that are available to indicate the depth of anesthesia, these differ from the signs for other anesthetic agents Many authorities believe it preferable to use the closed technique and, because the respiratory center is not stimulated, premedication that affects the respiratory rate should be used with caution Details of induction, maintenance and recovery are given, relaxation and oozing are discussed and the use of various types of gas machines are mentioned There seems to be no special type of case in which cyclopropane should be avoided, with the possible exception of certain cardiac conditions, because of the tendency of the agent to produce arrhythmias Its usefulness in obstetrics both as an anesthetic and for analgesia and in thyroid and thoracic surgery is described Brief mention is made of the homologues of cyclopropane

This review indicates that cyclopropane is a suitable anesthetic agent when used cautiously by those fully informed of its properties, potential dangers and signs which indicate the stages of anesthesia obtained with this agent

75 Goetsch Arthur Cyclopropane Anesthesia in Thyroidectomy *Ann Surg* 104 982 (Dec) 1936

76 Livingston H Personal communication to the Council

77 Eversole U H and Overholt R H Anesthesia in Thoracic Surgery *J Thoracic Surg* 5 10 (June) 1936

78 Roventine E A Cyclopropane Anesthesia in Thoracic Surgery *Anesth & Analg* 14 270 (Nov-Dec) 1935

79 Henderson V E and MacDonald S F Anesthesia with Cyclopropane Derivatives *J Pharmacol & Exper Therap* 61 182 (Oct) 1937

80 Lott W A Christiansen W G and Shackell L F Homologues of Cyclopropane—Methyl Cyclopropane *J Am Pharm A* 27 125 (Feb) 1938



## Council on Foods

### ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED

FRANKLIN C. BING, Secretary

#### CLAPP'S STRAINED MIXED GREENS

**Manufacturer**—Harold H. Clapp, Inc., Rochester, N. Y.

**Description**—Canned strained mixed greens containing equal proportions of kale, lettuce and Swiss chard. Slightly seasoned with salt.

**Manufacture**—The fresh kale, lettuce and chard are inspected, sorted, mechanically cleaned and washed. The washed greens are softened by live steam in the absence of air and strained. Salt is added and the strained greens are filled into cans, sealed and heat processed.

**Analysis** (submitted by manufacturer)—Moisture 93.8%, total solids 6.2%, ash 0.8%, sodium chloride 0.12%, fat (ether extract) 0.4%, protein (N  $\times$  6.25) 1.6%, reducing sugars (as invert sugar) 0.3%, sucrose (copper reduction method) 0.2%, crude fiber 0.5%, carbohydrates other than crude fiber (by difference) 2.9%, calcium (Ca) 0.06%, phosphorus (P) 0.04%, iron (Fe) 0.001%.

**Calories**—0.22 per gram, 6.2 per ounce.

**Vitamins**—No evidence has been provided the Council as to the vitamin content of this product. The method of preparation and processing is designed to retain the natural vitamin values to the highest degree consistent with adequate and safe heating processes. Contact of the product with air during processing is avoided as far as possible.

#### CELLU BRAND PRUNE PLUM JUICE

**Distributor**—Chicago Dietetic Supply House, Inc., Chicago.

**Description**—Canned juice expressed from fresh prune plums packed without added sugar.

**Manufacture**—Fresh Italian tree-ripened prune plums on which no toxic spray materials have been used are sorted, washed, pitted and preheated. The pulp is pressed through a strong special mesh cloth and the resulting juice is filled into cans, sealed and heat processed.

**Analysis** (submitted by distributor)—Moisture 85.8%, total solids 14.2%, ash 0.3%, fat (ether extract) 0.5%, protein (N  $\times$  6.25) 0.3%, crude fiber 0.1%, carbohydrates other than crude fiber (by difference) 13.0%, invert sugar 6.9%, sucrose 3.7%.

**Calories**—0.6 per gram, 17 per ounce.

#### CALIFORNIA FRESH FLAVOR BRAND KADOTA FIGS FANCY QUALITY

**Manufacturer**—Beckwith Packing Corporation, Turlock, Calif.

**Description**—Canned Kadota figs, packed in syrup containing a mixture of sucrose and corn sugar, with added lemon juice and salt.

**Manufacture**—Ripe Kadota figs are hand sorted, mechanically graded for size, and blanched with steam and light hot water sprays. Cans are filled with fruit and syrup containing a mixture of sucrose and corn sugar, with added lemon juice and salt, preheated, sealed and heat processed. The fruit is sprayed with calcium sulfate, the last application being made not later than fifteen days before the fruit is gathered. According to the information submitted by the manufacturer, the blanching process, which draws the sap from the skin of the fruit, reducing the thickness of the outer portion, is adequate to remove any spray residue which might remain on the fresh fruit.

**Analysis** (submitted by manufacturer)—Moisture 67.2%, total solids 32.8%, ash 0.5%, fat (ether extract) 0.1%, protein (N  $\times$  6.25) 0.5%, total sugars as invert sugar 28.8%, crude fiber 0.6%, carbohydrates other than crude fiber (by difference) 31.0%, acidity (as anhydrous citric acid) 0.1%.

**Calories**—1.27 per gram, 36 per ounce.

#### W. N. CLARK BRAND TOMATO JUICE

**Manufacturer**—W. N. Clark Company, Rochester, N. Y.

**Description**—Canned tomato juice, seasoned with salt.

**Manufacture**—Fully ripe tomatoes are inspected, washed, again inspected, scalded, mechanically sliced, and preheated in an atmosphere of steam. The juice is extracted, seasoned with salt, heated to 85 C and automatically filled into cans which are sealed and heat processed.

**Analysis** (submitted by manufacturer)—Moisture 93.1%, total solids 6.9%, ash 1.1%, sodium chloride 0.6%, fat (ether extract) trace, protein (N  $\times$  6.25) 1.0%, reducing sugars before inversion, as dextrose 3.2%, reducing sugars after inversion, as dextrose 3.1%, crude fiber 0.2%, carbohydrates other than crude fiber (by difference) 4.2%, titratable acidity as citric acid 0.4%.

**Calories**—0.2 per gram, 6 per ounce.

**Vitamins**—Chemical titration shows an average of 0.156 mg of ascorbic acid (3.12 international units of vitamin C) per cubic centimeter, 92 international units of vitamin C per fluidounce.

#### CRADLE BABY BRAND STRAINED AND SEEDLESS FIG JAM

**Manufacturer**—Glaser, Crandell Company, Chicago.

**Description**—Canned strained fig jam sweetened with sucrose. The jam may contain small amounts of added acid and/or pectin.

**Manufacture**—Dried California figs are washed, softened in sufficient warm water to cover the fruit and sieved. Sugar is added (and pectin and acid if needed to obtain the desired consistency) the batch is mixed and the mixture concentrated under vacuum at 60 C to not less than 68 per cent soluble solids. Glass jars are automatically filled and are sealed in a high temperature steam vapor chamber.

**Analysis** (submitted by manufacturer)—Moisture 25.5%, total solids 74.5%, water-insoluble solids 1.5%, water-soluble solids 73.0%, ash 0.6%, protein (N  $\times$  6.25) 0.8%, crude fiber 0.3%, carbohydrates other than crude fiber (by difference) 73.0%, acidity 0.2%.

**Calories**—2.95 per gram, 84 per ounce.

#### KAFFEE HAG DECAFFEINATED COFFEE

**Manufacturer**—General Foods Corporation, New York.

**Description**—A blend of selected roasted coffee from which almost all the caffeine has been removed.

**Manufacture**—Green coffee is cleaned, steamed and the caffeine extracted with trichloroethylene, which is removed by steam distillation. The different coffees are blended in proportions designed to produce a standard beverage, roasted and automatically packed under vacuum in tins. The manufacturer states that each batch is tested to insure at least 97 per cent removal of caffeine.

**Analysis** (submitted by manufacturer)—Moisture 1.6%, water-soluble solids 22.1%, ash 4.2%, fat (petroleum ether extract) 16.9%, protein (N  $\times$  6.25) 12.1%, caffeine 0.03%, crude fiber 11.5%, tannins 3.3%, carbohydrates other than crude fiber (by difference) 53.7%.

#### MRS. PALEY'S BABY FOOD—STRAINED BEETS

**Manufacturer**—Paley-Sachs Food Company, Houston, Texas.

**Description**—Canned, cooked sieved beets slightly seasoned with salt.

**Manufacture**—Fresh beets are washed, pressure cooked until just soft enough to sieve, cooled in dilute salt solution, peeled, sieved, filled into glass jars, vacuum sealed and heat processed.

**Analysis** (submitted by manufacturer)—Moisture 91.6%, total solids 8.4%, ash 0.6%, fat (ether extract) 0.1%, protein (N  $\times$  6.25) 1.2%, reducing sugars as dextrose—trace, sucrose 3.7%, crude fiber 0.8%, total carbohydrates other than crude fiber (by difference) 5.7%, calcium (Ca) 0.024%, phosphorus (P) 0.032%, iron (Fe) 0.004%.

**Calories**—0.3 per gram, 9 per ounce.



# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 18, 1939

## STERILIZATION OF AIR IN THE OPERATING ROOM

Modern atraumatic aseptic technic in the operating room has almost eliminated infection of wounds in clean cases. However, the introduction of major surgical procedures involving exposure of large raw areas for a long time has again raised the problem of occasional infection. Recently Hart<sup>1</sup> of the Duke University School of Medicine has reported studies during the past five years of efforts to eliminate the occasional sporadic operating room infection. After carefully checking all possible sources of infection, Hart concludes that the least controlled source of infection was air-borne bacteria. Most of the infections were caused by *Staphylococcus aureus-haemolyticus*. The organisms entered the wound from the air rather than from the skin of the patient. The air was contaminated by the operating room personnel and patients. All supplies and all procedures in the operating room technic were checked by the culture method and were found to be satisfactory except for the air, which was heavily contaminated with *Staphylococcus aureus-haemolyticus*. The personnel of the operating room and the general population were found at times to have *Staphylococcus aureus* in the nose and throat in as high as 78 per cent of the cases. A reduction of from 60 to 80 per cent was accomplished by reducing the number of persons in the operating room to the minimum, insistence on masks worn over the nose and mouth at all times, and elimination from the operating room of all persistent carriers of *Staphylococcus aureus* or of *Streptococcus*. The rooms were painted frequently and washed daily with an antiseptic solution. By forced ventilation the contaminated air was replaced by clean, washed air taken from above the roof. Despite these measures the number of organisms in the air was not reduced sufficiently to eliminate all infections. In every case of infection in which cultures of the air had been taken the organism cultured

from the wound was identical with the one cultured from the air during the operation.

The bacteriologic studies carried on daily convinced the author that the most important source of wound infection was not the bacteria present in the skin but the organisms eliminated from the noses and throats of the operating room personnel. The wearing of thick gauze masks was not apparently an adequate protection against this source of contamination. To eliminate this source the author turned to irradiation of the air. The problem consisted of designing a source of radiant energy which would provide a sufficiently high level of bactericidal radiation to destroy the bacteria without, at the same time, injuring the patient. The Westinghouse Lamp Company, at the request of the author, designed and constructed a special radiant energy apparatus which answers the requirements. An operating room was equipped with eight of these lamps, each 30 inches long. Two blond volunteers from among the students were exposed to radiation from these tubes for eighty minutes and received only a slight reddening of the exposed area, which disappeared within twenty-four hours. The author found that it was possible with eight tubes operating to kill a lightly sprayed culture of *Staphylococcus aureus-haemolyticus* on blood agar plates within sixty seconds or a heavily sprayed culture within less than five minutes. Practically all organisms exposed to the radiation from these tubes at a distance of 8 feet from the center of the cluster were killed within less than ten minutes, and at a distance of 10 feet within less than thirty minutes. In the corners of the room, 13 feet from the center of the cluster and 11 feet from the nearest tube, the number of viable organisms falling out of the air was reduced from 60 to 90 per cent. The air of the entire room could not be completely sterilized within one hour with only eight tubes and, when they were turned off, recontamination quickly occurred if people were present.

In a series of 132 individual stages of extrapleural thoracoplasties on fifty-nine patients performed in a field of air sterilized by means of bactericidal radiant energy, Hart<sup>2</sup> was able to report a lowering to one half of mortality due to infected wounds. There was an incidence of 3.8 per cent of skin infections as compared with 33 per cent in a previous series of 100 similar operations. The incidence of postoperative elevation of temperature was lowered so that more than two thirds of the patients did not have more than two recorded elevations above 38 C (100.4 F) as compared to one third of the patients without radiation who fell in this group. The wound healing has been more rapid and with less reaction when reopened for the second and third stages of thoracoplasty than in those cases in which radiation was not used. In practically all

<sup>1</sup> Hart Deryl. Operation Room Infections. Control of Air Borne Pathogenic Organisms with Particular Reference to the Use of Special Bactericidal Radiant Energy. Preliminary Report. Arch Surg 34: 874 (May) 1937.

<sup>2</sup> Hart Deryl. Sterilization of the Air in the Operating Room with Bactericidal Radiation. Comparative Analysis of 132 Individual Stages of Extrapleural Thoracoplasties Performed With Radiation and 110 Stages Performed Without Radiation. J Thoracic Surg 7: 525 (June) 1938.

cases the postoperative pain has been less and convalescence has been more rapid.

In a later report<sup>3</sup> the author presents an analysis of the results obtained in 456 clean primary incisions and eighty-six reopened clean incisions of more than 800 operations performed in the field of bactericidal irradiation. The operations were gastric or intestinal resections, cholecystectomies, mastectomies, appendectomies and amputations of gangrenous extremities. The analysis reveals that postoperative infections have been reduced more than 85 per cent. The occasional death anticipated from infection of a wound did not occur. The number of patients with postoperative temperature above 38 C has been reduced in thoracoplastics from 68 to 30 per cent, in radical mastectomies from 46 to 34 per cent and in inguinal herniorrhaphies from 36 to 22 per cent. The number of patients with a temperature above 37.5 C (99.2 F) for more than four days after operation has been decreased in thoracoplastics from 78 to 22 per cent, in radical mastectomies from 54 to 21 per cent and in inguinal herniorrhaphies from 46 to 14 per cent. There has also been noted a more rapid wound healing, a lessened systemic reaction and a shortened convalescence.

The bacteriologic studies carried out by Hart and his co-workers as well as the practical results obtained, seem to establish that air is an important source of contamination in every operative wound. They demonstrated further that sterilization of the air in the operating room can be accomplished by bactericidal irradiation. The method of bactericidal air irradiation may prove to be an important addition to efforts for eliminating infections of wounds in clean primary incisions.

## SECONDARY ANTIGENS IN RHEUMATIC FEVER

The demonstration of secondary antigens and antibodies in rheumatic fever recently reported by Coburn and Pauli<sup>1</sup> of Columbia University is clinical confirmation of a speculative hypothesis proposed a decade or more ago by immunologists.<sup>2</sup> If confirmed, this renaissance of the speculative theory of secondary anaphylaxis and immunity may lead to practical diagnostic and therapeutic methods in numerous infectious diseases.

The New York clinicians picture the evolution of rheumatic attacks in three distinct phases. Phase 1 is an acute pharyngeal infection usually of not more than three days' duration, hemolytic streptococci being the causative agent. This is followed by an afebrile, symptom-free period (phase 2) commonly lasting about fourteen days. Phase 3, the period of acute rheumatic symptoms, often shows one or more cycles of activity.

From then point of view the second period (phase 2) is the crucial stage in the genesis of rheumatic symptoms. Only one serologic abnormality has been definitely established during this period, a diminution in serum complement.<sup>3</sup> A still further reduction in complement titer takes place during the acute attack (phase 3). Since decreases in serum complement are known to take place when antigen and antibody coexist in the circulation, Coburn and Pauli postulate the existence of a phase 2, prerheumatic antigen, reacting with a phase 3 antibody as a cause of this complement "deviation."

To test this hypothesis, blood samples were taken at least once a week from rheumatic subjects recovering from hemolytic streptococcus pharyngitis. The resulting serums were preserved with merthiolate, stored at 5 C and afterward cleared by high speed centrifugation or by Chamberland filtration. 0.1 cc of the presumptive antibody-containing serum (phase 3) was layered over 0.1 cc of the presumptive antigen serum (phase 2) and flocculation reactions were recorded after ten minutes at room temperature, after two hours at 37 C and at the end of twenty-four hours at 5 C. The following scale of precipitin reaction was adopted: "cloudy whirl" (+), "small flakes or granules, supernatant clear" (++) and "large flakes" (+++).

Serums taken by the New York clinicians at the height of the rheumatic attack (phase 3) almost invariably showed definite precipitates (++) with the prerheumatic serums (phase 2) of the same individual. No reactions were noted between phase 1 and phase 2 serums or between phase 1 and phase 3 serums, nor would two phase 2 serums or two phase 3 serums from the same individual react with each other. A mixture of phase 2 and phase 3 serums was necessary to demonstrate the hypothetic antigen-antibody reaction.

Cross reactions of varying intensity were obtained between phase 3 and late phase 2 serums of different patients, the intensity of the reaction varying with the severity of the rheumatic attack. One patient with rapidly fatal fulminating rheumatism, for example, gave +++ reactions with the six heterologous phase 2 serums tested.

The controls included the serums of patients who had recovered from hemolytic streptococcus pharyngitis without subsequent development of rheumatism. Thirty-seven of the forty-seven control tests thus made were negative. As further controls it was shown that normal human serum and serums taken during nonrheumatic fevers were also consistently negative when layered over either phase 2 or phase 3 rheumatic serum.

An attempt was made to determine the nature of the presumptive phase 2 prerheumatic antigen by a study of control reactions with streptococcus antigens isolated from the same patient during the initial pharyngitis. Group specific carbohydrates, nucleoproteins and

<sup>3</sup> Hart Deryl. Sterilization of the Air in the Operating Room by Bactericidal Radiant Energy. Results in Over Eight Hundred Operations. *Arch Surg* 37: 956 (Dec.) 1938.

<sup>1</sup> Coburn Alvin F and Pauli Ruth H. *J Exper Med* 69: 143 (Jan.) 1939.

<sup>2</sup> Manwaring W H, Marino H D, McCleave T C and Boone T H. *J Immunol* 13: 319 (May) 1927.

<sup>3</sup> Veil W H and Buchholz Bruno. *Klin Wchnschr* 11: 2019 (Dec 3) 1932. Coburn A F. *Lancet* 2: 1025 (Oct. 31) 1936.

"M-substance" were prepared from these autogenous streptococci. Mild precipitin reactions were obtained with one or more of these fractions plus phase 3 serum. These reactions, however, were not parallel with reactions to the patient's own phase 2 serum. Absorption of the phase 3 antibodies with the streptococcus antigens led to a complete removal of the streptococcus precipitins with little or no reduction in anti-phase 2 rheumatic titer. Tests with specific antistreptococcus antibodies of both human and veterinary origin were also negative.

The conclusion seems inevitable that the hypothetical phase 2 prerheumatic antigen is not a streptococcus product or an anti-streptococcus albumin or globulin. This seems to narrow the possibilities to the assumption that the phase 2 prerheumatic antigen is some secondary colloidal product arising from the primary reaction of hemolytic streptococci on pharyngeal tissue. Denatured cartilaginous material, for example, might be conceived as the source of this secondary antigen. A heterophil anticartilaginous antibody, although purely hypothetical, might be the basis for a plausible "inverse anaphylactic" theory of acute rheumatism.

While the possibility was borne in mind by the Columbia investigators that phase 2-phase 3 flocculation may not be due to a specific antigen-antibody reaction, the theory suggested or implied by their data is a stimulating working hypothesis for future serologic and biochemical research. The historical theory of secondary antigens and antibodies is presumably also applicable to numerous other microbial infections. The possibilities of using phase 3 rheumatic serum therapeutically or as a diagnostic agent (cutaneous test) have not yet been tested.

## Current Comment

### TRICHINOSIS IN THE UNITED STATES

The recent evidence from necropsies that 36 per cent of the inhabitants of Cleveland have trichinosis must not be interpreted as proof that Cleveland is the most highly infested area in the United States. It suggests rather that the routine diagnostic methods employed by earlier investigators were fallacious. Routine examinations of the diaphragms of adult cadavers by the Baermann digestion method led previous investigators to the conclusion that approximately 13.67 per cent of all persons in or around Washington, D. C., are infested with trichinae, 17.5 per cent in Minneapolis and Rochester, N. Y., 24 per cent in San Francisco and 27.6 per cent in Boston. Hall and Collins,<sup>1</sup> however, showed that the routine Baermann technic failed to detect about 29.3 per cent of the positive cases. Evans<sup>2</sup> of the Institute of Pathology, Cleveland, therefore supplemented this routine diagnostic method by application of the newer compression microscope technic. In this technic 1 Gm samples of the diaphragm, intercostal muscle and sternomastoid muscle are compressed

between two pieces of plate glass and examined microscopically. Parallel digestions were made with 100 Gm samples of the same muscles. Diaphragmatic digestion alone revealed the presence of twenty cases of trichinosis in 100 consecutive necropsies. This is about the average of the percentages reported by previous investigators. Many cadavers, however, whose diaphragms were negative showed trichinae in one or both of the skeletal muscles. Combining all positive data, Evans found thirty-six positive cases of trichinosis in the first hundred Cleveland necropsies studied by his double technic. Applying the implied correction coefficient (36/20) to the percentages previously reported from other cities, one would conclude that there are presumably the following percentages of trichina infestation in other American cities: Washington, D. C., 24.6 per cent, Minneapolis and Rochester, N. Y., 31.5 per cent, San Francisco 43 per cent and Boston 49.7 per cent, an average of 37 per cent infestation of the urban population of the United States. There is no way, of course, of estimating the resulting social or economic loss, but the estimated 48,000,000 cases of trichinosis in the United States is far from being a national asset.

### TUBERCULOSIS IN DRESSED POULTRY

About 3 per cent of the dressed poultry offered for sale in American markets is infected with tuberculosis. In order to test for the possible presence of tubercle bacilli in dressed poultry, W. H. Feldman<sup>1</sup> of the Mayo Foundation removed spleens aseptically from 125 fowls at the time of evisceration by a local dealer. The fowls thus examined included sixty-six young chickens, thirty mature hens, eighteen domestic ducks, four turkeys, three capons and four wild ducks. Each spleen was emulsified in 5 cc of sodium chloride solution, and 1 cc of the resulting emulsion was distributed over the surface of four tubes of egg yolk glycerin agar. The tubes were incubated at 37 C for ten weeks. Positive growths of acid-fast bacilli were obtained from four spleens. One young chicken, two adult hens and one domestic duck were the sources of these four organs. Subcultures from each of the four cases were inoculated in duplicate into guinea pigs, rabbits and chickens. All guinea pigs were without macroscopically demonstrable lesions when killed from six to eight weeks later. Three of the eight rabbits died within two to eighteen days, presumably from intercurrent infection. The five remaining rabbits died or were killed from one to two months later. At necropsy each of the five showed extensive tuberculous lesions. The eight chickens died or were killed at the end of from six to eight weeks, all showing extensive tuberculosis of the so-called Yersin type. From this evidence the investigator concluded that each of the four positive spleens was the carrier of virulent tubercle bacilli of the avian type. Since virulent tubercle bacilli are thus present in about 3 per cent of apparently normal fowls and since no practical method of postmortem inspection will disclose their presence, Feldman concludes that the rearing of fowls for food markets should be prohibited in environments known to be infected with avian tuberculosis.

<sup>1</sup> Hall M. C. and Collins B. J. Pub Health Rep 52: 468 (April 16) 1917.

<sup>2</sup> Evans C. H. J Infect Dis 63: 337 (Nov-Dec) 1938.

<sup>1</sup> Feldman William H. J Infect Dis 63: 332 (Nov-Dec) 1938.

# ORGANIZATION SECTION

## CITIZENSHIP AND MEDICAL LICENSURE

J E McINTYRE, M D

Secretary, Michigan State Board of Registration in Medicine  
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In the formulation of rules by boards of medical registration and in the preparation of proposed legislation and proposed amendments relative to the practice of medicine in the several states, provision has been made and is being made in many of the states for the requirement of citizenship for admission to the practice of medicine. In some states the requirement is made by rule of the medical board in others the provision is by statute.

It is interesting to note that most states have already required either United States citizenship or first papers as a condition precedent to taking the state board examinations. Only the following states require neither full citizenship nor first papers at the present time: California, Illinois, Massachusetts, New Hampshire, New Mexico, New York, Ohio, Texas, Utah and the District of Columbia. Either by state law or by a ruling of the state boards of registration in medicine the following states now require full United States citizenship: Alabama, Arkansas, Delaware, Florida, Georgia, Indiana, Kansas, Kentucky, Michigan, Missouri, Montana, Nevada, Nebraska, North Carolina, North Dakota, Oklahoma, South Carolina, South Dakota, West Virginia, Wyoming and, except in the case of Canadians, Arizona, Iowa and Minnesota. States now requiring that first papers for United States citizenship must be taken out are Colorado, Connecticut, Idaho, Louisiana, Maine, Mississippi, New Jersey, Pennsylvania, Rhode Island, Virginia, Washington and Maryland except in the case of Canadians. In addition to these requirements there is a great variety of other restrictions. In some states such as South Carolina and Wyoming, foreign graduates are not accepted under any circumstances. In some other states there is a requirement of a senior year's work in an approved United States medical school and a one year rotating internship in a United States hospital approved for internship training. Still others require that the candidates pass the National Board examination and apparently there is no uniformity whatever as to these special requirements.

In any discussion of this question, the paramount consideration should and must be the maintenance of the standards of health of the public. The primary reason for the establishment of boards of registration and the basis for enacting laws relative to the practice of medicine has been and must be such maintenance of high standards of public health by regulation of the practice of medicine. Of course doctors individually quite naturally consider the economic aspect of the question. In these times of unemployment and financial difficulty it is somewhat open to question whether the profession of medicine stands to suffer more from the competition of newcomers than do other professions and industry generally. It is probably true that in certain areas the influx of well trained foreign physicians has caused a

definite hardship to American doctors in certain communities, particularly in the larger cities. It is not the function and duty of medical boards to promote the economic security of doctors as a class but to promote and maintain high standards of education and practice in the field of medicine. Indirectly, those entitled to economic protection by reason of high standards of efficiency, ability and ideals of public service are actually benefited by able administration in boards of medicine. We must seek to eliminate the unfit. The single question therefore arises as to whether alien nationality becomes a factor of unfitness.

I find that it is the consensus of both physicians generally and students of sociology that the adherence to high ethical standards of medical practice constitutes an important factor in the service of a physician to his community. Included in such high ethical standards are standards of social responsibility, a sincere respect for our governmental endeavors for the promotion of public health, the assumption of responsibility of common social welfare, respect for our fundamental system and operation of government and, I might add, a sincere concern for the maintenance of high standards of morality in relation to those matters which our social order and system of government have decreed to be part of our moral fiber. Obviously, the alien who can meet these tests must be the exception rather than the rule of type to be found. It is therefore fitting and proper that we, as physicians, adopt the premise that citizenship of the United States should be included in the qualifications of the individual in whose hands is placed the responsibility for the moral and spiritual, as well as the physical, well-being of the citizens of any community. Thus I have pointed out the basis for the assumption that it is socially expedient and advisable to require citizenship as a condition precedent to the practice of medicine.

### THE QUESTION OF LEGALITY

The next question which confronts us, granted that such requirement is expedient and advisable, is whether such provision by rule of the medical board or by statute in any state is legal, that is whether it would be sustained in courts of last resort if attacked by any individual or group. The precise question of whether citizenship may be required as a condition precedent to the practice of medicine has never been before the United States Supreme Court. Examination of the decisions, however, of the United States Supreme Court and of the supreme courts of the various states relative to kindred questions indicates that arguments may be advanced against the validity of such provisions. However, analysis of these decisions does not indicate that the courts, because of such precedents, would decline to sustain such legislation providing for the citizenship requirement. With the help of the Bureau of Legal Medicine and Legislation of the American Medical Association and able lawyers interested in the problem,

I have made a summary of some of the decisions in relation to the question applied to certain occupations.

The constitution of the United States, article VI, clause 2, provides

This Constitution, and the laws of the United States which shall be made in pursuance thereof, and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land, and the judges in every State shall be bound thereby, any thing in the constitution or laws in any State to the contrary notwithstanding

Anything in the constitution or laws of any state, therefore, that purports to require citizenship as a condition precedent to the issue of a license to practice medicine or to the practice of dentistry is legally void and without force and effect if contrary to the provisions of the constitution of the United States or of any treaty made by virtue of that constitution

Under the constitution, the crux of our problem lies in the interpretation the Supreme Court will make of the fourteenth amendment which reads as follows

All persons born or naturalized in the United States and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States, nor shall any State deprive any person of life, liberty or property, without due process of law, [and then as it especially applies to us, the following last clause of the amendment] nor deny to any person within its jurisdiction the equal protection of the laws

The right of a state to enact laws discriminating against the employment of aliens in private industry came squarely before the United States Supreme Court in *Truax v. Raich* decided in 1915. This case arose under an Arizona statute that undertook to require every employer of more than five workers at any one time to employ not less than 80 per cent of qualified electors or native born citizens of the United States. An alien who was in danger of losing his employment because of this statute appealed to the courts for protection. The case having reached the United States Supreme Court, the court said

Being lawfully an inhabitant of Arizona, the complainant is entitled under the Fourteenth Amendment to the equal protection of its laws. The description 'any person within its jurisdiction,' it has been frequently held, includes aliens. The provisions said the court, 'are universal in their application to all persons within their territorial jurisdiction, without regard to any differences of race, of color, or of nationality, and the equal protection of the laws is a pledge of the protection of equal laws'

It is sought to justify this act in an exercise of the power of the State to make reasonable classifications in legislating to promote the health, safety, morals, and welfare of those within its jurisdiction. But this admitted authority, with the broad range of legislative discretion that it implies, does not go so far as to make it possible for a state to deny to lawful inhabitants, because of their race, or nationality, the ordinary means of earning a livelihood

The authority to control immigration—to admit or exclude aliens—is vested solely in the Federal Government. The assertion of an authority to deny to aliens the opportunity of earning a livelihood when lawfully admitted to a State would be tantamount to the assertion of the right to deny them entrance and abode for in ordinary cases they cannot live where they cannot work

The United States Supreme Court had been called on to pass on a similar question in the Chinese Laundry Cases, covered by the citation *Yick Wo v. Hopkins*,

decided in 1886, cited in *Truax v. Raich*, supra. The Chinese Laundry Cases arose under a San Francisco ordinance relating to the establishment and maintenance of laundries. On its face the ordinance did not discriminate against Chinese, but it was so administered as to operate to that end. In holding the ordinance unconstitutional, the United States Supreme Court said

The Fourteenth Amendment to the Constitution is not confined to the protection of citizens

These provisions are universal in their application, to all persons within the territorial jurisdiction, without regard to any differences of race, of color, or of nationality, and the equal protection of the laws is a pledge of the protection of laws

The constitutionality of a statute forbidding the licensing of aliens as barbers came before the Supreme Court of Michigan in 1902, in *Templar v. Michigan State Board of Examiners of Barbers*. Section 5 of act 212 of the Public Acts of Michigan, 1889, provided for the examination and licensing of barbers, but it provided that no person should receive a license who at the time of his examination was an alien. This section, the Supreme Court of Michigan held, so far as it discriminated on account of citizenship, was repugnant to the fourteenth amendment, as denying equal protection of the law. The court said

In the exercise of the police power, the legislature has the undoubted right to require, as a prerequisite to his plying his trade that he submit to an examination. But had it the right to require citizenship? If it had the right to couple that with other requirements, it would have the same right to make that the only requirement. In other words, it would have the right to exclude alien labor wholly. We think the cases cited demonstrate that it had not this power. To hold that he is not entitled to practice this calling, because not a full citizen of the United States, is to deny him rights which are preserved by the fourteenth amendment

Not only does the fourteenth amendment of the federal constitution seem to preclude a state from denying to aliens as such, the right to work in the state, if the alien is physically, morally and qualified by training to work, but our treaties with foreign countries have a material bearing on the situation. Our treaty with Germany, for instance, signed in Washington Dec 18, 1923, and proclaimed Oct 14, 1925 (44 Stats 2132), provides in article 1

The nationals of each of the High Contracting Parties shall be permitted to enter, travel and reside in the territories of the other, to exercise liberty of conscience and freedom of worship, to engage in professional, scientific, religious, philanthropic, manufacturing and commercial work of every kind without interference, to carry on every form of commercial activity which is not forbidden by the local law and generally to do anything incidental to or necessary for the enjoyment of any of the foregoing privileges upon the same terms as nationals of the state of residence or as nationals of the nation hereafter to be most favored by it submitting themselves to all local laws and regulations duly established

Article VI, clause 2, of the federal constitution declares that the judges in every state shall be bound by all treaties made under authority of the United States, anything in the constitution or laws of any state to the contrary notwithstanding. As to the treaties, it is unlikely that any rights would be asserted, as several of the countries have repudiated their treaties with the United States, and for the further reason that our

nationals have been deprived of the benefit of such treaties in those countries

As I have already stated, the decisions of the courts holding that citizenship cannot be made a requirement for obtaining a license to pursue certain occupations or to conduct certain businesses do not indicate that the same ruling would be applied in the case of the practice of medicine. Courts have uniformly upheld legislation excluding aliens from the practice of law. While the decisions in some instances were based on the argument that a lawyer is an officer of the court and the court an agency of the state, nevertheless other reasons were given for excluding aliens from the practice of law. Under the general police power of the states where matters of health or morals are involved, such exclusions can be sustained on the premise that the type of occupation or profession is inherently one involving public morals and public health. To illustrate, the Supreme Court of the United States has upheld legislation excluding aliens from a license to sell intoxicating liquors for the reason that such occupation, of necessity involves public morals.

As I have already pointed out in relation to the question of the social advisability of such legislation, the same reasons, I am told by able lawyers, would be used by the courts in sustaining such provisions, that is on the ground that the practice of medicine involves a high degree of moral and social responsibility to the community, and respect and adherence to the morals and ethical standards of our people. I am further advised

that the cases which I have cited refer to a denial of an alien of his right to work. A license to practice medicine does not confer a right to work. It is not a right but merely a conditional privilege to be granted or withheld by the state purely in consideration of public welfare, public health and morals. Chief Justice Charles Evans Hughes, in a case involving the validity of the Oregon Dental Law, restated this oft repeated rule of law, namely, that the right to practice the healing arts is not in itself a right, but only a conditional privilege to be granted or to be withheld, as the health and welfare of the public may require. In view of the fact that courts have gone far in permitting states under their police power to regulate matters of public health and welfare, it is safe to assume that the decisions I have cited will not be controlling nor held to be analogous to this question.

In passing, I recommend that such provisions for the citizenship requirement be incorporated into the medical statutes of the states rather than left to the rules of the board, as from a standpoint of administrative law a legislative enactment of such a far-reaching requirement would withstand any attack more strongly.

#### CONCLUSIONS

I would leave the thought that, in view of the importance of the problem should any such legislative provision be attacked in any state, every cooperation and force of legal ability be provided so that a disastrous precedent will not result by reason of inadequate legal counsel and cooperation.

## AMERICAN MEDICAL ASSOCIATION STUDY ON MEDICAL CARE

### REPORT FROM THE MEDICAL SOCIETY OF DELAWARE

The study, covering the state of Delaware, which has a population of approximately 250,000, was conducted by the Medical Economics Committee of the Medical Society of Delaware. It was assisted in the distribution and the collection of forms by the state board of health and the Wilmington board of health. The compilation of the data and the preparation of the summary were made under the direction of the secretary of the state medical society. The information obtained is believed to furnish the most pertinent facts regarding the availability or lack of medical care in this area.

The information and data are based on reports from 109 physicians, or 36 per cent of the 303 physicians in active practice. No replies were received from dentists and only seven pharmacists returned their forms. The hospitals all cooperated in supplying information. There are nine general hospitals, including a contagious disease unit and a mental deficiency unit, one army hospital, one mental hospital, two tuberculosis hospitals, one preventorium and one state welfare home.

The health departments were very cooperative in furnishing information and data, and consequently the conclusions on the need and supply of medical care depends a great deal on their information. The Wilmington board of health furnishes medical services, laboratory diagnosis and sanitary supervision. The state board of health with a component unit in each county, maintains records and vital statistics, makes laboratory tests and maintains sanitation supervision, maternal and child health supervision, communicable and venereal disease controls, tuberculosis sanatoriums,

and dental hygiene and public health nurses. All schools, colleges, nurses and relief agencies also contributed valuable information to the Medical Economics Committee for this study.

The consensus of the physicians who returned the forms is that medical care is available to every one. Of 109 physicians supplying information only ten, or 9 per cent, reported that they knew of cases in which any type of medical care was not easily obtainable. Since the 109 physicians are located in all parts of the state, it can be assumed that their experiences are representative of all the physicians in the state. Therefore approximately only twenty-seven of the total 303 active physicians in the state have observed inadequacies of any type of medical care.

The Medical Economics Committee's report on the specific needs for increased facilities for the distribution of medical care and recommendations for services that should be expanded in order to make medical care more easily obtainable to certain low income groups, follow.

Delaware is a small compact and conservative state, with a per capita wealth well ahead of most of the states. Its terrain is practically level, the roads are excellent, and medical care can easily be reached. As a matter of fact, among the few instances reported of persons receiving no medical care, there must be a fair sprinkling of those who did not know how to secure such care and still another group who did not wish for care at the hands of the regular medical profession. However, by this statement it is not meant to imply that Delaware is a land of plenty, medically speaking,

because certain facilities definitely need to be expanded and there are certain services which should be enlarged, among these are

1 Increased facilities for Negro tuberculous patients. A bill is now in the legislature which, if passed, will appropriate \$150,000 to provide sixty additional beds for this purpose.

2 An increase in beds available for Negro maternity work is desirable, especially outside Wilmington. No program is at present outlined. Within the past year two hospitals in Wilmington have built new maternity wings, including a fairly adequate number of beds for Negroes.

3 There is a need for more public health nurses and/or visiting nursing service, especially in rural New Castle County. The levy court of this county is being petitioned to provide funds for this purpose, as well as an additional county physician or physicians who perhaps will serve on a part time basis.

4 The hospitals throughout the state need additional beds for general medical and surgical care despite the fact that their occupancy last year was approximately 60 to 65 per cent. This is due to the fact that there are certain peaks of the load, during which time the most urgent cases can be admitted and the less urgent cases are placed on a waiting list.

5 The care of the psychiatric sick is limited to one institution, which serves the whole state and which has been the victim for many years of a vicious degree of overcrowding. Whatever remedy for this condition there may be must come from the legislature, before which appropriation bills will be presented.

6 The mentally deficient are being cared for at a state colony accommodating some 468 patients. However, the lack of housing facilities and a sufficient budget prevents some 200 eligibles from being admitted. The legislature is now conducting a special investigation of this institution and its needs.

7 The care of certain of the aged indigents and chronically ill is centralized in one state welfare home, which replaces the three county poor houses. This is a splendid institution but is already overcrowded, and relief is now being sought from the present legislature.

8 The various clinics operated by the state board of health for venereal diseases, tuberculosis, well baby and maternal welfare are scattered throughout the state at strategic points, and this service will be expanded as, when and if the demand can be demonstrated.

9 Certain clinics, notably the birth control clinic, are being conducted by lay organizations, but the clinics so far established under these auspices are well managed and are staffed by the medical profession.

10 The care of the blind is arranged for by the Delaware Commission for the Blind, which does not operate its own clinic but which has not failed to provide adequate services through the various physicians and hospitals.

11 Care of the crippled has been given by the hospitals and medical profession and has seemed to be fairly adequate. Whatever deficiencies there may be today will be remedied within a year by a new hospital-school to be erected by the Nemours Foundation, which was endowed by the will of the late Mr. Alfred I. du Pont and which will be one of the leading orthopedic institutions in the country.

#### GENERAL NEEDS

The feeling throughout the profession is that physicians should be paid for services rendered to the indigent and near indigent. This introduces a question the answer for which is not apparent with certainty, but certain plans are in the making to provide for this feature. Wilmington has a group hospital service on the board of which the medical profession is adequately represented and which has been functioning for three years with satisfaction to all concerned. It is proposed to extend this coverage to the counties as well as to the city and to include individual memberships in addition to the employed groups, which now make up the 13,000 members. In addition to this feature there is a surprisingly large general demand for medical expense indemnity insurance, and the Medical Economics Committee of the New Castle County Medical Society is at present working on this problem and will in due time propose to the society a plan for its adoption. It is fairly certain that if and when this plan is adopted in Wilmington it will soon thereafter become statewide in its operation.

Delaware has, in lieu of county commissioners, a levy court of each county, which makes appropriations for the maintenance of hospital beds for the indigent on a per diem basis. These appropriations are inadequate, the deficits being met from private sources. If the medical indemnity insurance plan succeeds, it may be proposed that the levy courts, together with appropriations from the state, buy and keep in force the insurance for indigents and near indigents, which may in the long run prove cheaper than the present system of appropriations if there are an equal number who need this service.

In addition to such medical expense indemnity insurance there should be set up at strategic points throughout the state some central authority whose duty it shall be to weed out the indigent and near indigent from those who are able to pay their sickness expense in full or in part.

#### CONCLUSION

From these statistical data and summaries it will be appreciated that the needs in Delaware are not as acute as they are in many other communities, but it will also appear that neither the profession nor the public is fully satisfied, to remedy these defects, adequate plans and proposals are already in the making.

#### FIVE PER CENT OF ALL INCOMES FOR RELIEF

Figures recently published by the Social Security Board show that public relief payments have constituted the following percentages of total national income in each year since 1929:

Year	Per Cent	Year	Per Cent
1929	0.1	1934	4.3
1930	0.1	1935	4.4
1931	0.3	1936	4.8
1932	0.9	1937	3.8
1933	2.7	1938	5.0

The amount of money in each type of income in 1938 was as follows:

Compensation of employees	\$39,869,000,000
Entrepreneurial income	12,348,000,000
Dividends and interest	8,186,000,000
Payments to veterans	57,000,000
Relief and social insurance	
Direct relief	\$1,005,000,000
Work relief	2,216,000,000
Insurance benefits	503,000,000
Total	\$64,184,000,000



## OFFICIAL NOTES

### MEETING OF THE COUNCIL ON INDUSTRIAL HEALTH

The third meeting of the Council on Industrial Health took place January 11 at the Association Headquarters. Those attending were Drs. Harvey Bartle, Leroy U. Gardner, Henry H. Kessler, Anthony J. Lanza, Allen D. Lazenby, Earl D. Osborne, C. W. Roberts, Stanley J. Seeger, Clarence D. Selby, and Carl M. Peterson. Drs. Seeger and Lazenby were elected chairman and vice chairman respectively for the 1939 term.

Other transactions of interest to the profession were as follows:

1 The Committee on Nomenclature reported that its project to provide the profession with a compendium of terms and acceptable definitions relating to industrial health is more than half completed. The authoritative character of the final published material will be augmented by the use of consultants.

2 The Council has on file information regarding most agencies interested in industrial health. It is planned to attach information of this character in the form of an appendix to the published material on nomenclature.

3 Data regarding available opportunities for instruction of physicians in the fundamentals of industrial hygiene were presented. Inadequate provision of undergraduate, graduate and postgraduate training resulted in the formation of a subcommittee to determine the most effective contribution the Council could make for improvement.

4 Additional plans were made for the issuance of useful and authoritative articles to impress on the general profession its opportunities and responsibilities in the industrial health movement. A series of articles is contemplated on medical organization in industry.

5 The Council decided to continue the Congress on Industrial Health as an annual function.

6 At the request of the Council, committees on industrial health and related subjects have been formed in a number of the state medical associations. The importance of these groups and the necessity for regular interchange of information was recognized. A subcommittee was formed to undertake this assignment.

7 The Council decided to continue the development of a clearing house of information as a necessary and desirable service to the medical profession.

8 The best means for analysis and review of medical progress standards and interest under workmen's compensation procedure were discussed, especially cooperative action with official agen-

cies in the constituent and component societies. In this connection the Council undertook to explore the possibilities for a more scientific approach to the relationships existing between trauma and disease to determine if therein lie better prospects for extraprofessional understanding and acceptance of medical opinion regarding etiology.

9 Conversations with representatives of rehabilitation and compensation groups were deferred until the Council had a better opportunity to discover the exact nature of the problems under discussion and the degree of medical interest involved.

10 The relations of the Council on Industrial Health with the sections of the Scientific Assembly, more particularly the Section on Preventive and Industrial Medicine and Public Health, were considered.

11 The Council agreed that its activities would be facilitated by holding two meetings annually, one in conjunction with the Annual Congress early in the year, and another at midyear subject to adopted regulations.

12 The tenure of office of members of the Council was determined and nominations were considered to fill one vacancy in the present membership.

### RADIO BROADCASTS

The radio broadcasts by the American Medical Association and the National Broadcasting Company, under the title *Your Health*, continue as previously announced each Wednesday over the Blue network of the National Broadcasting Company at 2 p. m. eastern standard time (1 p. m. central standard time, 12 noon mountain time, 11 a. m. Pacific time).

Changes in this time will be necessary to take into consideration daylight saving time. Announcement of this change will appear in advance in *THE JOURNAL*. Owing to network conflicts the Chicago broadcast will not occur at 1 p. m. on Wednesday but there will be a rebroadcast from a recording over Station WGNR at 8 o'clock each Monday evening. The program broadcast each Monday will be identical with the network program of the preceding Wednesday.

It has been necessary to curtail the length of the series by omitting the last two programs, which would have been broadcast June 14 and June 21. The series, therefore, will end with the broadcast scheduled for June 7.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

March 22	Auditing the Health Record
March 29	Animal Diseases Transmitted to Man
April 5	Don't Believe Everything!

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Changes in Status*—S. 1706 has been reported to the Senate, proposing to provide for reorganizing agencies of the government. H. R. 1776 has passed the House, providing for the assignment of medical officers of the Public Health Service for duty on vessels of the Coast and Geodetic Survey. H. R. 3537 has passed the House, extending facilities of the Public Health Service to officers of the foreign service of the United States.

*Bills Introduced*—S. 758, introduced by Senator Wheeler, Montana, and H. R. 3694, introduced by Representative Dempsey, New Mexico, propose to amend the Federal Emergency Relief Act of 1933 for continuation of the civil works program by eliminating the requirement that an injury sustained by an employee must be of traumatic origin to entitle the employee to compensation, including medical and hospital benefits. H. R. 4740 introduced by Representative Boren, Oklahoma, proposes to extend the services of the National Bureau of Standards by providing for establishing performance standards when in the public interest. H. R. 4779, introduced by Representative Tenerowicz, Michigan, proposes to amend the federal income tax law so as to authorize the deduction of amounts paid during the year as fees to physicians and dentists, and the amount

expended, not in excess of \$500, for funeral expenses. H. R. 4791, introduced by Representative Pfeifer, New York, proposes to establish a federal Department of Health to be headed by a Secretary of Health appointed by the President from the medical profession. This bill is pending in the House Committee on Expenditures in the Executive Departments, of which Representative John J. Cochran of Missouri is chairman.

### STATE MEDICAL LEGISLATION

#### Arizona

*Bill Passed*—H. 129 has passed the house and senate, proposing to make it a felony to practice or attempt to practice medicine without having a valid recorded license so to practice issued by the State Board of Medical Examiners. The present law makes it a felony to practice or attempt to practice without having a valid recorded certificate.

*Bill Introduced*—H. 276 proposes that a person shall not be entitled to hospitalization or medical care at public expense unless he or she has continuously resided in the state for at least three years immediately preceding the date of application for relief.

**California**

*Bills Introduced*—A 1727 proposes to require hospitals to keep hospital records on file for at least three years after the persons to whom the records apply are discharged and to permit patients and ex-patients or persons they designate to examine, inspect or copy the pertinent records. S 492 proposes to direct the Director of Institutions, with the approval of the State Board of Control, to provide suitable property for one or more institutional units to be known as State Inebriate Colonies and to be used for the isolation and rehabilitation of chronic inebriates committed thereto by appropriate courts. A 2748 proposes to give the juvenile court jurisdiction over any person under 21 years of age who is afflicted with syphilis, gonorrhea or chancroid and who is in need of medical and custodial care or both.

**Connecticut**

*Bill Introduced*—S 305 proposes to establish a department of professional and vocational licensing, to be in charge of an executive secretary, who is to be a secretary of each of the licensing boards and commissions of the state, including the state board of healing arts, the medical examining board, the homeopathic medical examining board, the osteopathic board, the chiropractic board, the naturopathic board, the optometry board, the chiropody board, the dental commission and others. The executive secretary is to exercise all the powers and perform all the duties conferred or imposed on the secretary of the boards enumerated.

**Colorado**

*Bills Introduced*—H 466 proposes as a condition precedent to the issuance of a license to marry that each party to a prospective marriage present a physician's certificate that he or she has submitted to such examination including a standard serologic test as may be necessary for the discovery of syphilis and that in the opinion of the physician the party either is not infected with syphilis or is not in a stage of that disease which may become communicable. H 470 proposes to require every physician attending a pregnant woman to take or cause to be taken a sample of her blood within ten days of the first professional visit and to submit that sample to an approved laboratory for a standard serologic test for syphilis.

**Delaware**

*Bills Introduced*—S 79 proposes to enact a law regulating the manufacture, sale, distribution or advertising of foods, drugs, cosmetics and devices. H 141 proposes to repeal the existing laws providing compensation for workers injured or acquiring stated occupational diseases in their employment and to enact a new workmen's compensation act. The bill proposes to provide compensation to workers (1) suffering personal injury arising out of and in the course of their employment, (2) contracting disease or infection as naturally results directly from the industrial injuries or (3) contracting from their employment the following occupational diseases: anthrax, lead poisoning, arsenic poisoning, phosphorus poisoning, poisoning from benzene and its homologues, wood alcohol poisoning, chrome poisoning, caisson disease, radium poison, or poisoning from carbon disulfide or hydrogen sulfide. The bill proposes to require the employer during the first thirty days after the injury to furnish reasonable surgical, medical and hospital services, medicines and supplies not to exceed in cost, however, \$150. The workmen's compensation bureau which is to administer the act, may in its discretion require the employer to furnish additional surgical, medical and hospital services, medicines and supplies as and when needed, for such further period as it shall deem necessary. H 76 proposes to direct the State Board of Trustees of the Delaware State Hospital at Farnhurst to establish a psychiatric observation clinic for the observation study, psychiatric diagnosis and treatment of persons suffering from mental and nervous diseases. H 143 proposes to prohibit the retail sale and distribution, except on the written prescription of a licensed physician, dentist or veterinarian, of barbitol, sulfonethyl methane (trional), sulfon-methane (sulfonal), diethylsulfone, diethylmethane (tetronal), paraldehyde, chloral or chloral hydrates, chlorobutanol.

**Georgia**

*Bill Passed*—S 117, to amend the chiropractic practice act passed the senate February 22, proposing (1) to require applicants for licenses to practice chiropractic to have graduated from chiropractic schools which require for graduation a period of active attendance equivalent to a standard four year college course, instead of the present requirement that such applicants have graduated from chiropractic schools requiring a course of three years of six months each and (2) to require chiropractic licentiates to renew their licenses annually and to condition that renewal on attendance during the preceding year at least one of the two "educational" programs conducted by the Georgia Chiropractic Association.

**Illinois**

*Bills Introduced*—H 324 proposes to appropriate \$25,400 for a cancer diagnostic service by the Department of Public Health. H 327 proposes to enact a separate naprapathic practice act and to establish an examining committee to examine and license persons to practice naprapathy. The bill attempts to define naprapathy as follows: Any one or any combination of the following practices, without the use of drugs, serums or operative surgery, constitutes the practice of Naprapathy: (a) examination of the human body, to ascertain the presence of defects or abnormal conditions involving the connective tissues, (b) diagnosis of aforesaid defects or abnormal conditions, (c) prescription recommendation or advice regarding treatment of aforesaid defects or abnormal conditions, (d) treatment of aforesaid defects or abnormal conditions, (e) attempting any of the foregoing practices."

**Indiana**

*Bills Enacted*—The following bills have become laws. H 21 to require every physician attending a pregnant woman to take or cause to be taken a sample of her blood at the time of diagnosis and to submit such sample to an approved laboratory for a standard serologic test for syphilis, H 37, appropriating \$75,000 annually for the fiscal biennium beginning July 1, 1939, for the purchase and distribution free of charge to poor persons of pneumococcus serum, diphtheria toxoid, smallpox virus and typhoid bacterins. H 134 requiring both parties to a prospective marriage to present a physician's certificate as to freedom from syphilis and S 173, to regulate the manufacture, distribution and advertising of foods, drugs, cosmetics and devices.

**Iowa**

*Bills Introduced*—H 431, to amend the chiropractic practice act proposes (1) to provide that "The practice of chiropractic shall be deemed to be the adjustment by hand of articulations of the spine and other incidental adjustments, and shall include the right to use air, light, heat, water, diet and exercise, in the treatment of diseases, and (2) to prohibit a chiropractor 'from practicing operative surgery, electro-coagulation, radium in any form, general hyperpnea, osteopathy, optometry, obstetrics, x-ray treatment or administering or prescribing any drug or medicine included in materia medica and (3) to provide that every licensed chiropractor shall place on all signs used by him and to display prominently in his office the word 'chiropractor or chiropractic physician'". H 180 proposes to appropriate \$2,000,000 for the erection of a hospital for the treatment and care of the insane, to care for at least 1,500 patients. H 543 proposes to make it a ground for the revocation of a license to practice medicine, osteopathy, chiropractic dentistry, optometry or podiatry for the licentiate to be 'guilty of aiding or abetting an unlicensed person to practice either by direct employment or indirectly through subterfuge or arrangement, whereby the unlicensed person through the use of such professional services profits monetarily in any manner'.

*Bill Passed*—H 59 has passed the house, proposing to condition the issuance of a license to marry on the presentation by both parties to the proposed marriage of certificates from licensed physicians that they are either free from syphilis or not in a stage whereby it may become communicable, as nearly as can be determined by a thorough physical examination and such standard microscopic and serologic tests as are necessary for the discovery of syphilis. The bill proposes to limit the fee a physician may charge for such physical examination and standard microscopic and serologic tests to \$2 for each person so tested and examined.

### Kansas

*Bills Introduced*—S 328 proposes to prohibit a pupil or teacher from attending or teaching in any school public or private, unless possessing a physician's certificate that he or she has been successfully vaccinated against smallpox or that he or she is not a fit subject for vaccination. H 348 proposes to direct the State Board of Education to require a course of study in the public schools concerning the evil effects of the use of marijuana, alcohol, narcotics and hypnotic drugs. H 448 proposes to establish a board of examiners for consulting psychologists to examine and license applicants for licenses to practice as consulting psychologists. The bill proposes to make it unlawful for any one but licentiates to represent themselves as or to assume to act as consulting psychologists. Applicants for such a license must hold a degree of doctor of philosophy in psychology or in education from a college or university recognized by the board of examiners. H 509 proposes to grant to a hospital furnishing any service to a person injured by an accident not covered by the workmen's compensation act a lien on all rights of action, claims, judgments, settlements or compromises accruing to the injured person because of his injuries.

### Maine

*Bills Introduced*—S 414 proposes that in criminal cases in which the defendant is charged with operating a motor vehicle while under the influence of intoxicating liquor the results of scientific analysis of body fluids legally obtained from the defendant shall be admissible as evidence. S 416 proposes to repeal the existing laws regulating the possession or distribution of narcotic drugs and to enact what appears to be the uniform narcotic drug act.

### Maryland

*Bill Introduced*—H 392 proposes to authorize the State Board of Health to establish such minimum standards as it considers necessary for laboratories in the state except in Baltimore City, which make examinations in connection with the diagnosis and control of human diseases.

### Michigan

*Bills Introduced*—S 140 proposes to repeal existing laws relating to coroners and to create a medical examiner system in the state under the direction of a state medical examiner appointed by the governor. The board of supervisors of each county is, with the approval of the state medical examiner to appoint a licensed physician to serve as a county medical examiner. A county medical examiner is to have jurisdiction only in cases in which a person is supposed to have come to his or her death by violence without medical attendance or as a result of an abortion or in case a prisoner dies in any city jail. H 215 proposes to authorize the organization of corporations to establish maintain and operate nonprofit medical care plans whereby medical care is provided at the expense of the corporations to such persons or groups of persons of low income as become subscribers to such plans under contracts which entitle each such subscriber to definite medical and surgical care appliances and supplies, by licensed physicians in their offices in hospitals and in the home. The bill states that medical care is not to be construed to apply to hospital service. H 277 proposes to require every physician attending a pregnant woman to take or cause to be taken a sample of her blood at the time of first examination and to submit that sample to an approved laboratory for a standard serologic test for syphilis.

### Minnesota

*Bills Introduced*—S 781 and H 853 propose to prohibit except on the written prescription of a licensed physician, dentist or veterinarian, the retail sale or distribution of barbituric acid, propional, isopropyl, dial, neonal sandoptal amylal phenobarbital phanodorn noctal allonal medinal or any preparation mixture or other substance containing any of the aforementioned substances. S 683 proposes that any graduate of a chiropractic school who (1) made application for a certificate of registration in the basic sciences before Oct 1 1927 (2) is an honorably discharged soldier of the World War and (3) was a resident of the state prior to and since May 1 1925 shall be entitled to

receive a certificate of registration in the basic sciences without examination if he makes application within thirty days after this bill becomes a law.

### Missouri

*Bills introduced*—S 132 proposes to create in the State Board of Health a division of child hygiene to issue educational literature on the care of the baby and the hygiene of the child to study the causes of infant mortality and the application of preventive measures for the prevention and suppression of the diseases of childhood to supervise and regulate the physical inspection of public school children and to inspect sanitary and hygienic conditions on public school property. H 152 proposes that hereafter in the administration of any public health project in the state all doctors of medicine and all doctors of osteopathy must be given equal rights and privileges. H 500 proposes to require every person licensed to practice medicine in the state annually on or before December 31 to register with the State Board of Health and to pay an annual fee of \$1. H 462 to amend the medical practice act, proposes to require an applicant for a license to practice medicine, in addition to educational qualifications now required by law, to furnish evidence of "completion of premedical education consisting of a minimum of sixty semester hours of college credit in acceptable subjects from a reputable college or university approved by the board of health. H 548 proposes to permit any person to file an information in the nature of a quo warranto or an action to enjoin or oust from the unlawful practice of medicine any person who practices medicine or surgery without being licensed to do so.

### Nevada

*Bills Introduced*—S 8 proposes to establish a state sanatorium for the treatment and care of persons suffering from tuberculosis, to be subject to the control and jurisdiction of the State Department of Health. A 178 proposes to authorize the sexual sterilization of insane, feeble-minded or epileptic inmates of state institutions. The bill further proposes that all prisoners who have previously been convicted of two or more felonies are to be subject to observation and examination by any mental hygiene clinic and, if it is found that the criminality is caused by mental abnormality or mental disease the prisoner may be sterilized. A 165 proposes to prohibit a county clerk from issuing a marriage license unless the applicant files a certificate of the examining physician, duly signed and dated within fifteen days prior to the application, that physical examination and serologic tests do not disclose syphilis in the applicant that the applicant has submitted to a Wassermann or Kahn or other similar standard laboratory blood test, and that in the opinion of such physician at the time of the examination the applicant either is not infected with syphilis or is not in a stage of that disease which may become communicable.

*Bill Passed*—A 149 passed the assembly March 2 proposing to enact a law regulating the sale distribution and advertising of foods drugs cosmetics and devices.

### New Hampshire

*Bill Passed*—H 232 has passed the house and senate proposing to authorize the formation of nonprofit hospital service corporations to maintain and operate plans whereby hospital care may be provided at the expense of the said corporations by hospitals to subscribers to said plans under contracts entitling the subscribers to stated hospital services.

### New Jersey

*Bills Introduced*—S 144 proposes to authorize the board of education of any school district to require immunization to diphtheria as a prerequisite to school attendance. A 210 proposes extensive amendments to the existing medical practice act. Most important the bill proposes that after 1945 applicants for licenses to practice chiropractic must meet the same educational requirements as are imposed on applicants for licenses to practice medicine and surgery. Such applicants apparently after that date would be given licenses to practice medicine and surgery without restriction. The bill also proposes to limit licensure to citizens of the United States and to authorize a court of chancery to enjoin the unlicensed practice of medicine. A 245 proposes so to amend the state pure food and drug act as (1)\* to include also cosmetics and therapeutic

devices and (2) apparently to make it conform generally to the Federal Food, Drug and Cosmetic Act. S 171 proposes to require every physician, pharmacist and head of every hospital, when any person infected with syphilis, gonorrhea or chancroid applies for treatment, to report the facts to the State Department of Health. The bill further proposes to require any person infected with venereal disease to consult at once a licensed physician or hospital "or any person who practices healing by spiritual, religious or mental means." S 167, to amend the medical practice act, proposes to limit licensure in the healing arts to citizens of the United States. The present law permits the licensing of persons who have declared their intention of becoming citizens.

#### New Mexico

*Bill Passed*—H 282 passed the house February 28 proposing to require every practitioner of the healing art attending a pregnant woman to take or cause to be taken a sample of her blood at the time of first examination and to submit that sample to a laboratory approved by the State Department of Public Health or to the State Department of Public Health for a standard serologic test for syphilis.

#### New York

*Bills Introduced*—S 965, to supplement the medical practice act, proposes to enact a series of provisions with respect to the practice of physiotherapy, which the bill states "means the use for the treatment of diseases, pain, injury, deformity, or physical condition, by means of actinotherapy, hydrotherapy, mechanotherapy, thermotherapy and electrotherapy, exclusive of x-rays." The bill proposes to require a licensed physiotherapist to register annually with the secretary of the board of medical examiners. The bill seems to lack any provision whereby persons other than those now licensed to practice physiotherapy may obtain such licenses. S 969 proposes to prohibit the practice of radiology except by licensed physicians, osteopaths, dentists or chiropractors subject, however, to the conditions and limitations of their respective licenses. A 1308 proposes that no person who has a communicable or contagious disease shall work or be permitted to work in a factory in which a food product is manufactured. The bill also proposes to require any such employee, when required by a medical inspector of the labor department to submit to a physical examination. A 1416 proposes to reimburse annually to a city maintaining a hospital for the care and treatment of persons afflicted with tuberculosis one half of the amount appropriated during the preceding year by the city for the maintenance of the hospital. A 1417 proposes to authorize any city common council to convey to the state any hospital owned and operated by the city for the care and treatment of tuberculosis. Any hospital when so required by the state is to be deemed a state tuberculosis hospital and is to be under the jurisdiction and control of the State Department of Health. The cost of its operation and maintenance shall be provided by state appropriations. A 1428 proposes that a license to practice osteopathy shall entitle the holder thereof to use instruments for minor surgical procedures and to use anesthetics, antiseptics, narcotics and biologic products. The present law specifically states that a license to practice osteopathy shall not permit the holder thereof to administer drugs or perform surgery with the use of instruments. A 1433 proposes to prohibit, except on the written prescription of a licensed physician, dentist or veterinarian, the retail sale or distribution of barbital, sulfon ethylmethane (trional), diethylsulphur diethylmethane [sic] (tetronal), carbromal, chloral or chloral hydrate or chloro butanol. A 1280 proposes to establish in the motor vehicle bureau a board of motor vehicle accident compensation to assure the payment of medical and hospital expenses resulting from motor vehicle accidents. The bill proposes to require every owner of a motor vehicle either to furnish bond or an insurance policy or to pay \$5 in addition to the registration fee now required by law. Any person injured in a motor vehicle accident, if the car involved in the accident is uninsured, may recover from the fund so created expenses incurred for medical, surgical, nursing and hospital services up to \$600 to be ratably distributed among those injured. A 1238 and S 914 propose to include employment in hospitals within the workmen's com-

pensation act. A 1265 proposes to prohibit the performance of an operation, the purpose or effect of which is to change or alter the skin or tissues of the fingers or thumbs so as to alter finger patterns or fingerprints. The bill also prohibits the performing of any operation of plastic surgery on a known criminal the purpose or effect of which is to alter his personal appearance and make identification and apprehension difficult. A physician, the bill proposes, must report immediately by telephone, if possible, to appropriate police authorities all requests for operations which seem to come within the prohibitions of this bill. A 1213 proposes to enact what the bill cites as the New York uniform food, drug and cosmetic act to regulate the manufacture, distribution or advertising of foods, drugs, cosmetics and devices. A 1585 proposes to prohibit private hospitals from requiring or permitting any employee to work more than eight hours in any day nor more than forty eight hours in any calendar week.

#### North Carolina

*Bills Introduced*—S 185 proposes to collect from each applicant for an automobile license 50 cents in addition to existing license fees, to establish the North Carolina Highway Accident Hospitalization Fund, which when it totals \$100,000 is to pay \$3 a day for up to twenty-one days of hospitalization for every resident of the state sustaining a motor vehicle injury and needing hospital care for his injuries. Any indigent who has suffered a motor vehicle injury is to be entitled to full hospital service for up to twenty-one days and to have the fund pay the entire cost. Persons who are not indigents are to be permitted to apply the amount payable from the fund as a credit on their hospital bill. S 232 proposes to enact what it cites as the North Carolina food, drug and cosmetic act to regulate the manufacture, distribution and advertising of foods, drugs, cosmetics and therapeutic devices.

#### Ohio

*Bills Introduced*—H 204, to amend the law prohibiting a physician from testifying concerning a communication made to him by his patient in that relation except by the express consent of the patient, proposes that if the patient is dead the physician may testify by the express consent of the surviving spouse, personal representative or heir of the patient. H 379 proposes, as a condition precedent to the issuance of a license to marry, that each party to the proposed marriage present a certificate of a physician that he or she is free from epilepsy, feeble-mindedness and insanity and is not infected with syphilis, or is not in a stage of that disease which may become communicable as nearly as these facts can be determined by examination of the party and by the application of standard laboratory tests for syphilis.

#### Oklahoma

*Bill Introduced*—H 354 proposes to prohibit a licensed practitioner of the healing art, in making professional calls away from his office from charging or collecting more than his regular fee for each call plus 50 cents per mile for each mile actually and necessarily traveled in going from his office to the place where he attended the patient.

#### Oregon

*Bills Introduced*—S 426 proposes to prohibit the operation of a maternity hospital or other place for the reception, care and treatment of women during pregnancy or within ten days after delivery unless licensed by the State Board of Health. S 435 is apparently a proposal to permit chiropractors, osteopaths and naturopaths to practice "massotherapy," which is defined by the bill to include all terms defined in section 1 of the bill. Section 1 reads as follows: "For the purposes of this act the following terms shall be construed respectively to include and mean: 1 The word 'massotherapy' shall mean massage. 2 The word 'hydrotherapy' shall mean the use of water for treating elimination through the pores of the skin. 3 The word 'physiotherapy' shall mean light therapy, galvanism, faradism, high frequency, diathermy, sinusoidal currents, short wave and any or all other phases of physiotherapy. 4 The word 'electrotherapy' shall mean the therapeutic use of electricity. 5 The words 'physical therapy' shall

mean the use of natural forces such as light, heat, air, water and exercise [sic], a thorough knowledge of physiological and pathological effects on anatomy of the above modalities in the treatment of disease. The bill further provides that all masseuses or masseurs or other technicians having establishments and giving treatments as defined in this act and who have been engaged in practice in the state for six years or more, and who in the opinion of the State Board of Chiropractors or Naturopaths are competent, shall be licensed (by whom the bill does not state) to practice massotherapy as defined in the bill. S 475, to amend and supplement the laws relating to the practice of osteopathy, proposes (1) to deprive the board of medical examiners of its present jurisdiction in examining and licensing persons to practice osteopathy and (2) to establish an independent board of osteopathic examiners to examine and to license persons to practice osteopathy. The bill states that "Osteopath" or "osteopathic physician" or "osteopathic physician and surgeon" shall mean one who practices osteopathy and the science of healing as taught in the branches and embraced in the subjects covered by the examination provided for by the act. The act requires applicants to be examined in anatomy, physiology, chemistry, surgery, bacteriology, histology, pathology, gynecology, obstetrics, theory and practice of osteopathy, diagnosis and hygiene and public health.

#### Pennsylvania

*Bills Introduced*—S 129 proposes as a condition precedent to the issuance of a license to marry, that each party to a proposed marriage present a physician's certificate that the party has submitted to an examination and is free from communicable tuberculosis, is not infected with communicable syphilis as determined by a standard laboratory blood test made not more than ten days preceding the application for license. H 367 proposes that, whenever in any civil or criminal proceeding issues arise on which the court deems expert evidence is desirable, the court may appoint one or more experts, not exceeding three, on each issue to testify at the trial.

#### South Carolina

*Bill Passed*—H 361 passed the house February 24 proposing to require every physician, midwife, nurse or other person attending at the birth of a child to instill, or have instilled in the eyes of the baby, within one hour after birth, a 1 per cent solution of silver nitrate, or some equally effective prophylactic approved by the State Department of Public Health, for the prevention of blindness from ophthalmia neonatorum. A record of such administration or instillation must be reported on the birth certificate, showing the time with respect to the birth and the kind of prophylactic administered.

*Bill Introduced*—S 325 proposes, in effect, to grant to a physician, dentist, trained nurse, or hospital furnishing care or treatment to an injured person a lien on all judgments and settlements accruing to the injured person because of his injuries.

#### Tennessee

*Bills Introduced*—H 997 proposes to authorize the organization of corporations to operate nonprofit hospital service plans whereby hospital service may be provided by one or more hospitals which have contracted with such corporations to persons who become subscribers to such plans. H 821 and S 584 propose to establish a division of tuberculosis control in the Department of Public Health, which is to provide financial aid to counties or municipalities in the maintenance of patients in tuberculosis hospitals or in wards or pavilions in approved hospitals other than tuberculosis hospitals for the treatment and care of indigent persons sick with tuberculosis. H 1038 proposes to require a food handler to undergo a physical examination and blood test every six months to ascertain whether or not he or she has tuberculosis or venereal disease and to make it unlawful to employ any such person unless he or she presents a physician's certificate as to absence of tuberculosis or venereal disease. H 1054 proposes to require all public school teachers to undergo annually a physical examination and to submit to blood tests to determine the presence or non-presence of tuberculosis and venereal disease. H 1039 proposes to require physicians attending pregnant women to make the

necessary blood tests of the patient to determine the presence of syphilis prior to the birth of the issue. S 868 and H 1174, to amend the workmen's compensation act, propose to require an employer to provide an injured workman such medical, surgical and hospital services as are reasonably required to cure or relieve from the effects of the industrial injury. The present law limits such liability to \$200 and requires the aid to be rendered only during the first thirty days after knowledge of injury. S 1003 and H 1385, to amend the workmen's compensation act, proposes to require an employer, during sixty days after notice of an industrial accident, to furnish free of charge to the injured workman such medical and surgical treatment, medicine, medical and surgical supplies, crutches and apparatus as may be reasonably required, provided, however, that the total liability of the employer for medical and surgical services shall not exceed \$100 and for hospital services shall not exceed \$300.

#### Texas

*Bill Introduced*—H 818 proposes to prohibit the admission of a child to school "for the first year of its school life" until he or she has been successfully vaccinated for the prevention of smallpox, typhoid and diphtheria. The bill proposes to make it the duty of the county health officers and city health officers of the state to administer such vaccine as is necessary free of charge.

#### Vermont

*Bills Introduced*—H 285 proposes to establish within the Department of Public Welfare a psychiatric clinical division to provide local and traveling clinics at such places and at such times as will efficiently examine (1) children under the supervision and jurisdiction of the public welfare department, (2) dependent, neglected or delinquent children against whom court proceedings have been instituted, and (3) children against whom complaints or petitions have been made to the state probation officer. H 319 proposes, as a condition precedent to the issuance of a license to marry, that each party to the proposed marriage present a physician's certificate that he or she has been given such examination as may be necessary for the discovery of syphilis, including a standard serologic test, made not more than thirty days prior to the date of application for a marriage license, and that in the opinion of the physician the party either is not infected with syphilis or if so infected is not in a stage of that disease which is or may become communicable to the marital partner.

#### Washington

*Bill Enacted*—S 114 has been enacted as Laws, 1939, C 46, proposing to establish at Soap Lake an institution to be known as the McKay memorial research hospital for the treatment and care of persons afflicted with Buerger's disease and for study of the disease and of the properties of the waters of Soap Lake.

*Bills Introduced*—S 187, to amend the law establishing in the department of social security a division for improving the condition of the blind and for preventing blindness and providing certain monthly payments to needy blind persons, proposes that medical care or other corrective treatments, such as glasses, earphones and all other appliances, shall be provided by the state to such recipients, and the cost thereof shall not be deducted from blind assistance allotments. S 374 proposes to require a physician attending a pregnant woman to take or cause to be taken a sample of her blood at the time of first examination and to submit that sample to an approved laboratory for a standard serologic test for syphilis. S 373 proposes as a condition precedent to the issuance of a license to marry, that both parties to the proposed marriage present physicians' certificates that they have been given such examination, including a standard serologic test, as may be necessary for the discovery of syphilis and that, in the opinion of the physicians, the applicants are not infected with syphilis or, if so infected, are not in a stage of that disease which is or may become communicable to the marital partner.

#### West Virginia

*Bill Passed*—S 159 passed the senate February 22 proposing to make it unlawful for any person to use the prefix "Doctor" or "Dr" in connection with his name in any letter, business

card, advertisement, sign or public display of any nature, without affixing thereto suitable words or letters designating the degree which he holds

### Wisconsin

**Bills Introduced**—S 183 proposes (1) to supplement the chapter of the statutes entitled "Construction of Statutes" by proposing definitions of (a) "physician," "surgeon" and "orthopedic surgeon" that will include persons authorized to practice osteopathy and surgery, (b) "medical" and "practice of medicine" that will embrace the activities of osteopaths and (c) "medical college" that will include osteopathic schools, (2) in effect to permit an osteopath to execute the examining physician's certificate required for admission to the Wisconsin general hospital or for commitment to governmental and private insane asylums, and (3) apparently to give all physicians as defined, equal rights in the treatment of venereal disease. S 192 to amend the medical practice act, proposes that Applicants for license to practice osteopathy and surgery, after July 1, 1945, in addition to having a diploma from a reputable professional college approved and recognized by the board [of medical examiners] shall establish having completed a two years college course including physics, chemistry, biology and either German or French, and if the professional college from which a diploma is presented does not require for graduation a hospital internship of at least twelve months in addition to a four years course, such applicant shall present a certificate that he has served at least twelve months internship. S 185 proposes that any person licensed before 1916 to practice osteopathy in the state is to have the right and privilege to exercise his professional judgment in the treatment of patients. The bill further provides that Any license heretofore or hereafter issued [apparently referring to a license to practice osteopathy] shall legally qualify the holder for service in the capacity of physician under any statute of this state which provides for or permits the employment, appointment, election, or selection of a physician for any purpose whatever concerning health, service or

relating to health matters, without other recommendations by a professional society or association." S 186 proposes that "Any sick or injured person entitled by statute or otherwise to the services of a physician, whose services for such person are to be paid for in whole or in part by said person's employer, or by some insurance carrier of such employer, or by any municipality, or by some society or association, or by some other person or persons, corporation, or partnership, shall be entitled to have the unrestricted and free choice of a physician to care for and administer to him." A 392 proposes that "All employes in all state charitable and penal institutions shall be employed on the eight hour day basis." A 401 proposes to authorize the incorporation of "associations on a cooperative basis. 1 By individuals for the purpose of securing or paying for medical and hospital care for themselves and their families. 2 By a group of physicians for the purpose of providing medical and hospital care." Associations so formed are not to be subject to any of the insurance laws of the state. The bill also proposes to make it unlawful for any hospital, supported in whole or in part by public funds or wholly or partially exempt from taxation, to deny to any patient or any physician the facilities of such hospital because of affiliation with a cooperative association. The bill also proposes that no physician otherwise eligible for membership shall be excluded from membership in the state or county medical society because he enters into contracts with individuals or cooperative associations to furnish medical service on the basis of a stipulated sum to be paid periodically or because he is employed by an individual, a partnership or a cooperative association furnishing medical services on such terms. A 411 proposes, in effect, to permit chiropractors to treat, at the expense of the employer, workmen injured in the course of their employment. The bill proposes to give the injured workman the right to "the attendance of any licensed chiropractor" and to require the employer to maintain a panel of licensed chiropractors ready to undertake the treatment of such of employees as may be injured.

## WOMAN'S AUXILIARY

### WINNERS IN THE HYGEIA CONTEST

The American Medical Association offered \$150 in cash prizes to the county auxiliaries obtaining the largest number of subscription credits to *Hygeia* during December 1938 and January 1939.

The winners were

Group I Auxiliaries with a membership of from one to forty-nine

\$50 prize to Union County Ark. Mrs. Warren S. Riley, Hygeia chairman, El Dorado, Ark.

Group II Auxiliaries with a membership of from fifty to 199

\$50 prize to Berks County, Pa., Mrs. William F. Krick, Hygeia chairman, Reading, Pa.

Group III Auxiliaries with a membership of more than 200

\$50 prize to Cook County, Ill., Mrs. W. J. Waininger, Hygeia chairman, Chicago.

Honorable Mention was given to the following county chairmen

Duval County, Fla., Mrs. Dan Funkenstein, chairman, Jacksonville, Fla.

Baldwin County, Ga., Mrs. C. H. Richardson, president, Milledgeville, Ga.

Lafayette County, Kan., Mrs. C. S. McGinnis, chairman, Parsons, Kan.

Orleans Parish, La., Mrs. Henson Coon, chairman, Monroe, La.

Park Region District, Minn., Mrs. L. C. Combacker, president, Fergus Falls, Minn.

Washington County, Minn., Mrs. R. J. Joseph, chairman, Stillwater, Minn.

Albany County, N. Y., Mrs. F. L. Coughlin, chairman, Albany, N. Y.

Pottawatomie County, Okla., Mrs. R. M. Anderson, chairman, Shawnee, Okla.

Chelan County, Wash., Mrs. A. G. Young, chairman, Wenatchee, Wash.

Sheboygan County, Wis., Mrs. G. J. Hildebrand, chairman, Sheboygan, Wis.

Other counties that reached their quota were

Mesa County, Colo., Bulloch-Evans Candler County, Ga., St. Joseph County, Ind., Shawnee County, Kan., Wayne County, Mich., Jackson County, Mo., Burt-Dodge-Washington County, Neb., Cayuga County, N. Y., Guilford County, N. C., Robeson County, N. C., Elk-Cameron County, Pa., Huntingdon County, Pa., Lehigh County, Pa., Mifflin County, Pa., Montgomery County, Pa., Westmoreland County, Pa., Seventh District, South Dakota, Collingsworth-Childress Hall County, Texas, Hunt-Rockwall-Raines County, Texas, Salt Lake County, Utah, Weber County, Utah, Clark County, Wash., King County, Wash., Pierce County, Wash., Spokane County, Wash., Walla Walla County, Wash., Kanawha County, W. Va., McDowell County, W. Va., Rock County, Wis., Washington Ozaukee County, Wis.

The final result in this year's contest was 6,242 subscriptions, as against 4,747 received in the contest last year and 3,855 in 1937.

To the Hygeia chairmen, officers and members of the various county and state woman's auxiliaries who have assisted in making this contest a success, Mrs. James D. Lester, National Hygeia Chairman, expresses appreciation.



## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### ARKANSAS

**Sixth Graduate Course**—The Arkansas Medical Society presented its sixth course of graduate instruction at the University of Arkansas School of Medicine Little Rock January 31 February 1. In addition to clinics papers were presented by Drs David Harvey Shipp Little Rock General Considerations of Empyema, Herbert F H Jones Little Rock, Treatment of Ureteral Calculi, Cyril M MacBryde St Louis 'Effects Obtainable with Pituitary Gonadotropic and Sex Hormones' Joseph F Shuffield Little Rock, Internal Fixation of Fractures of the Neck of the Femur, Frank D Gorham St Louis, Management of Peptic Ulcer and David T Hyatt Little Rock Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis.

### CALIFORNIA

**County Society's Building Receives Honor Award**—The Southern California chapter of the American Institute of Architects recently awarded a certificate of honor to the Los Angeles County Medical Association to recognize merit in design and execution of work in architecture and fine arts within its territory. The certificate records the chapter's belief that the library and assembly hall of the association deserve exceptional merit and its appreciation of the sympathetic collaboration with the architect and the builder which made the building possible.

**New Medical Laboratory at Stanford**—A new laboratory building has been given to Stanford University School of Medicine San Francisco by Mrs Louis Stern Palo Alto in the name of her daughter Ruth Lucie Stern. The new unit will be used for research in cancer neurology infantile paralysis childhood tuberculosis and other phases of pediatrics certain types of fever and other public health problems with special emphasis on neurology in which the donor is chiefly interested. The three story building will be designed for workshop purposes without administrative offices or lobbies and will contain thirty glass paneled workrooms.

### DISTRICT OF COLUMBIA

**Society News**—The Medical Society of St Elizabeths Hospital will hold its second annual meeting in Washington April 14. The afternoon will be devoted to the presentation of papers. Guests will include Drs Charles Macfie Campbell medical director of the Boston Psychopathic Hospital and professor of psychiatry, Harvard University Medical School Boston and Riley H Guthrie newly appointed first assistant physician at St Elizabeths Hospital. Further information may be obtained from Dr Salomon Katzenelbogen at the hospital.

### ILLINOIS

**Society News**—Dr Claude N Lambert Chicago addressed the Stephenson County Medical Society at Freeport March 16 on 'Fractures of the Hip'. At a meeting of the Lee County Medical Society in Dixon March 16 Dr Channing W Barrett, Chicago spoke on fibroids of the uterus. Dr Howard L Alt, Chicago discussed Trends in Treatment of Diseases of the Blood before the Sangamon County Medical Society in Springfield March 2. Dr Frank H Lahey Boston presented the annual lecture of the Springfield Medical Club March 14 discussing gastrointestinal surgery. Mr Charles C Thomas publisher of medical and scientific books and periodicals spoke at this meeting on William Beaumont.

### Chicago

**The Luckhardt Lecture by DeKruif**—On April 12 Paul DeKruif Ph D Holland Mich will speak at Mandel Hall of the University of Chicago delivering the Arno Benedict Luckhardt Lecture of the Phi Beta Pi Fraternity under the title 'Human Conservation'.

**Chicago's Health**—The general mortality rate for Chicago in 1938 dropped to an all time low of 97 deaths per thousand of population a decrease of 6 per cent from the rate of 103

for 1937 according to a recent report. A new low point was established for infant mortality when thirty-four deaths of babies under 1 year of age per thousand live births were recorded the maternal mortality rate dropped to 26 per thousand births which, it was stated, was 25 per cent fewer deaths than in 1937. The city's birth rate was 14.3 per thousand of population, an increase over the rate for 1937, when it was 13.8. The total number of births was 51,500. The daily attendance at clinics throughout the city was 2,000 and more than 100,000 persons voluntarily took blood tests in the health department's campaign against syphilis.

**Branch Meetings**—Dr Irving S Cutter addressed the Northwest Branch of the Chicago Medical Society March 17 at the Norwegian-American Hospital on 'State Medicine—Present Trends in This Country'. Discussion was opened by Drs Morris Fishbein, Editor of THE JOURNAL, Rollo K Packard and Nathan S Davis III. Dr John M Berger discussed Acute Intestinal Obstruction, Diagnosis and Conservative Management before the West Side Branch February 16 and Dr George F Thompson, the surgical treatment. Among others Dr J Arnold Barger, Rochester Minn, addressed the Jackson Park Branch February 16 on 'Constipation The Mechanism of Production and Management'. A symposium on genito urinary diseases dealing with infections of the upper urinary tract was presented before the Calumet Branch February 17 by Drs William J Baker Andrew J Sullivan and Dorris F Rudnick. At a meeting of the Douglas Park Branch February 21 Dr Harry A Gussin spoke on Proctology in General Practice. Dr Nathan S Davis III discussed Arteriosclerotic Heart Disease before the Southern Cook County Branch February 21.

### INDIANA

**County Survey of Syphilis**—Lake County launched a survey of syphilis January 3 under the direction of the U S Public Health Service the Indiana State Board of Health and the state medical society. The study aims to determine the number of cases in the county the number of those not receiving treatment and those receiving adequate care. With Drs Albert W Ratchiffe and Wendell C Kelly, Indianapolis, pathologist of the state department of health and chief of the state bureau of venereal diseases, respectively as consultants a county committee will carry out the work with the cooperation of physicians in the county.

### KANSAS

**Society News**—A symposium on acute otitis media was presented before the Sedgwick County Medical Society Wichita February 7, by Drs Ernest E Tippin, Orville C McCandless Charles L Woodhouse, Hal E Marshall, Earl D Carter Anthony F Rossitto and Ernest M Seydell all of Wichita. The Shawnee County Medical Society was addressed January 9 by Drs Orville R Clark on 'Acute Obstruction of the Ureter', Arthur D Gray, Making Lantern Slides from 35 Mm Film and Archibald J Brier Bacterial Sensitization in Relation to Other Allergic States. All are from Topeka. Dr Vern L Pauley, Wichita, discussed 'Renal Anomalies' before the Pratt County Medical Society, Pratt, January 27, Dr Newman C Nash, Wichita, spoke on 'Carcinoma of the Uterus'. Dr Lawrence S Nelson, Salina addressed the Clay County Medical Society January 18 on 'Modern Treatment of Fractures of the Neck of the Femur'. The Rice County Medical Society was addressed in Sterling January 26 by Dr Joseph V Van Cleave Wichita, on 'Fungus Diseases'.

### LOUISIANA

**Exhibit of Medical Prints**—Two hundred medical prints are on display in the library of the Orleans Parish Medical Society New Orleans representing a part of the collection of Dr Rudolph Matas. There are also photographs of the recent International Congress of Surgeons of which Dr Matas was president.

**Society News**—A symposium on recent advances in scleroderma was presented before the Orleans Parish Medical Society in New Orleans January 23 by Drs James K Howles George E Burch Jr Edward W Alton Ochsner and Michael F DeBakey. Dr Isidore S Kahn San Antonio Texas discussed Bronchial Asthma and Other Aspects of Allergy before the East Baton Rouge Parish Medical Society recently. At a recent meeting of the Pointe Coupee Parish Medical Society in Morganza a round table discussion was held on infections of the hand.



## MASSACHUSETTS

**Another Doctors' Orchestra**—The Boston Doctors' Symphony Orchestra is being formed under the direction of Nicolas Slonimsky, according to the *New England Journal of Medicine*. All physicians, dentists and medical and dental students who are interested should communicate with Dr. Julius Loman, Pelham Hall Hotel Brookline. Meetings began March 9 and will be held at Hampton Court Hotel, Brookline, every Thursday night.

**The Dunham Lectures**—Dr. K. Linderstrom-Lang of the Carlsberg Laboratory, Copenhagen, delivered the following lectures at Harvard Medical School, Boston:

- March 6, Micromethods for the Determination of Enzymes
- March 8, Distribution of Enzymes in Cells and Tissues
- March 10, Proteins and Proteolytic Enzymes

This series is presented under the Edward K. Dunham Lectureship for the Promotion of the Medical Sciences.

**Society News**—At a meeting of the Worcester District Medical Society in Worcester January 11 the speakers were Drs. Channing C. Simmons, Boston, on "Tumors of the Breast," and John T. B. Carmody, Worcester, "Injuries of the Peripheral Nerves". Dr. Raymond H. Goodale, Worcester, showed a bacteriologic exhibit and slides of nonepithelial tumors of the breast.—The Boston Medical History Club was addressed January 9 by Dr. Edwin B. Dunphy on "Development of Knowledge of Diseases of the Eye."

**New Position in Clinical Psychiatry**—Dr. John J. Slatery, acting superintendent of the state hospital at Medfield, has been appointed director of clinical psychiatry at the Boston State Hospital, a new position created by the legislature this year with an annual salary of \$3,300 and maintenance. The director will have charge of all medical activities at the hospital. Under the former system the assistant superintendent was medical director in addition to handling administrative work. Dr. Slatery graduated at the Boston University School of Medicine in 1929.

## MINNESOTA

**Changes in Health Officers**—Dr. John A. McIntyre has been chosen health officer of Owatonna, succeeding the late Dr. Jerome T. Smerish.—Dr. Dennis M. O'Donnell has been appointed health officer of Ortonville.

**Society News**—The Winona County Medical Society was addressed January 9 by Drs. Lewis G. Jacobs on "Therapy of Cancer of the Breast" and John A. Tweedy, both of Winona, on "Chronic Abdomen and Its Relation to the Abdominal Triad".—At a meeting of the Washington County Medical Society in January Dr. David Greth Gardiner, St. Paul, discussed bronchoscopy.

**Six Day Graduate Courses**—A series of six day graduate courses in special fields of medicine recently started at the Center for Continuation Study of the University of Minnesota, Minneapolis. Following is the schedule:

- Nervous and Mental Diseases March 13-18
- Diseases and Injuries of Bones and Joints March 13-18
- Diagnostic Roentgenology March 27-April 1
- General Surgery April 10-15
- Diseases of Blood and Blood Forming Organs April 17-22
- Obstetrics May 1-6
- Gastro-Enterology May 8-13

The programs are held in the special building devoted to graduate education for all professional fields. The building also serves as a residence hall for professional groups while they are attending the university. The tuition for each of the courses is \$25, and room and board may be secured for \$16. Physicians from outside of Minnesota are admitted on the same basis as residents. Further information may be obtained from J. M. Nolte, director, Center for Continuation Study, University of Minnesota, Minneapolis.

## MISSOURI

**District Meeting**—The Second Council District Medical Society will hold its second annual meeting at the Mark Twain Hotel, Hannibal, March 23. Dr. Morris Fishbein, Chicago, Editor of *THE JOURNAL*, will open the session by addressing a luncheon meeting of the chamber of commerce on "Frontiers of Medicine." Included in the scientific program will be:

- Dr. Joseph C. Jaudon, St. Louis: Hypoglycemia of Infants and Children
- Dr. Howard A. Rush, St. Louis: Diagnosis and Treatment of Chronic Undulant Fever
- Dr. Ernest Sachs, St. Louis: Present Status of Surgery of Brain Tumors and Some of the More Important Points of Diagnosis
- Dr. Francis A. Graham, St. Louis: Primary Cancer of the Lung

Speakers at the dinner will include Mr. Elmer H. Bartlesmeyer, St. Louis, executive secretary of the Missouri State Medical Association, Dr. James R. McLav, Kansas City,

president-elect of the state association, and Dr. Fishbein, whose subject will be "American Medicine and the National Health Program."

**Neuropsychiatric Meeting**—The Missouri-Kansas Neuro-psychiatric Society met in Kansas City February 15 with the following speakers:

- Dr. Edward T. Gibson, Kansas City: Thrombocytopenic Purpura with Hemorrhage and Softening of the Spinal Cord
- Dr. Arthur Graham Asher, Kansas City: The Heart Before and After Metrazol Convulsions
- Dr. Ferdinand C. Helwig, Kansas City: Studies of the Brain in Delayed Death Following Strangulation
- Drs. Benjamin Landis Elliott, Robert Lee Hoffmann and Caryl R. Ferris, Kansas City: A Case of Hypertensive Encephalopathy
- Dr. Norman Reider, Topeka, Kan.: Aphasia Following Exsanguination
- Dr. Harry Wilkins, Oklahoma City: Cerebellar Tumors: Their Diagnosis and Treatment
- Dr. Wallace Marshall Appleton, Wis.: Psychologic Observations with Reducation in a Case of Multiple Sclerosis
- Dr. Theodore A. Watters, New Orleans, La.: Fundamental Principles in Teaching Psychiatry
- Dr. Guy I. Witt, Dallas, Texas: Psychiatric Factors in Bromide Intoxication
- Dr. Lloyd H. Ziegler, Winnetka, Wis.: Aspects of the Basic Science Underlying Clinical Neurology and Psychiatry

**Annual Spring Clinic**—The St. Joseph Clinical Society will hold its eighth annual two day spring clinic March 28-29 at St. Joseph. There will be no registration fee. The speakers will include:

- Dr. Gershom J. Thompson, Rochester, Minn.: Transurethral Prostatic Resection
- Dr. Quintan U. Newell, St. Louis: Cancer of the Uterus
- Dr. Fred J. Taussig, St. Louis (round table discussion): Treatment of Septic Abortion and Coordination of Radium with Surgery in the Treatment of Cancer of the Cervix
- Dr. Willis C. Campbell, Memphis, Tenn.: Some Aspects of Surgery of the Hip Joint
- Dr. Heyworth N. Sanford, Chicago: Jaundice in the New Born
- Dr. August A. Werner, St. Louis: Effect of the Ductless Glands in Growth and Development
- Dr. Ralph A. Kinsella, St. Louis: The Pneumonias
- Dr. Walter C. Alvarez, Rochester, Minn.: Useful Hints in the Treatment of Indigestion
- Dr. Maurice C. Howard, Omaha, Neb.: Problems of Gastric Hemorrhage
- Dr. J. Arthur Myers, Minneapolis: Modern Methods in Diagnosis and Therapy of Tuberculosis
- Dr. Coyne H. Campbell, Oklahoma City: Practical Points in the Management of Neurotic Symptoms: Inhibitions and Anxiety
- Dr. Emanuel Grodinsky, Omaha: Pyogenic Infections of the Hand and Foot

Dr. Sanford will speak at the banquet on disturbances of blood coagulation. Dr. Morris Fishbein, Chicago, Editor of *THE JOURNAL*, will speak at a noon luncheon on "American Medicine and the National Health Program" and will deliver a public address on "The Social Aspects of Medical Care."

## NEW YORK

**Personal**—Dr. John F. McNeill, assistant superintendent of Matteawan State Hospital, Beacon, has been appointed superintendent of the Institution for Male Defective Delinquents at Napanoch, it is reported.—Dr. Henry W. Lattin, Albion, was recently the guest of honor at the annual reunion of the Society of the Erie Canal in Albion. Dr. Lattin received a master pilot's license in 1880 when he was 21 and for several years before studying medicine operated steamers between Buffalo and New York.

**Society News**—Dr. Allen O. Whipple, New York, addressed the Rochester Academy of Medicine March 1 on "Indications for and Results of Operations on the Spleen".—Dr. Willard M. Allen, Rochester, addressed the Rochester Pathological Society March 16 on "Types of Glandular Unbalance Frequently Seen".—Dr. Hugo Roesler, Philadelphia, conducted courses on heart diseases and demonstrations of fluoroscopic examination of the heart and aorta in Syracuse February 3-5 and 10-12 under the auspices of the Onondaga County Medical Society.—Dr. William Thalheimer, New York, addressed the Medical Society of the County of Nassau, Garden City, February 28, on "Prophylactic and Therapeutic Uses of Convalescent Measles and Convalescent Scarlet Fever Serums".—A Joint Committee in Specialties, comprising pathologists, radiologists, anesthetists and physical therapists has been formed in New York with Dr. Maxwell J. Fern, Brooklyn, as chairman and Dr. Madge C. L. McGinness, New York, as secretary. About 1,500 members of the Medical Society of the State of New York are represented.

## New York City

**Heart Association Honors Dr. Conner**—Directors of the American Heart Association recently voted to name an annual lecture established last year the Lewis A. Conner Lecture in honor of Dr. Conner, who was the first editor of the *American Heart Journal* and the first president of the association. The lecture will be given during the annual meeting in St. Louis May 12-13.

**Hospital News**—Parkway Hospital at 123 West One Hundred and Tenth Street has been taken over by the Italian Hospitalization Society to be operated for the Italian community on a nonprofit basis. The society was established in 1937—Dr Paul Liebeson, formerly director of the physico-medical section of the Physiologic Institute in the Allgemeines Krankenhaus, Vienna, has been appointed director of the physical therapy department of the Bronx Hospital.

**Dr Thygeson Succeeds Dr Wheeler at Columbia—Dr Dunnington Promoted**—Dr Phillips Thygeson, assistant professor of ophthalmology at Columbia University College of Physicians and Surgeons since 1936 has been promoted to a full professorship and appointed executive officer of the department of ophthalmology to succeed the late Dr John M. Wheeler. Dr Thygeson is 35 years old and graduated from Stanford University School of Medicine, Stanford University, Calif., in 1928. In 1931-1932 he held a National Research Council fellowship in medicine, working on trachoma at the Pasteur Institute in Tunis. Announcement was made at the same time of the promotion of Dr John H. Dunnington, associate professor of ophthalmology, to a full professorship. Dr Dunnington graduated from the University of Virginia Medical Department in 1915 and has been assistant director of the Institute of Ophthalmology, Presbyterian Hospital, since 1933.

**Courses for New Library Technicians**—The School of Library Service at Columbia University announces two new courses to be given during the summer session: one on microphotography and one on bibliographic and reference service in the medical sciences. The course on microphotography is designed to meet the need which libraries are now facing for skilled service in the production and use of microfilms as a substitute for the printed page or original documents according to the announcement. A new laboratory is now under construction for the course, which will consist of daily lectures and two laboratory periods a week. Registration for laboratory work is limited to twenty students to be selected from applications received before June 1. The course in medical library service will be given by Mr Thomas P. Fleming, librarian of the Columbia University Medical Library. If the response is satisfactory, it will be given regularly in the summer session and possibly also in the spring session after 1940. Besides reference and bibliographic work, it will include indexing, abstracting and reviewing medical journals.

#### NORTH CAROLINA

**Health Officer Honored**—Dr Joseph A. Morris Oxford, who recently retired as health officer of Granville County after about twenty years of service, was honored at a testimonial dinner February 16, given by the Granville County Medical Society, the Rotary and Kiwanis clubs and the Young Men's Club. Among the speakers were Dr Robert E. Fox, Raleigh, director of county health work for the state board of health and State Supreme Court Justice W. A. Devin. Raleigh. The group presented a watch to Dr Morris.

**Society News**—Dr William D. Hall, Raleigh, was elected president of the North Carolina Neuropsychiatric Society at its annual meeting at the Caswell Training School, Kinston, January 27. Dr William Ray Griffin, Asheville, was elected vice president and Dr Malcolm D. Kemp, Pinebluff, reelected secretary. Dr Joseph Stokes Jr., Philadelphia, addressed the Guilford County Medical Society, Greensboro, February 9 on 'Newer Advances in Infectious Diseases, Particularly Respiratory Diseases'. Dr Louis L. Hobbs Jr., Ridgeway, Pa., addressed the society January 5 on 'Gonorrhea: Its Clinical, Surgical and Pathological Aspects'. Dr William L. Kirby, Winston-Salem, addressed the Davidson County Medical Society, Lexington, January 11, on allergy in relation to dermatology.

#### OHIO

**State Board Officers Elected**—Dr Louis T. Franklin, Chillicothe, was elected president of the State Medical Board of Ohio at a meeting January 17. Dr John H. J. Upham, Columbus, was elected vice president and Dr Herbert M. Platter, Columbus, reelected secretary.

**Funds for Research on Dementia Praecox**—The National Committee for Mental Hygiene recently granted \$10,000 to Longview State Hospital, Cincinnati, to continue research on dementia praecox under Drs Esther Bogen Tietz and Douglas Goldman. The funds for this work were contributed by the Committee on Research on Dementia Praecox, founded by the Supreme Council, Scottish Rite Masons, North-eastern Jurisdiction.

#### OREGON

**Changes in State Health Board**—Drs Harvey A. Woods, Ashland, and Wendell H. Hutchens, Portland, were recently appointed new members of the state board of health and Drs Arthur W. Chance, Portland, and Norman E. Irvine, Lebanon, were reappointed. Dr Frank Mount, Portland, was elected president at a meeting January 10, Dr William J. Weese, Ontario, vice president, and Dr Frederick D. Stricker, Portland, executive secretary and state health officer.

#### PENNSYLVANIA

**Society News**—Dr Harold W. Jones, Philadelphia, addressed the Cambria County Medical Society, Johnstown, February 9 on 'Treatment of Diseases of the Blood'. Dr Harold L. Foss, Danville, addressed the Northampton County Medical Society February 17 at the Country Club of Northampton County on 'Treatment of Advanced Thyrotoxicosis'. Dr Joseph H. Barach, Pittsburgh, addressed the McKean County Medical Society, Bradford, January 17 on 'Nutritional Requirements in Diabetes'. Dr Murray M. Copeland, Baltimore, addressed the Washington County Medical Society, Washington, March 8 on 'Diagnosis and Treatment of Tumors of the Breast'.

#### RHODE ISLAND

**Special State Meeting**—Dr Rock Sleyster, Wauwatosa, Wis., President-Elect of the American Medical Association, addressed a special meeting of the Rhode Island Medical Society in Providence January 6 describing the development of American medicine and the work of the American Medical Association.

#### SOUTH CAROLINA

**State Society Entertains General Assembly**—The South Carolina Medical Association entertained the members of the general assembly and Governor Maybank at a luncheon at the Columbia Hotel, Columbia, January 25. Preceding the luncheon Dr Reginald Fitz, Boston, addressed the legislators on trends in medical education.

**State Pediatric Meeting**—Dr Daniel Lesesne Smith Jr., Spartanburg, was elected president of the South Carolina Pediatric Society at its annual meeting in Columbia January 23. Dr Lomita M. Boggs, Greenville, was elected vice president and Dr William Weston Jr., Columbia, secretary. Dr Martha M. Eliot of the Children's Bureau, U. S. Department of Labor, Washington, D. C., was the guest speaker on 'The Maternal and Child Health Program Under the Social Security Act'.

#### UTAH

**Annual Registration Due April 1**—All practitioners of medicine and surgery licensed to practice in Utah are required to register annually on or before April 1, with the Department of Registration and to pay a fee of \$3. If a licensee fails to reregister within from ninety days to six months after April 1 his license can be revoked, and if revoked it will be reinstated thereafter only on his paying the delinquent registration fees and an additional year's fee as a penalty.

#### WASHINGTON

**Personal**—About seventy-five friends and colleagues honored Dr Nils A. Johanson, Seattle, with a stag party February 9, on the thirtieth anniversary of the founding of the Swedish Hospital by Dr Johanson. It was also a farewell party to Dr Johanson, who is leaving for New Guinea.

#### WISCONSIN

**Pneumonia Control Committee Appointed**—At the request of the state board of health, the council of the State Medical Society of Wisconsin has authorized appointment of a committee to confer with the board on the formulation of a program for control of pneumonia. The members are Drs Arthur J. Patek, Milwaukee, Thomas J. Snodgrass, Janesville, and Alvin G. Koehler, Oshkosh.

**Society News**—Dr Armand J. Quick, Milwaukee, addressed the Racine County Medical Society, Racine, February 16 on 'Value of Prothrombin Determination and Hippuric Acid Test in the Study of Jaundice Patients'. Dr Stephan Epstein, Marshfield, addressed the Wood County Medical Society, Marshfield, February 21, on 'Differential Diagnosis and Treatment of Benign Skin Tumors'. Dr Elmer L. Sevringhaus, Madison, discussed endocrinology at a meeting of the Columbia-

Marquette-Adams County Medical Society in Portage February 21—Drs John L Emmett and Horton C Hinshaw, Rochester, Minn, addressed the Chippewa County Medical Society, January 24, on "Management of Urinary Calculi" and "Recent Advances in the Treatment of Pneumonia" respectively—Dr Reginald Jackson, Madison, addressed the Dane County Medical Society, Madison, January 10, on "Surgery of the Colon"

### WYOMING

**Annual Registration Due April 1**—All practitioners of medicine and surgery licensed to practice in Wyoming are required by law to register on or before April 1 with the secretary of the Board of Medical Examiners and to pay a fee of \$2.50. If a licensee fails to pay the fee within three months after April 1, his license can be annulled and if annulled it will be reinstated only on his paying the stated fee plus \$5 as a penalty.

### GENERAL

**Society News**—Dr L. Gerald Foster, Bay City, Mich., was chosen president of the Northwest Regional Conference at its session in Chicago February 12—Dr M. Pierce Rucker, Richmond, Va., was named president-elect of the South Atlantic Association of Obstetricians and Gynecologists at its first annual meeting in Charleston, S. C., February 11. Dr Robert E. Seibels, Columbia, S. C., became president and Dr Robert A. Ross, Durham, N. C., was reelected secretary. The association was organized a year ago at a meeting in Charlotte, N. C. The next meeting will be in Richmond, Va., in 1940.

**Pacific Coast Surgeons to Meet**—The annual meeting of the Pacific Coast Surgical Association will be held in San Francisco and Del Monte, Calif., March 28-31. The tentative program includes the following speakers:

Dr Frank Hinman, San Francisco: Cancer of the Prostate  
 Dr Maurice G. Kahn and Howard F. West, Los Angeles: Adenoma of the Pancreas  
 Dr Andrew A. Matthews, Spokane: Cancer of the Breast  
 Dr Thomas F. Mullen, San Francisco: Safeguarding the Unconscious Operative Patient  
 Dr Paul C. Flathow, Seattle: Advances and Retreats in Neurosurgery  
 Dr Millard T. Nelson, Tacoma: The Surgical Anatomy of Fistula in Ano

Dr Sumner Everingham, Oakland, is president of the association.

**Prevalence of Communicable Disease**—The U. S. Public Health Service recently announced that for the first six weeks of 1939, 20,877 cases of influenza were reported as compared with 18,420 for the corresponding period of 1938. The number of deaths from pneumonia for a group of cities with a total population of about 33,000,000 was 762 for the week ended February 4 as compared with a five year average of 992. Smallpox was reported to be unusually prevalent in Indiana (308 cases), Ohio (126), Iowa (117), Kansas and Minnesota (97 cases each), Oklahoma (94), Arizona (83), California (71) and Texas (65) during January. More than two thirds of the total number of cases (1,548) for the whole country occurred in these nine states. The total was about 65 per cent of last year's figures.

**Prize for Thesis in Obstetrics**—The American Association of Obstetricians, Gynecologists and Abdominal Surgeons again offers its annual Foundation Prize for a thesis. The prize this year will be \$100. Those eligible to compete are (1) interns, residents or graduate students in obstetrics, gynecology and abdominal surgery, and (2) physicians who are actually practicing or teaching obstetrics, gynecology or abdominal surgery. Competing manuscripts must be presented in triplicate under a nom de plume to the secretary of the association before June 1, must be limited to 5,000 words and such illustrations as are necessary for a clear exposition of the thesis and must be typewritten (double spaced) on one side of the sheets, with ample margins. The successful thesis must be presented at the annual meeting of the association in September without expense to the association and in conformity with its regulations. For further details address Dr James R. Bloss, Secretary, 418 Eleventh Street, Huntington, W. Va.

**Pacific Science Congress in San Francisco**—The sixth Pacific Science Congress will be held in California July 24 to August 12 under the auspices of the National Research Council. Sessions will be held at the University of California, Berkeley, Stanford University and in 'Pacific House' on the grounds of the Golden Gate International Exposition in San Francisco. The theme of this congress will be the present state of knowledge of Pacific problems and methods by which

that knowledge may be most profitably enlarged" and the program will be arranged as a series of symposiums. Among them are one on 'Communicable Diseases of the Pacific Area, Origin, History, Distribution, Tropical Medicine' and one on 'Nutritional Problems of the Pacific Area'. Information about the congress may be obtained by addressing the secretary general, Roy E. Clausen, Ph.D., Room 205 Hilgard Hall, University of California, Berkeley. The last previous congress in this series was in Vancouver and Victoria, B. C., in 1933.

**Physicians' Art Exhibition**—The American Physicians' Art Association will hold an exhibition of art by members at the City Art Museum of St. Louis, May 14-30. Works in any of the fine or graphic arts are eligible. The privilege of exhibiting works is open to members of the American Physicians' Art Association, to honorary members and to other physicians, dentists and doctors of philosophy, by invitation. All works submitted must be appropriately framed. Foreign exhibitors, however, might well have their art pieces framed in this country as picture frames are taxed on entrance whereas unframed pictures are not taxed. Not more than five works will be accepted from any one entrant. The hanging fee is one piece \$2, two pieces \$4, three pieces \$5 and five pieces \$7. The check should be made out to Dr. R. W. Burlingame, treasurer, and mailed with entry notice to Miss Dorothy Hetlage, City Art Museum, St. Louis, Mo. No entries will be received after 5 p. m. May 1. Prizes, medals and cups will be awarded.

## Government Services

### National Cancer Institute Buys Radium

The National Cancer Institute purchased in December 95 Gm of radium valued at \$200,000. The radium supply will be lent to hospitals and clinics for treatment of cancer. An institution that borrows the radium must take the responsibility of transporting it from the Bureau of Standards and back again for periodic testing; must store it properly while using it and must insure it against loss and damage. According to the *Health Officer*, personnel and equipment of the borrowing institution must meet standards equal to those established by the American Board of Radiology for the safe use of radium. According to the terms of the loan preference in use of the radium will be given to persons unable to pay for treatment.

### Examination for Medical Officers in Veterans' Administration

The U. S. Civil Service Commission announces an open competitive examination for the position of associate medical officer in the Veterans Administration with a salary of \$3,200 a year. Competitors will not be required to report for written examination but will be rated on the extent of their education and on their experience and fitness. If conditions permit an oral examination will be given to a sufficient number of competitors in the order of their standing to meet the needs of the service. Applicants must not have passed their fortieth birthday on the closing date for applications. They must have graduated from a recognized medical school since May 1, 1934 and must have completed at least one year of internship. Persons now serving internships may apply but cannot be appointed until proof of satisfactory completion of the internship is furnished. Detailed information and application forms may be obtained from the secretary of the U. S. Board of Civil Service Examiners at any first class postoffice, from the commission at Washington or from the civil service district office at any of the following cities: Atlanta, Boston, Chicago, Cincinnati, Denver, New Orleans, New York, Philadelphia, Seattle, St. Louis, St. Paul, San Francisco, Honolulu, Balboa Heights, C. Z. and San Juan, P. R. The closing date is April 10 except from the following states for which the date is April 13: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.

### CORRECTION

**Evanston Hospital's Necropsy Percentage**—Evanston Hospital, Evanston, Ill., should have been included in the list of approved internship hospitals having over 70 per cent necropsies on page 924 of the *Hospital Number of This Jour* N. L. March 11 1939. Its record was 81.2 per cent.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Feb 18, 1939

#### Epidemic Nausea and Vomiting

In 1935 Danish writers described under the name of epidemic nausea what appears to be a new disease. They meant by nausea not simply the feeling of sickness but all the symptoms of sea sickness. In 1936 the disease was first observed in England in a boarding house for girls at the seaside resort of Broadstairs by the pediatrician Reginald Miller and M. O. Raven. It affected fifty-two of 117 residents. Miller described the disease in the 'Proceedings of the Medical Officers of Schools Association'.

The chief symptoms are vomiting, nausea, giddiness and diarrhea. Vomiting occurred in forty-two of the fifty-two cases. It was often explosive and unexpected, in many cases it was a single vomit only and tended to occur on the patient's waking in the morning. In no case did the sickness last more than six hours. Nausea without vomiting occurred in ten cases and giddiness in thirteen. Diarrhea did not occur. The disease seemed clearly of the same type as the Danish epidemics but there were certain differences. In the first Danish epidemic mild diarrhea with mucus in the stools occurred toward the end of the illness in twelve of forty-seven cases. In the second also diarrhea occurred, but it is particularly mentioned that no blood or mucus was present in the stools. Fever was rare and always slight. Recovery was complete in forty-eight hours. The epidemic affects persons of all ages but has a tendency to spare infants. A characteristic is the high proportion of a population attacked (from 33 to 75 per cent). The cause is obscure. Miller regards it as an borne and probably infectious.

Other epidemics have been observed in England. The last was reported by J. D. Gray (*Brit. M. J.* 1:209 [Feb. 4] 1939). It occurred in a country district (South Hampshire). In addition to the vomiting, frontal headache, diarrhea, pyrexia (the temperature always below 100 F) and occasionally bradycardia were observed. In a girls' school forty-five of eighty-two pupils were attacked and at the same time the disease was prevalent in the surrounding country. No organisms known to cause gastroenteritis were found. The greatest argument against food or water contamination was the type of spread in families or institutions from the first patient. Thus two of the school children went home and two days later both parents contracted the disease. Some dysentery in an institution might be confounded with epidemic vomiting but is distinguished by its much greater severity.

#### Thrombosis Following Injection of Iopax (Uroselectan)

Though mishaps occur from time to time in the injection of veins, a case in which the surgeon has to defend himself against a charge of negligence has only now arisen. A woman aged 52 was given an injection of iopax (uroselectan) for a ray examination of the kidneys by the house surgeon of the Kent and Canterbury Hospital in December 1934. He first tried to inject the substance into the veins of the arms but could not do so because these veins were not visible. He then found a suitable vein in the left leg which he injected. This was the only occasion on which he saw the woman. A roentgenogram taken seven minutes after the injection clearly showed the pelvis of the kidney. She alleged that the injection was so negligently performed that some of the fluid escaped into the tissues around the vein and gave rise to phlebitis, the

consequence of which was disability likely to be permanent. She suffered much pain and when she returned home had to go to bed, where she remained under medical care for six months. In his evidence the surgeon stated that he had successfully injected this drug on many occasions. When he injected the plaintiff's vein the needle was in the vein. Pain was commonly caused, but he had no recollection of any unusual complaint on her part. Medical evidence was given that thrombosis might result when the injection was made into the vein and that some people had a tendency to thrombosis, the reason for which was not known. The judge said that there was no evidence that the surgeon had done anything that he ought not to have done or that there was any lack of skill on his part. He therefore gave judgment for the defendant.

#### The British Heart Journal

A new periodical, the *British Heart Journal*, has been inaugurated by the British Medical Association. It is under the control of an editorial board of cardiologists. In a foreword Sir Thomas Lewis states that the Cardiological Society of Great Britain has decided to have a journal of its own. He points out that there is no stronger tradition of work on the heart than the British, which begins with the incomparable Harvey and passes through Lower, Hales, Heberden, Stokes, Mackenzie and other clinicians as well as the physiologists Gaskell and Starling. The *Journal* is to be published quarterly and the subscription fee is \$5 to members of the society and \$6 to nonmembers. The January issue, which has just been published, contains 'Some Disturbances of the Rhythm of the Heart' by John Cowan, 'Digitalis in Heart Failure with Normal Rhythm,' by C. J. Gavey and John Parkinson, 'Chest Leads in Clinical Electrocardiography,' by Paul Wood and Arthur Selzer, 'A New Sign of Left Ventricular Failure,' by Paul Wood and Arthur Selzer, 'The Significance of Electrocardiograms Showing a Second Positive Wave of QRS in Lead III,' by A. A. Fitzgerald Peel, and 'Some Notes on the Cardiac Club,' by John Cowan and others.

### PARIS

(From Our Regular Correspondent)

Feb 11, 1939

#### Blood Transfusion During War

Several years ago a committee composed of Profs. A. Gossset, E. Levy-Solal and Arnault Tzanck was appointed to elaborate a technique for blood transfusion on a large scale which might be applied in case of war. This committee submitted its report at

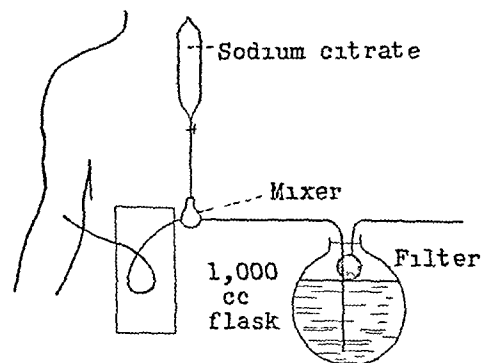


Fig 1—Henry Jouvet apparatus

the February 7 meeting of the Académie de médecine of Paris. The recent experience of countries at war in Europe and Africa has shown that no matter how thorough the prewar preparations for transfusions have been they are usually found to have been inadequate. At least 60 liters of blood must be ready for imme-

diate use in each of the main centers and subcenters. This means that only conserved refrigerated blood can be considered as practicable, because of the necessity of transporting it to the first aid stations. This amount of blood must be furnished by noncombatants relatively far behind the front and ought not to be furnished either by soldiers or by hospital personnel. The

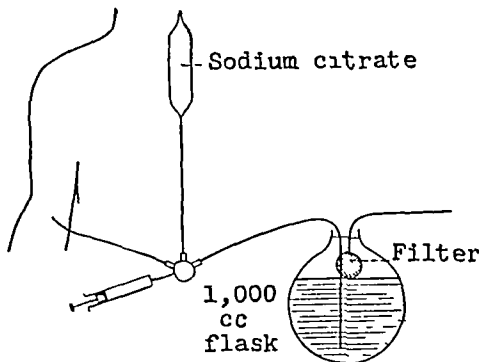


Fig. 2—Tzanck three way distributor

blood should be ready to be used, having been conserved in simple sterilized flasks, such as are employed for conserving ordinary serum. All laboratory examinations are made at the chief or subcenters, each donor giving from 300 to 500 cc, which is collected in a 1,000 cc flask. The apparatus which the committee recommended is that of Henry and Jouvet,

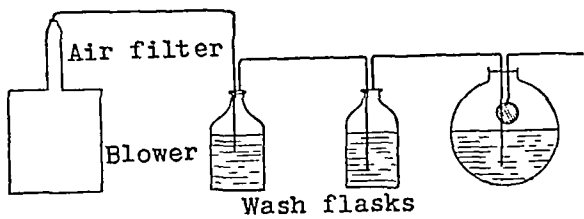


Fig. 3—Apparatus for oxygenation of blood

which delivers 1 cc of blood at each revolution. This enters a special chamber, where it mixes with 1 drop of a 9 per cent solution of sodium citrate and 1 Gm of dextrose. Instead of the Henry-Jouvet apparatus, the Tzanck three way distributor can be used, in which 1 cc of citrated serum is mixed with every 10 cc of blood. Although not absolutely necessary, oxygenation of the blood is of great aid, because it indicates absence of infection if the blood retains its red color. After 1,000 cc

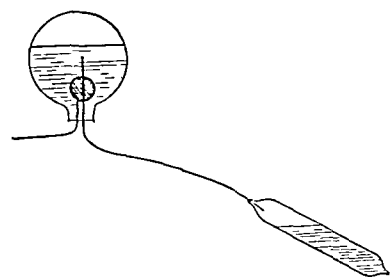


Fig. 4—Distribution into ampules

of citrated blood has been collected, the flask is inverted and its contents are allowed to run into four flasks each with a capacity of 250 cc. Each 250 cc flask is placed in a cardboard box, well covered by corrugated paper, so that the blood will retain its low temperature after it is taken out of the refrigerator. For transportation an airplane or fast motor vehicle with refrigeration equipment is to be preferred to a train and six flasks are placed in a single corrugated cardboard box. Instead of a simple 250 cc flask, one with a marked constriction at the center is now being used in the Spanish armies to eliminate, so far as possible, shaking of the blood during its transportation to the front. As to injection, the citrated blood is allowed to flow by gravity into the

vein of the recipient through a sterilized rubber tube and needle, which traverse a dish filled with water at 39 or 40 C. At least six mobile laboratory units should be available, which can function in some city well behind the front. To make possible the securing of 60 liters of blood, the unit should be established in a community where at least 30,000 potential donors can be examined. Such units ought really to be established in the larger cities in peace time, so that they would be ready to function when war broke out. This has already been done in France, each civilian donor being given an identity card after the necessary laboratory examinations.

The personnel of the chief and secondary centers ought to be provided for in peace time. The physician in charge of the center, the laboratory head and the assistants should be persons who are exempt from mobilization and who have had ample experience in the collection of blood for transfusion purposes. The slightest error made by a technician may be followed by disastrous results. Although citrated conserved blood is indispensable when large quantities are needed, one must not overlook the fact that noncitrated blood, i. e. pure blood, is to be given preference when available or when transportation of citrated blood to the front is impossible. Technicians ought to be trained during peace time so as to be available

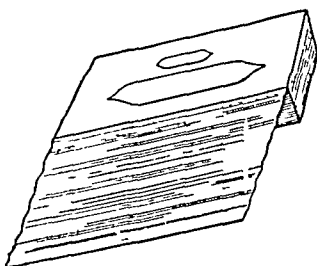


Fig. 5—Package for transportation

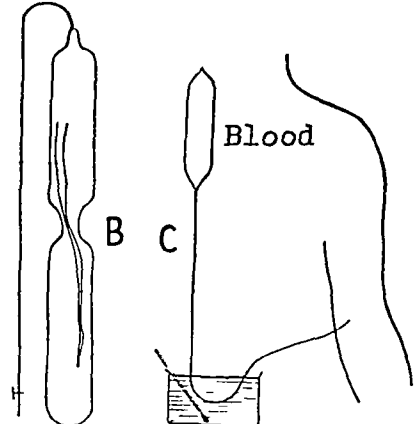
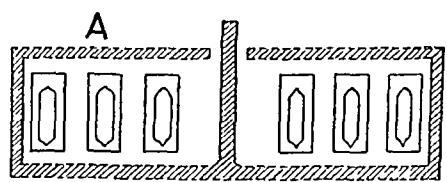


Fig. 6—A six ampules ready for transportation. B hourglass ampule, used to prevent shaking. C bowl for reheating blood.

in war. At the Paris center more than 150 technicians have been given a thorough course of instruction.

A Proposed Health Record for Every Citizen

Several years ago the minister of public health gave orders that a study be made as to the practicability of every person's possessing a book in which all illnesses and injuries are to be recorded, so that a physician who is called to treat a man, woman or child will immediately have at his disposal much valuable information as to the previous medical history. Objec

tions were raised that the recording of venereal infections would be resented, hence but little progress was made until recently, when the present minister of public health appointed a physician who has had a large experience in the French colonies to study the advisability of a health book, or "carte de sante," which would be obligatory for every person in European France and its colonies. It has been proposed to eliminate the previous objection to the recording of venereal disease by the use of some secret initials or nomenclature which can be interpreted only by physicians.

## BERLIN

(From Our Regular Correspondent)

Jan 30, 1939

### The Genetic Aspect of Diabetes Mellitus

Extensive studies of the hereditability of diabetes mellitus in an unselected group of twins heretofore have not been available. Research is now being carried on by Hildegard Then-Berg at the Kaiser-Wilhelm Institute of Genealogy and Demography, Munich. Then-Berg began with a basic material of some 85,000 persons with diabetes mellitus, among whom there were 411 pairs of twins, and she has already studied 147 of these pairs. Forty-six were enzygotic and eighty-seven were dizygotic, the exact zygotic origin of two pairs was open to question, and the remaining twelve pairs had to be eliminated from the study, since they presented no diabetes mellitus whatever. The author tries to observe all the twins personally. She examines the urine and blood sugar and in most cases performs a blood sugar tolerance test. A pair of twins is termed "absolutely concordant" if each twin of the pair was at the time of examination suffering from a manifest diabetes mellitus with demonstrable excretion of sugar in the urine. If one twin, although not manifestly ill and passing normal urine, shows by the tolerance test that the insular system is unable to metabolize a tolerance test dose of twice 20 Gm. of dextrose, the pair is termed concordant according to tolerance. A group termed discordant according to tolerance is also distinguished, among these the dextrose tolerance test of the twin who is not manifestly ill reveals a normal blood sugar curve which (after fasting) is not above 120 mg. per hundred cubic centimeters. This curve furthermore at its peak does not exceed 180 mg. per hundred cubic centimeters. In the second tolerance test with dextrose (after forty minutes) it shows no further rise, and finally, after 120 minutes it returns to its normal value. Termed probably discordant are those pairs of twins who could not be examined because they had already died but who according to the histories of their cases, appear not to have been affected with manifest diabetes mellitus.

According to the figures thus far elicited from these carefully performed studies seventeen pairs of enzygotic twins were absolutely concordant, thirteen were concordant according to tolerance, six were discordant according to tolerance and ten were probably discordant. Nine pairs of dizygotic twins were absolutely concordant, nine were concordant according to tolerance, thirty-two were discordant according to tolerance and thirty were probably discordant. Then-Berg established an interesting correlation between manifest diabetes mellitus and age. It was found that almost without exception after the age of 43 the enzygotic pairs were all concordant, and not one discordant pair was to be observed above this age limit.

It is therefore proved on the basis of a large group of twins that diabetes mellitus is purely hereditary. It is possible, however, with the examination methods available, to establish certain proof of the inherited inferiority only if the twins have passed the forty-third year of life.

### Immediate Resection in Cases of Perforating Gastric Ulcer

The therapeutic results with freely perforating gastric and duodenal ulcers have been considerably bettered in the last fifty years. The mean mortality in earlier times was as high as from 60 to 90 per cent, but in the last decade it has decreased to below 20 per cent. Information on this topic has recently been compiled by Dr. Junghanns at the surgical clinic of Frankfurt University (Professor Schmieden's clinic). Whereas formerly only 16 per cent of the patients came to operation during the first six hours and 54 per cent during the first twelve hours following perforation, in the last ten years 75 per cent came to operation during the first six hours after perforation and 95.4 per cent within the first twelve hours.

Moreover, changes in the surgical technic have made possible a more favorable prognosis. Immediate gastric resection has supplanted the older palliative interventions (suturing over, with or without gastro-enterotomy). In the last ten years there were performed at the Schmieden clinic sixty gastric resections (second method of Billroth), with a mortality of 67 per cent, and fifty-one palliative operations, as mentioned, with a mortality of 39.2 per cent. More favorable results can be obtained if the general condition, the circulation in particular, is correctly evaluated. The time elapsed between perforation and intervention is therefore not the decisive factor. Immediate resection has the additional advantage of leading to essentially more favorable permanent results. Follow-ups disclosed that 95.8 per cent of the patients who submitted to resection were completely fit to work, whereas only 67.8 per cent of those who had undergone palliative operations had regained complete working capacity.

### Indications for Arteriography and Ventriculography

The neurosurgeon Professor Tonnis recently discussed the indications for arteriography and ventriculography before the Berlin Medical Society. X-ray examination by means of ventriculography has become an important procedure for neurosurgeons, despite the fact that a mortality of 8 per cent is still to be reckoned with. A great many brain tumors and other cerebral disorders could not be diagnosed without ventriculography, and conditions of this sort incorrectly diagnosed almost invariably result in a fatal outcome. Insufflation of the ventricle, which is generally done after suboccipital puncture, makes possible an exact evaluation of the site, size and type of any tumor relating to the ventricles. Cases in which a considerable elevation of cerebral pressure is present are unsuitable for ventriculography. Consequently, arteriography has come increasingly to the fore. In the latter method the exposed internal carotid is injected with thorium dioxide sol. In this way information with regard to tumors of the medial or anterior cranial fossae is elicited without exposing the patients to the danger of increased cerebral pressure. Tumors of the temporal lobe can be visualized readily by this means. Since the region of the posterior cranial fossa is not supplied by the internal carotid artery, tumors arising there cannot be diagnosed by arteriography. The method is particularly valuable because it not only makes possible conclusions with respect to the site of the tumor but shows the source of the neoplasm's vascular supply as well. Since by arteriography tumors can be differentiated according to their richness or poverty in vasculature, accurate diagnoses with regard to their histologic structure may be made. The procedure is of special importance for the diagnosis of meningiomas and multiform neoplasms. It also aids in the recognition of brain abscesses and subdural hematomas. Ventriculography as well as arteriography should be done only if the indication is definite and then only by a specialist skilled in the technic.

## POLAND

(From Our Regular Correspondent)

Feb 1, 1939

## A Clinical Study of Angina Pectoris

Dr M Semerau-Siemianowski, professor at Warsaw University, and Dr H Rasolt have published a study of angina pectoris based on 518 patients seen by Professor Semerau-Siemianowski in his private practice and on eighteen patients admitted to the St Lazarus Hospital in Warsaw. These 536 patients were observed between 1925 and 1933. In 1936 a follow-up letter was sent to every patient. The small number of patients admitted to the hospital in proportion to those seen in private practice agrees with the records of others.

The ratio between the number of patients with angina pectoris and all patients over 20 with cardiovascular disorders consulted during the same period was 518 to 4373, or 12 per cent. White in America found the percentage to be 12.5, Koller in Germany 8.1, and J Pawinski in Poland 5.2. According to Cabot, cardiovascular disease occurs in 38 per cent of all patients, then the actual incidence of angina pectoris in Poland could be estimated at about 4.6 per cent of all other diseases. The incidence of angina pectoris obtained in the same way from the statistical data of White is 4.75 per cent, while in the former (1913) Polish report of Pawinski it was but 2.9. Thus there was an increase in the incidence of angina pectoris in Poland during the last two decades. Furthermore, this increase was more marked in the later four years of the period considered 1929-1932, than in the former four years, 1925-1929. This applies particularly to the organic forms of angina pectoris. Professor Semerau-Siemianowski supposes that this rise in the angina pectoris incidence may be due partly to social factors.

According to Professor Semerau-Siemianowski there are two main types of this disease, the organic and the functional. In the former he has distinguished two main forms: the acute form consists of only one variety, the cardiac infarction. The chronic form has three varieties: coronalgia, attributed to changes in the main coronary arteries and occurring with the clinical picture of angina of effort, myocardialgia, attributed to diffuse changes of the minute coronary arteries, followed by small necrotic foci in the myocardium and characterized by slight attacks of cardiac pain occurring at rest and by coexisting signs of heart failure, and aortalgia, due to pathologic changes in the aorta. There are four varieties of so-called functional angina pectoris: (1) the neurotic variety, (2) reflex angina pectoris, the attack being provoked by disorders in other organs, e.g. by flatulence or gallbladder diseases, (3) toxic angina, attributed to nicotine, caffeine or such endogenic factors as gout and endocrine disorders, and (4) anemic angina pectoris, caused by myocardial ischemia without any coronary disease.

The incidence found for these varieties of angina pectoris was coronalgia 52.7 per cent, aortalgia 11.5 per cent, myocardialgia 6.8 per cent and cardiac infarction 7.7 per cent. The organic forms of angina pectoris were found in 78.7 per cent of cases and the functional forms in 21.3 per cent. Neurotic angina pectoris was found in 11.5 per cent of cases, reflex angina in 4.7 per cent, the toxic form in 2.3 per cent and the anemic form in 2.8 per cent. The figures obtained for the incidence of the organic form agree strikingly with those obtained by some foreign authors. Gallavardin found organic forms in 78 per cent of his cases, White in 74 per cent and Lian in about 80 per cent. This comparison brought out that in at least three fourths or four fifths of cases angina pectoris has an organic substratum: cardiac infarction being present in every one of ten cases of organic angina pectoris. In 25.7 per cent of the cases of chronic organic angina a combination of the organic fundamental disease and functional factors was present. Coexisting functional factors were due to a reflex mechanism in 14.6 per cent of the cases of organic forms, to toxic influences in 7.1 per cent and to psychoneurotic agents in 4 per cent.

Angina pectoris begins most commonly in the fifth and sixth decades, and in the later decades the incidence decreases. This is in strong contrast to the age incidence of pathologic changes of the coronary vessels observed at necropsy, for these changes increase with the age of the subject. The authors then imply that an important cause of angina pectoris might be such agents as intense professional work and the irritations of everyday life as well as sympathetic and endocrine disorders arising at the age of about 50.

Angina pectoris has a strong tendency to affect Jews, the incidence being nearly four times greater in Jews than in others. Women were affected in only 12.5 per cent of all cases. The majority of the subjects were well-to-do and intelligent.

Heredity is likely to play an important part in the genesis of angina pectoris. A history of cardiovascular diseases in parents or in kinsfolk was found in 41.6 per cent of all cases of angina.

Syphilis is held to be the cause in from a fourth to a fifth of all cases.

The role assumed by nicotine in producing angina pectoris has been overrated. Although there might be some individuals particularly sensitive to smoking, no parallel was found between the amount of smoking and the seriousness of the condition. The same is to be said concerning the influence of alcohol.

The duration of the disease from the onset of symptoms to the first consultation did not exceed five years in about 50 per cent of the cases. The average duration until the first consultation was from three to four years. According to the 140 replies to the inquiry, the average time of survival was eight years after the onset of the disease. Death occurred at the average age of about 64. It occurred most frequently within the first year of the disease, afterward the mortality rate decreased gradually until the ninth year, after which the chances for survival lessened.

In 83.1 per cent of cases the pain was located behind the sternum; most commonly it was felt transversely and in rare instances longitudinally. In 12.1 per cent of cases the pain was located far from the precordial region. The pain was accompanied by anxiety in 37.5 per cent.

The anginal attack could be provoked by physical efforts in 68 per cent of all cases, by emotional disturbances in 37 per cent and by heavy meals in 20 per cent.

Normal systolic arterial pressure was found in 31.9 per cent of cases. It was lowered in 17.1 per cent and elevated in 51 per cent. The average systolic pressure of all the cases of angina pectoris was 168.1 mm. In females this average systolic pressure was higher than in males: 183 against 166 mm. The average diastolic pressure was 99.1 mm. The authors emphasize the considerable difference between the average systolic and diastolic pressures.

As shown by an x-ray examination, structural changes in the aorta were present in 36 per cent of all cases. There was evidence of sclerosis of the peripheral arteries in about 60 per cent of the cases. Intermittent claudication coexisted in 2.8 per cent and it occurred most frequently in tobacco smokers.

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## Marriages

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ARTHUR SUMNER BRINKLEY, Richmond, Va., to Miss Constance Elizabeth Brown of Greenwich, Conn., January 3.

WILLIAM EDWARD BARFIELD, Atlanta, Ga., to Miss Ellen Theresa Ryan of Savannah, Dec 23 1938.

WILLARD N. BLOVE, Oak Park, Ill. to Miss Mabel Lillian Wingard of Chicago, February 11.

STEPHEN TRENT BARNETT JR. to Miss Josephine Meador, both of Atlanta, Ga., in February.

SAMUEL TAMARKIN to Mrs. Ida Broida, both of Youngstown, Ohio, recently.



## Deaths

**James Carroll Flippin** \* Charlottesville, Va. University of Virginia Department of Medicine, Charlottesville 1901 member of the House of Delegates of the American Medical Association 1934-1938 and in 1936 was elected a member of the Council on Scientific Assembly for a term of five years to end in 1941, dean since 1924 and professor of internal medicine since 1915 at his alma mater, and at various times demonstrator of histology and pathology adjunct professor of bacteriology and professor of clinical medicine past president of the Medical Society of Virginia, aged 61 died, February 16, of heart disease

**William Gray Ricker** \* St Johnsbury Vt Johns Hopkins University School of Medicine, Baltimore, 1904, member of the House of Delegates of the American Medical Association 1925-1928, 1930, 1932-1934 past president and secretary of the Vermont State Medical Society, past president of the New England Medical Council, at one time chairman of the Vermont Department of Public Health, member of the American Academy of Ophthalmology and Oto-Laryngology and the New England Ophthalmological Society, aged 62, died, February 28

**Harry Philip Cahill** \* Boston, Harvard University Medical School, Boston, 1911, assistant professor of otology at his alma mater and the graduate school, member of the American Academy of Ophthalmology and Oto-Laryngology, American Otological Society and the New England Otological and Laryngological Society, served during the World War, surgeon to the Massachusetts Charitable Eye and Ear Infirmary, aged 54 died, January 15, in the Peter Bent Brigham Hospital of cerebral hemorrhage, hypertension and cerebral thrombosis

**P Maxwell Foshay** \* New York University of Pennsylvania Department of Medicine, Philadelphia 1891, member of the House of Delegates of the American Medical Association, 1902-1903 vice president of the Mutual Life Insurance Company of New York, aged 71, died, January 26 at the Mount Sinai Hospital, Montclair, N J, of coronary sclerosis and myocarditis

**Joseph Thomas Hornback**, Nevada, Mo Kansas City Medical College 1896, member of the Missouri State Medical Association, formerly secretary of the Vernon-Cedar Counties Medical Society, at various times county coroner county health officer and treasurer of the school board, aged 66, died, Dec 31, 1938, of cerebral hemorrhage

**Inman Williams Cooper** \* Meridian Miss University of Tennessee Medical Department, Nashville 1903 past president of the Mississippi State Medical Association, served during the World War, formerly member of the state board of health aged 56, died, January 26, at the Rush's Infirmary of cirrhosis of the liver

**Chester Dale Christie** \* Cleveland Western Reserve University School of Medicine Cleveland 1913, assistant clinical professor of medicine at his alma mater, served during the World War, aged 52, on the staff of the Lakeside Hospital, where he died, January 27 of coronary thrombosis

**Frank Guillemont** \* Niagara Falls, N Y, Western University Faculty of Medicine London, Ont, Canada, 1893, on the staff of the Niagara Falls Memorial Hospital, president of the board of managers, Niagara Sanatorium, Lockport, aged 66 died, Nov 1, 1938, of coronary occlusion

**George Emmet Hart**, Lyman, Neb Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1906 member of the Nebraska State Medical Association, aged 62, died Nov 6 1938 in the West Nebraska Methodist Episcopal Hospital, Scottsbluff, of lobar pneumonia

**Arthur Thomas Paull**, Flint, Mich, Detroit College of Medicine 1909, member of the Michigan State Medical Society, served during the World War, aged 61 died, Dec 11, 1938 in the Women's Hospital of heart disease and pneumonia following influenza

**Justin E Rowland**, South Euclid Ohio Homeopathic Hospital College Cleveland, 1891, past president of the county school board, aged 74, died Dec 9, 1938 in the Huron Road Hospital, East Cleveland, of coronary thrombosis

**Willis F Huntsman** \* Lexington, Tenn, University of Tennessee Medical Department Nashville, 1900 past president of the Henderson County Medical Society, aged 70, died, Dec 22, 1938 of coronary occlusion

**Edward J Higgins**, Joliet, Ill, Northwestern University Medical School, Chicago, 1901, member of the Illinois State Medical Society, city health officer, aged 67, died, Dec 24, 1938 of coronary thrombosis

**Alfred Ephraim Reiter**, Melcher Iowa, State University of Iowa College of Medicine, Iowa City, 1901, member of the Iowa State Medical Society, aged 61, died, Dec 8, 1938, of cardio-renal vascular disease

**David Wells Register**, Columbia, S C, Atlanta Medical College 1914, member of the Medical Association of Georgia, aged 52 was found dead, Dec 22, 1938, of carbon monoxide poisoning, self administered

**James John Conlon** \* Cuyahoga Falls, Ohio, University of Michigan Homeopathic Medical School, Ann Arbor, 1915, aged 54 died, Dec 2, 1938, in the City Hospital of carcinoma of the stomach

**David H Kogan**, Philadelphia Universität Bern Medizinische Fakultät, Switzerland, 1919, on the staff of the Mount Sinai Hospital, aged 49, died, Nov 23, 1938, of cerebral hemorrhage

**Jordan Lally** \* Long Island City, N Y, University of Vermont College of Medicine, Burlington 1921, aged 45, died, Nov 26 1938 in the New York Hospital of heart disease

**George William Woodnick**, Los Angeles, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois 1906 aged 62, died, Nov 10, 1938

**Jones Riley McMillan**, Cardington, Ohio Cincinnati College of Medicine and Surgery, 1895, aged 88, died, Dec 13, 1938 of arteriosclerosis and chronic interstitial nephritis

**John B Keaggy**, Pittsburgh, Jefferson Medical College of Philadelphia, 1875, member of the Medical Society of the State of Pennsylvania aged 86, died, Nov 6 1938, of uremia

**Walter Emil Frank** \* St Louis, Washington University School of Medicine, St Louis, 1910 aged 52, died, Dec 2, 1938 in the Lutheran Hospital of carbuncle on the neck

**William Otwa Lee**, Danville Va University College of Medicine Richmond, 1903, aged 59, died, Dec 31, 1938, in the Memorial Hospital of cancer of the pancreas and liver

**John Edwin Dearden** \* New York University of the City of New York Medical Department, 1891, aged 75, died, Dec 10 1938, in the Misericordia Hospital of pneumonia

**Hubert Lewis Hollenbeck**, Los Angeles, State University of Iowa College of Medicine, Iowa City, 1900, aged 62, died, Nov 18, 1938, of tuberculous bronchopneumonia

**Ezekiel E Gillilan**, Columbus, Ohio, Kentucky School of Medicine, Louisville 1893, aged 66, died, Dec 28, 1938, in the White Cross Hospital of heart disease

**Szabo Serge Kalman**, Roseville, Calif, Univerzita Komenského Fakulta Lekarska, Bratislava, 1921, aged 42, died, Nov 21 1938, of coronary occlusion

**William John Sweasey Powers**, New York, Cooper Medical College San Francisco, 1904, aged 63, died, Dec 12, 1938 of acute dilatation of the heart

**John Bernhard Egts**, Delphos, Ohio, Homeopathic Hospital College, Cleveland, 1885, formerly city health commissioner, aged 87, died, Nov 5, 1938

**Franklin Charles Hull**, Twining, Mich, Saginaw Valley Medical College, Saginaw Mich, 1901, aged 59, died, Dec 9, 1938, of cerebral hemorrhage

**Wellford B Lorraine**, Richmond, Va, Hahnemann Medical College and Hospital, Chicago, 1906, aged 58, died, Nov 12, 1938 of cerebral hemorrhage

**John Robert Pate**, Los Angeles Central College of Physicians and Surgeons, Indianapolis, 1897, aged 71, died Nov 5, 1938 of coronary occlusion

**Charles Jeremie Coulombe**, St Justin Que Canada, Victoria University Medical Department, Coburg, Ont, 1872, aged 92, died Dec 1, 1938

**Robert E La Rue** \* Erie, Ill Louisville (Ky) Medical College, 1894, aged 64, died suddenly, Dec 6, 1938, of coronary sclerosis and myocarditis

**Robert A Blackburn**, Glendale Calif, Hahnemann Medical College and Hospital, Chicago 1886, aged 82, died, Nov 24, 1938 of acute nephritis

**William Randolph Pettit** \* Brooklyn, Long Island College Hospital, Brooklyn, 1901, aged 66 died, Nov 11, 1938, of cerebral hemorrhage

**Carl Huston Wright**, Yorktown, Ind Medical College of Indiana, Indianapolis, 1903, aged 60, died, Nov 25, 1938 of angina pectoris

**Harry Sutphin Hatch**, Madison, Ind, Pulte Medical College Cincinnati, 1892, aged 71, died, Nov 29, 1938, of cerebral hemorrhage

## Correspondence

### THE CHEMIST IN THE MEDICAL LABORATORY

*To the Editor* —The place of the chemist in a clinical laboratory cannot be evaluated either by a busy physician or by a chemist without experience in laboratories. The problems of each laboratory are different.

From personal experience I feel that the chemist undervalues the participation of the physician in his laboratory work and that few physicians quite understand the purpose of the chemist. The less participation on the part of the physician in the clinical laboratory, the better for the essential work of the laboratory. At the same time, the fewer times the chemist is called on for his opinion as to whether a given determination is normal or pathologic, the better for the patient and the hospital. A physician, who believed his knowledge of chemistry to be adequate and who was asked to pass critical judgment on the work of the laboratory studied the intricacies of the work, and his confidence lessened at every step. Modern clinical chemistry involves, or at least should involve, the frontier of chemistry. An active physician cannot possibly keep abreast of the rapid developments in practical chemistry. I should ask for no better proof of the inadequacy of the determinations of the laboratory than that the attending physician "knows" what is going on. The physician gains little from his exposure to chemistry at best. Much pseudochemistry is encountered by the student after he leaves the chemistry laboratory by overenthusiastic teachers of other subjects. The ideal, of course, is to have in charge of the laboratory a man who has received fundamental training in chemistry in his premedical years and then taken a medical degree, but these men are rarely available and, when available, are frequently undesirable for one reason or another. It is far better to adopt the scheme that has been found to work with unquestionable efficiency. Let the physician ask the laboratory for certain definite determinations. Let the laboratory make the determination as its experience and judgment dictate. Let the interpretations lie with the physician. It is he, not the chemist, who can maintain touch with the meanings of results, the normals and the departures. The chemist has his chore in keeping abreast of the chemical times. The chemist is apt to accept as normal not the data given by his own observations but those published from some distant, perhaps foreign, laboratory. A certain chemist pasted into the end boards of a book he had written a series of normals as he gained the data from reading but checked against his own results interpreted as normal by a medical colleague (applied Biochemistry, ed 2, Philadelphia, W. B. Saunders Company, 1927) yet the list has been subjected to violent criticism, which is justified since the data applied more to the locality in which the determinations were made and less to the results of others in different regions. The physician should see that he is supplied by his laboratory with normals for the region in which he is working and draw conclusions of deviations from these normals as to whether his laboratory reports are within normal limits. Only the physician can determine whether the patient from whom the specimen is taken is normal or otherwise.

And so I would recommend the Monroe Doctrine for the clinical laboratory. The laboratory for the laboratory worker, interpretations for the physician. Far better than placing a medical man in charge of a laboratory is the procedure adopted by many fine institutions: namely, to have one or more chemists of unquestioned standing act as consultants to insure that the methods employed by the laboratory worker are acceptable and modern. Industries pay roundly for such services but they reap rewards.

W. THORW MORSF, PH.D., Lake Bluff, Ill.

### THE CLINICAL APPLICATION OF DUODENAL EXTRACT

*To the Editor* —Since reporting on the clinical application of duodenal extract (Macallum-Laughton) in the treatment of diabetes (Duncan, G. G., Shumway, N. P., Williams, T. L., and Fetter, Ferdinand *Am. J. M. Sc.* 189:403 [March] 1935), my associates and I have received many inquiries regarding the action of this preparation and the likelihood of its permanent value, but most of all its availability for distribution. At least one pharmaceutical firm has quoted our work as corroborating their questionable observations. We of course were not consulted about having our names used for this purpose.

It seems appropriate to recount, through the medium of *THE JOURNAL*, our disappointments, difficulties and the present status of this problem.

Following the apparently excellent results with two or three batches of the extract, made up in small quantities, the effect was lost when treatment with material made in large lots was begun. The former insulin requirement of the two children (G. D. and A. B.) returned. The two patients (T. G. and R. M.) who had been admitted in ketosis were obliged to resume taking large amounts of insulin several weeks after the apparently effective batch of extract was exhausted in spite of the normal dextrose tolerance curves obtained while receiving the extract.

In the interim between 1935 and the present (January 1939) we have not been able to reproduce our original results either in the original or in new patients. It is true that mild beneficial effects were noted occasionally, but they were not maintained nor were they convincing when subjected to critical analysis.

Under the assumption that the original extract made in small batches was effective, the following possible causes for the loss in potency have been considered: (1) changes from small to large quantity production, La Barre's method of isolating the duodenal hormone which was clinically successful in laboratory preparations has also failed to give active material in mass production, (2) changes in the method of extraction and preservation, and (3) obtaining the extract from animals which had not been fed for several days before being slaughtered. This is the most probable. Macallum (*Canad. Chem. & Process Industries* 22:13, 1938) indicates that there is active material, physiologically identical to Young's glycopeptide but possessing greater stability, in the pancreas of starving cattle but that the problem of isolation is complicated by the presence of insulin and a powerful insulin antagonist.

After a survey of the clinical results the following just criticism can be offered. New patients with diabetes were used for our observations and not patients who had had the disease for long periods and whose insulin need was thoroughly known.

There are rare diabetic patients who present an apparently severe form of diabetes when first seen but who, following initial treatment, do well on diet therapy alone for a short period but eventually need large amounts of insulin. That several of these patients should be seen consecutively, as would appear to be the case if this explained our results, is most unlikely, especially when two were children and one was an adolescent youth.

In summary, we have been unable to confirm our early results but believe that the striking effects obtained from an apparently potent duodenal extract were not merely coincidental. Clinical work with the extract has been discontinued pending the outcome of animal experimentation which is being actively pursued by Macallum.

GARFIELD G. DUNCAN, M.D., Philadelphia

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### CEMENT BURNS AND DERMATITIS

*To the Editor*—1 What is the best treatment for skin burns from wet quick setting cement? 2 What is the incidence of recurrence of cutaneous eruptions at the sites of old cement burns? Is the development of blebs containing clear fluid on the once healed areas a criterion of chronic cement poisoning? 3 Is it possible that painful hip and knee joints could be caused by extensive cement burns on the legs three weeks after the wounds have healed?

M D Texas

**ANSWER**—1 Quick setting cements may contain, in addition to calcium oxide, such other cutaneous irritants as potassium sulfide, sodium carbonate, potassium carbonate, alum, calcium chloride and aluminum chloride, but the treatment for burns caused by quick setting cement is the same as for burns caused by ordinary cement, viz the application of mild palliative lotions such as boric acid solution calamine lotion or soothing ointments such as boric acid ointment, zinc oxide ointment or calamine ointment. In addition to this the worker should be removed from further exposure to the cement.

2 Cutaneous eruptions at the sites of old cement burns should not recur unless there is a fresh exposure to cement. However, workers with psoriasis or lichen planus may have an occurrence of these diseases on the site of old cement burns.

The development of blebs containing clear fluid on the once healed areas of cement burns is not a criterion of chronic cement poisoning. There is no such condition as a chronic cement poisoning in the same sense as there is a chronic lead or benzene poisoning. If a dermatitis caused by cement is not properly treated and the exposure to cement continues, a chronic eczema may result. In this condition the skin is thickened and may have cicatricial infiltrations which may become covered with vesicles and pustules. Conjunctivitis and ulcers of the mucous membranes of the nose and mouth and fever may develop at this stage. Such a condition might be termed by the workers chronic cement poisoning.

3 Extensive cement burns on the legs three weeks after the wounds have healed may cause painful hip and knee joints if the cicatrices are deep and pull on the joints, but workers with cement in the open air may suffer from rheumatic pains in the joints resulting from rapid changes in temperature, strain and fatigue, and not due to any damage caused by the cement.

Further information on cement dermatitis may be found in *Queries and Minor Notes*, THE JOURNAL Nov 12, 1938, page 1867.

### PAPULAR URTICARIA AND ALLERGY

*To the Editor*—Will you kindly advise me just what is the underlying cause or what are the factors involved in the well known fact that the urticaria of infants and young children is so frequently papular vesicular or bullous or a combination of such lesions and that the lesions of urticaria in an adult are nearly always wheals? Is it a question of histopathologic differentiation or is it a matter of allergy? Kindly explain in detail if possible.

ALBERT S TENNEY MD East Orange N J

**ANSWER**—First it must be emphasized that the adult type of urticaria (erythema with wheal formation) does occur in children. The type of urticaria which the inquirer describes as occurring in infants and young children no doubt has reference to lichen urticatus or urticaria papulosa. This urticarial manifestation appears to be common in Europe but less common in this country. The lesions begin with small areas of pale pink to deep red blotches or wheals. The wheals last for only a few hours and are frequently present only at night, therefore they are usually missed. The latter are replaced quickly by papules or vesicopapules. The papules last for several days or weeks. They are mainly above the surface of the skin. The itching often leads to excoriation and crusting and subsequent discoloration. Where the skin is thicker, large vesicles or bullae may result. The lesions are discrete and occur particularly on the extensor surfaces of the forearms and legs, on the buttocks and on the lower portion of the back.

The classic description of the tissue changes in the ordinary urticaria are those of capillary dilatation, areolar flush and wheal formation from increased permeability leading to localized edema. In lichen urticatus, Sequeira (*Diseases of the Skin*,

New York, Macmillan Company, 1927) describes the papule as a papillary edema, with infiltration of leukocytes and dilatation of vessels. The corpus mucosum is edematous and under the stratum corneum there is a mass of imperfectly formed corneous cells. The cells of the epidermis are in a spongy condition, resembling that in eczema. While allergy is generally regarded as the most important single factor in the whealing type of urticaria, the status of allergy in papular urticaria is more uncertain and more complex. According to Bray (*Recent Advances in Allergy*, Philadelphia, P Blakiston's Son & Co., 1934) in the majority of such cases dietary and thermal factors are involved. The dietary causes are due primarily to two types of foods. The fats, especially bacon and pork products and fish oil, constitute an important group. The other foods include common allergens such as egg, fish, potato and cocoa. In allergy to the first type of foods, cutaneous reactions are almost never obtained. The factor of heat is an important one, according to Bray, since this rash generally appears only in the warmer months or after warm baths, exercise or other causes for increased temperature of the skin.

It is quite evident, therefore, that lichen urticatus or papular urticaria shows evidence of histopathologic differentiation from the common urticaria. Whether this is due to the nature of the child's skin as differing from that of the adults or whether the explanation lies in the difference of the etiologic factors cannot be definitely ascertained. Nevertheless, in the final analysis, the allergic background is usually present in both of these conditions.

### TENDRA MEAT TENDERIZER

*To the Editor*—A patient has inquired about Tendra. It is used to brush on steak and is supposed to make the muscle tender breaking down the fiber. The patient said it is made from a plant or fruit which comes from South America. Could this be harmful and should patients be advised against using it?

T P BENNETT MD Alliance Ohio

**ANSWER**—There are a number of "meat tenderizers" in addition to one marketed under the name of "Tendra" by Tendra Kitchens, Cincinnati. It appears from information available that Tendra (and some of the other preparations intended for "tenderizing" meat) is made from Carica papaya, or melon trees, of tropical and semitropical districts. The juice of the fruit contains a proteolytic enzyme called papain. Like trypsin, this enzyme is capable of digesting many proteins. From time to time such products have been introduced into therapeutics, although nowadays they have received little use in that connection. It is claimed that by applying an extract containing papain to tough meat it can be rendered more tender, probably by the partial digestion of some of the connective tissue. According to a report of Shiro Tashiro and L H Schmidt in the *American Journal of Physiology* (119 413 [June] 1937) the product is nontoxic when ingested in small amounts by mouth, but workers and others handling the material must exercise precautions to keep their hands washed because otherwise the papain will attack the skin. According to a release of the Federal Trade Commission, the Perfect Manufacturing Company, trading as Tendra Kitchens, Cincinnati, has stipulated that it will cease representing that by using "Tendra" every portion of the meat can be cut with a fork and one can serve the "tenderest meat in town" and that use of "Tendra" shortens the time of cooking by a definite percentage.

### PEPTIC ULCER

*To the Editor*—What is the consensus on the use of vitamins in duodenal ulcer and which vitamins seem most helpful? What are the latest books covering this? What books or other literature are available on their recent efforts in ulcer treatment?

GEORGE TAYLOR, MD Mooresville N C

**ANSWER**—Vitamins have no specific role in the treatment of duodenal ulcer. However, because of the fact that many of the diets for ulcer produce an avitaminosis it might be well to incorporate mixtures of vitamins in the therapy of peptic ulcer. Furthermore, because a patient may have had a previous limited intake of a sufficient number of vitamins it might be included a priori in the diet at the beginning. The latest book on the treatment of ulcer is by G B Eusterman and D C Balfour (*The Stomach and Duodenum*, Philadelphia, W B Saunders Company, 1935). The following are the references for some of the newer works on peptic ulcer.

- Metz M H and Lackey R W Posterior Pituitary Extract *Dallas M J* 24 46 (April) 1938  
Jones C R Colloidal Aluminum Hydroxide *Am J Digest Dis & Nutrition* 4 99 (April) 1932  
Mutch Nathan Hydrated Magnesium Trisilicate *Brit M J* 1 254 (Feb 8) 1936  
Emery E S Jr and Schmitzer N A Effect of Administration of Bile *Ann Int Med* 11 2007 (May) 1938

## HAZARDS FROM GLUE MANUFACTURE

*To the Editor*—I wonder whether there is any industrial hazard in the manufacture of an envelop glue which consists of a tapioca dextrose mixture and acetic acid which is boiled together for about five hours. A patient says that he has headaches daily which are increased by the fumes of this mixture. The reflexes the Wassermann reaction and the heart are normal. Blood examination gives hemoglobin 96 per cent (Sahli), 4 000 000 red cells differential normal 10 000 white cells.

M D Illinois

**ANSWER**—The characteristic point of attack of acetic acid vapors is the conjunctiva. Action may also be exerted on the mucous membranes of the respiratory tract and thereafter on the skin. Unless some of these manifestations have appeared, it is most unlikely that acetic acid is any direct producer of the headaches mentioned in the query. The tapioca powder conceivably might lead to allergic manifestations of which headache might be one. When tapioca is boiled over a long period with acetic acid the chemical reaction that takes place probably leads to hydrolysis with the possible formation of polyhydroxy compounds. Higher aldehydes may be produced. However it is not known that any of these compounds possess toxic properties. The presence of headaches under conditions of prolonged boiling of a product should lead to the suspicion of carbon monoxide poisoning particularly if gas is the fuel.

## STATURE OF AMERICANS

*To the Editor*—Kindly give me the average height for the full grown normal American male and female of this present generation.

M D Ohio

**ANSWER**—This question was referred to Prof. C. A. Hooton of the Department of Anthropology of Harvard who has kindly supplied us with the following tables:

*Statues of Americans (Native Born of Native Parentage)*

		Males			
				Stature	
		Age Range	Number	Cm	Inches
Century of Progress	15 84	1544	174 81	68 82	(geographic totals)
Criminals	15 79	4201	171 90	67 67	
Harvard sons	17 21	480	177 50	69 88	
		Females			
				Stature	
		Age Range	Number	Cm	Inches
Century of Progress	15 79	1840	162 03	63 79	(geographic totals)
Eastern college women	17 19	571	164 53	64 78	

## INTRAVENOUS DEXTROSE AND BLOOD AGGLUTINATION

*To the Editor*—It has been stated that at least four hours must elapse after a patient has had dextrose before the blood is suitable for cross matching with a donor's blood. The presence of 5 or 10 per cent dextrose in the blood stream is said to favor false agglutinations. Is this correct?

M D Idaho

**ANSWER**—The intravenous injection of 5 or 10 per cent dextrose solution does not give rise to false agglutination. While it is true that in vitro high concentrations (above 5 per cent) of dextrose can cause agglutination of red blood cells, in vivo such concentrations are never reached after intravenous injection. It is obvious that if intravenous injections of dextrose were to give rise to false agglutination, attention would have been called to this fact by individuals doing grouping tests yet no report of such a phenomenon has been published in the literature.

## HEPTYL ALDEHYDE AND MOUSE TUMORS

*To the Editor*—I noticed the request from Dr. A. Grebler in *Queries and Minor Notes* January 28 about heptyl aldehyde in mouse tumors. One reference to Dr. Strong's work is found in *Science* (87:144 [Feb. 11] 1938). Dr. Frank Dickens in the 1938 report of the British Empire Cancer Campaign reports work that he has done with Dr. E. W. Miller with feeding heptyl aldehyde to tumor-bearing animals and also with injections of the substance dissolved in sesame oil. He states that neither in transplanted nor in spontaneous mouse tumors have any marked effects on the growth of the tumors been observed although with the transplanted tumors there was slight retardation but it was not possible to state at that time whether or not retardation was significant. He states further that the respiration of tumor tissue (Walker carcinoma and Jensen sarcoma) is more susceptible to heptyl aldehyde than is normal rat tissue (liver kidney testis) but that brain is also rather susceptible. No work on man is reported.

RALPH L. HOFFMAN, M.D., San Diego, Calif.

## Council on Medical Education and Hospitals

## ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Thirty-Fifth Annual Meeting held in Chicago Feb. 13 and 14, 1939

DR. RAY LYMAN WILBUR, Stanford University, Calif.  
in the Chair

## COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

FEBRUARY 13—MORNING

## Protection of the Public Through Activities of the Council on Medical Education and Hospitals

DR. RAY LYMAN WILBUR, Stanford University, Calif.  
Among the really great possessions of the human race are the code of ethics and other traditions of the medical profession. Rooted in the remote past and of steady growth over the centuries, the established relations of the physician to his patient and to the public have seemed so necessary that they have been taken largely for granted. To grasp their great values one need think only of what would have happened if medicine had been operated on a cut-throat competitive basis regardless of anything else than the money involved. What a sinister picture it would be if the traditions of the profession based on long experience had not been a controlling factor at the beginning of this modern era of the application of science to the relief of human ills. The potentialities of the doctor for good or evil in private life in organized society and in public health are great. It would be impossible to control him by fiat or legislative acts. There is no possible substitute for competence in medical care and competence can come only from education and training. There is a constant increase in the number of people who want good medical care and who know its value. A great movement is stirring for a wider spread of such care throughout the country.

The work of the physician brings him imperative lessons on the damage done to human lives through ignorance. His constant battle with the quack is based on the results to human lives which he knows have come from improper or inadequate treatment fostered by false promises. A lack of scientific appreciation and training makes it difficult for the public to judge many medical questions. So few persons understand biology or know anything about life except that they are living that naturally many can be easily imposed on.

The physician has led in all civilized countries in the efforts to control the activities of those who are inadequately trained for the care of the sick. The public itself has no adequate way in which it can give protection to individuals or to the community without the intervention of the trained scientist and the expert physician.

The policy of licensing physicians was first started in the United States in New York in 1766. Since that time various methods have been employed in an effort to secure for the public an assurance of competence in the practice of medicine. Examining boards of various sorts have been set up. Limitations have been placed around membership in medical societies. Public officials have had to meet certain requirements and have been appointed or elected to carry out the provisions of health laws. Reciprocity between various states has been devised. A national examining board has been set up. These procedures no matter how carefully conducted fail to accomplish many of the results desired. Experience has shown that the only real safeguard which the public has is the requirement that candidates for medical licenses be graduates of established medical schools of good quality. In the past large numbers of medical schools that gave a valueless education have been chartered by the state. When those associated with the American Medical Association decided that steps should be taken to insure a better training of physicians, the Council

on Medical Education was set up to provide those interested, including the state boards of registration, with a reliable and impartial list of medical schools worthy of recognition. No agency except the American Medical Association could be depended on to procure this information in an impartial manner and to present it to the public. The American Medical Association has broad enough shoulders to take the responsibility and can stand up for standards for the protection of the public even at the expense of certain schools. As a result of the activities of the Council on Medical Education which later took on the responsibility of rating certain educational features of the hospitals as well there has been an unparalleled advance in the last thirty years in medical education. The Council is without power over these medical institutions. It can only try to discover the facts, make them public and indicate its judgment as to the merits or demerits of the medical schools or the hospitals for the training of those who are to care for the sick. Its relationship to the hospitals depends on the internships for young physicians and graduate work. It aims to see that no young doctor wastes his time on an internship in which it is impossible to gain sufficient experience and that a physician seeking further training gets full value for his time. A record is maintained of every practitioner from the time he enters medical school until his death.

The activities of the American Medical Association through the Council on Medical Education and Hospitals constitute one of the most potent forces for the protection and care of the health of the American people. Only by learning continuously and keeping up to date can the physician render the best service. The Council therefore has interested itself in the instruction of graduate physicians in medical schools and hospitals and in the development of educational programs in the county, state and national medical societies. It has taken a part in the preparation of opportunities for specialists and in devising plans by which suitable recognition can be given to those who have had satisfactory training. Only trained physicians can judge just what a medical education should be or test the candidate for practice as to competence. The acceptance by the American Medical Association of this great task has resulted in a major service to all mankind.

#### College Education for the Future Doctor

JAMES B. COVANT, PH.D., Cambridge, Mass. This paper will be published in full in *THE JOURNAL*.

#### Organization and Subject Matter of General Education

ROBERT MAYNARD HUTCHINS, LL.D., Chicago. This paper will be published in full in *THE JOURNAL*.

#### Canadian Experiments in Medical Economics

DR. T. C. ROUTLEY, Toronto, Ont. This paper will be published in full in *THE JOURNAL*.

FEBRUARY 13—AFTERNOON

DR. CHARLES GORDON HEALD, New York, in the Chair

#### The South as Testing Ground for the Regional Approach to Public Health and Public Welfare

HOWARD W. ODUM, LL.D., Chapel Hill, N.C. There are so many facts available that it seems best to present my comments in a sort of factorial syllabus in which a series of assumptions constitutes the premises for discussion.

1. Public health is a new problem arising from the extraordinary developments in the trends of population, in modern technologic civilization and from the increasingly vital relation between the economy of the people and the health of the people.

2. The population of the Southern states is being and will continue for a long time to be reproduced more rapidly than that of any other region of the nation. Its excess of births over deaths is 10 per thousand, as compared with the national average of 7 per thousand and already it has the most thickly populated rural area in the United States. Of the 108,600,000

native born persons in the country in 1930, 28,700,000 were born in the Southeast, all but 4,600,000 in rural districts. Since the turn of the century the South has sent into the rest of the nation something like 4 million people. It is clear how important to the nation the health and vitality of the southern people are.

3. The South is a region of multiple cultures with subregions representing the lowest measure of health efficiency in the nation and other subregions approximating high standards. Considering the rural and frontier nature of the culture, the situation is often not half so alarming as it appears to the citizen and student versed only in the perfection of urban health and sanitation.

4. The southern regions reflect an extraordinary deficiency in nearly all aspects of public health and medical services and many special problems are found in the South on which special attack must be made for the good of the people, the region and the nation. It is possible to point out a nucleus of four counties in a state of the lower South which had a death rate in 1935 from malaria of from 116 to 130 per hundred thousand of population as compared with only 21.6 for the whole state and 3.6 for the nation. This subregion is surrounded by five counties with a rate of from two to three times the rate of the state and from ten to twenty times the national rate. It is possible also to select a group of counties in the Piedmont subregion with an estimated incidence of 600 cases of pellagra per hundred thousand of population. In another state of the lower South the 1935 health indexes for the whole state indicate that more than three of every hundred people have actually been reported as having malaria, nearly two of every thousand as having pellagra and hookworm and about the same number as having social diseases. It is generally recognized that morbidity is greatly under reported.

One may follow this first series of assumptions with a second series somewhat more specifically applied to the South.

1. A problem to be attacked is that of developing a more balanced economy in which the income and wealth of the people of the South may approximate adequacy for higher standards of living and a richer culture. All the king's horses and all the king's men cannot put together the components which go into an adequate health and medical service for a majority of the people whose income is simply not adequate.

2. On the other hand, the great majority of southern rural folk cannot attain economic effectiveness until they have been adequately conditioned in health and vitality.

3. Basic both to the explanation of the health situation and to the planning of the future is the recognition that a first task, almost prior to public health and medical technique, is provision for adequate diet and general home regimen and sanitation. This applies particularly to pellagra and hookworm on the one hand, and, on the other, to the importance of recent discoveries and contributions in the field of biochemistry and nutrition in the reconstruction of an entire group of people. The minimum dietary requirements for the whole Southeast may be set at 2,450,000,000 gallons of milk, of which there is a production deficit of 1,161,455,000 gallons. Only 62 per cent of all farms reported cows milked and the average number of gallons per animal was only 394, as compared with 618 for the Northeast, 638 for the Far West and 530 for the Middle states. The number of pure bred cattle per farm is less than 1 per cent, as compared with 28 per cent for the nation.

4. A prime problem again almost preceding the problem of the technical tools and administration of public health and medicine, is general health education. It may be no reflection on the people but it is no alteration of the fact that, without opportunity to understand the fundamentals of health, medicine and hygiene, as well as the essential meaning of high standards of living, of work and of food values, the people do not understand needs, opportunities and fundamentals. Many not only do not understand but would oppose standards and procedures. They would continue in many of the folk beliefs and practices which have held them back. There must be an effective bar-

rage of school and adult education to pave the way for the public health program. Indeed this is a part of the testing field for realistic public health planning.

5 Another assumption with reference to the South as a testing field for public health and medical service is that the burdens and handicaps which come from present and prospective deficiencies fall extremely hard on the youth, who, like the youth of the rest of the nation, search for security and reality. In the present and prospective economy and culture of the region not more than half of the youth may hope, under the most optimistic of premises, to find either.

6 The last assumption in the second series has to do with the actual program of public health and medical services. The premise is that in the South there is a supreme need of immediately increasing programs of public health and medicine accompanied by realistic programs of research, education and public welfare planning.

The third and last series of assumptions tends to focus more nearly on the implications of the other series in terms of programs.

1 There does not appear to be any alternative to an increasingly larger contribution to the problem on the part of public health agencies. Inherent in the assumption is the consideration that in proportion as the nation helps enrich its regions it enriches itself and prevents subsequent drain of its resources for relief.

2 In the regular normal machinery of the Southern states and in particular the county unit basis of their public services there is an admirable testing ground for wholesome and effective cooperation between and among the counties, the states and the federal government.

3 Success in all aspects must be predicated on the training and use of a larger number of public health officials and workers as well as the strengthening of the personnel and availability of medical and hospital services. Such training centers as are being developed in the Nashville-Vanderbilt region and in Southeastern Region 2, in the state of North Carolina, represent policies and procedures which should be strengthened.

4 There is an extraordinary need for more study and research in many areas. There are almost no reliable data to give an adequate basis for conclusions in relation to diet and climate in the South or with reference to the environmental influences in farm tenant and other groups.

5 In view of these facts and the fundamental situation with reference to the growing population and the inadequacy of resources, a fifth assumption naturally focuses on sound programs relating to birth control. The North Carolina birth control clinical services are representative of what might be done, clinics already being in operation in between sixty and seventy counties in the state.

6 There is great need for an increasing number of experimental services in this and in many other fields distributed throughout the various subregions and comprehending private and public efforts. The University of North Carolina Division of Public Health expects to have, through a grant from a private agency devoted to the study and reduction of social diseases, a full time professor of syphilology.

These assumptions indicate both the nature and the promise of the South as a testing ground for the regional approach to public health work. From the premise that the South has a superabundance of natural wealth and human wealth but that there is an extraordinary degree of waste in both, the conclusion is justified that for science skill and the professions devoted to the development, conservation and utilization of all resources in harmony with a practical adaptation to the normal process of democratic government and civic cooperation it will constitute the perfect testing grounds for next steps.

#### DISCUSSION

DR L. J. KOSMINSKY, Texarkana, Ark. In Arkansas under the state health officer Dr W. B. Gravson, there is a good strong program with health units. The counties do not

all have them, but through the American Legion and the Forty and Eight, cooperating with the state department of public health, serums of all types, diphtheria toxoid and vaccines are being issued and typhoid immunization and treatment for syphilis are being given free irrespective of whether the recipient is indigent, in an effort to eradicate the diseases concerned. In my county in the last year several children were given rabies serum, which was furnished by the state health department. They were also given antitetanus serum. Physicians should teach rural families how to have good health and to provide during the productive months for foodstuffs for the winter. Many families who have milk and make butter and sell it in town do not give their children any milk or butter.

DR R. N. WHITFIELD, Jackson, Miss. I will be glad if you will not think that the South is in such a bad situation as you might from the address you have just heard. A man from the University of North Carolina got his Ph.D. degree by coming to my office and getting one year's statistics on births and going back in two or three weeks with his thesis. He had proved that the birth rate is higher on some soils than it is on others. I did not find out what soil it is in Mississippi that produces a higher birth rate than any other, but I might guess that it is sandy soil down where they have or have had the hookworm disease. There are some good things in the South. The work of the state board of health is free from politics in Mississippi, and I understand that this is not true in a great many states in the North and in the East. Visitors have come from all over the United States, Europe, Asia and South America to learn our methods. There are only two states in the Union with a Negro population of less than 10 per cent that have a lower death rate than the white people of Mississippi. It seems that the South is a testing ground right now. I guess that there are 100 WPA projects in Mississippi alone—sewing projects and every other kind of project. The country down there is a little poor financially, but it is doing fine.

DR ANTON J. CARLSON, Chicago. I have seen mass deficiencies in nutrition in many parts of the world. I am disturbed by the speaker's all-inclusiveness, as if the physician under the program of public health, is to be the savior of mankind. I think that we shall have to differentiate a little. The doctor is not a farmer. Part of the difficulty with nutrition in the South is of course the lack of diversified farming and the lack of distribution of foodstuffs from other parts of the country. It would be unfortunate to hook up all these things all the while in the South, with what a program of public health is ordinarily understood to be. The program is entirely too broad for the doctor. Soil conservation, diversified farming and education in the fundamentals of biology and nutrition must be carried on through other agencies which already exist. The essential program of public health should not be obscured by this all-inclusiveness. I listened to a Negro sharecropper from the South and he prided himself on the fact that there is no shortage in the crop of children. One of the big educational needs is what the speaker mentioned, namely birth control. There should be no pride in mere numbers, regardless of the proportion of incompetents and unfortunates.

DR HOWARD W. ODUM, Chapel Hill, N. C. Because the problem is so important so big and so conditioned by economic social and historical factors, the physician cannot manage it alone. It must be a problem of cooperation. Few things are more futile than a superimposed artificial program set up by a group of single-track specialists. Mississippi is my favorite state. I was three years at the university. The man mentioned took five years to get his doctor's degree and he is teaching at the University of Florida. Southerners are the best people in the world, but I am looking at facts as they are, and they must be faced. I want to stress the nonacademic realistic practical value of recognizing the regional folk because in diversity there is strength in America.

(To be continued)



# Medical Examinations and Licensure

## COMING EXAMINATIONS

### STATE AND TERRITORIAL BOARDS

ALABAMA Montgomery, June 20 22 Sec Dr J N Baker 517  
Dexter Ave Montgomery  
ARIZONA Tucson March 21 Sec Dr Robert J  
Nugent Science Hall University of Arizona Tucson  
April 11 12 Sec Dr J H Pitter on 826 Security Bldg Phoenix  
ARKANSAS Medical (Regular) Little Rock June 8 9 Sec State  
Medical Board of the Arkansas Medical Society Dr J J Kosminsky  
317 State Lane Texarkana Medical (Elective) Little Rock June 8 9  
Sec Dr Clarence H Young 1415 Main St Little Rock  
CALIFORNIA Written examinations San Francisco July 10 13 and  
Sacramento Oct 16 19 Oral examinations (required when reciprocity  
application is based on a state certificate or license issued ten or more  
years before filing application in California) San Francisco March 22  
Los Angeles August 7 and San Francisco Nov 15 Sec Dr Charles  
B Pinkham 420 State Office Bldg Sacramento  
COLORADO Denver April 5 7 Sec Dr Harvey W Snyder 831  
Republic Bldg Denver  
CONNECTICUT Medical Endorsement Hartford March 28 Sec  
Dr Thomas P Murdock 147 W Main St Meriden Basic Science  
New Haven June 10 Prerequisite to license examination Address State  
Board of Healing Arts 1995 Yale Station New Haven  
DELAWARE Dover July 11 13 Sec Medical Council of Delaware  
Dr Joseph S McDaniel 229 S State St Dover  
DISTRICT OF COLUMBIA Basic Science Washington June 26 27  
Medical Washington July 10 11 Sec Commission on Licensure Dr  
George C Ruhland 201 District Bldg Washington  
FLORIDA Jacksonville June 19 20 Sec Dr William M Rowlett  
Box 786 Tampa  
GEORGIA Atlanta June Joint Sec State Examining Boards Mr  
R C Coleman 111 State Capitol Atlanta  
HAWAII Honolulu April 10 13 Sec Dr James A Morgan 48  
Young Bldg Honolulu  
IDAHO Boise April 4 7 Address Dir Bureau of Occupational  
License Rm 385 State Capitol Bldg Boise  
ILLINOIS Chicago April 11 13 June 20 22 and Oct 17 19 Super  
intendent of Registration Department of Registration and Education  
Mr Homer J Byrd Springfield  
INDIANA Indianapolis June 20 22 Sec Board of Medical Registration  
and Examination Dr J W Bowers 301 State House Indianapolis  
IOWA Basic Science Des Moines April 11 Dir Division of  
Licensure and Registration Mr H W Grefe State Department of  
Health Capitol Bldg Des Moines  
KANSAS Kansas City June 13 14 Sec Board of Medical Registration  
and Examination Dr J F Hassig 905 N 7th St Kansas City  
KENTUCKY Louisville June 7 9 Sec State Board of Health Dr  
A T McCormack 620 S Third St Louisville  
MARYLAND Medical (Regular) Baltimore June 20 23 Sec Dr  
John T O'Mara 1215 Cathedral St Baltimore Medical (Homeopathic)  
Baltimore June 20 21 Sec Dr John A Evans 612 W 40th St  
Baltimore  
MICHIGAN Ann Arbor and Detroit June 14 16 Sec Board of Regis-  
tration in Medicine Dr J Earl McIntyre 100 W Allegan St Lansing  
MINNESOTA Basic Science Minneapolis April 4 5 Sec Dr J  
Charnley McKinley 126 Millard Hall University of Minnesota Minne-  
apolis Medical Minneapolis April 18 20 Sec Dr Julian F Du Bois  
350 St Peter St St Paul  
MISSISSIPPI Jackson June Asst Sec State Board of Health Dr  
R N Whitfield Jackson  
MONTANA Helena April 4 5 Sec Dr S A Cooney 216 Power  
Block Helena  
NEBRASKA Basic Science Omaha May 23 Medical Omaha  
June 8 9 Dir Bureau of Examining Boards Mrs Clark Perkins State  
House Lincoln  
NEVADA Carson City, May 13 Sec Dr John E Worden Capitol  
Bldg Carson City  
NEW JERSEY Trenton June 20 21 Sec Dr Earl S Hallinger 28  
W State St Trenton  
NEW MEXICO Santa Fe April 10 11 Sec Dr Le Grand Ward 135  
Sena Plaza Santa Fe  
NEW YORK Albany Buffalo New York and Syracuse June Chief  
Bureau of Professional Examinations Mr Herbert J Hamilton 315 Edu-  
cation Building State Education Department Albany  
NORTH CAROLINA Raleigh June 19 Sec Dr William D James  
The Hamlet Hospital Hamlet  
NORTH DAKOTA Grand Forks July 5 8 Sec Dr G M Williamson  
4½ S Third St Grand Forks  
OKLAHOMA Basic Science Oklahoma City May 15 Sec of State  
Hon C C Childress State Capitol Oklahoma City Medical Oklahoma  
City June 14 Sec Dr James D Osborn Jr Frederick  
OREGON Basic Science Corvallis July 8 and Portland Oct 28 Sec  
State Board of Higher Education Mr Charles D Byrne University of  
Oregon Eugene  
PENNSYLVANIA Philadelphia and Pittsburgh July Sec Board of  
Medical Education and Licensure Dr James A Newpher 400 Education  
Bldg Harrisburg  
RHODE ISLAND Providence April 6 7 Chief Division of Examiners  
Mr Robert D Wholey 366 State Office Bldg Providence  
SOUTH CAROLINA Columbia June 27 Sec Dr A Earle Boozer  
503 Saluda Ave Columbia  
SOUTH DAKOTA Rapid City July 18 19 Director Medical Licensure  
Dr C J Van Heuvelen State Board of Health Pierre  
TENNESSEE Memphis March 22 23 Sec Dr H W Qualls 130  
Madison Ave Memphis  
TEXAS June Sec Dr T J Crowe 918 Mercantile Bldg Dallas  
VERMONT Burlington June 14 16 Sec Board of Medical Registra-  
tion D W Scott Nay Underhill  
VIRGINIA Richmond May 21 23 Sec Dr J W Preston 30½  
Franklin Road Roanoke  
WISCONSIN Basic Science Madison April 1 Sec Prof Robert N  
Buer 3414 W Wisconsin Ave Milwaukee Medical Milwaukee June  
2 30 Sec Dr Henry J Gramling 2203 S Layton Blvd Milwaukee

### NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special  
Boards were published in THE JOURNAL March 11 page 1012

## Alabama Reciprocity and Endorsement Report

Dr J N Baker, secretary, Alabama State Board of Medical  
Examiners, reports nineteen physicians licensed by reciprocity  
and one physician licensed by endorsement from Aug 12 through  
Dec 23, 1938 The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine		(1936)	Arkansas
Denver Homeopathic College		(1901)	Colorado
Emory University School of Medicine		(1936)	Georgia
University of Illinois College of Medicine		(1931)	Missouri
Tulane University of Louisiana School of Medicine		(1921)	Virginia
(1932) Minnesota, (1937) Louisiana			
University of Michigan Medical School		(1924)	Michigan
Washington University School of Medicine		(1936)	Missouri
New York University College of Medicine		(1936)	New York
University of Buffalo School of Medicine		(1936)	Ohio
Ohio State University College of Medicine		(1933)	Ohio
University of Oklahoma School of Medicine		(1934)	Oklahoma
University of Tennessee College of Medicine (1931)		(1936)	Tennessee
(1937) Louisiana			
Vanderbilt University School of Medicine		(1935 2)	Tennessee
Medical College of Virginia		(1917)	Maryland
School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Harvard University Medical School		(1911)	N B M Fx

## Book Notices

**Essentials of Pathology** By Lawrence W Smith MD Professor of  
Pathology Temple University School of Medicine Philadelphia and  
Edwin S Gault MD Associate Professor of Pathology Temple Univer-  
sity School of Medicine Philadelphia With a foreword by James Ewing  
MD Memorial Hospital New York City Cloth Price \$9 Pp 886  
with 679 illustrations New York & London D Appleton Century Com-  
pany Incorporated 1938

This presents an interesting excursion in pedagogic technic,  
involving as it does the use of the case history method for  
teaching which, in the words of Ewing's introduction, is  
employed "to take the teaching of pathology out of the realm  
of abstract philosophy and make it an effective force in the  
professional equipment of the medical student" The textbook  
which Smith and Gault have so constructed will provide an  
excellent instrument to test the advantages of teaching from this  
point of view That the case history method will have advan-  
tages must be obvious There are inherent dramatic features  
which arouse interest there is close integration with the clinic,  
and with this an early familiarity with clinical terms is estab-  
lished, there is recognition that in reality "pathology" and  
'disease' are not to be compressed into stereotyped categories,  
finally there lurks the possibility that pathology will be envi-  
sioned as a dynamic process rather than as a wholly anatomic  
and static one All these possibilities, though not expressed in  
the preface, were no doubt in the minds of the authors The  
case history method may however, bring with it disadvantages  
which must be considered from the standpoint of the instructor  
in pathology Let us visualize a student out on the street on  
a dark night suddenly confronted with the dim outlines of a  
vast building Myriads of dark windows range toward the sky  
No street signs are visible, no door is evident, the student  
pries open a window, climbs in turns on a light and examines  
the contents of the room From one room he enters the next  
and repeats the process ad infinitum until he has examined every  
room As he finds much of interest in many of the rooms, the  
tour becomes fascinating Most of us, however, prefer to  
approach a building in daylight, knowing the street and number,  
observing its relation to adjacent structures If the building is  
of importance, we might wish to know something of the architect  
and builder and possibly examine the floor plans so that we  
may have some sense of direction once we have entered the  
structure

In pathology as projected for the student in the Smith and  
Gault manner the mental approach must involve something of  
the nature that has been implied because there is no beginning,  
and no growth only the finished and completed frame work is  
to have validity the rest is not of the 'essentials' and there-  
fore can be sacrificed to the exigencies of the world's fast pace  
One may deny the expediency while granting the exigency We  
frequently decry the narrowness of the modern specialist mourn  
the scholar of the passing generation We realize the inherent  
dangers of our cubicle system of instruction and now we are



to teach this basic medical science as though it were another specialty. If the student is to get a broad perspective anywhere in medicine he must get it in pathology, for today there certainly is little perspective even in medicine as taught in modern medical schools. There is another possible difficulty. General pathology as now fitted into the medical curriculum is usually taught in the second year. In the case history method much clinical detail is involved the significance of which cannot possibly be grasped by a sophomore student who has never had contact with a patient, who has never taken a history, who in many instances is still in the early stages of his knowledge of physiology. It is doubtful whether a sophomore student is prepared to evaluate, even if he has time to absorb, all the clinical features spread out before him. That he is in danger of seeing the trees and not the forest comes to mind when one reads the chapters on inflammation, after all the keystone of any course in pathology. Nowhere are the obvious questions of why and how ever approached. But if the student is not to be interested in the basic reactions of inflammation if he is to slur over the chemical and physical alterations that are reflected in his histopathologic slide, of what use is it to him merely to pile up the unlimited variety of the inflammatory pictures which the microscope can reveal?

This textbook is an experiment in pedagogy, the advantages that have been suggested for this method may possibly far outweigh the objections that are listed—and they have been listed not in criticism of the work, which is excellent, but possibly of the method. The authors and the publishers have provided a first class teaching apparatus, whether the method will be superior to the old one is a question that can be determined only after proper trial. Certainly no pathologist would suggest that we have perfected a teaching technic that could remotely be considered approaching an ideal. The text itself offers a well balanced presentation of both general pathology and the special pathology of the various organ systems. About one fourth of the text is devoted to the various degenerations and inflammations, another fourth to tumors, and the remaining half to special pathology. The descriptive text leaves nothing to be desired, it is clear and concise and special effort has been made to present the orthodox point of view, controversial subjects have been avoided. While this at times results in a somewhat colorless impression, it has decided advantages in a book which aims at brevity in presentation. Reviewers can always find fault in the treatment of selected topics, but the teacher of pathology will probably find little cause for dissent. The paper used is not highly enameled, which makes for restful reading though it may possibly at times impair the quality of some of the illustrations. These are abundant and all are provided with concise and proper legends to integrate them with the text. They are by no means limited to the microscopic field but include also the gross specimen and in some instances the patient. In a series of color plates, drawings of microscopic fields have been reproduced, these include cells from inflammatory exudate, blood cells and arterial changes.

**Chemie und Technik der Gegenwart** Herausgegeben von Dr. H. Carl, Dozent an der Universität Leipzig. Band VI. Vitamine und Hormone und ihre technische Darstellung. Teil I. Ergebnisse der Vitamin- und Hormonforschung. Von Dr. Hellmut Brederick, Dozent an der Universität Leipzig, und Dr. Robert Wittig. Second edition. Boards. Price 7 maris. Pp. 138. Leipzig: S. Hirzel, 1938.

This is a technical review of recent chemical research on the vitamins and hormones and is the first volume of a series. The remaining three volumes will be concerned with the preparation of vitamin and hormone products. The sex hormones will be the subject of a separate volume, the fourth in the series.

It is interesting to note that the authors refer to vitamin A as "xanthoptol." This name is unfortunate because it refers to but one symptom of A deficiency in animals. Moreover the name is chemically uninformative. The discussion of the chemistry of vitamin A is brief and clear. There is included a description of the synthesis of vitamin A according to Kuhn. Vitamin B<sub>1</sub>, for which the authors have not used the preferred American term thiamin chloride, is also discussed briefly but in sufficient detail. The methods of preparation of riboflavin are described. Mention is made of some of the other members of the vitamin B complex, but no reference is made to nicotinic acid. Discussion of the organic chemistry of vitamin C is fairly

complete. There is a brief description of vitamins D and E, with many chemical formulas. Brief mention is also made of vitamins H, J, K and P. There is a section also on the relation between vitamins and ferments which is limited to a discussion of the yellow ferment co-carboxylase and ascorbic acid. The organic chemistry of the hormones accounts for the subject matter of a little more than half of the book. A goodly portion of this material is concerned with sex hormones. There is a discussion of insulin, including the recent work on its composition. Epinephrine and the cortical hormone are discussed in detail. The chemistry of thyroxine is discussed briefly but adequately. Brief mention is made of the chemistry of the parathyroid, the hypophysis and other ductless glands, and to histamine, acetylcholine and related compounds. There is practically no mention of the hormones of the intestinal tract. This is surprising in view of the brief discussion of plant hormones with which the book concludes.

**Emotion and the Educative Process. A Report of the Committee on the Relation of Emotion to the Educative Process.** By Daniel Alfred Prescott, Ed. D., Chairman, Professor of Education, Rutgers University, New Brunswick, N. J. Cloth. Price \$1.50. Pp. 323. Washington, D. C.: American Council on Education, 1938.

This work is a report to the American Council on Education by the Committee on the Relation of Emotion to the Educative Process. It is a thoroughgoing report which analyzes the mechanisms of emotion and their application to teaching. The literature has been combed, and the material evaluated. In the introduction the author of the volume gives credit to other members of his committee for supplying most of the material, nevertheless he has compiled and written it, and he assumes the chief responsibility for the work. There are twelve chapters. The first four deal with psychologic descriptions of emotion and affective phenomena with the physiologic basis of emotion and behavior, one is devoted to a discussion of how greatly emotion may be modified by training. The book then passes on through the next several chapters to discuss what is meant by maturity and emotional reaction and how the basic personality needs are modified by various conditions so that maturity might not be arrived at, and there are discussions of the effects of contemporary social institutions on emotion. The remainder of the book treats of the influence of emotion on learning and evaluates the importance of education in controlling and modifying emotion. There are a number of individual discussions in these chapters which are of great value, not the least of which are incorporated in the eleventh chapter, dealing with personnel problems in education. In this chapter the question is brought up whether the educational profession satisfies the personality needs of teachers and points out how important maladjusted teachers are in disorganizing a school system. There are also discussions of the pupil-teacher relationship and how to deal with emotional problems in the school. The last chapter is a summary of the whole project. There is an excellent bibliography covering 180 references dealing with emotion and teaching. The whole work is a serious, comprehensive and worthwhile monograph. There are no case histories. The material is not particularly predicated for the medical man, but the psychiatrist, particularly the one who deals with children should find the book of considerable interest in outlining the present status of emotion in terms of the psychology of learning and of education.

**Guiding Human Misfits. A Practical Application of Individual Psychology.** By Alexandra Adler, M.D., Research Fellow in Neurology, Harvard University. Cloth. Price \$1.75. Pp. 38. New York: Macmillan Company, 1938.

This little book is written by Alfred Adler's daughter. In a brief fashion Dr. Alexandra Adler attempts to cover the field of child guidance, neurosis in childhood, problems of adolescence, significance of dreams and earliest recollections, and some practical aspects of child guidance and psychotherapy, but since the book is not very extensive it is obvious that this must be carried out in a superficial fashion. Alexandra Adler's underlying psychiatric philosophy is that of her father with some modification, namely, that people who are in an inferior position in life as the result of organic defect, rank in the family or social inferiority compensate for this and either retreat from reality through neurosis or into bad behavior. She cites numerous examples, not in the form of complete case histories but rather

an interesting but superficial discussion of many cases. Each chapter describes one or two illustrative cases but, of course, the whole field of behavior disturbance or neurosis is not covered. The author's experience with children seems to be limited by the fact that her philosophy of treatment is confined chiefly to the so-called individual psychology school of mental treatment. While there is no frank criticism of other schools of psychiatric thought, her vision is so limited that modern psychiatrists will not find that this book gives either a new and useful point of view or even a complete understanding of the mechanisms of behavior problems in children or of their treatment.

**Alkoholemi** Studier over Rusen I Af Max Schmidt [Alcoholemia Studies on Intoxication] Denne Afhandling er af det lægekandidatlige Fakultet antaget til offentlig at forsvares for den medicinske Doktorgrad. København. Læger. Pp. 328 with 20 illustrations. Copenhagen. NIT Nordisk Forlag. Arnold Busch. 1937.

This monograph is of great interest to physiologists, pharmacologists and physicians concerned with the medicolegal aspect of alcoholism. The author presents his own extensive studies of alcohol concentration in arterial, venous and capillary blood in cerebrospinal fluid and in urine during the first two hours after taking various quantities of alcohol, on the fasting stomach and after food and gives good critical summaries and evaluations of the relevant literature. The author's material includes also 400 medicolegal cases in which the amount of the alcohol ingested was unknown or in dispute. In the few cases tested the concentration of alcohol in the cerebrospinal fluid tended to exceed that in the arterial blood. The author studied also alcohol concentration in the blood of normal people not ingesting alcohol and accepts as probable the view that a trace of alcohol (production and ultimate oxidation) is part of normal metabolism and not dependent on fermentation of carbohydrates in the alimentary tract.

**Medicine in the Outpatient Department. An Introductory Handbook.** By Winthrop Wetherbee Jr. M.D. Junior Visiting Physician Boston City Hospital Boston. With a foreword by George R. Minot M.D. S.D. F.R.C.I. Professor of Medicine Harvard University Boston. Fabrikhold. Price \$1. Pp. 111. New York & London. Paul B. Hoeber Inc. 1938.

This excellent, simple book may be read with a great deal of pleasure and profit in about an hour. The author has collected many common experiences and routine procedures of medical practice which will help the student in his clinical study of the patient. Especially commendable is the collection of clinical maxims. Every student will appreciate these as his medical experience increases and every medical practitioner likewise will enjoy rereading them. This book supplies the long needed practical suggestions so definitely lacking in the textbooks of physical diagnosis. It is a notable contribution.

**Milk and Nutrition. New Experiments Reported to the Milk Nutrition Committee. Part III. The Effect of Commercial Pasteurization on the Nutritive Value of Milk as Determined by Experiments on Calves.** From the National Institute for Research in Dairying (University of Reading) and the Rowett Research Institute, Bucksburn, Aberdeen. Paper. Price 6s. Pp. 27. Sharnfield, Reading, England. National Institute for Research in Dairying. 1938.

This report of the Milk Nutrition Committee is concerned with the Aberdeen studies of the relative effects of pasteurized and raw milk in the feeding of calves. An earlier report of this comprehensive investigation on the nutritive value of milk was concerned with the relative effects of pasteurized or raw milk on the growth and health of school children. As in the feeding experiments with children, so in the present better controlled experiments with calves there was little difference observed in growth on pasteurized as compared with raw milk. Because of the safety of pasteurized milk, the conclusion may be drawn that the pasteurization of milk is a desirable procedure in the preparation of milk for human consumption.

**Text Book of Histology for Medical Students.** By Evelyn E. Hewer. D.Sc. Cloth. Price \$4.50. Pp. 365 with 340 illustrations. St. Louis. C. V. Mosby Company. 1938.

This is a concise, elementary textbook of histology written primarily for medical students. The text is generously illustrated with mediocre free hand drawings and photomicrographs. This publication lacks the fundamental detail necessary for understanding histology. It is far below the standard of textbooks of histology published in this country.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Evidence Admissibility of Statements Made by Examinee to Examining Physician.**—A physician, said the Supreme Court of Missouri, Division No. 2, who has been in attendance on a patient for the purpose of treatment, may testify as to present symptoms or complaints of his patient as told to him by his patient and also as to his observations from his examination of the patient. He may not testify, however, as to statements made by his patient with respect to his past physical condition or with respect to the circumstances surrounding the injury or the manner in which the injury was received. If, as was stated in the case of *Coghull v. Quincey O & K C R Co* (Mo.), 206 S. W. 912, the physician has examined a person for the purpose of preparing himself as a witness in a case then pending or which is expected to arise, different considerations must be recognized, for then there exists a temptation to falsify or at least magnify, the true condition.—*Evans v. Missouri Pac. R. Co* (Mo.), 116 S. W. (2d) 8.

**Workmen's Compensation Acts. Insurer May Recover Damages from Physician Who Negligently Treats Employee.**—Baker, in the course of his employment, injured his left leg and was treated by the company physician. A diagnosis of dislocation of the hip was made and treatment rendered accordingly. The patient, however, continued to complain of pain. About eight months after the injury, the physician discovered that "the man had really suffered a fracture of the bone at the neck of the femur, but thought he could see evidence of callous and 'thought probably he would get a fairly serviceable fibrous union'." No change in treatment was prescribed. Pain in the leg persisted, there was some looseness at the left hip joint and the left leg was shorter than the right. Later the industrial commission sent the workman to another physician, who performed a reconstruction operation during which an ununited fracture at the neck of the femur was found with almost complete absorption at the neck and a small devitalized shell representing the head of the femur. While the workman thereafter gradually improved, he was permanently partially disabled.

Compensation was paid Baker and all his medical and hospital bills were paid. Subsequently he brought suit for malpractice against the company physician. The industrial commission, being the administrator of the state insurance fund from which compensation had been paid to Baker, intervened, alleging that Baker's cause of action had by statute been assigned to it and that it was subrogated to his rights. The trial court denied the right of the workman to recover from the physician but rendered judgment in favor of the industrial commission in an amount in excess of what it had paid. Pending an appeal to the Supreme Court of Utah the physician died, and his administrator continued the action.

The workmen's compensation act of Utah contains this provision:

When any injury for which compensation is payable under this title shall have been caused by the wrongful act of a third person the injured employee or in case of death his dependents may at their option claim compensation under this title or have their action for damages against such third person and if compensation is claimed and awarded the employer or insurance carrier having paid the compensation shall be subrogated to the rights of such employee or his dependents to recover against such third person provided if such recovery shall be in excess of the amount of the compensation awarded and paid then such excess less the reasonable expenses of the action, shall be paid to the employee or his dependents.

Under this provision said the court, the industrial commission had the right to sue the company physician, for when Baker accepted compensation from the commission after he was aware of the negligence of the physician any right of action he had against the physician passed to the industrial commission. The trial court was warranted in finding, the Supreme Court thought, that the company physician in his

diagnosis and treatment did not exercise such reasonable care and diligence as is ordinarily exercised by physicians in the locality in which he practiced. Nor did the trial court err in admitting the testimony of physician witnesses as to what diagnosis in their opinion would have been made by the average practitioner in the community, having the roentgenograms before him and having had them taken under his orders or direction. The witnesses did not thereby pass on the question of negligence and thus invade the province of the jury. It is permissible, the court said, to allow a medical witness to testify as to what an ordinary physician in the locality holding himself out as able to interpret roentgenograms, could or should have seen in them.

Neither did the trial court err in rendering judgment for the industrial commission in a sum greater than the commission had paid out, the excess being payable to the injured workman. The workmen's compensation act clearly provides that a judgment against the third person tort-feasor may be recovered in excess of compensation awarded and paid but that excess must be paid to the workman.

For the reasons stated, the judgment in favor of the industrial commission against the physician was affirmed.—*Baker v. Vcoff (Utah)*, 79 P (2d) 77

## Society Proceedings

### COMING MEETINGS

American Medical Association St Louis May 15-19 Dr Olin West, 535 North Dearborn St, Chicago Secretary

Alabama Medical Association of the State of Montgomery April 18-20 Dr D L Cannon 519 Dexter Ave Montgomery Secretary

American Academy of Tuberculosis Physicians St Louis May 13-14 Dr Arnold Minig 638 Metropolitan Bldg Denver Secretary

American Association for the Study of Neoplastic Diseases Detroit April 8 Dr Eugene R Whitmore 2139 Wyoming Avenue N W Washington D C Secretary

American Association for Traumatic Surgery Hot Springs Va May 8-9 Dr Ralph G Carothers 409 Broadway Cincinnati Secretary

American Association of Anatomists Boston Apr 6-8 Dr E R Clark University of Pennsylvania School of Medicine Philadelphia Secretary

American Association of Pathologists and Bacteriologists Richmond Va Apr 6-7 Dr Howard T Karsner 2085 Adelbert Rd Cleveland Secretary

American Association of the History of Medicine Atlantic City N J April 30-May 1 Dr Henry E Sigerist 1900 Monument St Baltimore Secretary

American Association on Mental Deficiency Chicago May 3-6 Dr E Arthur Whitney Washington Road Elwyn Pa Secretary

American College of Physicians New Orleans March 27-31 Mr E R Loveland 4200 Pine St Philadelphia Executive Secretary

American Gastro Enterological Association Atlantic City N J May 1-2 Dr Russell S Boles 1901 Walnut St Philadelphia Secretary

American Laryngological Rhinological and Otolaryngological Society Chicago May 10-11 Dr C Stewart Nash 277 Alexander St Rochester N Y Secretary

American Medical Legal Association Chicago May 12-13 Dr Michel Pijean 124 Commonwealth Ave Boston Secretary

American Pediatric Society Sky Top Pa Apr 27-29 Dr Hugh McCulloch 325 North Euclid Ave St Louis Secretary

American Physiological Society Toronto Canada Apr 26-29 Dr A C Ivy 303 East Chicago Ave Chicago Secretary

American Psychiatric Association Chicago May 8-12 Dr Arthur H Ruggles Butler Hospital Providence R I Secretary

American Society for Clinical Investigation Atlantic City N J May 1 Dr Isaac Starr University of Pennsylvania Hospital Philadelphia Secretary

American Society for Experimental Pathology Toronto Canada April 26-29 Dr Paul R Cannon Dept of Pathology University of Chicago Chicago Secretary

American Society for Pharmacology and Experimental Therapeutics Toronto Canada Apr 26-29 Dr G Philip Grabfield 319 Longwood Ave Boston Secretary

American Society of Anesthetists New York Apr 14 Dr Paul M Wood 131 Riverside Drive New York Secretary

American Society of Biological Chemists Toronto Canada Apr 26-29 Dr C G King Univ of Pittsburgh Dept of Chemistry Pittsburgh Secretary

American Society of Clinical Pathologists St Louis May 12-14 Dr Alfred S Giordano 531 N Main St South Bend Ind Secretary

American Surgical Association Hot Springs Va May 11-13 Dr Charles C Mixer 319 Longwood Ave Boston Secretary

American Therapeutic Society St Louis May 12-13 Dr Joseph T Flward 1726 Eje St N W Washington D C Secretary

Arizona State Medical Association Phoenix Apr 13-15 Dr D F Harbridge 15 East Monroe St Phoenix Secretary

Arkansas Medical Society Hot Springs National Park May 8-10 Dr W R Brooksher 602 Garri on Ave Fort Smith Secretary

Associated Anesthetists of the United States and Canada St Louis May 15 Dr F H McMechan 318 Hotel Westlake Rocky River Ohio Secretary General

Association for the Study of Internal Secretions St Louis May 13-14 Dr E Kost Shelton 921 Westwood Blvd Los Angeles Secretary

Association of American Physicians Atlantic City N J May 2-3 Dr Hugh J Morgan Vanderbilt University Hospital Nashville Tenn Secretary

Association of Military Surgeons of the United States Washington, D C May 8-10 Dr H L Gilchrist Army Medical Museum Washington D C Secretary

California Medical Association Del Monte May 1-4 Dr George H Kress 450 Sutter St San Francisco Secretary

District of Columbia, Medical Society of the Washington May 3-4 Mr Theodore Wiprud 1718 M St N W Washington Executive Secretary

Federation of American Societies for Experimental Biology Toronto Canada Apr 26-29 Dr D R Hooker 19 West Chase St. Baltimore Secretary

Florida Medical Association Daytona Beach May 1-3 Dr Shaler Richardson 111 W Adams St Jacksonville Secretary

Georgia Medical Association of Atlanta Apr 25-28 Dr Edgar D Shanks 478 Peachtree St N E Atlanta Secretary

Illinois State Medical Society Rockford May 2-4 Dr H M Camp 224 S Main St Monmouth Secretary

Iowa State Medical Society Des Moines Apr 25-27 Dr Robert L Parker 3510 Sixth Ave Des Moines Secretary

Kansas Medical Society Topeka May 1-4 Mr C G Munns 112 W 6th St Topeka Executive Secretary

Louisiana State Medical Society Alexandria Apr 24-26 Dr P T Talbot 1430 Tulane Ave New Orleans Secretary

Maryland Medical and Chirurgical Faculty of Baltimore Apr 23-26 Dr Walter Dent Wise 1211 Cathedral St Baltimore Secretary

Mississippi State Medical Association Gulfport May 9-11 Dr T M Dye McWilliams Bldg Clarksdale Secretary

Missouri State Medical Association Excelsior Springs Apr 10-12 Dr E J Goodwin 634 North Grand Blvd St Louis Secretary

Nebraska State Medical Association Grand Island May 2-4 Dr R B Adams 414 Federal Securities Bldg Lincoln Secretary

New Mexico Medical Society Gallup May 11-13 Dr L B Cohenour 219 W Central Ave Albuquerque Secretary

New York Medical Society of the State of Syracuse April 24-27 Dr Peter Irving 2 East 103d St New York Secretary

North Carolina Medical Society of the State of Cruise to Bermuda, May 9-14 Dr T W M Long Roanoke Rapids Secretary

North Dakota State Medical Association Fargo May 8-10 Dr Albert W Skelsey 20 1/2 Broadway Fargo Secretary

Ohio State Medical Association Toledo May 3-4 Mr C S Nelson, 79 E State St Columbus Executive Secretary

Oklahoma State Medical Association, Oklahoma City May 1-3 Dr L S Willour Third and Seminole McAlester Secretary

Pacific Coast Surgical Association San Francisco Oakland Del Monte March 28-31 Dr H Glenn Bell University of California Hospital San Francisco Secretary

Society for the Study of Asthma and Allied Conditions Atlantic City, N J Apr 29 Dr W C Spain 116 E 53d St New York Secretary

South Dakota State Medical Association Aberdeen Apr 24-26 Dr Clarence E Sherwood Madison Secretary

Tennessee State Medical Association Jackson Apr 11-13 Dr H H Shoulders 706 Church St Nashville Secretary

Texas State Medical Association of San Antonio May 8-11 Dr Holman Taylor, 1404 West El Paso St Fort Worth Secretary

### CENTRAL SOCIETY FOR CLINICAL RESEARCH

*Eleventh Annual Meeting Held in Chicago Nov. 4 and 5 1938*

The President, DR WILLIAM H BUNN, Youngstown, Ohio,  
in the Chair

(Continued from page 1017)

#### Serum Sickness Effective Treatment and Probable Prophylaxis by Means of Histaminase

DRS LEE FOSHAY, Cincinnati, and O L HACEBUSCH, St Louis. The important work presented to the society last year by Dr Grace Roth on histaminase indicated to us that this enzyme should be effective in controlling the symptoms and other manifestations of serum sickness. This expectation has been tested and verified by the treatment of twenty patients, selected at random, most of them with the severer forms of this disorder. Sixteen were treated on either the first or the second day of illness, and thirteen obtained relief in from eighteen to thirty-six hours or less. In most cases the clinical responses were actually dramatic. A beginning attempt at prophylaxis has been made, with extremely hopeful outlook. The treatment seems to be rational, highly effective, safe and devoid of untoward by-effects or after-effects.

#### DISCUSSION

DR LOUIS E PRICKMAN, Rochester, Minn. I have not used this preparation in the treatment of serum sickness but I have had considerable experience with it in the treatment of vasomotor rhinitis. The study of vasomotor rhinitis has one outstanding advantage. It permits one to observe objectively changes which may occur from time to time. Of twenty-six carefully selected and studied cases of vasomotor rhinitis definite relief from this preparation was obtained in only nine (34 per cent). In four cases the results were questionable, in the remaining thirteen cases (50 per cent) no relief whatever occurred. On the other hand striking beneficial results were obtained in certain cases in which my associates and I had tried many different means of relieving the distress without any benefit whatever. Although

certain of my patients have obtained satisfactory results from the use of this preparation, the results in the whole group of cases of vasomotor rhinitis are certainly in contrast to those reported by Drs Foshay and Roth. This discrepancy may be attributable to many factors only a few of which I shall mention. Vasomotor rhinitis is a chronic disease, in contrast to serum sickness, in which the symptoms are acute and not of long duration. One important point is the apparent variability of the material itself. This must certainly be reflected in the results reported, as it has been demonstrated both clinically and experimentally. Although the material is said to be nontoxic and although Dr Foshay has noticed no toxic effects in any of his cases I have some evidence that there may be a limit of tolerance to the oral administration of the preparation. One of my patients who obtained great relief of vasomotor rhinitis (due to food sensitivity) from this material noted that when the dose was increased beyond a certain point she had distressing abdominal cramps. She is still using the material but must be careful not to exceed a certain dose. Finally, when the material is found to be effective in vasomotor rhinitis its use must be continued; it therefore does not appear to be a desensitizing agent. It does not seem to affect the fundamental allergic nature of the patient but seems to have an effect on the allergic reaction.

DR GRACE ROTH, Rochester, Minn. I continue to obtain good results in patients who have a hypersensitivity to cold. I have added to that group some patients who are hypersensitive to insulin with whom I am doing equally well. I want to call attention to the batches of the preparation sent out. The last patient with local hypersensitivity to insulin was put on one batch and the local lesions disappeared. Then for two days I gave him tablets of another batch, and the local lesions returned. When I returned him to the tablets of the first batch the lesions disappeared, and he has had no further trouble.

DR HEINRICH NECHLES, Chicago. I should like to ask the authors whether my impression was correct that histaminase given intramuscularly had a longer latent period than that given by mouth. It is known from the work of Best and his co-workers that the body contains much histaminase and the dose of a few units of histaminase administered by the authors seems to be therefore insignificant in comparison to what the body actually contains. Taking into consideration what Drs Roth and Foshay said, I wonder whether the therapeutic effects reported may not be nonspecific rather than due to histaminase.

DR PHILIP W. BROWN, Rochester, Minn. I should like to ask the authors, for scientific as well as personal reasons, whether they have had opportunity to use this treatment for giant urticaria, or whether the rest of the discussers have had opportunity to use it.

DR LEE FOSHAY, Cincinnati. I realize that we know little about the composition of this compound. It is undoubtedly a mixed substance, and how much of it is actually histaminase has never been shown. I think one should be careful about the selection of proper patients for its use. I am sure it is going to be widely used and abused for a great variety of demonstrated and suspected so-called allergies. I have heard from two discussers today and from other persons that different batches of the material have varied in potency. As I have said, all of mine came from one batch. The effect of intramuscular injection appears sooner than that of oral administration. The shortest period observed was twenty minutes and three patients obtained marked relief after six, eight and ten hours respectively. We did not usually get such prompt results from patients using the enteric coated tablets by mouth. I believe that peptone injected intramuscularly produces considerable reaction. No untoward reactions were noted in our patients receiving injections. I have not used the substance in giant urticaria. I thought it wise to restrict its use to the one condition for which I had adequate controls, and one which is easily recognized clinically and is readily measurable with regard to severity and duration. I know of its use for one patient with angioneurotic edema. This patient was comfortable with great reduction in the edema during the time of administration of the tablets or the injections. However, the edema returned to its previous state from nine to fourteen hours after the cessation of injections or oral administration.

### The Cholinergic Nervous System and Its Relation to the Thyroid Gland

DRS A. R. MACLEAN, B. T. HORTON and A. C. DAVIS, Rochester, Minn. It has been previously understood that sympathetic stimulation occurs in hyperthyroid states. It is our opinion that any sympathetic (adrenergic) stimulation that may occur in the hyperthyroid state is overshadowed by a stimulation of the parasympathetic (cholinergic) nervous system. The stimulation of the cholinergic nervous system of normal persons with acetyl-beta-methylcholine chloride (mechoyl) produces signs and symptoms that simulate those of the hyperthyroid state. Persons who have hyperthyroidism have markedly increased sensitivity to this drug. Myxedematous patients appear to have a paralysis of this nervous system and an increased tolerance to mechoyl.

#### DISCUSSION

DR LOUIS N. KATZ, Chicago. I wonder whether the authors are not carrying their interpretations too far. I am sure they know that mechoyl, like other cholinergic substances, not only stimulates the parasympathetic myoneural junctions but acts on all synapses in the peripheral ganglions in the autonomic nervous system. Because of this, the cholinergic substances in the animal and in man have not only a parasympathetic but also a sympathetic stimulating action. In addition, it has been shown that cholinergic substances bring about an outpouring of epinephrine. A cholinergic substance like mechoyl cannot be used to distinguish between parasympathetic and sympathetic stimulation. I should like to ask the authors whether they used atropine to prevent the manifestations from mechoyl and whether they have used prostigmine, a derivative of physostigmine, in patients with thyroid disease. Prostigmine acts to enhance cholinergic activity and gives less dramatic but more protracted effects.

DR GRACE ROTH, Rochester, Minn. I think Dr Katz's criticism is well taken. I think the results should be taken only as a theoretical interpretation until more physiologic work is done, and care should be used in calling the stimulation either parasympathetic or sympathetic. However, in this study the basal metabolic rate was definitely increased by the subcutaneous injection of mechoyl.

DR A. C. DAVIS, Rochester, Minn. We realize that the interpretation which we have placed on our results is open to criticism from a number of angles. Of course it is rather difficult to say just why these patients overreact. Perhaps the reaction from hyperthyroidism is the same as overreaction of any kind—from nervous shock and many other nonspecific agents. However, it seems to us that the individual reaction to hyperthyroidism is similar to the reaction to an injection of mechoyl. With regard to Dr Katz's question in reference to prostigmine and physostigmine, we have not used them in this connection.

### Clinical Desensitization to Wheat with a Derivative of Acetylcholine

DR ENMET F. PEARSON, Springfield, Ill. Asthma, vasomotor rhinitis, eczema, urticaria and angioneurotic edema were reproduced in seven patients who complained of one or more of these symptoms by addition of wheat products to the diet. The symptoms subsided promptly on withdrawal of wheat. The same symptoms peculiar to the individual subject were reproduced at will by injection of approximately 10 mg. of acetyl-beta-methylcholine chloride (mechoyl). While wheat was eliminated from the diet the patients were given daily injections of mechoyl in increasing doses from 0.5 mg., as tolerated by the patient. After from thirty to sixty days wheat was again added to the diet, and the original symptoms did not recur. In four of the patients previous attempts to desensitize with wheat extract had been unsuccessful. Symptoms have now been controlled for at least six months. It is postulated that repeated cholinergic stimulation alters the status of the bodily reactions so that a tolerance is gained for other stimuli.

### Fatty Acids as Cholesterol Solvents in Bile

DRS CLARENCE F. G. BROWN and RALPH E. DOLKART and K. K. JONES, PH.D., Chicago. Gallstones rarely form spontaneously in dogs, sheep, cats and rabbits. In contradistinction, in human beings, oxen and hogs biliary calculi occur frequently. Experiments carried on by means of shaking human gallstones in solutions of animal bile, bile salts and other mediums and by

direct insertion of human gallstones into the gallbladders of dogs demonstrated that greater dissolution occurred in the bile of dogs and sheep and less in the bile of human beings, oxen and hogs. Fractionation of the bile showed that the capacity of the bile as a cholesterol solvent could be isolated in the saponifiable or fatty acid fraction. This fraction was found to be high in the bile of the dog and sheep and significantly reduced in amount in the bile of animals which form gallstones. Repetition of the shaking experiments with tablets made of pure cholesterol confirmed the observation of greater activity of fatty acids as cholesterol solvents as compared with solutions of bile salts. It was found in addition that for each mixture of a specific bile salt with varying concentrations of a fatty acid there was an optimal concentration which if exceeded or not reached resulted in an inhibition of the rate of dissolution obtained with the fatty acid alone. Our data indicate that the cholesterol is held in solution in the bile by the fatty acids rather than the bile salts.

#### Calcium Balance in Thyroid Disease

DRS. ITAIO D. PUPPEL, KARL P. KLASSEN and GEORGE M. CURTIS, Columbus, Ohio. Three normal persons maintained on a constant low intake of calcium remained in negative calcium balance. Four patients with exophthalmic goiter similarly maintained revealed an increased mobilization of calcium and a tremendous increase in excretion of this element through both the urinary and the gastrointestinal tract. Likewise, two patients with toxic nodular goiter showed an increase in excretion of calcium, but only slightly over normal. On the other hand two patients with nontoxic nodular goiter remained in physiologic calcium balance. Increased feeding of calcium to a normal person on a low intake of calcium produced an immediate positive calcium balance. Similar increased feeding of calcium to a patient with hyperthyroidism resulted in a retention of calcium which was six times normal and a consequent positive calcium balance. One patient with exophthalmic goiter had shown an increase in the negativity of the calcium balance prior to subtotal thyroidectomy. Examination two years postoperatively revealed an absence of all characteristic symptoms and a basal metabolic rate of  $-9$  per cent. Studies of calcium balance showed that the excretion of calcium was also normal and that the calcium balance had returned to within normal limits.

#### DISCUSSION

DR. RUSSELL M. WILDER, Rochester, Minn. I have long believed, as has Aub, that the loss of calcium from the skeleton in hyperthyroidism is not to be explained by increased activity of the parathyroids if for no other reason than that the level of calcium in the blood has never been found elevated. The observation of Drs. Puppel, Klassen and Curtis that calcium is excreted differently in toxic goiter, as compared to exophthalmic goiter, provides further support for the contention of Plummer that these two conditions are distinct entities. However, the evidence presented for a difference in the calcium balances is not entirely satisfactory, for the reason that the basal metabolic rate in the cases of toxic goiter was lower than in the cases of exophthalmic goiter. It would be desirable to compare patients with comparable basal metabolic rates.

DR. GEORGE M. CURTIS, Columbus, Ohio. Our determinations of the calcium balance of patients with thyroid disease have gone hand in hand with our studies of iodine balance. Ten years ago we set out to determine the total iodine balance in patients with hyperthyroidism. After the development of three successive methods for the biologic determination of iodine this has been accomplished with fifteen patients, the majority having thyroid disease. At the same time we determined the total calcium balance. We wished to compare the two owing to the close physiologic as well as clinical relations between the thyroid and parathyroid glands. A part of these combined studies have been reported (Puppel, I. D., and Curtis, G. M. Calcium and Iodine Metabolism in Thyroid Disease, *Arch. Int. Med.* 58:957 [Dec.] 1936). Others are being reported. It has been thought that exophthalmic goiter and toxic nodular goiter are two diseases. Nevertheless, some authors think that they are the same disease, the one representing a more acute manifestation of hyperthyroidism and the other a more chronic and hence more insidious form. The results which Dr. Puppel has presented reveal a difference between the calcium metabolism of exophthalmic goiter and toxic nodular goiter. Admittedly, this is a

small series on which to base conclusions, nevertheless it is indicative and in accord with the work of others. The two patients with toxic nodular goiter had a lower average basal metabolic rate  $+28$  per cent. The three with exophthalmic goiter had a higher rate, averaging  $+40$  per cent. Nevertheless, there appeared to be a difference in the management and utilization of calcium in the two diseases. Moreover, the iodine balance of these same patients revealed differences, giving further ground for regarding the two diseases as differing. The two patients with toxic nodular goiter showed a greater increase in the negativity of the iodine balance than the three patients with exophthalmic goiter. This in itself may not be so significant. Nevertheless, the increased excretion of iodine was greater in the urine of the patients with toxic nodular goiter and greater in the feces of the patients with exophthalmic goiter. In all we should consider these metabolic differences as indicative of corresponding differences between the two diseases. Comparing the disturbed iodine metabolism of patients with hyperthyroidism with the disturbed calcium metabolism of patients with hyperparathyroidism reveals a striking similarity.

#### Percutaneous Absorption of Estrogenic Substances by the Human Female, with Especial Reference to Growth of the Breast Induced by Local Application of Estrogenic Ointments

DR. CYRIL M. MACBRYDE, St. Louis. Several workers have produced local and general effects on the animal body by application of estrogenic substances to external surfaces. The application of appropriate amounts of the substances to any part of the skin has resulted in estrous changes and in mammary and uterine growth in certain spayed animals. DeFremery of Holland has reported that the best production of mammary growth in the virgin goat is accomplished by the application of estrogen directly to the skin of the udder. There are few studies of the effects of percutaneously applied estrogen in the human female and there are no reports of the effect of estrogen directly applied to the breast to induce mammary development. Studies were performed on three women lacking mammary development and exhibiting signs of hypogonadism. Estrogenic ointments were found to induce unilateral mammary growth when only one side received applications of the active material and the other side was treated with the inactive ointment base. The results are shown by caliper measurements and photographs. Vaginal smears changed from inactive to the active estrous state, and characteristic changes were noted in the vulva as the result of the percutaneously absorbed estrogen.

#### DISCUSSION

DR. PAUL STARR, Chicago. I wonder whether Dr. MacBryde mentioned some work by Hans Selve on mechanical stimulation of the breast in order to produce lactation. Is it possible that the factor of mechanical stimulation of the breast was not thoroughly controlled? It was dramatically shown by Dr. MacBryde that after injection treatment was discontinued atrophy was extremely rapid. Was that also true after the injection treatment?

DR. SAMUEL SOSKIN, Chicago. Dr. MacBryde's photographs are convincing. I do not think the members need doubt that he produced the results he reported. Nevertheless, I think it should be mentioned in a meeting of this sort that, while it may be permissible to produce a desirable effect by the use of estrogenic substance in a patient whose ovarian function is decreased or absent, one should not transfer such experiments to women with normal ovaries. It is well known that the prolonged use of small doses of estrogen may result in ovarian atrophy. It is also known that with larger doses one can get luteinization of the ovaries, which results in sterility and other phenomena. Therefore, one should be cautious about considering the use of such therapy in women in whom one wishes to preserve or improve ovarian function.

DR. CYRIL M. MACBRYDE, St. Louis. My work was purely experimental and I hope the procedure will not be introduced into general practice until a great deal more study has been done. The limitations and dangers of estrogen therapy by injection have not yet been clearly defined. In two patients who received the treatment I felt from my previous thorough study that there was probably no active ovarian tissue and so there

was no danger of injuring any possible gonadal function. In the third patient, who had some ovarian activity, I undertook the experiment with a great deal of trepidation. She has improved generally and has suffered no ill effects. However, I agree with Dr Soskin that the use of estrogen in normally menstruating women and women with presumably normal ovaries may have great potential danger, especially with large doses such as I used. In answer to Dr Starr about the effect of manipulation, I may say that as far as it was possible to determine there was exactly the same amount of mechanical stimulation on the two sides, but the breast which received the estrogenic ointment always grew at a much more rapid rate than the control breast. It is true that the breast will regress in size markedly and quickly after discontinuance of either injection orunction. Whether treatment with the ointment causes a persistence in size of the breast for any greater length of time than the injection treatment I am not sure as yet.

#### Urinary Excretion of Androgens Following the Injection of Testosterone Propionate

DRS E PERRY MCCULLAGH and J M RUMSFORD and W KENNETH CUYLER, MA, Cleveland. About 100 assays for urinary androgens are reported for sixteen men with hypogonadism and seven normal men. Single assays have been done in one group following single injections of varying doses, and the ratio of excretion to injection shown. Repeated assays for the same persons appeared to demonstrate diminished rates of excretion as injections continued. Single injections followed by daily assays for hypogonadal persons showed a prompt rise in excretion and a gradual fall to normal. With single doses of from 5 to 10 mg the excretion of androgen rises to near or to within the lower range of normal falling to previous levels within one or two days. With larger doses the elevation is much greater. With doses as high as 100 mg, relatively normal levels of excretion may be maintained for about five days. Single injections in a normal person caused a prompt rise followed by a distinct depression to below normal and finally a recovery of the original excretion rate in four or five days. If excreted androgens are calculated as androsterone, it is found that the amount of androgen which can be recovered from hypogonadal persons on the first day following injection of testosterone propionate is from 20 to 50 per cent of the injected quantity, whereas, if assays are done each day for five to seven days, quantities varying approximately from 25 to 75 per cent of the injected substance can be recovered.

#### Variations in Genital and Somatic Development with Bilateral Cryptorchidism

DRS W O THOMPSON and N J HECKEL, Chicago. A study has been made of eleven males from 15 to 29 years of age with bilateral cryptorchidism. In no instance was somatic development completely normal. When both testes remained within the abdominal cavity there commonly resulted infantile genitalia, a high pitched voice, long extremities, broad hips and absence of hair on the face and body. This was not uniform, as demonstrated by a normal-size penis in two cases in which neither testis could be palpated. In one patient with bilateral intra abdominal testes genital growth was produced with anterior pituitary like principle. Usually, however, growth could not be produced in such instances. Spermatogenesis was not observed in any patient, either before or during treatment with the anterior pituitary-like principle. Testes in the inguinal canal are more capable of function than those in the abdomen as demonstrated by frequent growth of the genitalia in such instances, with and without administration of the anterior pituitary like principle. Both testes can be completely normal only when they are in the scrotum. However, the interstitial cells may show a surprising degree of function even though both testes remain within the abdomen.

#### DISCUSSION

DR PAUL STARR, Chicago. There seem to be a number of variants, one of which is the factor controlling the response of the testes to the substance, evidently specifically suited to stimulating it when the testis is normal. Do I understand

that these studies indicate that the location of the testis in the abdomen renders it unlikely to respond to the anterior pituitary like principle? How is it possible, then, that in children in whom the testis is in the abdomen the material produces the onset of puberty and the descent of the testis? If that criticism is just, is the difference in responsiveness of these patients a matter of age rather than of location of the testis?

DR SAMUEL SOSKIN, Chicago. I should like to ask the authors to discuss some work reported six or eight months ago by T W MIMPRISS (Treatment of Retention of Testis, *Lancet* 1 533 [March 5] 1938), who presented evidence to show that if the testes were intra-abdominal the use of anterior pituitary-like principle, if it did not cause them to descend, might actually cause them to atrophy.

DR E P MCCULLAGH, Cleveland. The authors have come to the conclusion that the reason for failure of response of the testes in these patients to injection of anterior pituitary-like principle is that they lie in an abnormal position in the body. This may be true in some degree, but I believe that an alternative explanation might be considered. Two types of relatively severe hypogonadism are seen clinically. In one type the remnant of testicular tissue can be detected in the scrotum, and all the symptoms can be accounted for on a basis of deficiency of activity of the testes themselves. In the other there may be obvious testicular hormonal deficiency, but, in addition, there are other signs which cannot be accounted for purely on a basis of testicular hormonal failure. The authors' cases of cryptorchidism are of this latter type. It seems fair to assume that, if the mechanism which is involved in the bringing of these testes into normal position is severely damaged, the testes may be subnormally developed as well as lying in a markedly abnormal position. Under such circumstances, may it not be possible that the development of the testes themselves may be altered by deficiency in this mechanism? If this is true and the mechanism which causes testicular descent is more nearly normal, then the testes should be more nearly normally developed, as well as lying closer to their normal position. Therefore, I suggest that the lack of response in cases of severe cryptorchidism might be more intimately connected with a deficiency in the factor which causes their development and descent than to actual position in the body per se.

DR CLYDE L SEARINGHAUS, Madison, Wis. I should not want to minimize the position of the testis in its biologic response. I think there is an analogy in the position of the ovary. I have observed cases of primary amenorrhea or marked underactivity of the ovary which responded well to pituitary gonadotropic material. I have observed other cases in which there was little ability to respond to treatment with the same preparation. The ability to respond was measured by the intensity of the vaginal smear. Here one is dealing with an objective thing, the menstrual cycle, and it cannot be a matter of position because the ovaries function entirely within the abdomen. It must be something else, the ability of the gonad to respond to a given stimulation. Why do some ovaries never respond more than a little? There must be a similar problem in the testes. Unfortunately in the testes there is nothing to act as a measure of responding intensity except the size of the external genitalia.

DR W O THOMPSON, Chicago. I am sure Dr Starr did not understand what I said about location. In the boys I presented in whom we got a response to stimulation, one or both testes were either in the inguinal canal or deflected over the external oblique muscle a position in which we think they are more responsive to stimulation. Mimpriss recently wrote an interesting article on the whole problem of undescended testes. I do not know whether his evidence that the anterior pituitary-like principle causes atrophy if the testis is incapable of response is adequately supported by the data he presented. One of the most interesting things that Mimpriss pointed out is that the only testes which came down with treatment were those which would have come down spontaneously at the time of puberty if no treatment had been given. We have come to that conclusion.



independently as the result of a large number of observations over a period of about three years. Dr McCullagh questioned the wisdom of concluding that the position of the testis accounts for its failure to respond to administration of gonadotropic substance. With this point of view I heartily agree. It is possible that the testes remained within the abdomen because of lack of development, or they may have undergone atrophy or been replaced by scar tissue as a result of remaining within the abnormal environment of the abdomen for such a long period. It would therefore be unwise to conclude that position alone was the responsible factor. Rather, the changes associated with or resulting from long-standing position of the testes in the abdominal cavity produce the results observed. Dr Sevringhaus pointed out that in patients with underdeveloped ovaries striking response may be observed after the administration of the gonadotropic factor from the pituitary. He suggested, therefore, that not too much attention be paid to the position of the testis as a cause of failure of response. However, the situation is different in the two instances. The ovary is normally located in the abdominal cavity, while the testis is normally located within the scrotum. Absence of the normal environment is presumably the determining factor. It has been repeatedly demonstrated in both man and animals that, when testes which normally are in the scrotum are placed in the abdominal cavity, atrophy occurs and spermatogenesis ceases. In many instances normal size and function may be resumed if they are again placed in the scrotum.

#### Is the Potassium Tolerance Curve Specific for Detecting Adrenal Cortical Insufficiency in Disease?

DRS JAMES A GREENE and H LEVINE, Iowa City. The potassium tolerance curve has been advocated as a method for detecting adrenal cortical insufficiency. Before it can be accepted as a diagnostic criterion its specificity for adrenal cortical insufficiency must be ascertained. We have obtained the potassium tolerance curve in a variety of maladies, and it was altered in certain cases of asthenia, bromism and edema. The first two conditions may be confused with early Addison's disease. Therefore the similarity of the manifestations of Addison's disease and bromism and the possible causes for alteration of the potassium tolerance curve in association with conditions other than Addison's disease are discussed.

#### DISCUSSION

DR PAUL STARR, Chicago. Is it necessary to control the sodium chloride balance in these patients for some time before the test is given or is it sufficient to assume that a diet high in salt will do? Is it possible that patients with bromism had had an abnormally high potassium intake?

DR JAMES A GREENE, Iowa City. I cannot answer that question. In some cases of induced bromism we had to reduce the salt intake in order to induce bromism. In others we did not. Some patients were on a salt-free diet and others were on a general diet.

#### Measles Encephalitis

DRS M G PETERMAN and M J FOX, Milwaukee. It is our opinion that measles encephalitis, or encephalomyelitis complicating measles, is an entity as distinct as is the encephalitis following vaccination against smallpox. We believe that the disease is an acute inflammatory lesion of the brain caused by an attenuated virus of measles which has accumulated in the brain in certain patients. This entity must be kept in mind by every physician who deals with measles. It may easily be recognized if it is kept in mind. On or about the fourth day after the appearance of the rash the child suddenly becomes drowsy, lethargic or comatose or a convulsion may develop. Examination then reveals a comatose child with usually some degree of rigidity of the neck, dilated pupils and exaggerated reflexes. The blood count usually shows polymorphonuclear leukocytosis, the spinal fluid, pleocytosis, usually lymphocytic, an increase in globulin and a colloidal gold curve with the greatest change in color in the middle or meningeal zone (0123321000). The sugar content of the fluid is usually normal or elevated unless that of the blood is low. No further examinations are necessary or advisable to establish the diagnosis. There can be no question of interpretation of this clinical picture. In the matter of treatment we are convinced that good nursing care and symptomatic

treatment constitute the limits of present therapy. As in polio myelitis and all virus diseases, when the earliest symptoms are recognizable the virus has already completed an irreversible reaction with the nerve cells. There is no specific treatment, and the convalescent serum of measles cannot possibly be of value.

#### DISCUSSION

DR JAMES A GREENE, Iowa City. I should like to ask Dr Peterman if he thinks the disease represents a secondary infection or a complication of measles. I studied mumps and found that encephalitis as a complication of mumps occurred frequently. I wonder whether the cases described were of the more severe type and whether the milder type was overlooked.

DR LEE GOSHAY, Cincinnati. In view of the therapeutic results obtained by Dochez and his associates in distemper and by Tamura in venereal lymphogranuloma I do not think Dr Peterman's therapeutic pessimism should be accepted in its entirety. There are both specific and nonspecific modes of treatment that modify the course of some virus diseases. I know it is often stated that treatment is of no avail in any virus disease but I do not think this should hamper physicians in future trials of therapeutic procedures. I should like to ask the authors whether they think the recent use of human convalescent serum or of human placental globulin in attempted prophylaxis of the disease may have played any part in the apparent recent increase in the incidence of measles encephalitis.

DR M G PETERMAN, Milwaukee. It seems to us that measles encephalitis is a definite entity, that is the virus of the disease has invaded the nervous system. In that respect we may say it is a primary disease, and yet since it develops only with measles it must be a secondary infection. It apparently results from the same virus with perhaps an accumulation in the brain. We have seen mild meningitis with all the mild infectious diseases. Scarlet fever often has its onset with convulsions. Pneumonia may be associated with meningitic symptoms, and there may be changes in the spinal fluid which promptly subside, and we consider the meningitis a secondary symptom complicating pneumonia, whereas in measles encephalitis we consider that the virus has produced the disease and then a secondary extension has produced another disease of the central nervous system. I doubt that any case of typical complete measles encephalitis could be overlooked because of the severity of the symptoms and the duration of the disease. I doubt that the meningeal irritations or the milder cerebral symptoms can be classified as encephalitis because in all contagious diseases, particularly those mentioned as well as mumps some mild cerebral involvement may occur. Young children particularly have cerebral involvement with many infections in which there is high fever. I am pessimistic about the use of convalescent serum, probably as an attempt to counteract the scientific salesmen from the convalescent serum centers. I have heard physicians remark 'I had to give convalescent serum because the people demanded it. I think it should be understood that convalescent serum is of no value and has had no value in preventing encephalitis. After all only approximately 60 per cent of the persons coming in contact with measles will have measles, and that depends entirely on the intimacy and the duration of exposure. It is difficult to evaluate statistics on prophylaxis against measles.

#### Focal Epileptogenic Lesions of Birth and Infancy and Their Eventual Radical Treatment

DRS H M KEITH and WILDER PENFIELD, Montreal. This is a clinical study of patients who had craniotomy because of focal epileptogenic lesions which could be traced to injury at birth or in early infancy. The patients were carefully studied clinically, electrical explorations of the cortex were carried out at operation, and an attempt has been made to diagnose in retrospect the type of lesion that occurred at birth. Certain types of injury were found as follows: 1 Old fracture of the skull laceration of the brain, hemorrhage and scar formation. 2 Subdural hemorrhage with resultant subdural adhesions and convolutional atrophy. 3 Cerebral atrophy due to thrombosis of a large artery. 4 Focal atrophy due to compression ischemia. 5 Diffuse atrophy due to natal asphyxia. 6 Adhesions and convolutional atrophy due to infantile meningitis.



## Current Medical Literature

### AMERICAN

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Titles marked with an asterisk (\*) are abstracted below.

#### American Journal of Cancer, New York

71 501 648 (Dec) 1938

- \*Synovial Sarcomas in Serous Bursae and Tendon Sheaths L. Berger Quebec Que.—p. 501  
Production of Primary Bone Tumors (Osteosarcoma of Bone) by Intramedullary Injection of Methylcholanthrene A. Brunschwig Chicago—p. 540  
The Production of a Melanotic Neoplastic Disease in Fishes by Selective Matings IV. Genetics of Geographic Species Hybrids M. Gordon and G. M. Smith New Haven Conn.—p. 543  
Carcinoma and Venous Thrombosis The Frequency of Association of Carcinoma in the Body or Tail of the Pancreas with Multiple Venous Thrombosis E. E. Sprout New York—p. 566  
Comparative Study of Ovaries and Other Endocrine Glands in Rats with Benign Transplanted Breast Tumors and in Normal Rats Injected with Sex Hormones J. Heiman New York—p. 586

**Synovial Sarcomas**—From a study of five personal cases of synovial sarcomas and a review of the literature, Berger concludes that histologically only those tumors should be considered of synovial nature which present one or more specific features of the normal synovial tissue. From a topographic point of view his cases show that synovial sarcomas may arise outside of and far from articulations, in the midst of soft tissues where they originate in serous bursae normal or irregular from a purely anatomic point of view. With regard to evolution, synovial sarcomas are highly malignant tumors, although they seem at first to grow slowly. Synovial sarcomas of serous bursae apparently take a more rapid course than those of articulations. Recurrences develop in almost all patients operated on. Death is generally due to pulmonary, exceptionally to cerebral metastases. Definite cure is exceptional and can be obtained only by early removal. Therapeutic measures should therefore be prompt and radical.

#### American Journal of Clinical Pathology, Baltimore

9 1120 (Jan) 1939

- The Septic Syphilodermas C. S. Butler—p. 1  
History of Syphilis in 180 Patients in Which the Kline Tests, the Kolmer Test and the Kahn Test Are in Disagreement J. H. Mills and Elsa Jahn Baltimore—p. 10  
Simplified Complement Fixation Technique for Serologic Diagnosis of Syphilis F. Boerner and Marguerite Lukens Philadelphia—p. 13  
Tumor Nomenclature Suggestions for Its Revision H. E. Robertson Rochester Minn.—p. 24  
Changes in Serum Calcium Inorganic Phosphate and Phosphatase Activity in the Pregnant Woman M. Bodansky with assistance of Katherine Campbell and E. Ball Galveston Texas—p. 36  
The Protective Action of Alcohol in Experimental Trichinosis J. B. McNaught and G. N. Pierce Jr. San Francisco—p. 52  
Nutritional Anemia Clinical and Experimental Studies R. M. Tyson, F. W. Konzelmann and H. C. Lennon with technical assistance of Hanna Eymann Philadelphia—p. 58  
\*Study of the Complement Fixation Reaction in Tuberculosis J. A. Kolmer Philadelphia and J. F. Mahoney Stapleton N. Y. with assistance of Elsa R. Lynch—p. 71  
The Criteria of a Dependable Basal Metabolism Report P. Roth and Pearl E. Buckingham Battle Creek Mich.—p. 79  
The Gout Cycle and Its Anatomic Findings Report of 1028 Sectioned Gouters B. Markowitz Bloomington Ill.—p. 93  
Practical Classification of Leukemic and Related Conditions V. H. Moon Philadelphia—p. 100

**Alcohol and Trichinosis**—Since there are reports that alcoholic beverages taken liberally with trichinous meat offers protection against infection and since the use of generous quantities of alcoholic liquors has been advised as therapy in trichinosis, McNaught and Pierce investigated this problem by *in vitro* studies and by experimentation on rats. Their conclusions are that while alcohol has little direct action on trichinella larvae *in vitro* and only halves the number of larvae which develop in the rat after a fixed dose of free Trichinella

is ingested, it reduces the severity of the infection by 80 per cent if the alcohol is taken at the same time as is trichinous meat. A single dose of alcohol taken together with trichinous meat reduced the number of Trichinella that encysted in the muscles of rats by 80 per cent, but when alcohol was taken in large quantities over a period of seven weeks during the maturation, larval bearing, migrating and encysting stages of the parasites it gave no protection. *In vitro* experiments suggest that this protective action is due to the fact that alcohol interferes with the digestive liberation of encysted Trichinella. Experiments on rats verify this. The daily ingestion of from 6 to 8 cc of absolute alcohol per kilogram of rat did not appreciably raise their blood alcohol values. Rats infected with Trichinella showed the highest blood eosinophilia during the third week of infection.

**Complement Fixation Reaction in Tuberculosis**—Kolmer and Mahoney performed tuberculosis complement fixation tests on the serums of 408 tuberculous individuals, of these 637 per cent gave positive reactions with an 8 year old antigen of partially degenerated human bacilli prepared and tested by the Kolmer method. The presence or absence of fever at the time the specimens of blood were collected had little or no influence on the results since positive reactions were obtained in sixty-three of the febrile and 641 per cent of the afebrile cases. Four of twenty-five serums from syphilitic nontuberculous donors gave positive tuberculosis complement fixation reactions presumably due to the fixation of complement by syphilitic antibody with the lipoids and waxes remaining in the partially degenerated bacilli of the tuberculosis antigen. The authors recommend the performance of the Wassermann test on all serums submitted for the tuberculosis complement fixation test, when the former gives a positive reaction, great caution is required in the interpretation of a positive tuberculosis reaction.

#### American J. Digestive Diseases, Huntington, Ind

5 721 776 (Jan) 1939

- Studies on Humans with a New Secretagogue Meil R. Upham and F. Spindler New York—p. 721  
Peptic Ulcer of the Esophagus D. T. Chamberlin Boston—p. 725  
Food Allergy and Its Rationalization H. C. Bradley and S. Belfer Madison Wis.—p. 730  
Pain in Carcinoma of the Stomach Preliminary Report A. B. Rivers and T. J. Dry Rochester Minn.—p. 732  
The Effect of Acetyl- $\beta$ -Methylcholine (Methylol) on Gastric Secretion in Animals and in Man J. Flexner and I. S. Wright New York—p. 736  
History and Development of Gastric Analysis Procedure I. Hollander and A. Penner New York—p. 739  
Peptic Ulcer Effect of High Protein Diet on Behavior of the Disease C. Windover and M. J. Matzner Brooklyn—p. 743  
Value of Gastroscopy in Diagnosis of Phytobezoar Case Report J. M. Ruffin and R. J. Reeves Durham N. C.—p. 745  
Ulcerative Colitis of Twenty Eight Years Duration with Recovery W. Z. Fradkin Brooklyn—p. 746  
Treatment of Operable Rectal Cancer in Poor Surgical Risks G. E. Binkley New York—p. 749  
\*Practical Method of Analyzing the Precipitating Factors Producing Peptic Ulcer E. J. Callahan and D. W. Ingham Saratoga Springs N. Y.—p. 751

**Factors Producing Peptic Ulcer**—It is evident to Callahan and Ingham from the cursory review of the current theories that despite criticism against the neurogenic origin it is yet the most constant etiologic factor in peptic ulcer. The food habits of a patient with ulcer must be carefully studied, as a well arranged nonirritating low residue diet is the foundation on which treatment is built. Although studies in heredity have not clearly demonstrated that there is a transmitted tissue susceptibility to peptic ulcer, this may be assumed because there seems to be a correlation between body build, personality and other qualities and this common gastrointestinal lesion. The authors employ an uncomplicated office procedure in their practice of gastro-enterology. They have constructed two charts each containing an equilateral triangle the sides of which are represented by the letters A B C. The hereditary factor is represented by A, the psychogenic factor by B and the food factor by C. One chart represents the diagnostic or analytic chart and is constructed with the apex of the triangle downward, which symbolizes imbalance. This demonstrates to the patient the mechanism of his recurrences and recurrences by the ease with which this triangle is thrown

off balance. After a routine history and physical examination have been completed and a clinical diagnosis of peptic ulcer has been confirmed by fluoroscopic and x-ray examination, the first chart is shown to the patient. The cause of peptic ulcer may be projected on the sides of the triangle. The A side of the triangle is dismissed by explaining to the patient that he has an inherited susceptibility to peptic ulcer. The B side of the triangle may be divided into four main divisions: long illness in the family, financial troubles, unfaithful spouse and unexplained worry. The C side of the triangle, although the food habits of people with and without peptic ulcer are practically the same, is necessary to complete the hypothesis. After this survey has been made with the patient, the psychogenic factor is considered. The particular inciting agents responsible for the presenting complaint are elicited and identified. Careful and repeated questioning will reveal the psychic stimulus which by constant repetition produces the onset of his disease or a recurrence. A second chart is designated the therapeutic chart, in which the triangle is constructed with the base downward representing stability. The sides of the triangle are labeled in the same manner. Thus, the one factor which is within control is the food factor, hence it has been established as the base of the triangle. The remaining two sides are explained as follows. On the assumption that there is a hereditary trend in peptic ulcer the patient must accept this and try to live within this limit of ability. For example, if he is 25 per cent disabled by his disease he must strive to live 100 per cent of the 75 per cent and not more. The patient is urged to seek possible solutions for the anxieties which he may have. If the problem is of such magnitude that it cannot be dismissed with ease, he is cautioned to accept a philosophic view and do the best he can each day, be honest with himself and avoid fatigue and worry.

### Journal of Lab and Clinical Medicine, St Louis

24 337 448 (Jan) 1939 Partial Index

- Juvenile Diabetes Mellitus. Comparative Study of Standard Insulin, Crystalline Insulin, Protamine Insulin and Hexamine Insulin. H M Feinblatt Brooklyn—p 337
- Atmospheric Pollen of Nashville Tenn. Evangeline Bowie Nashville Tenn—p 342
- \*The Effect of Copper and Iron on Secondary Anemia of Therapeutic Malaria in General Paresis. P G Schube Boston and B D Prescott Hartford Conn—p 346
- Studies in Bone Marrow. A S Gordon Brooklyn—p 352
- Coronary Artery Thrombosis. F J Smith B E Goodrich and R J Needles Detroit—p 367
- Clinical Observations on Value of Various Xanthine Derivatives in Angina Pectoris. H M Massel Chicago—p 380
- An Attempt to Mobilize Lipoids from Storage Depots by Deep Massage and Increased Tissue Temperatures. J J Short and J D Currence New York—p 395
- Skin Reactions. VI Simple Micromethod for the Assay of Histamine in Mammalian Blood. H A Abramson and I Ochs New York—p 398
- Photo Electric Recording of the Pulse and of Other Oscillatory Movements with the Electrocardiograph. A B Hertzman St Louis—p 409
- Response to Liver Extract of Experimentally Induced (Typhoid) Anemia in Rabbits. Negative Result. A J Creskoff and T Fitz Hugh Jr Philadelphia—p 411
- Refining of Antiserums. II Improvements in Preparation of Refined and Concentrated Pneumococcus and Meningococcus Antibacterial Serums. E Cardone and K G Falk New York—p 417
- Use of Noncooked Nonsterilized Coconut Milk as Additional Nutrient Substance in Culture Mediums. L Blauvelt Asheville N C—p 420
- Method for the Determination of Bromine in a Protein Free Filtrate. Helen L Wikoff Eloise Bame and M Brandt Columbus Ohio—p 427

### Copper and Iron in Anemia from Therapeutic Malaria

—In the course of their work on the treatment of dementia paralytica with malaria Schube and Prescott often observed that the secondary anemias which almost invariably resulted were exceedingly alarming not only in their intensity but also in the persistence with which they remained after the termination of the malaria, and irrespective of the institution of ordinary iron or liver therapy. The combination of copper with iron was instituted in some of these cases, and the combination enhanced the formation of hemoglobin and erythrocyte. This was well illustrated in cases of secondary anemia of unknown origin, as the combination increased the hemoglobin and erythrocytes quite consistently in most instances. The hemoglobin and erythrocytes were both depressed in secondary anemia induced by malaria in dementia paralytica patients but untreated with

copper or iron and increased only many weeks after the termination of the malaria. When ferrous iron was administered regularly from the time of the malarial inoculation to the return of the blood picture to normal, the average curves of depression and the return of the blood elements to normal were approximately the same. But in the same type of patients when copper and iron were regularly administered from the time of the malarial inoculation to the return of the blood picture to normal the curve dropped slower, and before it had dropped half the distance of the other two groups it began to rise again and reached normal much sooner than those of either group. The time from the first temperature elevation to the lowest hemoglobin and erythrocyte counts was usually shorter, and the return to normal was generally more rapid. This lessened severity of the anemia coupled with the fact that it was more difficult for the malaria to produce the anemia and the fact that the erythrocyte counts and hemoglobin were rapidly restored to normal by means of copper and iron would indicate that these minerals are of value in combating the anemia incurred by malaria. Iron and copper did not interfere in any way with the expected therapeutic benefit from the malaria with the temperature rises or with the action of trypanamide. The authors feel that copper and iron can be used with impunity in dosages much larger than the ones (32 mg of ferrous iron and 1 mg of copper orally in capsules) they used. It is highly probable that larger doses would be more satisfactory. They believe that their work indicates that the reticulo endothelial system of man can be stimulated to such an extent that it can minimize the devastation wrought in the blood stream by malaria. It also indicates that the malaria did not materially affect the reticulo endothelial system of the cases studied and thereby intensify the anemia produced by direct erythrocyte destruction.

### Journal of Nutrition, Philadelphia

17 1102 (Jan) 1939

- Comparative Study of Metabolism of Certain Amino Acids with Special Reference to Respiratory Exchange and Heat Production. M Kriss State College Pa—p 1
- Level of Inorganic Phosphorus in the Blood of Dairy Cattle. S R Johnson State College Pa—p 15
- The Factor I (Vitamin B<sub>6</sub>) Requirement of the Rat. Mildred K Dimick and C B Schreffler Emeryville Calif—p 23
- Effect of Yeast and of Thiamin on Production of Low Iodine Goiter. P I Harris and R E Remington Charleston S C—p 31
- Acid Soluble Phosphorus Content of Muscle of Rats Under Various Diet Modifications. H C Struck C I Reed and Jeannette L Cohen Chicago—p 35
- Effects of High Humidity on Skin Temperature at Cool and Warm Conditions. H Freeman and B A Tengyel Worcester Mass—p 43
- Effect of Chondroitin Sulfuric Acid on Gizzard Erosion and Growth in Chicks. L A Crundall Jr F F Chesley R E Gray and H E Robinson Chicago—p 53
- Secondary Deficiency of Vitamin B<sub>1</sub> and Riboflavin in the Blacktongue Producing Diet. I H Margolis G Margolis and Susan Gower Smith Durham N C—p 63
- Digestibility of Raw Potato Starch in Man. J M Beazell C R Schmidt and A C Ivy Chicago—p 77
- Diet and Rate of Depletion of Hepatic Vitamin A. E J Lease and H Steenbock Madison Wis—p 85
- Biologic Value of Carotene in Various Fats. E J Lease Jane G Lease H Steenbock and C A Brumann Madison Wis—p 91

### Missouri State Medical Assn Journal, St Louis

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- Fractures of Both Bones of the Leg. F A Jostes and M B Roche St Louis—p 1
- Fractures of the Os Calcis. D C McKeever Kansas City—p 7
- Highway Accidents. Early Management of Fractures. M L Klinefelter St Louis—p 10
- Vision and Its Relation to Automobile Accidents. P S Luedde St Louis—p 14
- American Red Cross Highway Emergency First Aid Station Program. A W Cantrell St Louis—p 16
- Motor Mishaps and the Medical Profession. H D Griffith Jefferson City—p 18
- \*Hemorrhoids. Study of Series of Cases Improved by Conservative Treatment. G L Krause St Louis—p 20
- Artificial Fever Therapy. Report on Three Years Clinical Experience. L Bromberg St Louis—p 24

**Hemorrhoids**—Krause injected from 5 to 10 minims (0.3 to 0.6 cc) of 5 per cent phenol in sterile olive oil or 5 per cent quinine and urea hydrochloride in the treatment of seventy five cases of hemorrhoids. The ages of the patients ranged from 16 to 86 years. The injection was made around and above the hemorrhoid just beneath the mucous membrane. Chronic con-

stigation was complained of generally. Bleeding, pain and protrusion was a universal complaint. Itching occurred in 60 per cent of the cases, of which ten cases showed pruritus. The interval between injections varied from five to ten days, bleeding persisted in every case until the last ulcerated site had disappeared, for this reason the ulcerated spot was always chosen for the first injection. Symptoms of pain, bleeding and protrusion invariably improved following the first and second injection. Pruritus with itching was the most resistant condition and was the last to disappear. The patient is cautioned not to strain or defecate within from twelve to twenty-four hours after the injection. Seventy-one patients were ambulatory with normal activity restricted.

### Ohio State Medical Journal, Columbus

35 1120 (Jan) 1939

- An Autologous Fascia Suture Technique in Surgical Treatment of Direct Inguinal and Femoral Hernia R C Austin Dayton—p 17  
Clinical Aspects of Peripheral Vascular Disease H C Eddy Cleveland—p 21  
Nutritional Anemias of Infancy and Early Childhood C A Moore St Louis—p 25  
Incidence and Diagnosis of Cardiovascular Syphilis C F Garvin Cleveland—p 34  
Use of Benzodrine in the Depressed Phase of the Psychotic State I A Dub Columbus and L A Lurie Cincinnati—p 39  
Treatment for Acute Conjunctivitis A J Schonberg Cleveland—p 46  
Surgical Management of the Diabetic Patient A T Bowers and T P Sharkey Dayton—p 48  
Hemorrhoidectomy with Special Reference to Postoperative Care and Complications C C Perry, Cleveland—p 54  
Cooperation by the Roentgenologist and Otolaryngologist F R Hargett Springfield—p 58  
Scleroderma Report of Case Treated with Acetyl Beta Methylcholine Chloride (Mechoyl) Iontophoresis I A LeFevre Cleveland—p 60

**Amphetamine in Depressed Psychoses**—Dub and Lurie selected, for treatment with amphetamine sulfate, forty-eight depressed female patients from a service of about 1,500 patients at Longview Hospital because of their pronounced depression as revealed by their mood, speech and actions. The ages of the women ranged from 18 to 75 years. They had been institutionalized for from ten months to twenty-six years. The patients were given 5 mg of amphetamine sulfate twice a day. The first dose was given at breakfast and the second with the noon meal. To those patients who refused to take the medication the drug was mixed with the food. In certain cases the dosage was increased to 10 mg twice a day. This was done if there was no improvement after a week's trial on the smaller dose. The medication was continued for three weeks. A lactose placebo was then substituted without the knowledge of the attendants or patients. The placebo was continued for three weeks, after which no medication was given for two weeks. Following this rest period the patients were again given the placebo for four weeks, after which amphetamine sulfate was again substituted and continued for six weeks. The effects of the treatment on the appetite, thirst, pulse, sleep, mood and psychomotor activity were recorded daily. Weight and blood pressure were recorded weekly. Forty-two of the women showed definite improvement when amphetamine was administered. A patient was considered benefited if she showed improvement in at least two of the following criteria: weight, cooperativeness and psychomotor activity. During treatment with the placebo, five patients became so violent that they could no longer participate in the experiment. Only five of the remaining forty-three patients maintained their initial improvement while thirty-eight relapsed when the lactose placebo was substituted for the amphetamine. During the rest period of two weeks, three more patients were lost to the experiment, one through discharge as apparently cured and two because they became violent. Of the remainder six remained improved while thirty-four remained unimproved. When the patients were again placed on placebo treatment only three held their gains. In other words, at the end of this period 92 per cent of the patients in this series were practically in the same mental condition that they had been in at the beginning of the experiment. But when amphetamine was again administered an immediate and striking improvement was observed in thirty-five, while only six failed to respond. An equally striking slump was observed when the amphetamine therapy was again discontinued, the results being practically the same as

those during the rest period. The best response was obtained in the paranoid and patients suffering from cerebral sclerosis, while the patients with dementia praecox responded the least. The duration of the disease seemed to have no bearing on the results obtained. Age, however, seemed to be of some significance as the women from 41 to 60 years of age showed the highest incidence of improvement.

### Public Health Reports, Washington, D C

54 29 58 (Jan 13) 1939

- Undergraduate Engineering Training in Public Health and Related Activities in Engineering Colleges of the United States A P Miller—p 29  
\*Evaluation of Odor Nuisance in the Manufacture of Kraft Paper J M Dalla Valle and H C Dudley—p 35  
Amblyomma Philippi New Tick from Texas and Mexico with a Key to Known Species of Amblyomma in the United States (Acarina Ixodidae) R A Cooley and G M Kohls—p 44

**Odor in Manufacture of Kraft Paper**—There are three types of obnoxious odors due to the process of manufacturing kraft paper. Dalla Valle and Dudley list them as (1) hydrogen sulfide, (2) volatile organic sulfur compounds and (3) chemical smoke containing sodium sulfate, sodium sulfide, traces of hydrogen sulfide and quantities of carbon and organic materials. Hydrogen sulfide is formed and released to the atmosphere at smelter furnaces where molten sodium carbonate and sodium sulfide are dropped into water and in the separator building in which this solution is filtered. The treatment of the fresh wood chips by the digester liquor containing sodium sulfide brings about the formation of many unknown volatile organic sulfur compounds. At nearly all points of the process at which the pulp is handled after the digestion, certain of these ill smelling volatile organic compounds are liberated. The greatest volume and concentration of these compounds are released from the turpentine condenser as steam is led from the digester tanks and when the pulp is blown from these tanks with the release of large quantities of steam containing many volatile constituents. The large quantities of smoke which are released through exhaust stacks release large amounts of sodium carbonate in a colloidal state. Although sodium carbonate in a pure state is odorless, much uncarbonized organic matter accompanies these particles, traces of hydrogen sulfide and various volatile oils of unknown composition. These organic materials, which are at least partially adsorbed on the colloidal particles of sodium carbonate, give rise to the peculiar odor when this smoke is blown across the ground. Methods of study are recommended which may lead to the control of the odor-generating processes. The possibilities of electrical precipitators to prevent an excess of chemical smoke are stressed.

### Radiology, Syracuse, N Y

32 1130 (Jan) 1939

- \*Lipoid Pneumonia in Infants and Children R S Bromer and I J Wolman Philadelphia—p 1  
\*Bronchogenic Carcinoma Study of Eight Autopsied Cases W E Howes and S G Schenck Brooklyn—p 8  
Spontaneous Mediastinal Emphysema Report of Case Associated with Spontaneous Pneumothorax J B Morey Adri Okla, and M C Sosman Boston—p 19  
Correlation of Physical and Clinical Data in Radiation Therapy W H Meyer New York—p 23  
X Ray Rentals in Hospitals Analysis of Current Rental Costs in Hospitals and Medical Buildings L H Garland San Francisco—p 46  
Multiple Heteromorphologic Malignant Tumors of the Uterus H W Jirox G Major and Margaret R Baker Pittsburgh—p 51  
Researches in the Problem of Radium Poisoning and Tolerance Dose of Radium B Rajewski Frankfurt on the Main Germany—p 57  
Value of Radiation in Treatment of Carcinoma of the Breast L G Allen Kansas City Kan—p 63  
Further Study on Direct and Indirect Actions of Radiation on Malignant Cells I Transplantation of Tissue Cultures of Mouse Sarcoma 180 After Exposure to Roentgen Rays II Cultures of Tumors Irradiated in Vivo K Sugiyama and I Cohen New York—p 71  
Roentgen Diagnostic Importance of Adipose Tissue J Silbermann Vienna Austria translation by E T Leddy Rochester Minn—p 77  
Relation Between Radiation Quality Factors and Depth A Mutscheller New York—p 87

**Lipoid Pneumonia in Infants and Children**—Bromer and Wolman studied twenty-seven cases of lipoid pneumonia at the Children's Hospital. Twelve of these were found in a series of 137 consecutive necropsies. Of the twenty-seven

patients, twenty-two died and postmortem studies were performed on twenty. The nature of the pulmonary lesion was recognized in only one, although roentgenograms of the chest were made of sixteen. In two thirds of the cases the pneumonia was associated with some sort of constitutional debility (prematurity, rickets, congenital syphilis, microcephaly, infantile scurvy, mongolism, spastic diplegia, amyotonia congenita, *intestinal malformations or congenital cardiac defects*). This indicates that physical weakness must be considered as an important predisposing factor of lipid pneumonia. Retardation of growth and poor nutrition, attributable in most instances to the constitutional disturbance rather than to the pneumonia, was present in twenty-one patients. The most common single symptom was chronic cough, present in six patients. As a rule the chest on physical examination seemed clear, although in a few instances minor signs were observed over the consolidated areas. None of the patients had a positive tuberculin test. The distribution of the pulmonary lesions at necropsy clearly indicated the exogenous origin of the lipid. The posterior dependent portions of the lungs, and especially the perihilar regions, were always affected. The right lung was more involved than the left, possibly because of the straighter course of its main bronchus. The nodules and solid lobules of lipid pneumonia were confluent, grouped or widely separated. Bands of scar tissue were sometimes present. The bronchopulmonary nodes were involved in a few instances. The roentgenograms of this series of patients, some showing a wide distribution, others an extremely slight involvement, emphasize the diverse x-ray variations. The pulmonary lesions can be classified as mild, moderate or severe, according to the extent of the involvement. This division is not dependent on the time that has elapsed following the aspiration of the oily substance or on the kind of oil aspirated. Experimental production of lipid pneumonia as reported in the literature suggests that cod liver oil causes an acute pneumonia which, after subsiding, leaves residual foci, whereas liquid petrolatum produces a more chronic reaction, which should result in an unchanged appearance in the serial roentgenograms. The extent of involvement depends on the quantity of oil in the lung regardless of whether it is aspirated in a single large amount or in repeated small quantities. The roentgenograms of the patients having only a mild involvement show an increase both in degree of density and in extent of the hilar shadows. The linear markings of the pulmonary fields are more exaggerated than normal. If small scattered areas of increased density are present they are usually situated along the descending branches of the right bronchus. The cardiac shadow obscures the left hilar markings. In the group with moderate involvement there is greater density of the perihilar shadows with widening in all directions. The dense shadows spread more or less homogeneously in all directions from the hilus. In several cases the left lung was unaffected. In the severe cases the perihilar shadows spread well out toward the peripheries of the lungs, although usually a clear zone is left between the dense shadow and the walls of the chest. As the child grows, this clear zone becomes wider unless the aspiration of oil continues. The edges of the lesions are either sharply demarcated or feathery. A definite lobal pneumonia shadow is not seen unless nonlipid pneumonia is present simultaneously. Coincident inflammation of the lungs was found frequently at necropsy. This may develop in the mild, moderate or severe cases. Serial roentgenograms are necessary to recognize its development and also to establish the chronicity of the process when no pneumonia supervenes. The positive diagnoses made in the five patients of the series who are still living were based on the x-ray observations, typical of severe involvement and proved chronic by serial roentgenograms.

**Bronchogenic Carcinoma**—Howes and Schenck report the pathologic features of eight fatal cases of bronchogenic carcinoma submitted to postmortem examination. Of the 737 new cases admitted to the Brooklyn Cancer Institute during 1937 there were seventeen of bronchogenic carcinoma, an incidence of slightly less than 3 per cent. In larger series of cases, bronchogenic carcinoma shows an incidence as high as 10 per cent of all cancers. The cause is still unknown, but

it is generally conceded that some form of chronic pulmonary irritation accounts for the development of the neoplasm in most instances. The symptoms are not unlike those observed in other chronic pulmonary diseases, especially tuberculosis, bronchiectasis, pulmonary abscess, mediastinal tumor and fluid cyst of the lung. X-ray study, including the instillation of iodized oil, reveals the true nature of the pulmonary pathologic changes in the majority of cases. In the presence of pleural fluid which obscures the underlying markings of the lungs, overpenetrated films or Potter-Bucky exposures should be made. With a mass in the region of the thoracic aorta, kymographic studies are indicated to exclude the possibility of an aneurysm. A necrotizing process in the lung, portrayed roentgenologically, does not exclude the possibility of a carcinoma which has undergone necrotic liquefaction. A negative bronchoscopic examination does not preclude the diagnosis of a primary pulmonary tumor, especially when the involvement is in the upper lobes or located in the finer bronchi. If the diagnosis is in doubt, biopsy of an available enlarged lymph node or mass should be performed. A metastatic process may present the first symptom of the disease. Clinically the skeletal system, regional lymph nodes and pleurae are the sites of metastatic predilection. In the osseous system the pelvis, femur, spine, skull and ribs are the more susceptible regions. Roentgenologically the skeletal lesions show osteolytic, osteoblastic or combined types of involvement. The majority of patients with bronchogenic carcinoma die within one or two years. The present recognized forms of treatment are irradiation and surgery. Irradiation with the present technic is at best palliative, surgery offers hope in selected cases. Microscopically three types are recognized—the squamous carcinoma, the adenocarcinoma and an undifferentiated group.

### Texas State Journal of Medicine, Fort Worth

34 585 658 (Jan.) 1939

- \*Differential Diagnosis and Treatment of Anemias E. E. Osgood Fort  
Land Ore—p. 591
- Monocytic Leukemia Report of Two Cases W. N. Powell Temple—  
p. 595
- The Problem of the Diagnosis of the More Common Blood Dyscrasias  
W. J. Marr Galveston—p. 599
- Tumors of the Ankle W. G. Stuck and D. A. Todd San Antonio—  
p. 603
- Injuries of the Knee Joint V. J. Tuck Sherman—p. 607
- Induction of Labor by Rupture of Membranes A. T. Stewart Lubbock  
—p. 610
- Vomiting of Pregnancy Its Prophylaxis and Treatment Evelyn G.  
Powers Amarillo—p. 614
- Delivery as a Factor in Obstetric Treatment F. B. Smith Houston—  
p. 617
- The Problems of the Dief J. J. Shea Memphis Tenn—p. 619
- Whose Responsibility Is Public Health and Medical Service? A. T.  
McCormack Louisville Ky—p. 624

**Diagnosis and Treatment of Anemias**—Osgood states that the diagnosis of anemia should always be based on an accurate erythrocyte count and hemoglobin determination, since the symptoms of pallor, weakness, dizziness, shortness of breath and edema may be produced by other diseases and are absent in some cases of anemia. It is important to determine the reticulocyte count, the icterus index and the urobilinogen excretion in the urine in any case of anemia. If the reticulocyte count is above 4 per cent it indicates an increased rate of erythropoiesis and if below 4 per cent it indicates a decreased rate of erythropoiesis. An icterus index above 6 or the presence of clinical jaundice with a positive urobilinogen test in a dilution of 1 to 20 in the urine indicates an increased rate of hemoglobin destruction within the body if disease of the liver or obstruction of the biliary tract can be excluded. An icterus index below 4 indicates a decreased rate of erythrocyte destruction. Anemias should be classified as macrocytic, hypochromic, microcytic or normocytic by an accurate determination of the color, volume and saturation indexes. There is no longer a place for the old terms 'primary' and 'secondary' anemias, since all anemias are secondary to some usually determinable cause and intelligent treatment can be given only when this cause is determined and removed. Correct diagnosis is a prerequisite to intelligent therapy.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Simple case reports and trials of new drugs are usually omitted.

## British Medical Journal, London

1 150 (Jan 7) 1939

- The Problem of High Blood Pressure in Man C W Pickering—p 1  
Prolonged Injections of Male Sex Hormones into Normal and Senile Male Rats V Korenchuk and K Hall—p 4  
Sulfanilamide Treatment of Guinea Pigs Infected with Brucella Abortus G S Wilson and Irene Mair—p 8  
Clinical Observations with Stilbestrol (Diethylstilbestrol) W R Winter and T N MacGregor—p 10  
Therapeutic Trials of Diethylstilbestrol A A Loeser—p 11  
Vitamin D in Diet Palatable Methods of Supply Jessie Lindsay and V H Mottram—p 14  
Symmetrical Peripheral Cyanosis in Cardiac Failure C B Perry and T B Davie—p 15

**Clinical Observations with Synthetic Estrogen**—Winter and MacGregor treated forty-five patients complaining of symptoms referable to an endocrine disturbance and six others in whom it was considered desirable to inhibit lactation with the synthetic estrogenic compound diethylstilbestrol. The responses obtained were similar to those which would have been expected from treatment with natural estrogen. Oral administration of the synthetic substance was found to be as effective as intramuscular therapy. Some of the patients experienced slight nausea during the treatment, but in only one was the treatment poorly tolerated.

**Therapy with Synthetic Estrogen**—Loeser used a synthetic estrogen (diethylstilbestrol) in the treatment of fifteen patients with minor degrees of ovarian insufficiency, climacteric disorders, dysmenorrhea, hypo oligomenorrhea, secondary amenorrhea, ovarian insufficiency and pruritus vulvae. The synthetic estrogen shows such definite estrogenic effects that it has a good substitution action in various forms of ovarian insufficiency. In six of the fifteen cases for which it was used, unpleasant secondary effects such as nausea or vomiting were produced.

## Journal of Mental Science, London

85 1184 (Jan) 1939

- Revaluation of Psychiatry D K Henderson—p 1  
Diffuse Sclerosis with Preserved Mielin Islands Pathologic Report of Case with Note on Cerebral Involvement in Raynaud's Disease B Horanyi, Hechst and A Meyer—p 22  
Social Values in Mental Hospital Practice W J T Kimber—p 29  
Truancy J M Partridge—p 45  
Resultant and Purposive Psychiatry H Crichton Miller—p 82  
A Death During Insulin Treatment of Schizophrenia Pathologic Report S A MacKeith and A Meyer—p 96  
Insulin Therapy Unusual Hypoglycemic Sequels in Two Psychotic Patients with Observations on Glycemic Levels W M F Robertson and G L Ashford—p 106  
Preliminary Inquiry into the Part Played by Character and Temperament in Accident Causation E G Chambers—p 115  
Some Considerations of the Physical Factor in Delusional States R E Hemphill—p 119  
Note on Agglutination Reactions in Typhoid Carrier State J R Murray and F Partner—p 126

**Agglutination Reaction in Typhoid Carriers**—Murray and Partner performed Widal tests on twenty-five known typhoid carriers. Eleven of these carriers gave negative blood agglutination reactions at a time when the organism of typhoid could be recovered from the stools. The authors state that a greater number of carriers will be detected if bacteriologic studies of the stools are always made. In this connection attention may be drawn to the long persistence of the passage of organisms, one person in the series dates the original infection to 1910.

## J Royal Inst Public Health and Hygiene, London

1 887 950 (Dec) 1938

- The Rise and Fall of Certain Diseases Concurrently with the Progress of Hygiene and Sanitation S Woodward—p 897  
Review of the Medical Supervision of Industry by the State J C Bridge—p 911  
Development and Progress of Methods of Combating the Bedbug V Borland—p 923  
Treatment of Arthritis in the Home F M Hillard—p 932  
The New Maternity Services from the Point of View of the Obstetric Surgeon A L Robinson—p 937  
Physical Recreation for Women and Girls H M Watt—p 945

## Lancet, London

2 1503 1554 (Dec 31) 1938

- Hypotension and Flying A F Rook and D J Dawson—p 1503  
Rolling Disease New Syndrome in Mice Associated with Pleuropneumonia like Organism G M Findlay, Emily Kienberger F O MacCullum and R D McKenzie—p 1511  
\*Detection of Horse Serum (Meningococcus Antitoxin) in Blood and Cerebrospinal Fluid J M L Burtenshaw—p 1513  
Miles's Abdominoperineal Operation Treatment Before and After S O Aylett—p 1516  
Microcytic Anemia of the Achrestic Type Case Described G M Wruchope and M Leslie Smith—p 1518  
\*Treatment of Subacute Bacterial Endocarditis with Sulfapyridine G R Ellis—p 1521  
Pericarditis Associated with RT Deviation Without Tamponade A Morland and J Osborne—p 1522

**Horse Serum in Blood and Cerebrospinal Fluid**—Burtenshaw tried to find what proportion, if any, of therapeutic serum, administered parenterally to patients suffering from meningococcal meningitis, reached the cerebrospinal fluid. Since there is no simple method of assaying meningococcus antitoxin, it was thought that a test for the presence of the antitoxin-containing horse serum in the body fluids of subjects injected with the serum would furnish at least an indication of the presence of antitoxin. Such a test was provided by an adaptation of the precipitin reaction. Twenty-three patients with meningococcal meningitis and one from whom only a strain of staphylococcus was isolated received meningococcus antitoxin only by parenteral, usually intravenous, injection. Horse serum protein was detected in the cerebrospinal fluid in every one, though its concentration varied greatly from case to case and was always small compared with the simultaneous concentration in the blood. The values of the ratio horse serum in blood/horse serum in cerebrospinal fluid agree well with the observations of Freund for typhoid antibodies. Allott (1938) in a large series of cases, including the twenty-four of this investigation, finds similar variations of sulfanilamide content in the cerebrospinal fluid in spite of equivalent dosage, but in contrast to the behavior of horse serum the sulfanilamide concentration in the cerebrospinal fluid rapidly approximates, during the first twelve hours after administration that in the circulating blood. There is no apparent correlation between age and the permeability of the blood-brain barrier to horse serum, though this barrier may have varied with the intensity of the meningitis. Traces of foreign protein persisted for a long time, both in the blood and in the cerebrospinal fluid. Intrameningeal injections of serum ensure the immediate presence of large amounts of antibody at the site of infection, yet equally striking is the steepness of the drop in serum concentration from the heights reached by intrameningeal dosage. Within one or two days, however large the dose, the cerebrospinal fluid serum content has fallen to the low levels attained by parenteral administration alone.

**Treatment of Endocarditis with Sulfapyridine**—Ellis obtained much improvement in two cases of subacute bacterial endocarditis with sulfapyridine. The pyrexia in the first case was controlled in twenty-four hours by 2 Gm of sulfapyridine. The profound fall in temperature that can be produced by large doses makes the author wonder whether some temperature-reducing mechanism may not be at work other than the mere destruction of organisms. The fall in temperature is at least in part presumably due to a sterilizing of the blood stream, though there is as yet no certain proof of this. Obviously the ideal investigation which must be undertaken is daily blood cultures while the patient is apyrexial under the influence of the drug. As the dosage of sulfapyridine was reduced in the two cases cited, the temperature slowly rose, but it did not reach its former heights until the drug was practically stopped. It may be that there is partial sterilization of the blood, but not of the primary focus of infection, the endocardium. It seems that the mechanical problem of the locked up streptococci is still the stumbling block in the treatment of this type of endocarditis. Sulfapyridine is none the less, as far as the author is aware, the only drug which has ever been known definitely to reduce the temperature and temporarily to improve the clinical condition.

## Bruxelles-Medical, Brussels

19 323 360 (Jan 8) 1939

- \*Benign and Malignant Hypertension Their Relations to Kidney E Dicker—p 323  
Primary Abdominal Pregnancy Case M Vastesaegeer and G De Tauf—p 333

**Benign and Malignant Hypertension**—Dicker in discussing the pathogenesis of benign and malignant hypertension, reviews studies of other investigators and describes his own clinical and experimental observations. Summarizing the present status of the question he says that 1 The diminution of the irrigation of one or both kidneys suffices to induce a hypertension of long duration, without renal insufficiency 2 The hypertension that is secondary to renal ischemia does not have a nervous origin but is due to a humoral action 3 The vascular modifications that are observed in a man with benign hypertension and which consist essentially in a thickening of the media are the same as those which can be observed in dogs that have had hypertension for a long time but do not show renal insufficiency, thus they are secondary to hypertension and the late result of the renal intervention 4 Renal insufficiency alone never determines hypertension or anatomopathologic changes of the vessels 5 The necrotic lesions that are pathognomonic of malignant hypertension are the result of renal insufficiency developing unexpectedly in the course of an old hypertension. The kidney being responsible for the hypertension, it can be affirmed that in the last analysis the vascular changes are like wise the result of a renal intervention. Thus it can be seen to what extent the role assumed by the kidney is essential in the pathogenesis of hypertension. It remains to be determined what is the substance (or the complex of substances) which, originating from an ischemic kidney, is capable of producing a definite hypertension either directly or indirectly by means of endocrine products, finally it remains to be seen whether it is the same as that which, in case of renal insufficiency, is capable of bringing about necrosis of the arterioles and of transforming a benign hypertension into a malignant one

## Presse Medicale, Paris

47 57 80 (Jan 14) 1939

- \*Physiologic and Clinical Significance of Peroxidase Action of Blood M Polonovski and M Jayle—p 57  
Cerebrospinal Concussion F Pedrazzini—p 58

**Peroxidase Action of Blood**—In studying the biochemical mechanism of oxidation in human blood, Polonovski and Jayle show that the phenomena of oxidation are dependent on three types of enzymes: the dehydrogenases, the oxidases and the peroxidases. They demonstrate that there exist in human blood, apart from the peroxidases of the leukocytes, two peroxidase systems. The first is the peroxidase system A, its activity is related to 1 cc of plasma and expressed in iodine units (I U). The second is the peroxidase system B, 'the hemoglobin activator of the plasma', it is expressed by the same symbol and is related to 0.1 cc of plasma. In a table the authors compare the values for A and B in several healthy persons and in patients. From the biologic point of view, hemoglobin reveals itself as an animal peroxidase of catalytic action which is in all points comparable to that of vegetable peroxidases and like them capable of playing a part in the biologic oxidations of the tissues. From the clinical point of view, the existence and the pathologic variations of the hydro-alkyloperoxidase of the plasma (A) and of the plasmatic activator (B) of the peroxidase action of the hemoglobin permit certain prognostic deductions. The difference between A and B, which is normally positive, becomes in certain disorders the more negative as the prognosis becomes more unfavorable.

## Strasbourg Medical

98 475 490 (Dec 5) 1938 Partial Index

- \*Late Results of Stellectomy in Bronchial Asthma R Leriche and R Fontaine—p 475  
Differential Arteriographic Diagnosis Between Arterial Embolism and Acute Thrombosis R Fontaine and P Branzon—p 479

**Stellectomy in Bronchial Asthma**—From 1926 to 1934 Leriche and Fontaine resorted to stellectomy in fourteen cases of bronchial asthma. In order to evaluate the late results of the operation, eleven patients were followed up for some time

In seven cases in which unilateral stellectomy was performed the asthmatic crises immediately disappeared in two cases but the operation failed in five. Up to the present, the satisfactory results of unilateral stellectomy in one case have lasted for thirteen years (recovery) and in the other the crises, greatly attenuated, reappeared after a period of seven years of complete cessation of the attacks. In four cases of bilateral stellectomy the operation was followed by immediate disappearance of the asthmatic crises. In one case, recovery has lasted up till now (seven and a half years after the operation). In the other three cases the crises reappeared greatly attenuated both in frequency and in intensity. The satisfactory results in the last three cases have lasted from three to five years after the operation. The authors state that the preliminary infiltrations of the stellate ganglion before stellectomy is of value in attenuating or arresting the development of asthmatic crises while the patients are being prepared for stellectomy. Generally, but not in all cases, the patients who have a favorable reaction to the preliminary infiltration of the stellate ganglion have also a favorable response to stellectomy. They point out the dangers and lack of satisfactory results of other surgical treatments (vagotomy or resection of the posterior bronchial plexus) which are resorted to by some authors in the treatment of bronchial asthma. They emphasize the satisfactory results of bilateral stellectomy, especially in intractable forms of bronchial asthma. The operation involves a simple technic and is well tolerated by the patients and is dependable for immediate and late results.

## Schweizerische medizinische Wochenschrift, Basel

69 23 44 (Jan 14) 1939 Partial Index

- Prognosis of Mental Disturbances B Dukor—p 25  
Nature of Gout and Its Relation to Rheumatism Chronic Articular and Other Diseases E Stotzer—p 29  
\*Treatment of Acute and Chronic Diarrheas with Salt-Free Diet H Salomon—p 31  
Simulated Pregnancy Case W Neuweiler—p 32

**Treatment of Diarrhea with Salt-Free Diet**—Salomon shows that the treatment of diarrhea has undergone considerable changes in recent decades. Whereas formerly it was the rule first to remove the "materia peccans" by means of purgatives it is now believed that the intestine purges itself sufficiently in the course of a severe diarrhea. The author says that he as well as others have long defended this opinion, because the administration of purgatives in the course of diarrhea may have serious results. He further cites the experiments with tea and fruit juices which he carried out in 1909, the experiences of Heisler and Mora made with the apple cure and other observations. He agrees with von Noorden's opinion according to which the absence of sodium chloride is the essential factor in the fruit diet as well as in other measures that prove effective in diarrhea. He cites clinical histories to prove that the salt-free diet is effective in diarrhea. If the salt-free diet is employed in diarrhea, it should be carried out along lines similar to those employed in nephrosis. Sweet foods are especially desirable; the sugar replaces the salt to a considerable extent. The fluid intake should consist chiefly of fruit juices and indifferent mineral waters. Discussing the action mechanism of the salt-free diet in diarrhea the author shows that it is readily understandable on the basis of the laws of osmosis.

## Archivos Argentinos de Pediatria, Buenos Aires

9 611 739 (Dec) 1938 Partial Index

- Brant's Disease Late Results of Splenectomy Case E A Beretervide and S Mindlin—p 611  
\*Erythema Nodosum and Pulmonary Tuberculosis Cases I Rascovsky and A Rascovsky—p 623  
Septicemia Abscess of Kidney and Perinephric Phlegmon in Newborn Infant D A Giraldes—p 636

**Erythema Nodosum and Pulmonary Tuberculosis**—The Rascovskys report six cases of erythema nodosum in children ranging in age from 4 to 9 years. The condition developed in the course of a febrile attack similar to grip, during which the patients had a cough without any sputum. Four patients had a history of contact with patients who had pulmonary tuberculosis. The clinical examination for pulmonary tuberculosis gave negative results in three cases and positive results in three. The Mantoux test gave strongly positive results in all cases except the third, which became positive during aggravation of



the febrile and pulmonary symptoms. Roentgenograms were taken in the course of the febrile attack during which erythema developed. They showed secondary tuberculous infiltration at the hilus of the lung in three cases, secondary infiltration around the hilus in one case and primary infection in another. One of the patients was apparently in good health, but since the father had pulmonary tuberculosis a roentgenogram was made of the child's thorax, which showed the presence of a typical primary complex of recent development at the upper lobe of the lung. Three years later erythema nodosum developed three months later measles. Roentgenograms made in the course of the disease showed that the primary complex was entirely effaced. Two of the patients in the group developed allergic hypersensitivity and asthma within a year after the erythema disappeared but which improved after desensitization.

### Archiv fur Dermatologie und Syphilis, Berlin

178 201 372 (Dec 19) 1938 Partial Index

- Epidermophyton Latium and Its Variants S Szathmari —p 216  
Clinical Aspects and Histology of Anonychia J Alkiewicz —p 234  
\*Demonstration of Granular Formations of Type of Virus Elementary Bodies in Efflorescences of Patients with Pemphigus S Wolfram —p 240  
Oxidation Reduction Potential and Reducing Processes in Living Skin G Rudacki —p 253  
Dermatofibrosarcoma Protuberans C H Beck —p 260  
Capillaroscopy and Capillarophotograms of External Male Genitalia W Schonfeld —p 276

**Virus Elementary Bodies in Pemphigus** —Wolfram gives a brief survey over the efforts that have been made to detect an infectious causal agent of pemphigus and thinks that the supposed agent probably belongs to the invisible viruses rather than to the bacteria. At his request a search was made for virus bodies in pemphigus blisters at Gerlach's institute. When this investigation gave positive results, the author decided to study all cases of pemphigus seen in his clinic for the presence of virus bodies. Investigations were made on eight cases of pemphigus and on six cases of dermatitis herpetiformis. Duhning staining with victoria blue and with the primulin method was done in all cases. If the outcome was the same with the two stains, the results were regarded as positive provided the other criteria were fulfilled. The positive results of specimens that were stained according to Paschen's method or with Morosow's silver stain were accepted as valid only if at least one or both of the first two staining methods gave the same results. In all examined cases and in the majority of the examined specimens, granular formations were detected which were in every respect like the virus elementary bodies of the virus infections.

### Archiv fur Gewerbepathologie, Berlin

9 179 294 (Dec 21) 1938 Partial Index

- Chronaximetric Examinations Before and After Work in Lead Workers and in Persons Who Have No Contact with Lead H J Schutz —p 198  
Changes in Heart and in Blood Vessels of Lung During Experimental Silicosis and Silicotuberculosis G Hegemann —p 228  
Investigations on Causes and Prophylaxis of High Incidence of Pneumonia in Industrial Plant Producing Alloys for Refined Steel M Gundel and W Heine —p 248  
\*Vascular Diseases After Poisoning with Mercury K Fellingner and F Schweitzer —p 269

**Vascular Diseases After Mercury Poisoning** —Fellinger and Schweitzer report the clinical histories of three patients in whom severe vascular impairments developed in connection with mercury poisoning. To be sure it is justifiable to inquire whether the vascular lesions are actually the result of a mercury intoxication or whether their concurrence with mercury poisoning is merely accidental. Although positive proof is lacking, many factors militate for a causal role of the mercury poisoning. In all three cases the vascular lesions developed at a time at which although the early signs of mercury poisoning had disappeared, the chronic manifestations and sequels (dental lesions, tremor and psychic changes) were completely developed. This appearance at a time when late lesions and sequels develop seems to indicate that the vascular changes belong to the other manifestations of mercury poisoning the more so as the chronological connection is similar to that which is observed in lead poisoning, in which vascular impairments are comparatively

frequent. Moreover it appears improbable that, in comparatively young and hitherto entirely healthy persons, vascular lesions should develop with great rapidity, when it is considered that Raynaud's and Buerger's disease generally develop at first insidiously, causing only minor symptoms. These and other considerations make it probable that these vascular lesions and their sequels have a causal connection with the mercury poisoning. It was impossible to make anatomic studies on the vessels of the three patients with mercury poisoning, but the clinical manifestations of the vascular lesions resemble those of the various forms of obliterating endarteritis, however, in their unusually rapid, almost fulminant, course they differ from idiopathic vascular diseases.

### Klinische Wochenschrift, Berlin

17 1825 1856 (Dec 24) 1938 Partial Index

- Reduction of Respiratory Basal Metabolism in Defects of Right Side of Heart A Syllb —p 1829  
\*Pathogenesis of Essential Hypochromic Anemia W Thiele —p 1835  
Recent Results with Conglobation Reaction for Tuberculosis According to Hark and Niggemeyer I E Haag —p 1836  
Case of Addison's Disease on Traumatic Basis R Siehler —p 1839  
Determination of Arsenic in Cerebrospinal Fluid After Administration of Organic Arsenic Preparations Vonkennel and Kimmig —p 1840  
Epinephrine Effecting Inhibition of Resorption in Alimentary Alcoholism B Siegmund —p 1842  
\*Therapy of Nontropical Sprue H W Hotz —p 1843

**Pathogenesis of Essential Hypochromic Anemia** —Thiele directs attention to an anemia of the hypochromic type which frequently concurs with achlorhydria or achylia and occasionally with atrophies of the pharyngeal and esophageal mucosa. Moreover, it is often accompanied by koilonychia and by paresthesia, and it develops chiefly in women between the ages of 20 and 40. As regards the etiology of this form of anemia the opinions are still divided, but the role of the stomach has been discussed repeatedly. Those who investigated the problem of postoperative anemias have pointed out that the precipitated evacuation of the stomach plays an important part in the pathogenesis of these anemias. The author noted that in essential hypochromic anemia the gastrointestinal passage is almost regularly excessively accelerated. The evacuation of the stomach and of the upper portion of the small intestine is so rapid that after an hour the jejunum is empty and the chyme is already in the ileum. The author shows that the accelerated gastrointestinal passage of essential hypochromic anemia must be regarded as peculiar to this disease and the question arises whether this accelerated passage leads to disturbances in the resorption. He cites several investigators who are of the opinion that an accelerated passage of the ingesta through the small intestine impairs the resorption. The resorption of iron takes place chiefly in the duodenum and so it may be concluded that only a part of the iron content of the food is utilized during the accelerated transport in patients with essential hypochromic anemia. The author cites animal experiments made by M B Schmidt which demonstrated that hypochromic anemias produced by iron deficiency increase in severity in successive generations. This was explained as resulting from the depleted iron depots in the maternal organism. In this connection the author points out that essential hypochromic anemia often shows familial appearance. Moreover, it has been observed in families in which other members had pernicious anemia, achlorhydria or achylia. Deficiencies in acidity and ferments are often detected in the female forebears of patients with anemia. The author reasons that children from mothers who have an impaired intestinal resorption probably inherit a subnormal iron storage, although they may not develop anemia. It may be assumed that this deficient iron depot is incapable of coping with extraordinary demands such as menstruations and pregnancies and so it is explained why essential hypochromic anemia appears chiefly in women.

**Therapy of Nontropical Sprue** —Hotz says that it is not justified to regard the prognosis of nontropical sprue as entirely unfavorable. He shows that, although complete cure is rare, a suitable therapy will produce in the majority of cases freedom from symptoms. To be sure, since relapses are frequent the patients must remain under the supervision of the physician. Of twenty-two patients who were observed and treated



by the author, four were cured, thirteen were so greatly improved that they were able to resume their work, and five died of complications. The treatment requires much patience on the part of the physician as well as of the patient and it necessitates hospitalization. It consists chiefly in dietetic measures and in the administration of liver extracts. The intake of fats and carbohydrates should be reduced, but proteins, vegetables and fruits should be given in generous amounts. The liver extract must be given in large doses for a long time by parenteral administration. As soon as remission of the anemia is obtained, the liver therapy should be combined with oral and, if necessary, with intravenous administration of iron. With the administration of adrenal cortex extract and of yeast, a treatment which Verzar recommended for nontropical sprue, the author obtained no results which even approximately compared with those obtained by his own dietetic and liver therapy.

### Problemy Tuberkuleza, Moscow

Pp 1184 (No 9) 1938 Partial Index

- Thoracoscopy and Thoracocautery in Pulmonary Tuberculosis N G Stoyko—p 10  
 \*The Origin Course and Therapy of Tuberculous Lobitis B P Zvonnikov—p 26  
 Roentgenologic Appearance of Disappearance of a Cavity K V Pometsov—p 49  
 Roentgenologic Demonstration of Fresh and Old Cavities A Ya Rabinova—p 60  
 Healing of Tuberculous Cavity T N Olenov—p 69

**Tuberculous Lobitis**—According to Zvonnikov, lobitis in the majority of cases is a manifestation of a primary infiltrating flare-up of the tuberculous process. Three factors play a part in the formation of a lobitis: the interlobar septum as the point of origin, local sensitization of the pulmonary tissue and a partial atelectasis accompanying the inflammatory process. Correct topographic diagnosis is arrived at through oblique and frontal roentgenograms. Diagnostic errors are committed principally in the cases of tuberculous lobitis with an acute onset. The differential diagnosis includes nonspecific pneumonia, cancer of the lung and lobar atelectasis. The prognosis of tuberculous lobitis is governed by two contrary tendencies. On the one hand the process tends to remain limited to the lobe for a long time, on the other, it displays an early tendency to break down and form cavities. Spontaneous recovery is possible but is extremely rare. Regressive alterations in favorable cases are those of resorption, scar formation or gradual resorption with disappearance of the interlobar septum. The therapy of lobitis is collapse. Artificial pneumothorax or phrenic exeresis is recommended for the acute cases and thoracoplasty for the old fibrocavernous forms. In the author's material artificial pneumothorax gave a satisfactory clinical effect in 48 per cent of the cases and phrenic exeresis in 21 per cent. The relative effectiveness of the two methods, however, cannot be arrived at from these figures because of the dissimilarity in the gravity of the cases.

### Acta Orthopaedica Scandinavica, Copenhagen

9 115 233 (Nos 23) 1938 Partial Index

- \*Plastic Operations in Loss of Thumb K H Koster—p 115  
 Subtrochanteric Osteotomy in Relatively Old Congenital Luxation of Hip Arthritis Deformans and Coxa Vara E Platou—p 132  
 Some Cases of Transplantation After Orell's Method W Risinger—p 152  
 Congenital Pseudarthrosis of the Leg K Stenport—p 181  
 \*Different Types of Tuberculosis of Hip in Children G Odelberg Johnson—p 197

**Plastic Operations in Loss of Thumb**—Koster shows that extreme conservatism is necessary in operations on the thumb. If in spite of this it becomes necessary to amputate a thumb though the metacarpus is preserved and the carpometacarpal joint is mobile, it is advisable to mobilize the metacarpus by phalangization, a fissure being formed between the first and the second metacarpus. The author reports three cases in which this operation was successful. Descriptions are given of some of the numerous forms of plastic operations on the fingers such as finger substitution of Lucksch and the plastic operations on the fingers according to Nicoladoni. These operations, aside from being technically difficult, rarely produce the desired

results, that is, free mobility of the transplanted parts. Phalangization is the easiest operation, it rapidly produces a useful finger and it answers the demands which must be made on a finger substitute: strength, motility and sensitivity.

**Tuberculosis of Hip**—Odelberg-Johnson reports seven cases of tuberculous coxitis in children, illustrating the following types of this disease: (1) coxitis with primary destruction of the acetabulum, (2) coxitis with primary luxation, (3) focus in the neck of the femur with perforation into the joint and (4) sequestration of the capital epiphysis. It is pointed out that in the early stages of tuberculous coxitis weight put on the extremities as well as muscular contracture may contribute to the deformity of the atrophic bony components of the joint and also to the development of bone destruction in adjacent parts of bones. Moreover, "extra-articular pseudarthrosis" usually develops after coxitis in early childhood and this morbid condition often is the final stage of infantile coxitis with primary luxation.

### Ugeskrift for Læger, Copenhagen

100 1367 1396 (Dec 8) 1938

- (Chlamydia in Men I Andresen—p 1367  
 \*Treatment of Retention of Testis with Special Regard to Hormonal Treatment and Indications for It E Guldberg—p 1368  
 \*Some Cases of Apicitis H Rasmussen and T Meyer—p 1375

**Treatment of Retention of Testis with Special Regard to Glandular Therapy and Indications for It**—Guldberg advocates the institution of glandular therapy at the age of 10 in all cases of uncomplicated retention of the testis and in cases complicated with hernia. He says that if the treatment is not effective it will not lessen the chance for successful operative treatment and often considerably improves it. This view, he affirms, is supported by his results in the seven cases reported in which glandular therapy was given, in three instances followed by operative treatment. Cases in which the testis is fixed by stenoses in the inguinal canal, adhesions and so on are considered unsuited for endocrine treatment, they call for operation and later glandular therapy if needed. Glandular therapy is contraindicated in cases of malignant degeneration and ectopia, also in cases with threatening incarceration of the testis, which might increase to a fateful degree on glandular therapy. A complicating hernia may by rapid growth or incarceration indicate early operation regardless of the patient's age. In these cases one must try to avoid such changes in the anatomic conditions as might hinder a later spontaneous descent of the testis or a descent effected by glandular therapy.

**Some Cases of Apicitis**—Eight cases are reported, six in children from 6 to 12 years of age. In seven the diagnosis of apicitis was verified roentgenologically, in one only at necropsy. Rasmussen and Meyer state that the clinical symptoms vary greatly and may be vague or entirely absent and that only a ray examination establishes the presence of a destructive process in the apex. There was paresis of the abducens nerve, together with characteristic pain in three cases in two of which the paresis set in on the thirtieth and forty-sixth day respectively, in one there was double vision from the first day of the otitis. Five patients, including two of those with paresis of the abducens, had increased cell count in the spinal fluid. In three instances pronounced changes in the apex were manifest on the first x-ray examination on the eleventh, eighteenth and twenty-first day respectively of the apicitis. In the other four, marked changes appeared on later examinations. That the apicitis was accompanied by sphenoid sinusitis in five cases points to the advisability of careful examination of the sphenoid sinus in apicitis. In the first fatal case Ramadier's operation failed because there was not enough space between the carotid canal and the promontory to allow access to the apex. Operation on the apex with evacuation was done in four cases on the twelfth to the thirty-eighth day, in two by Ramadier's method. In all four there were soft cells in the apex with granulations or pus. One of these patients died from meningitis after a revision operation. The remaining three patients, two with marked processes in the apex, recovered although only ordinary chiseling was performed, with emptying of the perilabyrinthine cells. The author feels that more definite guides are needed for the treatment of apicitis, also for the time for operation.

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## THE PERIODIC HEALTH EXAMINATION AS A METHOD OF CLINICAL INVESTIGATION

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BOSTON

In 1923 I became interested in periodic health examinations and determined, for my own satisfaction, to discover whether or not such examinations were of use. In this paper I shall report certain results of my observations during the last fifteen years, stressing particularly my conviction that the periodic health examination method opens an interesting approach to a certain type of useful clinical investigation.

The beginning of the periodic health examination plan is of considerable historical interest. Lemuel Shattuck<sup>1</sup> of Boston, schoolmaster and visionary, deserves credit for first having promulgated it in this country. In 1850 in his famous report he recommended that individuals be encouraged to have frequent sanitary examinations made of themselves in an effort to promote their health and to prevent disease. For, said he, in the literature on health too much importance is attached to public health and too little to personal health. In order to maintain personal health, the history and condition of each individual's constitution should be studied and the character of the blood that courses in his veins should be ascertained from time to time. "Our persons should be *preserved* and *strengthened* by wise and uniform care and training. We should *cleanse* our persons by daily ablutions properly applied at suitable times and of the right kind and temperature, *strengthen* our persons, physically and intellectually by regular and progressive, not transient and excessive, exercise and labor, and should *refresh* our persons by rest and sleep, at proper times, in right places, by suitable means, and in sufficient quantities." He predicted that if careful personal sanitary examinations were periodically conducted there would be much less of the ravages of cholera, typhus and other epidemics in the community, and less also of isolated "sporadic diseases." Eleven years later Dr. Horace Dobell<sup>2</sup> advocated the same idea in England, and in 1900 Dr. George M. Gould<sup>3</sup> again put in a plea for it in the United States "as a means for adequately and scientifically conducting life." These three pioneers, however, like so many others, were never taken seriously by either physicians or laymen.

In 1913 a group of progressive business men foregathered and concluded that the periodic health examination idea not only was a good one for the client but also might be made a commercial success. At first these business men propagated the idea more effectively among the public than among physicians. But in 1922 the American Medical Association<sup>4</sup> became interested and appointed a committee to outline procedures and devise examination forms for the making of such examinations.

In reviewing the literature on periodic health examinations that has accumulated, one is struck by two peculiarities: the layman, on the whole, apparently can be easily interested in the plan and would like to cooperate in it; the physician, on the other hand, has been lukewarm to it, rather incredulous of its value and so far has not grasped its complete potentialities. This is in large measure due to the fact that individual physicians have but rarely taken the matter seriously.

### THE METHOD OF PERIODIC HEALTH EXAMINATION

The periodic health examination technic is not difficult. It entails no more than a history of the case methodically recorded and a complete physical examination of the patient repeated at intervals as time goes on. It need include as a routine only the simplest laboratory work: a Wassermann test, urinalysis, examination of a blood smear and estimation of the hemoglobin concentration. Occasionally more complicated procedures will be required such as x-ray studies or a determination of the basal metabolic rate. Chiefly the method requires a good system of records and follow-up, reasonable clinical judgment, a great deal of patient listening and, above all, in order to make the patients return from time to time, willingness on the examiner's part to assume a vital interest in the life of the person whom he examines.

In the cases reported here, the histories and physical examinations were uniformly made on a Mayo Clinic<sup>5</sup> history form, and in each instance such laboratory procedures were carried out as seemed indicated at the time of any examination. The patients were followed up in different ways, mainly by personal periodic rechecking at annual intervals or less or by correspondence with patients or their friends, by correspondence with physicians or hospitals, or even through the death notice column of various newspapers. In this manner a considerable volume of material has been assembled from which to construct the life history of a group of persons from the time they were first examined until they died. Thus an effort has been made on a small

Read before the Toronto Academy of Medicine Dec 6 1938

<sup>1</sup> Shattuck Lemuel Report of a General Plan for the Promotion of Public and Personal Health Boston Dutton and Wentworth State Printers 1850

<sup>2</sup> Dobell Horace Lectures on the Germs and Vestiges of Disease and on the Prevention of the Invasion and Fatality of Disease by Periodical Examinations London J Churchill 1861

<sup>3</sup> Gould, G M A System of Personal Biologic Examinations The Conditions of Adequate Medical and Scientific Conduct of Life J A M A 35 134 137 (July 21) 1900

<sup>4</sup> Proceedings of the House of Delegates J A M A 78 1709 (June 3) 1922

<sup>5</sup> Fitz Reginald The Case History in Practice of Surgery edited by Dean Lewis Hagerstown Md W F Prior Company Inc 1 1 12 1926

scale to develop knowledge regarding the clinical beginnings of a variety of fatal disorders

There is one difficulty about the technic of the periodic physical examination which cannot be overstressed. As judged by my own experience it is well nigh impossible to train oneself to be sufficiently systematic in one's work and to be properly thorough. My own conscience is by no means clear. I can recall at least one rectal cancer that developed under observation without

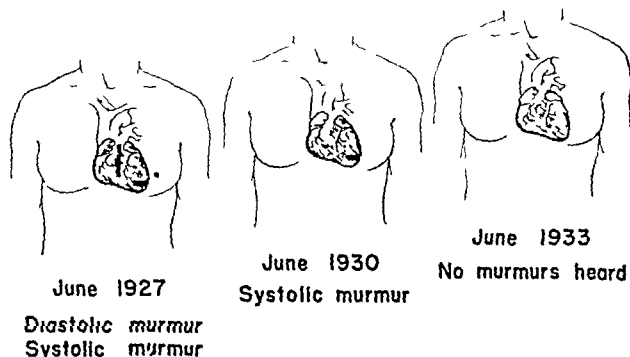


Fig 1—The apparent disappearance of murmurs in a patient supposed to have rheumatic heart disease

a note as to any initial rectal examination, an ovarian tumor that grew with never a vaginal examination being reported until too late and a neoplasm of the testis which through superficial and hasty examination was thought to be hydrocele. If one wishes to use the periodic health examination as a method of clinical investigation one must be as scientific in its use as in the use of any other research method, one must always be workman-like and painstakingly thorough lest the one important clue to the early manifestations of a disease be unrecognized through carelessness.

#### THE COMMON CAUSES OF DEATH IN THE UNITED STATES

Dublin and Lotka<sup>6</sup> have published interesting tables giving the common causes of death among the policyholders of the Metropolitan Life Insurance Company. In 1935, according to their figures, and they probably are as accurate as any, the ten leading causes of death in the United States were those given in table 1. Statistics such as these are necessarily significant to the periodic health examiner. What can be learned from the manner in which common causes of death develop that may be useful in preventing them or in mitigating their course once they have developed as a form of disease clinically recognizable?

Of heart disease there is little to be said. There were many cases of rheumatic and syphilitic heart disease and a few of congenital heart disease in this series, but the lesions were firmly established and incurable by the time the patients were first observed. In recent years, certainly, much has been accomplished to make the life of the cardiac patient longer and more useful, a good deal is being done, as Sir William Osler so fervently hoped, to jugulate syphilis and thus prevent syphilitic heart disease, but the problem of preventing or curing rheumatic heart disease still faces us. That possibly rheumatic heart disease is at times curable is suggested by the observations of Bland, Jones, and White,<sup>7</sup> who found in a group of 1,000 young persons

with clinical signs of rheumatic heart disease that in the course of time the physical signs characteristic of valvular disease disappeared in eighty-three instances. I have occasionally encountered such cases, always an experience sufficiently impressive to discount some of one's natural pessimism concerning the incurability of rheumatic heart lesions in young persons.

A girl aged 14 years had double mastoiditis in September 1926 followed by an attack of swollen and painful joints. In May 1927 her joints again became painful, and in June, when she was first examined, the blood pressure was 105 systolic, 60 diastolic, there was a blowing systolic murmur at the apex and a low pitched diastolic murmur along the sternum. She was later examined at intervals for several years. At first there was no change in the character of the murmurs, in 1930 all that could be heard was an apical systolic murmur, and after 1933 the heart sounds appeared entirely normal. The last time she was seen was in the fall of 1938, when she appeared the picture of health and had a heart that seemed normal in every way.

What makes certain persons able to recover from heart disease?

**Cancer**—Malignant disease indeed presents a bewildering problem. Table 2 illustrates the manner in which various tumors developed in patients under observation and emphasizes the difficulties entailed in early diagnosis.

To me the impressive feature of watching such cases was the apparent suddenness of onset of important symptoms. More data of this type should be recorded to confirm or refute the impression that cancer often begins its clinical course not insidiously but suddenly and that to recognize cancer early is impossible by present methods because the disease in its early stages produces no recognizable manifestations. If this is true, what is badly needed is a test for cancer analogous to the tuberculin test for tuberculosis and the Wassermann test for syphilis, by which cancer may be recognized.

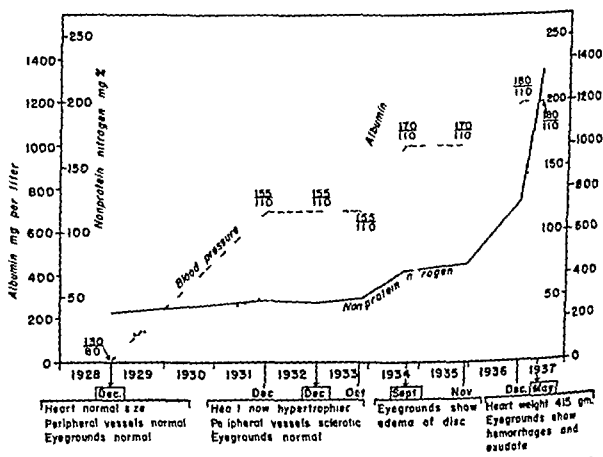


Fig 2—The development of cardiac hypertrophy, hypertension, peripheral vascular and retinal lesions in polycystic kidney disease

in its preclinical state. Until such a test is developed cancer inevitably must continue to be discovered in most cases when it is already far advanced.

**Accidents**—These are a constant threat. In this series two patients died from having fish bones stuck in their throats. Several found the vicissitudes of life unbearable and succumbed to self-inflicted trauma. One patient was run over, another was shot, a third was killed in an airplane crash. A man with well compensated valvular heart disease suddenly dropped dead

6 Dublin L. I. and Lotka A. J. Twenty Five Years of Health Progress. New York: Metropolitan Life Insurance Company, 1937.  
7 Bland P. B., Jones T. D. and White P. D. Disappearance of Physical Signs of Rheumatic Heart Disease. J. A. M. A. 107: 569-573 (Aug. 22) 1936.

from the exertion of attempting to save property from his barn, which had caught on fire. A somewhat older man was driving his motor car during a bad snowstorm when visibility was poor and collided with a railroad train. Were any of these fatalities preventable? They were discouraging because they seemed so unnecessary.

TABLE 1—Ten Leading Causes of Death in the United States in 1935

Diseases	Death Rate per 100 000 (Standardized for Color, Sex, and Age)
1. Diseases of the heart	138.6
2. Cancer	86.8
3. Influenza and pneumonia	67.8
4. Accidents (all forms)	57.5
5. Tuberculosis (all forms)	50.4
6. Chronic nephritis	52.0
7. Cerebral hemorrhage	47.0
8. Diseases of the coronary arteries and angina pectoris	32.4
9. Diabetes mellitus	20.5
10. Appendicitis	11.5

And yet how could they have been forestalled? Even a simple clinical study of a series of fatal accidents with analysis of the patient's previous medical history and of the events leading up to death might throw important light on a public health problem of increasing magnitude.

**Tuberculosis**—This is always a surprising disease. It keeps cropping up unexpectedly. Several years ago Dr. W. G. Smilie and I became interested in the problem of tuberculosis in medical students. A group of supposedly healthy students were tuberculin tested each year during their medical student life. It was surprising to see the proportion of negative reactors who became positive during that interval of time.

Having a positive tuberculin reaction is not the same thing, however, as having clinical tuberculosis. The onset of clinical tuberculosis, at least in certain instances, is strikingly acute.

In 1927 a robust looking young man went away on a vacation. He was in good condition so far as he knew. He played a violent game of tennis one morning and immediately after it began to raise large quantities of bloody sputum. Over the right upper lobe were rales and exaggerated voice and breath sounds. Roentgenograms of the chest showed marked infiltration through both lungs, suggesting an acute bronchopneumonia. The sputum contained tubercle bacilli.

To recognize the reactivation of a latent tuberculosis is a much more difficult matter.

A man aged 34 complained of a sore mouth in June 1933 which had apparently developed from bands on his teeth. Since the soreness persisted, a bit of tissue was removed from the floor of the mouth for microscopic examination. This showed no significant changes. Finally, because the symptoms continued, the sublingual glands were dissected out and proved to be tuberculous. This finding led to a chest film. There was infiltration in both lungs with lesions which appeared discrete and inactive. There was nothing in the past history to suggest when the lesion developed except that as a youngster the patient had been liable to "colds" and that he had been very ill with influenza in 1918. He was advised to take things easily for a few months until his mouth entirely healed up. He gained 20 pounds (9 Kg.) and felt perfectly well. In February 1936, having been in perfect health for a year, he began to complain of a sense of stiffness in his neck and of recurrent attacks of vertigo. Eventually these symptoms proved to be due to a tuberculoma of the left cerebellar hemisphere and to tuberculous meningitis.

When and how did the disease originally commence?

If a positive tuberculin reaction means what it is thought to mean, namely a form of tuberculosis either inactive or active within the body, we shall continue to

see a great deal of tuberculosis for many years to come. In order to combat the disease most intelligently we must continue to improve methods for treating it when it is active. Also we must continue to develop methods for recognizing it in its early stages. For the latter purpose the periodic health examination method should be important. There is a vast literature on tuberculosis and its treatment after the disease has developed, on the other hand there is very little description in carefully studied cases of how it begins. A critical analysis of the mode of onset of the disease in patients studied before as well as after they fall ill would be surprisingly useful in the antituberculosis campaign.

**The Cardiorenal Group Including Chronic Nephritis, Cerebral Hemorrhage and Diseases of the Coronary Arteries and Angina Pectoris**—Vascular disease in one of its various forms is by all odds the most common disease encountered in practice. Yet of its origin and early diagnosis little or nothing is known.

A man aged 48 was interested in periodic health examinations because he happened to occupy an unusually responsible position in the business world. In October 1924 he felt well. He was slightly overweight. His blood pressure was 150 systolic, 80 diastolic. The urine was normal. The heart was normal in shape as judged by ordinary physical and x-ray examinations. There were no murmurs. The eyegrounds showed nothing remarkable. The peripheral vessels were palpable and slightly thickened but were not sclerosed or tortuous.

In October 1925 he still felt well. No appreciable change in his physical condition had taken place. The blood pressure level was the same. The peripheral and retinal vessels were

TABLE 2—The Onset of Cancer in Supposedly Noncancerous Persons

Num ber	Age	Sex	First Nor mal Exam nation	Last Nor mal Exam nation	First Notice of Symp- toms of Disease	Symptoms	Diagnosis
1	34	♀	Sept 1929	Aug 1937	Aug 1937	Headache	Brain tumor
2	50	♀	June 1935	June 1936	July 1936	Tumor on fore- arm	Melanotic sar- coma
3	66	♂	Mar 1925	Mar 1926	Oct 1927	Loss of weight (9 pounds), no symptoms	Carcinoma of colon with liver and peritoneal metastases
4	50	♂	Oct 1927	Nov 1931	Apr 1932	Tenesmus and rectal bleeding	Carcinoma of rectum
5	73	♂	Mar 1928	Mar 1932	Oct 1932	Bronchitis which failed to clear up	Malignant tumor in right chest
6	55	♂	June 1929	June 1930	Sept 1930	Acute diarrhea followed by jaundice	Cancer of pan- creas
7	64	♀	Sept 1929	Sept 1929	Apr 1930 Nov 1931	Tumor in breast recently noticed Blood tinged va- ginal discharge recently noticed	Cancer of breast Cancer of uterus
8	60	♂	Nov 1925	Dec 1935	July 1936	Recent swelling in scrotum	Embryoma of testis
9	48	♀	Nov 1934	Dec 1936	Dec 1937	Increasing dys- pnea on exertion	Malignant lymphoma
10	59	♂	Mar 1931	Mar 1931	Oct 1932	Sudden painless hematuria	Carcinoma of left kidney and ureter

unchanged. The size and shape of the heart were unchanged, and the heart sounds continued to be normal. He died two months later of a sudden coronary thrombosis.

The widow of a patient with a similar history asked me how it is that a vigorous man in apparently splendid health can have such a frail hold on life. I wish I knew the answer.

I have made a conscientious effort to pick out even one case in which I could truthfully say that arterio-sclerosis had developed under observation. I must

confess that the onset of vascular disease has seemed so insidious that it has been beyond my power to recognize it

My nearest approach to watching the development of arteriosclerosis and hypertension was in a patient with polycystic kidney disease whose course was followed for nine years. My observations are of some interest, though I do not feel sure that they throw any light on how or why arterial degeneration develops

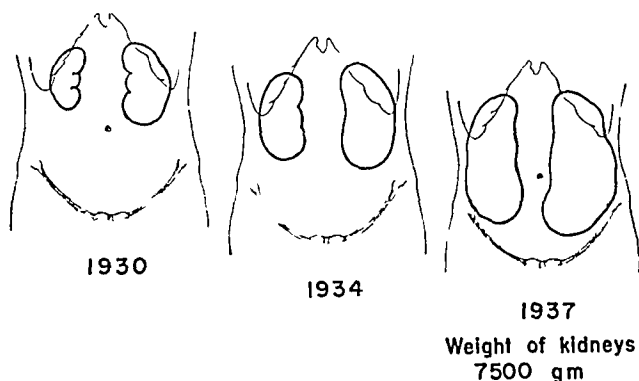


Fig 3—The growth of the kidneys in polycystic kidney disease

As can be seen (fig 2), vascular changes, hypertension, cardiac hypertrophy and retinal changes developed during the progress of a notably chronic renal insufficiency. Was the renal disease primarily responsible for the whole picture or had the patient two independent lesions, one in the kidney and the other in the vascular system?

There are several questions of this kind that can be answered only by following individual patients through all stages of vascular disease from before its beginning until its end, and this method of approach is obtainable only through the periodic health examination method. I venture to predict that if as small a group as 100 individuals were carefully studied from birth until death by the periodic health examination method, the information obtained from such a clinical investigation would throw considerable light on the early manifestations of several chronic diseases.

**Diabetes**—Joslin<sup>8</sup> says that the date of onset of diabetes is usually indefinite. Then he adds "It will be worth while to endeavor to learn more accurately the type of onset of diabetes. It will furnish assistance in a search for the etiology and will raise queries in the minds of the pathologists, it should indicate the character of the methods which must be adopted for prevention, it may be of value in classification and prognosis."

I can recall having seen four patients under supervision in whom diabetes developed. As in the case of cancer, in each instance I have been struck not by the indefiniteness with which the disease began but rather with its suddenness.

A man aged 30 was treated at the Peter Bent Brigham Hospital in 1921 for lobar pneumonia. During his hospital stay three samples of urine were examined, one of which contained a trace of sugar, the other two being sugar free. Six weeks later he reentered the hospital. After leaving he had felt splendid, gaining 16 pounds (7.3 Kg) and recovering all his strength. Suddenly he developed a ravenous appetite and a marked thirst and he began to lose weight. He was then discovered to have diabetes.

A man aged 47, 6 feet (183 cm) tall, weighed 227 pounds (103 Kg) in July 1930. His urine was normal. The blood sugar concentration after a hearty noon meal was 0.12 per cent.

In April 1932 his weight was unchanged. He was advised to lose weight lest by remaining fat he run the risk of having diabetes develop. He followed this advice for a time, so that in June 1933 he weighed 206 pounds (93.4 Kg). The urine was sugar free and the blood concentration was 0.11 per cent. In October 1935 he returned with 6 per cent sugar in his urine and a blood sugar concentration of 0.29 per cent. A few weeks previously he had suddenly noticed a little urgency of urination, nocturia and itching of the glans penis.

A man aged 45 was studied at the Robert Dawson Evans Memorial in October 1933. His blood sugar concentration was normal in several tests and the urine was sugar free. In May 1937 he suddenly developed a ravenous appetite, began to drink a great deal of water each day and pass large quantities of urine. Now the blood sugar concentration was 0.28 per cent and the urine contained 2.2 per cent of sugar.

A woman aged 60 entered the Robert Dawson Evans Memorial in July 1936. Because she had myxedema with a basal metabolic rate of -27 per cent she was given a sugar tolerance test. This was not abnormal. She was given thyroid and in January 1937 with a basal metabolic rate of -6 per cent the sugar tolerance test was repeated and again was found normal. In January 1938 her basal metabolic rate was +10 per cent, the blood sugar concentration was 0.12 per cent and the urine was sugar free. Last July during the berrying season she suddenly noticed one day when it was warm that she could not seem to get enough to drink. The thirst persisted. Soon she found that she was becoming unusually hungry and she noticed that she was losing weight. She reentered the hospital in September with a basal metabolic rate of -8 per cent, now with 1.5 per cent of sugar in the urine and with a blood sugar concentration of 0.49 per cent.

In each of these four cases the diabetes apparently developed suddenly. It would be extremely interesting to have reported the mode of onset of diabetes in a large group of cases in which the disorder had developed under observation. As Joslin suggests, a clinical investigation of this character might well be of assistance in discovering the etiology of diabetes and might well indicate new methods for preventing the disease.

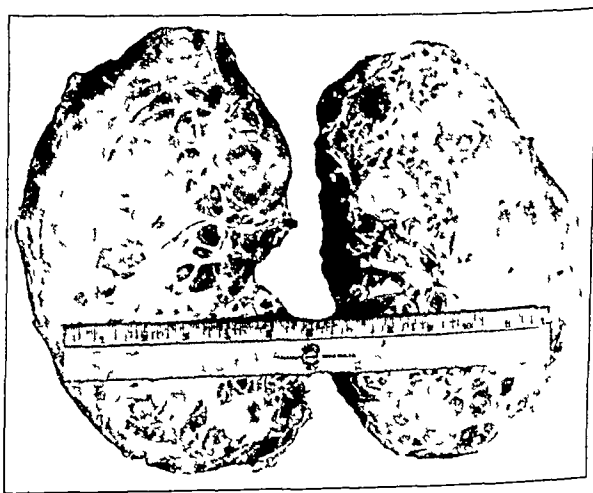


Fig 4—The pathologic changes of polycystic renal disease gross appearance of kidneys combined weight 7500 Gm

and for learning more of its life history. The periodic health examination offers a good method for such an investigation. Why will not some physician undertake it?

**Appendicitis**—That appendicitis is an important cause of death in the United States is a great pity. Considering how much is known of the disease, of its early diagnosis and of its treatment, it seems peculiar that so many people each year should die as a result of it. One

<sup>8</sup> Joslin E P. The Treatment of Diabetes Mellitus ed 6 Philadelphia Lea & Febiger 1937

case looms large in my mind, making me raise the question as to whether prophylactic appendectomy does not deserve a certain amount of consideration in selected cases

A woman aged 71 wished to live comfortably as long as she could and felt that periodic health examinations might be of some use to her for this purpose In 1927, when she was



Fig 5—Section reduced from a photomicrograph under medium power showing portion of pyramid No glomeruli present The collecting tubules are dilated and filled with polymorphonuclear leukocytes There is an acute inflammatory infiltration of the interstitial substance (Courtesy of Dr Kenneth Mallory Boston City Hospital)

first examined, she had a considerable degree of vascular disease with tension of 190 systolic and 80 diastolic The urine was normal The renal function was normal The eyegrounds showed evidence of vascular disease but no hemorrhages or exudates In 1928, 1929 and 1930 she appeared to show no signs of wear and tear Nothing about her general condition had changed except that she had lost a little weight in an effort to obey the medical advice given her May 5, 1930, she seemed as well as ever Two months later an attack of pain developed in the right lower quadrant with fever, nausea and vomiting She did nothing about all this for three days, and then it was too late She had a ruptured appendix with pelvic peritonitis and a terminal acute nephritis

Could she have enjoyed life longer and more effectively had her appendix been removed before it had become acutely inflamed?

**Miscellaneous Diseases**—Fifteen years' experience with the periodic health examination method is too short a time in which to draw any sweeping conclusions as to its ultimate usefulness During this period, however, I have seen isolated examples of the beginnings of several other diseases of obscure etiology in addition to the cases cited I believe that data obtained through the use of this method are bound to yield important results as literature on the clinical beginnings of such diseases accumulate For instance, in this series there were three patients with dementia praecox who were observed first as well persons, then as persons who appeared peculiar but harmless and finally as persons who needed institutional care A detailed report of a large series of such cases similarly observed would be helpful Two cases of multiple sclerosis were followed from the time when even expert neurologists were unable to make any diagnosis until at last the classic clinical features of the disease developed Certainly further knowledge is needed of what multiple sclerosis is and how it commences One patient was regarded as perfectly healthy until she had what appeared to be a trivial acute infection of unknown etiology From

this beginning a progressive organic disease of the spinal cord steadily developed which the pathologist was unable satisfactorily to classify In one patient myelogenous leukemia seemingly developed after she had been considered for several years to have polycythemia vera, and in another acute fulminating lymphatic leukemia developed under observation Exophthalmic goiter, gout, duodenal ulcer, gallstone disease, renal stones and fibroid tumors of the uterus have become apparent in patients without physical signs of such abnormalities when they were first examined On the whole, it is almost certain from this short experience that, if any physician will but stop to realize that man is naturally a long lived animal with peculiar liabilities to disease, if he will be patient, if he will be methodical and accurate in his description of the phenomena he observes, he has abundant opportunity at hand to inquire into the beginnings of a variety of clinical conditions by the periodic health examination method and thus to add significantly to clinical knowledge

HUMAN RELATIONS AND HEALTH

Finally, the periodic health examination method affords a technic for studying the very baffling problem of human relations and health There can be no doubt that factors such as fear, worry, happiness and unhappiness influence the way people feel By studying persons periodically and recording how their bodies react to external stimuli such as poverty, prosperity, contentment and discontentment, data may be obtained which can be expressed in measurable terms and thus be susceptible of analysis

A patient had a gastro enterostomy in 1920 The possible effect of social and economic misfortunes in relation to subsequent hemorrhage is shown graphically Whatever may be the

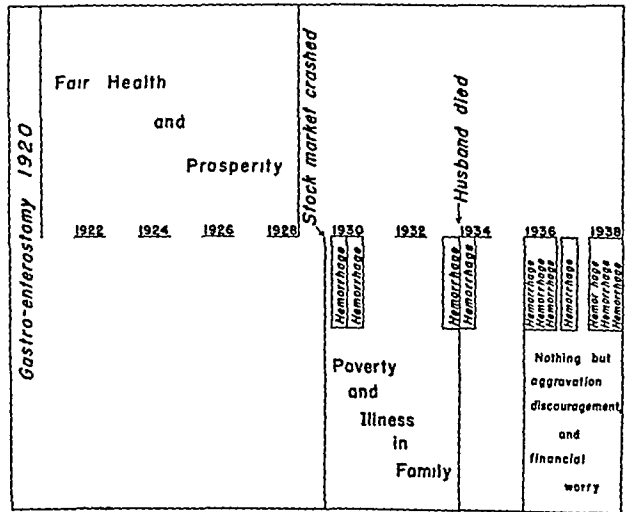


Fig 6—Human relations and health The possible relation of unhappiness and poverty to intestinal hemorrhage

underlying pathologic condition, it is a reasonable conclusion that no treatment for this patient will be successful which does not include in its program correction of aggravation, discouragement and financial worry as well as correction of any mechanical fault in the digestive tract

CONCLUSION

On the whole, the periodic health examination method should be regarded seriously as an important tool for clinical investigation In the light of present knowl-

edge so little is known of the mode of origin of many diseases that to expect the periodic health examination to be very useful in preventive medicine is unsound. The method, however, affords a means for studying the beginnings of a variety of disorders. Too little emphasis has been placed on the fascination of investigating how chronic disease begins. Accurate descriptions of the beginnings of all chronic disease are needed before rational preventive measures can be established.

To use the method of periodic health examination to full advantage requires the critical observation of a large group of persons over a long period of time. No one physician in his lifetime can expect to add more than a fragment of knowledge to all that can be obtained by the use of this method. Every physician, however, has an opportunity, as Sir William Osler said, to observe, record, tabulate, communicate. In this manner he has the chance to add bits of knowledge to the general fund of what little is known of the clinical beginnings of the common causes of death. The importance of the periodic health examination as a method of clinical investigation should be recognized. It should be utilized more generally.

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## THE TOXIC MANIFESTATIONS OF THE THIOCYANATES

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The increasing use of the thiocyanates in the treatment of hypertension suggests the need of a statement relative to the toxicity of this drug. Heretofore the only reports on this phase of therapy have been sporadic accounts of severe intoxication. Under such circumstances it may be understood that a great disparity of opinion relative to the advisability of using the thiocyanates therapeutically has arisen. This was justified in the face of the lack of satisfactory guides to its proper dosage. After ten years' experience with cyanate therapy, carefully controlled by determinations of the blood content of the drug, we feel prepared to offer a critical analysis of the literature on the subject of its toxicity and to make some suggestions for the clinical guidance to the toxicology and therapeutics of this salt.

It is essential at the outset of this communication to reemphasize the importance of the relationship between thiocyanate toxicity and the actual quantity of the electrolyte present in the blood of the patient. The drug is stored in the body, there being widely distributed in the body fluids<sup>1</sup> and tissues, and its toxic action is cumulative (table 1). The content of the thiocyanate in the blood is an index of the thiocyanate content of the tissues, and this depends on the intake and the rate of excretion of the drug through the kidneys. The rate of excretion of thiocyanates from the body is extremely variable. The only correlation

that we have seen between cyanate clearance and urea clearance is a rather general tendency of the former to be depressed when the latter is quite low. However, patients with normal or elevated urea clearance may also have a low thiocyanate clearance (table 2).

Since it has also been shown that the optimum "safe" level at which the blood cyanate content may be maintained seems to be between 8 and 14 mg (the level at which the hypotensive effect of the drug is fully effective), determination of blood cyanate levels constitutes the present safest guide to dosage. In the light of this information we are able to divide the manifestations of thiocyanate toxicity into two groups: first, those toxic manifestations observed in patients whose blood thiocyanate content is within "safe" limits, though therapeutically effective, for example between 8 and 14 mg per hundred cubic centimeters of blood; second, those toxic manifestations observed in patients whose blood thiocyanate content exceeds these limits, namely between 15 and 20 mg per hundred cubic centimeters of blood or higher. This distinction is of the utmost importance if a true evaluation of thiocyanate therapy of hypertension is to be achieved. A careful review of the literature on this subject has disclosed no instance in which blood determinations were made with a view to controlling dosage. The maintenance dosage in our experience ranges from 0.3 Gm (5 grains) a week to as much as 1 Gm (15 grains) a day, depending on the patient's rate of excretion of the drug at a particular time. Fluctuations in the dosage are seen frequently in the course of therapy in many cases. It is apparent, then, that a statement by an author of the dosage of thiocyanate administered to any one patient cannot be accepted as a guide to therapy or as a criterion of the possible presence of saturation.<sup>2</sup>

In reviewing the reports in the literature we cannot avoid an inclination to group the toxic manifestations which the authors present in terms of our own experience. The tabular review of the literature has been subdivided into three groups according to our interpretation of the toxic phenomena reported. Those symptoms listed in the "mild" category are those which we feel secure in stating were present with blood thiocyanate levels within a "safe" range. Interpretation of those symptoms which are listed in the last column in table 3 as "severe" all fall into a second group associated with very high blood thiocyanate levels. The middle column represents symptoms which might appear in either grouping.

The most common manifestations of cyanate toxicity in the first group are sensations of weakness and fatigue. These are such frequent complaints during the early weeks of cyanate therapy (occurring in 75 per cent of the cases) that we have come to look on them as hardly toxic states. That they should be classed as such is borne out by the occasional patient in whom fatigue and marked weakness are constant complaints during the administration of cyanate, and they are relieved only by discontinuance of the drug. In most cases these symptoms disappear spontaneously from the second to the sixth week of therapy. Some of the fatigue of which the patients complain is not always due to the thiocyanate itself but seems to be due to the hypotensive effect of the drug. It is well

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1 Crandall L A Jr, and Anderson M N. Am J Digest Dis & Nutrition 1: 126 (April) 1934.

2 As a guide to those interested in the use of this preparation it has been our usual routine to administer two doses of 5 grains (0.3 Gm) a day for three days followed by a blood cyanate determination for patients being observed in the hospital while for those observed only in office or clinic ten doses for a week are prescribed and a blood thiocyanate determination done on the eighth day. Reprints setting forth the simple technique of blood thiocyanate determinations may be had on request.



known that the hypertensive patient whose blood pressure is reduced by any means whatever often complains of marked fatigue and lethargy, as the blood pressure rises toward its former level the patient again feels especially well.

This common symptom of fatigue is not a serious toxic manifestation, and it appears with blood thiocyanate concentrations of less than 8 mg per hundred

TABLE 1—Distribution of the Thiocyanate Ion in the Body Tissue\*

Tissue of	Blood	Liver	Lung	Kidney	Thyroid	Spleen	Adrenal	Myocardium	Skeletal Muscle
Dog 14	19.4	0.5	0.17		0.22	0.21	0.33		
Dog 30	30.3	0.2	0.29		0.19		0.31	0.20	0.15
Patient L. M.	11.4	0.14		0.15			0.14		
Patient L.	5.1	0.07	0.078	0.296†			0.232†	0.183†	
		0.165†	0.272†						

\* Figures for blood thiocyanate content are in milligrams per hundred cubic centimeters of the ion in the blood serum. Figures for the various tissues are in milligrams per gram of the washed whole tissue and represent the average of two or more determinations of separate samples of tissue.

† Values derived from dehydrated and defatted specimens; these are the actual figures obtained on single analysis of the organs.

cubic centimeters. Taubmann and Heilborn<sup>3</sup> found that muscles of guinea pigs treated with thiocyanates showed a greater tendency to fatigue on electrical stimulation than did muscles of normal animals.

Aching and even cramping in the muscles of the calf are common complaints associated with this transitory period of fatigue. As to the cause of the actual cramping in the extremities, it is suggested that this might be on the basis of a reduced circulation, as evidenced by two of our carefully studied cases presenting known peripheral arteriosclerosis, in which pain, cramps and numbness developed repeatedly in the extremities when the blood pressure fell below 160 mm of mercury. These cramps developed with the blood cyanate below critical levels and disappeared as soon as the blood pressure reached 180 mm of mercury.

It will be noted in table 3 that several authors have written on the increased nervousness and irritability associated with the initiation of a cyanate regimen. McNeill,<sup>4</sup> Ayman<sup>5</sup> and Paul,<sup>6</sup> on the contrary, have reported on the supposed sedative action of thiocyanate and several have recorded good results in the treatment of neurasthenia and neurosis. We appreciate the fact that it is difficult to evaluate symptomatic relief of hypertensive states, but it is our feeling that patients do sleep better and are less irritable on treatment. They often report that they feel calm and quiet rather than that they have a feeling of constant drive and anxiety. Many patients feel actually sleepy while taking cyanates. This is often associated with the fatigue state previously mentioned. These conditions are noted even though there is no immediate drop in blood pressure. Nichols<sup>7</sup> also commented that there was a marked relief of nervous symptoms, but he did not believe that this was a true sedative action.

Toxic dermatitis, about which much has been written, has been encountered only six times in our series of patients with controlled blood cyanate levels. This has

taken the form of a maculopapular itching, scaling eruption which is poorly defined, appearing usually on the flexor surfaces of the wrists and forearms or on the lower third of the leg. Occasionally the rash is seen on the face, around the corners of the eyes and lips or over the scapular region. We have never found this to be of serious consequence, it causes little discomfort to the patient and has disappeared on withdrawal of the drug. In most cases we have been able to resume the drug after the dermatitis has disappeared, and there has been no recurrence of the rash. On one occasion the rash did appear the second time but it did not recur on subsequent administration. Only one patient has shown a dermatitis which has recurred on the third attempt at renewal of the drug. Although recognizing that dermatitis is customarily one of the toxicoses resulting from overdosage, we are inclined to classify it in the mild group. The reports in the literature describe severe exfoliating forms of dermatitis with fever, edema of the face and marked general symptoms of intoxication. This may be the result of excessive dosage, but we have not encountered any such severe reaction.

The goiter which occasionally appears seems to correspond to the thyroid enlargement observed by Chesney, Clausen and Webster<sup>8</sup> in rabbits fed a diet of cabbage. Clinically it appears as a benign enlargement of the gland, usually diffuse, with normal or slightly lowered metabolic rate. In one case which was of nodular form there appeared to be a rapid enlargement of a small adenoma which had been present for many years. We have had no opportunity to study these glands pathologically. Enlargement of the thyroid has appeared only after long continued administration of cyanate and with blood values constantly in the lower brackets, and it decreases with feeding of thyroid.

TABLE 2—The Wide Individual Variation in Renal Thiocyanate Clearance, the Lack of Relationship Between Blood Thiocyanate Level and Thiocyanate Clearance and the Marked Difference Existing Between Thiocyanate and Renal Urea Clearance\*

Case	Sex	Age	Type of Case	Urea Clearance, per Cent	Thiocyanate Clearance, Cc per Minute	Thiocyanate Blood Level, Mg per Cent
1	♂	35	Normal	55	3.50	5.70
2	♀	35	Normal	77	1.9	3.80
3	♂	50	Superhypertension	108	0.62	4.70
4	♀	68	Hypertension cardiac decompensation	44	0.32	5.20
5	♂	50	Chronic nephritis advanced	31	0.31	17.1
6	♂	31	Chronic nephritis advanced	5.5	0.62	11.4
7	♂	50	Hypertension	72	0.32	16.2

\* It will be noted however that although a high urea clearance may be accompanied by a low thiocyanate clearance, the latter is consistently low when the urea clearance is low.

The degree of severity of the various gastrointestinal disturbances may well be an index of the height of serum thiocyanate. Mild gastrointestinal complaints do occur, however, with the usual therapeutic levels. These usually consist of pyrosis, abdominal discomfort, anorexia, nausea and, rarely, vomiting. Above the safe blood level, gastrointestinal disturbances consisting mainly of nausea and vomiting are among the first signs of thiocyanate toxicity. Severe diarrhea, much

<sup>3</sup> Taubmann Gert and Heilborn Rudolf Arch f exper Path & Pharmacol 152 250 1930

<sup>4</sup> McNeill J F Psychiatric Quart 7 254 (April) 1933

<sup>5</sup> Ayman David Exfoliative Dermatitis from Potassium Thiocyanate J A M A 93 1671 (Nov 23) 1929

<sup>6</sup> Paul Wolfgang München med Wchnschr 1 153 1903

<sup>7</sup> Nichols J B Am J M Sc 170 735 (Nov) 1925

<sup>8</sup> Chesney A M, Clausen T A and Webster Bruce Bull Johns Hopkins Hosp 43 261 (Nov) 1928

abdominal pain and cramping may occur independently or as part of a general extreme toxic state. However, we have seen this only twice in ten years. In normal dogs fed toxic doses of the drug over a comparatively long period there always develops severe bloody diarrhea with associated dehydration.

It is well to point out at this time that some hypertensive persons display rather marked gastrointestinal symptoms, as already described, as part of the hypertensive syndrome, which go away with reduction of the blood pressure. These are to be distinguished from

The dogs in our experimental series, slowly intoxicated over a long period of time, showed first loss of weight progressing to marked emaciation, secondly, anorexia and diarrhea of a bloody type developed with marked signs of dehydration. Later spasticity of the hind legs developed, associated with marked weakness. The dogs that did not die from marked inanition developed severe generalized convulsions with marked opisthotonos and died in twenty-four hours. Blood studies that were made during this period showed a severe depression of certain of the blood elements

TABLE 3—*Interpretative Tabulation of Toxic Manifestations of the Thiocyanates Recorded in the Literature*

Author	Mild	Mild or Severe	Severe
Nichols J B Am J M Sc 170 735 (Nov) 1925	Increased nervousness	Nausea gastrointestinal disorders (reported from literature) vomiting abdominal pain Gastrointestinal upset dermatitis	Report of 3 deaths from the literature
Westphal K, and Blum R Deutsches Arch f Klin Med 152 331, 1926	Weakness fatigue	Dermatitis	
Takacs I Ztschr f d ges exper Med 50 432 1926		Nausea	
Smith, A G and Rudolph R D Canad M A J 19 288 (Sept) 1925	Weakness fatigue	Cutaneous rash	
Gager, L T J A M A 90 82 (Jan 14) 1925	Weakness		
Behrens H O Arch f exper Path u Pharmacol 131 255, 1928	Weakness depression		
Wels C R and Ruedemann R J A M A 93 988 (Sept 28) 1929			Diffuse exfoliative dermatitis (1 case)
Palmer R S and Sprague H B M Clin North America 13 215 (July) 1929	Weakness (in 2 cases)		Angina (in 2 other cases)
Logeffer R C Minnesota Med 12 151 (March) 1929	Weakness increased nervousness	Diarrhea dry skin	Edema of lids dermatitis
Ayman D J A M A 93 1671 (Nov 23) 1929			Generalized dermatitis edema of lids (1 case)
Palmer R S Silver L S and White P D New England M J 201 709 (Oct 10) 1929	Weakness	Exhaustion	Precordial distress or angina
Tyrrel J D Canad M A J 22 80 (Jan) 1930			Severe exfoliating dermatitis fever edema of face loss of hair (reports 1 case)
Borg J F Minnesota Med 13 292 (May) 1930	Unpleasant symptoms	Pruritus	Psychosis (disorientation mania hallucinations confusion persecutory ideas)
Maguire L M U S Vet Bur M Bull 6 978 1930	Weakness (in 1 of 4 cases)		
Eineberg M H J A M A 94 1822 (June 7) 1930	Weakness		
Salceby P F New Orleans M & S J 83 93 1930			Severe dermatitis coronary and mesenteric thrombosis (death)
Ayman D J A M A 96 1822 (May 30) 1931	Drowsiness weakness	Mental and physical retardation cramps diarrhea	Excitement disorientation (1 case of 7)
Meakins, J O and Scriver W de M Canad M A J 25 285 (Sept 31) 1931		Nausea vomiting diarrhea nervousness apprehension tinnitus gastrointestinal distress	Disorientation
Egloff W C Hoyt L H and O'Hare J P J A M A 96 1941 (June 6) 1931			2 deaths in 4 cases weakness delirium coma
Healy J C New England J Med 205 581 (Sept 17) 1931		Nausea muscular fatigue vomiting	Confusion disorientation hallucination motor aphasia dermatitis
Goldring W and Chasik H Arch Int Med 49 321 1932			2 deaths
Palmer, R S Am J M Sc 184 473 1932	Weakness angina	Nausea nightmares gastrointestinal symptoms nervousness	Vertigo confusion psychosis
Balatin M J Illinois M J 62 557 1932	Toxic effect in 5 of 148 cases		
McNeill J F Psychiatric Quart 7 254 1932		General weakness nausea	Collapse unsteady gait confusion aphasia (2 edema of glottis)
Queries and Minor Notes J A M A 102 637 (Feb 24) 1934			Twitching convulsions urinary retention coma mental confusion fever paralysis of lower extremities
Barker M H Wisconsin M J 36 281 (Jan) 1937	Fatigue weakness	Nausea anemia goiter dermatitis	Mental confusion disorientation thrombosis

thiocyanate toxicity most conveniently by determinations of the cyanate in the blood. If serum thiocyanate is within safe limits, we believe that one need have no cause to fear the presence of poisoning.

The work of Nichols<sup>7</sup> with animals intoxicated with thiocyanates stands as the most complete exposition on this subject to date. Using guinea pigs and dogs, and administering various dosages by oral and parenteral routes, he noted sluggishness, diarrhea, anal hemorrhage, marked loss of weight, spinal irritation, spasticity of the hind legs, general rigidity, convulsions, coma and death. The speed of the course of events roughly paralleled the size of the dose. Taubmann and Heilborn<sup>8</sup> noted anorexia, weakness, spastic paralysis and convulsions in their experimental animals.

These, which are to be reported elsewhere, further attest the toxic origin of the syndrome associated with the maintenance of excessive blood levels of this substance.

In the white rat, a single lethal dose injected subcutaneously produces the irritative phenomena with death in a few hours. Chronic poisoning resembles that observed in the dog. The diuresis that Nichols observed in rabbits has not been noted by us in animals but it is of interest because of the occasional diuresis that we have observed in human beings.

Healy's<sup>9</sup> observations on toxicity in rabbits were similar, and he correlated them with what he observed clinically. In addition, he reported pigmentation of the

9 Healy J C New England M J 205 581 (Sept 17) 1931

skin and felt, because of the asthenia and hypotension in the syndrome of intoxication with this drug, that "hypo adrena" resembling Addison's disease must be an important factor in its production. One of his rabbits, dead of thiocyanate poisoning, had large soft adrenal glands which gave a strongly positive reaction with ferric chloride when the cut surfaces were tested for the content of thiocyanate. In an attempt to repeat this work on dogs, however, we have been unable to confirm Healy's observations on rabbits. Grossly, the adrenal glands of several dogs appeared normal. There were no chemical changes of the blood which are ordinarily associated with hypoadrenia. Adrenal tissue analyzed for thiocyanate content showed no qualitative changes that were markedly different from any other tissue. Microscopically, so far as we could ascertain, there were no abnormal structural changes.

The signs of toxicity which we shall place in the second group are those which, in our experience, have been seen only in the presence of high blood thiocyanate levels. Those toxic manifestations enumerated in the first group may, of course, appear in this group as well. Vascular collapse may or may not be associated with one or more of the other major toxic reactions. Cerebral thromboses, as reported by Barker,<sup>10</sup> although next in importance, are probably not primary toxic effects but are secondary to the severe vascular insufficiency resulting from a sudden and marked depression of arterial tension.

The cerebral manifestations seen following the use of potassium thiocyanate seem to be truly toxic. These appear as a rule when the level has reached 20 mg or more per hundred cubic centimeters of blood. They are very important signs and should be watched for in all cases in which cyanate is given. The earliest sign is that of slurring speech associated with word aphasia. The patients very often do not realize that they have this difficulty and it is first noted by some member of the family. They have no other sign of toxicity although the blood thiocyanate level has always been found to be high. Later marked confusion develops and even delirium.

This type of toxic manifestation should not be confused with the cerebral symptoms that might develop in the advanced senile arteriosclerotic patient as a result of hypotension and vascular insufficiency. Among our cases is that of a Negro aged 75 years, with severe generalized arteriosclerosis and marked evidence of cerebral arteriosclerosis, including typical psychic changes. A superimposed confusional state has repeatedly developed during periods of thiocyanate therapy for a severe hypertension. This occurred in spite of the fact that the blood cyanate level did not exceed 12 mg per hundred cubic centimeters and no blood pressure reduction was obtained.

In the whole subject of the toxicology of the thiocyanates there is perhaps a no more confused chapter than that dealing with the relationship between cardiac pain and cyanate poisoning. In addition, the importance of the related incidence of angina pectoris and hypertension must not be overlooked, since our clinical material and that of most other writers on the subject are drawn almost exclusively from the ranks of patients suffering from hypertension. In the series of 3,000 patients with cardiac disorders published by White and Jones<sup>11</sup> angina pectoris was present in 11.8 per cent,

and 33.1 per cent of those patients had complicated or uncomplicated hypertension. Palmer,<sup>12</sup> Palmer, Silver and White<sup>13</sup> and Palmer and Sprague<sup>14</sup> have pointed out the apparent relationship existing between cardiac pain and the administration of the thiocyanates in the therapy of hypertension. They expressed the opinion that the thiocyanates increased the frequency of anginal attacks in patients who had previously experienced such attacks and that in others the onset of angina was initiated by the administration of this drug.

In the hope of lending some clarity to this phase of cyanate toxicology, we present herewith an analysis of the records of forty-seven unselected hypertensive patients who have been observed in our outpatient clinic over relatively long periods. We have considered all instances of precordial pain or pain in the left side of the chest, with or without radiation, as cardiac in origin. In none of these cases have other pathologic changes been demonstrated that might account for this pain. For convenience in this discussion we have grouped our patients with regard to the presence or absence of cardiac pain. Group 1 includes all patients who gave a

TABLE 4—Therapeutic Responses to Thiocyanate Therapy and to Other Treatment\*

	Thiocyanate Therapy		Other Treatment		Totals	
	Num ber	Per Cent	Num ber	Per Cent	Num ber	Per Cent
No history of previous pain (groups 1 and 3)	24	100	7	100	31	100
Pain developed while being observed (group 3)	3	12.5	1	14.3	4	12.9
Complaint of pain before observation (group 2)	11	100	5	100	16	100
Pain relieved while being observed	7	63.6	4	80	11	68.75
Pain mitigated	1	9.1	0	0	1	6.25
Pain questionably relieved	1	9.1	0	0	1	6.25
Pain unaffected	2	18.2	1	20	3	18.75

\* All cases in which thiocyanate was given at any time are included whether or not the level of blood thiocyanate was considered within the therapeutically (as regards blood pressure) effective range. In no case listed was blood thiocyanate ever displayed in the toxic range.

clearly negative history of cardiac pain and in whom pain never developed while under our observation. The total number of cases in this group was twenty-seven (57.4 per cent). Group 2, totaling sixteen patients (34.1 per cent), includes those who gave a clearly positive history of pain before coming under our supervision. Group 3 constitutes patients who gave a clearly negative history of cardiac pain but in whom pain developed while under our care, of these there were four cases (8.5 per cent).

Table 4 presents a brief summary of the therapeutic responses of this group of forty-seven patients. The only comment that we wish to make on this group of patients, which we consider representative of the entire series of patients we have observed, is relative to the work of Palmer and his associates. Our experience seems to indicate that no patient who previously experienced angina suffered a greater degree of angina during administration of thiocyanate. While it is true that the administration of cyanate was associated with the onset of angina, the percentage of patients thus affected has been no greater than in the group treated by other means. Notwithstanding this fact, we are certain that

10 Barker M H. The Blood Cyanates in the Treatment of Hypertension. J A M A 106 762 (March 7) 1936.  
11 White P D and Jones T D. Am Heart J 3 302 (Feb) 1978.

12 Palmer R S, Am J M Sc 184 473 (Oct) 1932.  
13 Palmer R S, Silver L S and White P D. New England J M 201 709 (Oct. 10) 1929.  
14 Palmer R S and Sprague, H B. M Clin North America 13 215 (July) 1929.

in a few cases in the last group the angina has developed as a direct result of the hypotensive effect of the drug. The patients who have been studied carefully from the electrocardiographic standpoint and who have had serial tracings made at various times before, during and after thiocyanate therapy have shown no alterations in the original configuration as a result of the therapy.

From our observations on animals and from the well documented reports in the literature on both animals and man, we do not question that coma, convulsions and death do occur as a result of thiocyanate poisoning, although we have not observed these occurrences in human beings. The mechanism of death is not known. Two possibilities seem logical: first, that ischemia of the central nervous system with subsequent thrombosis or vascular collapse may be responsible for the chain of events that follows, which may end fatally; second, that there may exist an acute poisoning of the cells of the brain and cord.

therapy. Today, after from five to ten years of constant and vigorous treatment with satisfactory blood pressure readings, they present a picture of anemia, emaciation and muscular wasting. They are constantly fatigued and have little ambition. As we have pointed out, all these things are observed in experimental animals that have been deliberately poisoned with thiocyanate over long periods of time. Similar degenerative features are also characteristic of severe progressive hypertensive vascular disease of many years' duration. This is particularly true in those who survive a vascular accident and live for years with a substantially lowered blood pressure. It is, then, possible that this picture is a manifestation of the progress of the vascular disease in a patient who many years earlier might have died of heart failure or a cerebral or coronary accident. Although the blood pressure is held in sufficient abeyance to prevent the acute catastrophe, we are witnessing the ultimate complete bodily deterioration secondary to the continued existence of

TABLE 5—Analysis of Deaths Recorded in Table 3, Reported to Be Result of Thiocyanate Poisoning

Author	Dosage	Clinical Course	Comment
Lesser (1898) cited by Nichols <sup>7</sup>	Unknown	Suicidal attempt death in 10 hours no clinical course reported	Necropsy Corrosion and hemorrhage of gastric mucosa
Robert (1906) cited by Nichols <sup>7</sup>	0.3 Gm	Convulsions	Doubtful case
Vintilescu and Popesco (1916), cited by Nichols <sup>7</sup>	100 Gm ??	Delirium convulsions anuria cold sweats unconsciousness extensor rigidity of spine and neck	Necropsy Negative except for presence of poison in tissues
Saleeby	15 grains t i d	Severe pruritic exanthem acute respiratory infection	Coronary and mesenteric thrombosis
Healy	15 grains t i d (1 week) b i d (4 days)	Hypotension associated with weakness which progressed to delirium vasomotor collapse and coma in spite of discontinuation of treatment after 11 days	Death in coma 3½ weeks after beginning treatment
Healy	15 grains t i d (1 week) b i d (3 days)	Progressive weakness hypotension semi coma vasomotor failure coma	Death after 10 days treatment and 1 month after starting treatment
Goldring and Chasis	9.77 Gm (total in 15 days)	Nausea delirium hallucinations motor restlessness nystagmus, convulsions disorientation anuria coma (blood pressure remained high) death 66 hours after discontinuation of treatment	Necropsy Pulmonary congestion pericardial effusion inactive mitral stenosis subendocardial hemorrhages atheroma and ulceration of abdominal aorta nephrosclerosis and profound renal arteriolar sclerosis cerebral edema
Goldring and Chasis	14.49 Gm (total in 18 days)	Same as reported above	Death 6 days after discontinuation of treatment

Analysis of the eight deaths reported in the literature (table 5), which are shown in the right hand column of table 3, shows that one patient died ten hours after the ingestion of an unknown quantity of thiocyanate, another died forty hours after entering the hospital following a suicidal attempt by ingestion of a large quantity of a thiocyanate salt. A third is reported to have died twenty-eight hours after taking 0.3 Gm by mouth. The possibility of this death being due to cyanate poisoning is remote. In the case reported by Saleeby,<sup>16</sup> death resulted from multiple arterial thrombosis, which might have been due to the marked hypotensive effect produced by severe poisoning, although no blood pressure studies were reported in the protocol. The remaining four deaths reported all agree in the antecedent clinical course with that described for experimental animals poisoned with thiocyanates. It appears thus far that in six of these eight deaths reported there is sufficient evidence on which to base an opinion of cyanate poisoning.

The possibility of inducing chronic poisoning by the continued use of thiocyanate over a period of years is an important question. Several elderly patients with severe grades of progressive vascular disease with hypertension, who were at first plethoric and obese and had good muscular development, were placed on cyanate

the basic vascular breakdown. Younger patients with a more elastic type of hypertension and less primary degenerative disease do not seem to show this same effect.

#### COMMENTS

We have made an attempt to present a summary of the toxicology of the inorganic thiocyanates now being more widely used in the treatment of hypertension. That thiocyanates are toxic and, indeed, that their beneficial action in cases of hypertension depends in part on their peculiar toxicology, are extremely important facts of which to be fully aware. We have tried to differentiate those toxic signs and symptoms which might occur normally in the hypertensive person from those which occur directly as a result of cyanate intoxication. We have analyzed the literature for the purpose of interpreting toxic manifestations and even deaths due to thiocyanate poisoning.

We hope that our interpretation may serve as a warning of the dangerous possibilities as well as a useful guide to those using this drug. Most important of all is the interpretation of symptoms as they appear in the light of the level of the blood cyanates. Without blood cyanate-determinations, this drug should not be used.

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THE FATAL IONIC MANIFESTATIONS  
OF THE THIOCYANATES

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The purpose of this report is to draw attention to the fatal toxic manifestations of the thiocyanates.

Ever since the first pharmacologic investigation of the thiocyanates in 1857 by Claude Bernard<sup>1</sup> there have been numerous references to the toxic properties of this drug. However, the observations of Pauli<sup>2</sup> in 1903 that thiocyanates were effective in reducing high blood pressure caused the use of the drug to gain favor. Untoward symptoms occurred so frequently, however, that the drug fell into disrepute until it was reintroduced in the treatment of hypertension by Westphal<sup>3</sup> in 1925. Since that time some investigators have felt that the thiocyanates were valuable drugs,<sup>4</sup> others have felt that they were not only useless but dangerous.

The published work of others and personal observations would indicate that in many instances the continued administration of thiocyanates leads to lowering of the blood pressure. There is a strong impression, however, that this is a secondary consequence of the toxic effects.

At all events there is no doubt that the drug may cause untoward results. Some patients show phenomena analogous to iodism: i.e. coryza, cutaneous eruptions and even exfoliative dermatitis. The usual effect, however, is vertigo and uncomfortable weakness of the arms and legs. In a lesser number of instances mental symptoms develop, in fact, the thiocyanates may cause a toxic psychosis similar to bromide mania with disorientation, hallucinations, mania and ideas of persecution. Finally convulsions, coma and death may intervene. Accordingly to date the Council on Pharmacy and Chemistry<sup>5</sup> has advised against the use of thiocyanates. It has pointed out that the evidence for their value is far from conclusive and has stated the contraindications to their use.

The toxic effects in animals were reinvestigated in 1933 by Jahr,<sup>6</sup> who found that death may occur suddenly but that usually the effects develop gradually with vomiting, diarrhea and emaciation among the first signs. The animals then show weakness, unsteadiness, tremors, inability to gain an upright position after being placed on the side or back, general tonic and clonic convulsions, coma and death.

The minimum lethal dose of sodium thiocyanate varies with different animals but is usually stated to be about 500 mg per kilogram of body weight. Nichols,<sup>8</sup> working with guinea pigs, found the lethal dose to range between 200 and 400 mg per kilogram. In the same ratio, the minimum lethal dose of sodium thiocyanate

for a medium sized man (weighing 70 Kg, or 154 pounds) would be from 15 to 30 Gm (from one-half to 1 ounce).

Search of the literature reveals seven human fatalities due to thiocyanates, in three instances the drug was taken with suicidal intent and in four instances it was administered for therapeutic purposes.

Lesser<sup>9</sup> reported the case of a magician aged 58 who used thiocyanate to convert iron-containing water into "red wine." With suicidal intent he consumed an unknown quantity of the salt dissolved in beer. He died in about ten hours. Autopsy showed corrosions and hemorrhages of the gastric mucosa, and traces of potassium thiocyanate were demonstrated in many of the viscera.

Kobert<sup>10</sup> described the case of a woman who, after taking ammonium thiocyanate 5 grains (0.3 Gm), had convulsions and died in twenty-eight hours. The amount of the drug seems entirely insufficient to produce any material effects. However, perhaps the statement of the amount taken was erroneous.

Vintilescu and Popesco<sup>11</sup> have recorded the case of a man aged 27 who after the ingestion of 100 Gm of ammonium thiocyanate had a toxic psychosis with extreme cerebral agitation, delirium, occasional convulsions and finally death. Autopsy was negative except that numerous organs gave strong reactions for the presence of thiocyanate.

Healy<sup>12</sup> reported the case of a woman aged 67 with hypertension and generalized arteriosclerosis. Before treatment the blood pressure was 205 mm of mercury systolic and 100 diastolic. She received potassium thiocyanate 5 grains (0.3 Gm) three times a day for one week. The dose was then decreased to 5 grains (0.3 Gm) twice a day. On the tenth day there was marked weakness and the blood pressure was 145 mm of mercury systolic and 90 diastolic. The drug was stopped but the symptoms progressed, the patient became profoundly weak, finally semicomatose, and died in shock nineteen days after the discontinuance of the drug. Autopsy was not performed.

Healy<sup>12</sup> also reported the case of a woman aged 63 with hypertension, the blood pressure being 200 mm of mercury systolic and 120 diastolic. Potassium thiocyanate was administered as in the previous case. On the tenth day the pressure had dropped to 170 mm of mercury systolic and 88 diastolic, but the patient felt worse than she had before the drug was given. The medication was stopped, but weakness, delirium, coma and shock ensued and the patient died two weeks after the drug was discontinued. Autopsy was not performed.

Goldring and Chasis<sup>13</sup> reported the case of a woman aged 40 who received potassium thiocyanate for hypertension in a dosage of 10 grains (0.652 Gm) daily. On the fourteenth day the patient was nauseated and weak. On the fifteenth day she was confused and her speech was incoherent. Administration of the drug was accordingly discontinued, a total of 9.77 Gm having been given in fifteen days. The blood pressure continued to be high, and the following day the patient was violently delirious with hallucinations of sight and hearing, extreme motor restlessness, nystagmus and frequent convulsive movements of the extremities. She

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<sup>1</sup> Bernard, Claude. *Leçons sur les effets des substances toxiques et médicamenteuses*. Paris: J. B. Baillière et fils, 1857, p. 354.

<sup>2</sup> Pauli, Wolfgang. *Ueber Ionenwirkungen und ihre therapeutische Verwendung*. München med. Wchnschr. **50**: 153, 1903.

<sup>3</sup> Westphal, K. *Ztschr. f. klin. Med.* **101**: 545-557, 1925. Westphal, A. and Blum, R. *Deutsches Arch. f. klin. Med.* **152**: 331 (Oct.) 1926.

<sup>4</sup> Barker, M. H. *The Blood Cyanates in the Treatment of Hypertension*. J. A. M. A. **106**: 762 (March 7) 1936.

<sup>5</sup> Ayman, David. *Potassium Thiocyanate in the Treatment of Essential Hypertension*. J. A. M. A. **96**: 1852 (May 30) 1931.

<sup>6</sup> Elvir, Kacyan McNeil and Tablets Kacyan McNeil Not Acceptable for N. R. Reports of the Council. J. A. M. A. **92**: 1838 (June 1) 1929.

<sup>7</sup> Jahr, E. G. *Beitrag zur Pharmakologie der anorganischen Rhodanide*. Arch. f. exper. Path. u. Pharmacol. **169**: 429, 1933.

<sup>8</sup> Nichols, J. B. *The Pharmacologic and Therapeutic Properties of the Sulfocyanates*. Am. J. M. Sc. **170**: 735 (Nov.) 1925.

<sup>9</sup> Lesser, A. *Vrtlshchr. f. gerichtl. Med.* **16**: 97, 1898.

<sup>10</sup> Kobert, E. R. *Lehrbuch der Intoxikationen*. **2**: 860, 1906.

<sup>11</sup> Vintilescu, J. and Popesco, A. *Ann. d'hyg. pub.* **25**: 239, 1916.

<sup>12</sup> Healy, J. C. *Therapeutics and Toxicology of the Sulfocyanates*. New England J. Med. **205**: 581 (Sept. 17) 1931.

<sup>13</sup> Goldring, William and Chasis, Herbert. *Thiocyanate Therapy in Hypertension*. Arch. Int. Med. **49**: 321 (Feb.) 1932.

was completely disoriented, continually muttering and thrashing about so violently as to require mechanical restraint. During the last twenty-four hours she voided almost no urine and became profoundly stuporous. Death occurred sixty-six hours after the thiocyanate had been discontinued. Even on the day of death the blood pressure had not dropped. At autopsy the lungs showed congestion, there was a pericardial effusion, cardiac hypertrophy and an inactive mitral stenosis. The kidneys showed nephrosclerosis with profound arteriolar sclerosis and the brain was edematous.

Goldring and Chasis<sup>13</sup> also reported the case of a woman aged 56 who, because of hypertension, received potassium thiocyanate in a daily dose of 12 grams (0.805 Gm) a day. After taking a total of 14.9 Gm in eighteen days she complained of nausea. The thiocyanate was immediately discontinued, but forty-eight hours later nervous manifestations almost identical with those described in their other patient developed. This state persisted six days before death occurred. Autopsy was not performed.

This communication records another death from potassium thiocyanate and has added interest in that the level of the blood cyanates was controlled. The danger of potassium thiocyanate therapy becomes more apparent when it is realized that untoward symptoms occurred while the blood cyanates were at a supposedly nontoxic level.

#### REPORT OF CASE

B W, a Negro woman aged 71, admitted to the Cleveland City Hospital Oct 5, 1936, complained chiefly of headache. She had had increasing hypertension and progressively severe headaches since 1930. On examination the patient was well developed, well nourished and neither acutely nor chronically ill. She weighed 57 Kg (125 pounds). The ocular fundi showed marked vascular sclerosis but no hemorrhages. The heart was slightly enlarged, there was a systolic murmur at the apex. Neurologic examination was negative.

The leukocytes, erythrocytes and hemoglobin were normal, urinalysis gave negative results. Reactions to the Wassermann and Kline tests were negative. The level of the blood urea nitrogen was 12.3 mg per hundred cubic centimeters. A concentration test showed the urine to have a maximum specific gravity of 1.022, a dilution test showed a minimum specific gravity of 1.003. The electrocardiogram showed left axis deviation. Numerous blood pressure readings averaged 250 mm of mercury systolic and 120 diastolic.

Beginning Oct 8, 1936, the patient received potassium thiocyanate 5 grains (0.3 Gm) daily. The blood cyanates rose from zero to 3.8 mg per hundred cubic centimeters on October 13. The following day the potassium thiocyanate dosage was increased to 5 grains (0.3 Gm) twice a day. October 19 the blood cyanates were 10.1 mg per hundred cubic centimeters. The blood pressure had not fallen in fact, on that particular day the systolic value was 300 mm of mercury.

The dosage of potassium thiocyanate was raised to 5 grains (0.3 Gm) three times a day on October 20. The following day the blood cyanates were 13.6 mg per hundred cubic centimeters and it was noted that the patient was agitated and apprehensive at times. The next day she was definitely psychotic, being noisy, excited, resistive and restless. She had delusions of persecution and various sorts of hallucinations. The potassium thiocyanate was discontinued, the patient having received a total of 135 grains, or 9 Gm, of the drug in fifteen days.

The next day, October 23, the blood cyanate level was 18.7 mg per hundred cubic centimeters. The blood pressure had not fallen. The patient was still noisy and mentally confused and required restraint. There was little change the following day, the patient muttering incoherently, making convulsive movements of the extremities and refusing food. October 25 the blood cyanates had fallen to 15.6 mg but the patient showed no improvement. She received food and fluids by means of stomach tube and hypodermoclysis.

During the next four days the patient's condition changed but little. October 29 the cyanates were 9.4 mg per hundred cubic centimeters of blood. October 30 the patient passed into coma and died. Death occurred nine days after the onset of the psychosis and eight days after the discontinuance of the thiocyanates. Terminally there was clinical evidence of bronchopneumonia at the base of the right lung. No dermatitis was noted at any time.

#### AUTOPSY

External examination revealed no abnormality. On section the viscera were found to be normally placed. The heart weighed 425 Gm. Except for hypertrophy there were no abnormalities. The aorta showed moderate arteriosclerosis. The lungs showed hyperemia and edema. There was a patchy bronchopneumonia in the right lower lobe posteriorly. The kidneys weighed 110 Gm apiece and showed arteriolar nephrosclerosis of moderate severity. The brain was completely normal externally, and on section there were no areas of encephalomalacia, hemorrhage or glial proliferation. The cerebral arteries showed slight to moderate arteriosclerosis. The remaining viscera showed no abnormalities.

Microscopic examination of the various viscera confirmed the diagnosis made on gross examination. There was generalized arteriolar sclerosis of moderate severity.

#### COMMENT

The observations of others and the case here reported indicate that the thiocyanates possess considerable potential toxicity. In general, from experiments on animals and from a study of human fatalities it can be said that death due to the thiocyanates is preceded by a rather characteristic train of symptoms and signs. In animals this consists of intense irritation of the spinal cord, in human beings there is in addition an associated toxic psychosis.

The case here described presented manifestations similar to previous human fatalities and comparable to those described in animals. The patient showed mental and physical excitement, delusions of persecution, disorientation, hallucinations, confusion and convulsive movements of the extremities. Finally coma and death occurred. The pathologic examination gave similar results to those of the three previously reported autopsies on patients who had died of thiocyanate poisoning in that there were no characteristic anatomic changes.

The case is especially instructive in that the psychosis began when the blood cyanate level was 13.6 mg per hundred cubic centimeters. During the psychosis the highest value of the blood cyanates was 18.7 mg per hundred cubic centimeters and this had fallen to 9.4 mg the day before death.

It has been stated by Barker<sup>1</sup> that the "optimum therapeutic level would seem to range between 8 and 12 mg [of cyanates] per hundred cubic centimeters of blood" and that "significant toxicity begins to appear at from 15 to 30 mg." Barker found that "toxicity increased rapidly above the blood cyanate level of 20 mg but that serious manifestations were not noted until levels of from 35 to 50 mg were reached."

This case indicates that the blood cyanate level can not be completely relied on as an indicator of the point at which toxic manifestations may appear. In this patient, toxic manifestations appeared when the blood cyanates were at a supposedly nontoxic level. Apparently certain persons, for reasons which are not clear, show an idiosyncrasy to the cyanates and have little if any margin of safety between the therapeutic and the toxic dose. Since such instances of intolerance to the drug cannot be recognized in advance, use of the thiocyanates, even when controlled by determinations of the blood level, must be considered dangerous.

## SUMMARY

This case presenting fatal toxic manifestations of the thioeynates is especially significant in that untoward symptoms occurred while the blood eynates were at a supposedly nontoxic level. Death was apparently due to an idiosyncrasy to the drug and, since such intolerance cannot be recognized in advance, thioeynate therapy must be considered dangerous.

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CROSS INFECTION IN PNEUMOCOCCIC  
PNEUMONIA

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Pneumonia presents another instance in which medical science is attempting to prevent disease before its pathogenesis is clearly understood. The cause of lobar pneumonia was discovered many years ago. Not only have recent bacteriologic and immunologic studies of the pneumococcus and its products made possible a much better understanding of the pathologic picture but, in the field of therapeutics, results have been so promising that already attention is being focused on the prevention rather than the treatment of the disease. Yet, despite these advances in our knowledge, no accurate information exists as to how the disease is contracted. Hence prevention for the present must be largely empirical.

As with many other diseases of the respiratory tract, the high incidence of morbidity during the colder months of the year has long been noted. Obviously this exciting cause does not suggest any angle of attack. For many years lobar pneumonia was considered a primary disease. Recently, however, it has been found on careful study that in a majority of instances a cold or infection of the upper respiratory tract precedes pneumonia. Here the approach to the problem of prevention resolves itself into one of mass policing or mass education as to general hygienic principles.

From the standpoint of etiology, two reservoirs of infection present themselves: patients and carriers. Pneumonia has long been classed as a contagious disease, yet it is rarely a reportable disease and the general failure to segregate or isolate patients with pneumonia implies that its contagiousness may be either underestimated or even mythical. In the midst of a pneumonia program at the Cincinnati General Hospital the importance of the patient as a source of infection was emphasized by several incidents, always by implication but with sufficient force to preclude the ignoring of this factor in the control of the disease. We are therefore reporting in some detail several series of cases.

In the course of studies<sup>1</sup> of the diagnosis and treatment of the pneumonias according to types, conducted at the Cincinnati General Hospital during the past three

years, those in attendance were so impressed by the fact that cross infection occurred in the open wards that now all pneumonia is treated as though contagious. Occasionally members of the family of a patient afflicted with pneumonia contracted the disease. Careful scrutiny of the data gathered brought out some interesting features concerning epidemiology.

Unless pneumococci are identified by type, such studies as these cannot be made, as any suspected cross infection must be verified by a homologous invasion in all those concerned. In presenting the contagious aspect of the disease, certain arbitrary categories, into which the cases fall, have been set up. Category 1: Epidemics in dormitories. Category 2: Disease contracted in the hospital: (a) patient to patient, (b) patient to doctor and (c) in the laboratory. Category 3: Disease contracted within the family (in the home): (a) simultaneous infection, (b) patient to nurse and (c) from a family carrier.

## CATEGORY 1. EPIDEMICS IN DORMITORIES

During the peak of the economic depression there existed in Cincinnati two bureaus for the care of homeless men, one for the local inhabitants and a federal one for transients. The inmates, ranging in age from 16 to 55 years, slept in large dormitories. Overcrowding was one of several unfavorable factors, for the buildings were merely lofts made ready for emergency use. Epidemics of type I pneumonia were encountered in each dormitory as shown in table 1.

It is noteworthy that the outbreaks occurred in the two buildings, at some distance from each other, suddenly and at about the same time and that the epidemics stopped equally suddenly. Two deaths occurred in each group. All patients were received and treated at the Cincinnati General Hospital.

The following November there was another outbreak at the Federal Bureau, Armleder Building. There were in residence at the time several hundred men. Within one month nine patients were admitted to the hospital, as shown in table 2. Of this group, all recovered. It is of interest that patient 50 was admitted in both the February and the November outbreak from the same dormitory with the same type of the disease.

Unfortunately many valuable data are missing. The proximity in the dormitories of one person to another is not known, nor is information available as to the number of carriers of type I pneumococci among the inmates. The actual number of men who had infections of the upper respiratory tract is not known, but that many had colds is definitely established. This agrees with the observation of Smilie,<sup>2</sup> who found that colds may be a factor which determines the transfer and establishment of type I and type II pneumococci from the infected to the uninfected.

CATEGORY 2. DISEASE CONTRACTED IN THE  
HOSPITAL

A. *Patient to Patient*.—We have abundant evidence that hospital contacts are frequently infected from pneumonia sufferers. In Smilie's<sup>3</sup> studies he concluded that only about 2 per cent of the hospital contacts contracted the homologous disease. This of itself would justify segregation of infected persons. In table 3 are listed all the patients treated in the medical wards of the Cincinnati General Hospital in two years whose

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1. Benjamin J. E., Blenkinshorn M. A. and Senior Fanny A. The Results of the Treatment of Pneumonia with Specific Therapeutic Serum. *Ohio State M. J.* 33: 36 (Jan.) 1937. Benjamin J. E., Blenkinshorn M. A., Rueggeger J. M. and Senior Fanny A. A Study of the Diagnosis and Treatment of Lobar Pneumonia According to Types and Specific Serum Therapy. *Ann. Int. Med.* 11: 437 (Sept.) 1937. Rueggeger J. M. and Benjamin J. E. Specific Diagnosis and Treatment of the Pneumonias. *Cincinnati M. J.* June 1938.

2. Smilie W. G. The Epidemiology of Lobar Pneumonia. *J. A. M. A.* 101: 1281-1286 (Oct. 21) 1933.

3. Smilie W. G. and Leeder F. S. Epidemiology of Lobar Pneumonia. *Am. J. Pub. Health* 24: 129 (Feb.) 1934.



infection definitely pointed to the fact that it was contracted from another patient in the same ward who had a homologous type of pneumonia. The patients listed were all hospitalized for some reason other than pneumonia and were unfortunately infected after their admission. Thirteen were treated in the winter of 1936-1937, which so significantly emphasized the contagious aspect of the disease that a technic for isolation or segregation was soon enforced. Only two of the patients were treated in the winter of 1937-1938, a most encouraging sign that our precautions have reaped their reward.

It might be of interest to report that in the winter of 1936-1937, when thirteen patients with cross infection were encountered in the medical wards, there were also five patients with pneumonia who had been admitted to the hospital for other illnesses but whose pneumococcal infection could not be traced to any other patient.

The following winter, 1937-1938, after rigid precautions had been enforced and when only two patients had pneumonia which could be attributed to cross infection, there were just two patients with pneumonia which developed in the medical wards whose infection could not be accounted for.

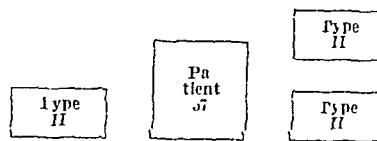
TABLE 1—Local Inhabitants, Laurel Street Rooming House

Case No	Age	Admission	Discharge
1	41	1/12/35	2/13/35
2	18	1/24/35	2/ 3/35
3	24	2/ 8/35	2/22/35
4	22	2/13/35	2/17/35 Died
5	16	2/15/35	3/ 0/35
6	32	2/18/35	3/15/35
7	35	2/19/35	3/25/35
8	35	2/20/35	4/11/35
9	47	3/ 2/35	3/25/35
10	39	3/15/35	3/28/35
11	28	3/18/35	3/27/35
12	43	3/18/35	4/ 5/35
13	18	3/21/35	4/ 5/35
14	22	3/25/35	4/11/35
15	24	3/29/35	4/ 8/35
16	25	3/31/35	4/11/35
17	18	4/ 2/35	4/ 8/35
18	35	4/ 4/35	4/20/35
19	22	4/ 8/35	4/21/35
20	31	4/10/35	4/ 6/35
21	39	4/15/35	5/11/35
22	28	4/15/35	5/ 6/35
23	49	4/22/35	5/10/35
24	30	4/23/35	5/ 4/35
25	43	4/29/35	5/ 4/35 Died
26	21	4/ 0/35	6/ 1/35
27	21	4/30/35	5/18/35
28	20	5/ 7/35	6/ 2/35
Transients Armleder Building			
29	26	2/13/35	3/ 6/35
30	44	2/13/35	3/12/35
31	44	2/15/35	3/15/35 Died
32	27	2/16/35	3/ 4/35
33	34	2/18/35	3/ 3/35
34	29	2/24/35	4/ 1/35
35	22	2/25/35	3/11/35
36	35	3/ 3/35	3/10/35 Died
37	17	3/ 6/35	3/21/35
38	28	3/ 8/35	3/27/35
39	26	3/12/35	3/27/35
40	46	3/23/35	4/ 5/35
41	29	3/27/35	4/12/35
42	29	3/28/35	4/11/35
43	31	3/29/35	4/18/35
44	39	4/12/35	4/28/35
45	40	4/23/35	5/ 7/35
46	44	5/ 7/35	5/11/35
47	38	5/15/35	5/27/35

Space does not permit a detailed account of every case listed in table 3. Just a few of them will be briefly mentioned.

CASE 57—W B, a Negro aged 41 with asthma, had been in the hospital five days when he was seized with symptoms of pneumonia and his temperature rose to 104 F. He died a few days later notwithstanding the administration of 140,000 units of serum. On each side of him and in an opposite bed

were patients who were seriously sick with type II pneumonia and had been in the ward with him for several days. The position of these patients is shown in the accompanying diagram.



Position of patient 57 in the ward

Not all the patients who contracted pneumonia in the ward were as completely surrounded as this one by patients harboring the type of organism that proved to be the infecting agent, but perfect isolation was not

TABLE 2—Second Epidemic of Type I Pneumonia Among Transients at the Armleder Building

Case No	Age	Admission	Discharge
48	34	11/ 9/35	11/20/35
49	39	11/20/35	12/ 4/35
50	28	11/23/35	12/ 4/35
51	41	11/30/35	1/16/36
52	37	12/ 2/35	12/16/35
53	31	12/ 3/35	12/16/35
54	27	12/ 3/35	12/16/35
55	33	12/ 8/35	12/13/35
56	36	12/13/35	1/14/36

in practice and the same nurses and physicians were in attendance on all. As the diagram indicates extra beds were placed down the center of the wards in order to accommodate more patients during the heavy service of the winter months. The ward capacity was thus increased 15 per cent. This represented overcrowding, as the wards were not designed for the extra number. As all medical patients are cared for in the open wards of a general hospital, it was decided that the overcrowding meant an undue hazard for cross infection and the custom is no longer permitted.

CASE 58—A S, a Negro located two beds distant from patient 10, had been in the hospital thirty-three days for clinical study. The diagnosis was periarthritis nodosa. Very suddenly five days after patient 57 was infected, the temperature rose to 104 F and pneumonia developed. Pneumococci of type II were found in the sputum. He died within fourteen hours, although he was given serum immediately.

CASE 59—C P, a white youth aged 18, who contracted two infections while in the ward, was admitted to the hospital Dec 21, 1936, with a diagnosis of acute rheumatic fever with myocardial and endocardial damage. His temperature, due to rheumatic fever, gradually returned to normal and remained so for twenty-one days. Otitis media then developed, followed two days later by pneumonia, with a temperature of 105 F. Type II pneumococci were found in the sputum. With homologous serum good results were promptly obtained. After eight days his temperature rose again, his condition became much worse and examination of the sputum revealed type III and type II pneumococci, with a preponderance of the former. The patient recovered. In the same ward at this time and close by were two patients with type II and two patients with type III pneumonia. The order of infection in this instance is most striking and leaves little doubt that patient 59 was infected twice from patients already sick with the disease.

While cross infections have been due, in the majority of cases, to type I and II pneumococci, instances were encountered in which other types have been responsible.

CASE 60—O H, a white woman aged 62, admitted to the hospital Dec 31, 1936, suffering from bronchial asthma, Jan 7 1937 suddenly showed alarming signs of pneumonia and died five days later. There were three other patients with type III pneumonia in the ward at the same time, one directly opposite her. These three patients had had their infections for several days prior to the onset of the disease contracted in the ward.

CASE 61—S H, a white woman aged 65, admitted to the hospital Dec 14, 1936, with a diagnosis of diabetes and myocardial failure, Jan 10 1937, suddenly showed severe symptoms of pneumonia. Type VII pneumococci were found in the sputum. There was another patient in the ward at this time, two beds distant, who had a type VII infection. She had been admitted January 5.

CASE 62—W O, a white man aged 47, admitted to the hospital Sept 18 1936, for a malignant growth in the abdomen, contracted type VIII pneumonia. October 29 with severe bacteremia. Five days previously, October 24 a patient had been admitted to the same ward seriously sick with type VIII pneumonia. One other patient with type VIII pneumonia was in the ward at this time.

In these cases and in the cases cited in table 3 infection could be traced to a patient in the ward who had primary pneumonia of a homologous type.

*B Patient to Doctor*—The following case is illustrative of infection from patient to doctor.

CASE 63—E G, a white man aged 26, an intern in the medical service, who had an acute exacerbation of chronic

instruments was neglected. She recalled that she had thoughtlessly handled instruments which had been used on a mouse infected with type VII pneumococci and without washing her hands had been putting cough lozenges in her mouth. Her recovery with serum was prompt.

#### CATEGORY 3 DISEASE CONTRACTED WITHIN THE FAMILY

It has been shown<sup>3</sup> that 20 per cent of immediate family contacts harbor the homologous strain in the nasopharynx. That a certain number of these carriers actually contract the disease is likewise true.

#### A Simultaneous Infection—

CASES 66 and 67—G H, a white woman aged 47, was admitted to the hospital Jan 9, 1937, critically ill with type II lobar pneumonia. The infection was an overwhelming one, with bacteria present in the blood and spinal fluid. She had been sick for ten days and died January 11. E H, her husband, a white man aged 48, admitted Jan 10, 1937, with severe type II pneumonia had been ill for one week. His infection was just as overwhelming as his wife's, with bacteremia and invasion of the spinal fluid. He died nine days later.

TABLE 3—Cases of Pneumococcal Cross Infection at the Cincinnati General Hospital from July 1, 1936, to July 1, 1938

(The diagnosis given is the reason for hospitalization.)

Case	Patient	Race	Sex	Age	Diagnosis	Hospital Day on Which Pneumonia Developed	Previous Temperature F	Temperature on Sudden Rise	Type of Pneumococci in Sputum	Treatment	Result
55	W B	N	♂	41	Cardiac failure and asthma	5th	100	104	II	Serum	Died
56	A S	N	♂	25	Periarteritis nodosa	3d	101	104	II	Serum	Died
59	C P	N	♂	18	Rheumatic heart disease and rheumatic fever	2d	Subnormal	104	II	Serum	Recovered
60	O H	W	♀	62	Second infection	31st		104	III		Recovered
61	S H	W	♀	65	Chronic bronchial asthma	7th	98	102	III		Died
62	W O	W	♂	47	Cardiac failure, diabetes	24th	100.98	102	VII	Serum	Recovered
63	F B	W	♀	6	Abdominal neoplasm	42d	98	100	VIII	Serum	Recovered
64	D P	W	♀	6	Syphilitic heart disease	3d	99	101	I	Serum	Died
65	W M	N	♂	31	U R I pregnancy six months	6th	101.95	103	II	Serum	Recovered
66	W M	N	♂	29	Prostatic cystitis	20th	Subnormal	106	II	Serum	Recovered
67	J A	N	♂	48	Bronchial asthma	20th	100	104	II	Serum	Recovered
68	J C	N	♀	44	Vincent's infection	5th	104	105	VII	Serum	Recovered
69	J B	W	♀	68	Cardiac failure	11th	101	104	VII	Serum	Died
70	J F	W	♀	71	Cardiac failure	24th	100	103	VII	Serum	Died
71	T H	W	♂	40	Diabetic coma	7th	98	103	VIII	Serum	Recovered
72	J P	N	♀	40	Meningovascular syphilis	2d	100	104	VII	Serum	Recovered

sinusitis Oct 2 1936 first examined and administered serum to a moribund patient with type I pneumonia. During the procedure the patient coughed in his face. One week later October 9 he showed severe signs of pneumonia found to be due to type I pneumococci. He made an uneventful recovery. During the interval of a week he had examined no other patient with pneumonia.

In this instance a conjecture as to the incubation period could be made. In the other cases cited this important period was ill defined. Apparently it must vary for the different types and the same types under varying circumstances.

*C In the Laboratory*—That those working with infectious material in the laboratory must be constantly protected seems self evident. Two instances of infection contracted in this manner are of interest.

CASE 64—C D, a woman aged 29, a laboratory technician early in September was testing some type I antipneumococcus serum for mouse protection titer. She was suffering severely with hay fever at the time and, owing to the necessary frequent use of handkerchiefs while at work, was probably careless in her technique. She suddenly showed symptoms of otitis media. Type I pneumococci were recovered from the exudate.

CASE 65—E F, a woman aged 32, a laboratory technician who showed signs of acute lobar pneumonia due to type VII pneumococci March 28, 1936 for one week had had a cold involving especially the trachea. Three days before the onset of pneumonia the gas was temporarily turned off in the laboratory and for a brief time the sterilizing of equipment and

The following instance of the simultaneous infection of two elderly sisters is of unusual interest because their infections produced symptoms and signs so strikingly similar.

CASES 68 and 69—Mrs E S, a white woman aged 65, a private patient of Dr Leon Schiff, had been sick for several days. She lived alone with her sister, Mrs H, aged 68, who ministered to her needs during her illness. Mrs E S died Dec 6 1936. Throat swabs and blood cultures revealed an infection due to type IV pneumococci. X-ray examination showed consolidation of the upper lobe of the right lung. No sputum could be obtained. Mrs H fell ill December 7, and the course of her illness followed in almost every detail that of her sister. In each case the disease had to be diagnosed by means of throat swabs and verified by blood cultures and roentgenograms. Both patients had involvement of the upper lobe of the right lung and one sister followed the other in death within a few days.

We have in our series one other instance of simultaneous infection.

CASES 70 and 71—M H, a Negress aged 48, and J H, a Negro aged 42 husband and wife, were admitted to the hospital Dec 26 1937, with type VIII pneumonia. Both received rabbit antipneumococcus serum and both had an immediate crisis with subsequent recovery.

#### B Patient to Nurse—

CASE 72—D C, a white woman aged 47, a nurse, admitted to the hospital Jan 17, 1937, with well established lobar pneumonia due to type V pneumococci, twelve days previously had

contracted a cold. Four days later she was called to nurse a patient sick with pneumonia, whom she attended for four days. The patient she was caring for was sent to the hospital January 13 and was found to have type V pneumonia with bacteremia. (In spite of serum therapy she died January 14.) The nurse made an uneventful recovery after the administration of serum. The train of events seems clear. Undoubtedly the nurse was infected by a virulent homologous organism from the patient she was attending. The incubation period would seem to have been eight days.

CASE 73—E L, a woman aged 50, had nursed for one day her son, aged 23, who was admitted to the hospital Jan 20, 1938, with type II pneumonia. January 24 she had a chill, and February 2 she came to the hospital with type II pneumonia.

This case corroborates Smillie's<sup>3</sup> one day exposure theory.

C From a Family Carrier.—It is probable that persons who have recently recovered from pneumonia may serve as carriers for a protracted period. Three patients encountered in these studies were of the immediate family of a patient who had returned from the hospital after recovery from a homologous infection.

CASE 74—E C, a white woman aged 54, was admitted to the hospital May 6, 1936, with a diagnosis of type I pneumonia and was discharged May 26. Two weeks after her homecoming her husband, C C, aged 54, was admitted to the hospital with pneumonia, also of type I.

CASE 75—E R, a white woman aged 44, was admitted to the hospital Feb 26, 1936, and "signed herself out" March 16. She had type II pneumonia, and just five weeks after her return home her son, H R, aged 16, was admitted to the hospital, also suffering with type II pneumonia.

CASE 76—J C, a white youth aged 20 admitted to the hospital March 23, 1938, had had a severe chill March 19. He had type XIX pneumonia of the lower lobe of the left lung. Seven days before, his child P C, had returned from the hospital after having the same type of pneumonia, with empyema.

These three instances immediately suggest the advisability of taking material for culture from the nose and throat of each patient convalescing from pneumonia before discharge from the hospital.

#### COMMENT

Physicians are, so to speak, at the halfway mark in the campaign against the pneumonias. Early diagnosis according to the specific etiologic organism and prompt administration of the specific curative serum have been conclusively shown to reduce the mortality in a most impressive manner. In the Cincinnati General Hospital in the nine years previous to the organized use of curative serum, the crude mortality rate from the pneumonias was between 30 and 50 per cent. The crude mortality rate has now been reduced to 11 per cent, and only those patients sick ninety-six hours or less have been serum treated. This figure represents an analysis of 600 cases observed during a three year period.

The 300 or more deaths from lobar pneumonia which are recorded each year in Cincinnati occur preponderantly between November and May, when most of the diseases of the respiratory tract are prevalent. When the first few cases appear we invariably stop to discuss the possible source of infection. While little is known of the incubation period of the infection and many other important features, it is reasonably sure that the disease is spread by two agents: (1) carriers of virulent type-specific pneumococci,<sup>4</sup> who may infect their contacts,

producing either (a) pneumonia or (b) simple carriers, and (2) patients with pneumonia who infect contacts with homologous strains.

While Smillie and others have doubted the probability or likelihood that a patient with pneumonia infects another person, ample proof has been recorded to assure the fact that this happens not infrequently. Only those patients are included in this report who showed evidence of having contracted their disease by cross infection. Many others for whom proof was not so conclusive, have been omitted. This being the case, and it seems unimportant whether the disease is highly contagious or not (tuberculosis is not), each patient with pneumonia should be regarded as a focus for the spread of the infection. The care of each patient should include those measures which have been found serviceable in the treatment of other communicable diseases.

It is essential that each patient be segregated in a cubicle and not treated in the open ward. Physicians and nurses should be required to observe the same precautions in caring for such patients as are usual in contagious disease wards. The wearing of gowns and masks and the washing of hands after each examination or treatment should be strictly enforced. Visitors to the patients should likewise be protected. Since these regulations have been adopted at the Cincinnati General Hospital, we have been convinced of their merits.

The part played by colds and other diseases of the respiratory tract, such as asthma, sinusitis and hay fever, may not be finally established. However, in these studies it was felt that colds have a definite relationship to the prevalence of homologous types of pneumococci in contacts with lobar pneumonia. This was particularly noted in the two epidemics reported in dormitories. While it may be truer of types I and II, as pointed out by Smillie,<sup>4</sup> it occurs with other types.

While overcrowding *per se* may not be a predisposing factor in the spread of pneumonia, our studies indicate that the disease exists in greater numbers under this condition. The two epidemics mentioned occurred when persons were crowded in dormitories. Only type I pneumonia was encountered in these outbreaks.

In a report which will appear later it will be shown that by far the greatest number of cases of pneumonia as well as the greatest number of deaths from the disease occur in a certain few census tracts where not only are overcrowding and economic conditions the worst in the city but also the incidence of other communicable diseases is the highest.

#### CONCLUSIONS

1 Pneumococcal pneumonia, a contagious disease, may infect contacts with homologous strains. This report indicates that physicians, nurses, other patients and other members of the family may be the victims.

2 Pneumococcal pneumonia should be treated as a contagious disease in the hospital and in the home and as a public health problem in the city. All cases should be reported by type.

NOTE.—In a study of the pneumonias in private hospitals two instances were noted of a husband and wife who entered the hospital on the same day with the same type of pneumonia. In one pair the diagnosis was type I pneumonia and in the other type IV pneumonia. Another example of family infection was in a man aged 48 who entered the hospital with type I pneumonia and was followed in five days by his daughter, aged 17, with the same diagnosis. A case of type II infection was encountered in which both the sister who was nursing the patient and the doctor contracted the disease. The patient and doctor both died but the sister recovered.

<sup>4</sup> Smillie W C. The Epidemiology of Lobar Pneumonia. Reprinted from the Tr A Am Physicians 51: 407 1936.

POSTOPERATIVE PARATHYROID  
TETANYCOMPLETE CONTROL OF THE MANIFESTATIONS  
BY MEANS OF DIHYDROTACHYSTEROI  
REPORT OF A CASE

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The case of postoperative parathyroid tetany that we are reporting here merits, we believe the attention of the practitioner because of the dramatically efficacious control of the disease effected by means of dihydrotachysterol (A T 10) whereas every form of treatment attempted previously was without any beneficial result. There are, moreover, few reports in the American literature dealing with the clinical use of dihydrotachysterol in the treatment of postoperative parathyroid tetany.

Despite all precautions and meticulous surgical technique, postoperative parathyroid tetany, following subtotal thyroidectomy, still occurs in about 15 per cent of cases. The prevailing impression that with the advent of solution of parathyroid an answer was found to the problem of controlling every case of parathyroid tetany has been shown, as in the case to be reported here, to be erroneous. Although parathyroid tetany may yield readily to treatment with adequate dosage of calcium and cod liver oil, cases occur in which there is no improvement under such treatment and among these are some which are refractory even to the addition of apparently adequate amounts of solution of parathyroid.

## REPORT OF CASE

**History**—A white man aged 30, married, seen July 28, 1937, complained of loss of weight, palpitation, nervousness, restlessness and insomnia. These symptoms dating back to May 1937, began with loss of weight of slight degree at first but more pronounced in the four weeks previous to admission. Thus from an initial weight of 190 pounds (86 Kg) in May 1937 there was a decline to 180 pounds (81.6 Kg) in June and to 147 pounds (66.7 Kg) in July 1937. He complained of marked nervousness and stated that he was restless and fidgety and unable to sleep. He had also become subject to palpitation and shortness of breath on usual exertion during the previous year. There were no other significant complaints. The past medical and family history were essentially negative.

**Physical Examination**—The patient was well nourished and appeared extremely restless and fidgety. There was only the slightest exophthalmos but a pronounced staring expression of the eyes and somewhat increased blinking but no edema of the eyelids. The thyroid was not palpably enlarged and bruits could not be heard over it. There was marked tachycardia, the pulse rate averaging 105 per minute. The heart was normal, except for the rapid rate. The blood pressure in millimeters of mercury was 135 systolic and 65 diastolic, yielding a higher pulse pressure than normal, characteristic of hyperthyroidism. There was moderate weakness of the quadriceps muscles. Physical examination was otherwise entirely negative.

Urinalysis determinations of hemoglobin, erythrocyte and leukocyte counts and the Wassermann and Kahn tests revealed essentially negative results. Roentgenograms of the chest revealed some cardiac enlargement but were otherwise negative. A substernal thyroid was not visualized. The basal metabolic rate on admission to the hospital was plus 93 per cent.

A diagnosis of exophthalmic goiter (diffuse hyperplasia of the thyroid) was made, and treatment with compound solution

of iodine 10 minims (0.65 cc) three times a day was instituted preparatory to subtotal thyroidectomy. The treatment otherwise consisted of rest in bed, a high caloric diet and sedatives as required.

Subsequent determinations of the basal metabolic rate yielded the following readings: August 3, after seven days' treatment with compound solution of iodine, +65 per cent; August 9, after thirteen days of this treatment, +65 per cent; and August 11, after fifteen days of this treatment, +44 per cent.

Examination August 11 revealed marked lessening of the degree of thyrotoxicosis. The patient volunteered that he felt much improved, he was less restless and nervous and the pulse rate was slower. Despite the basal metabolic rate of +44 per cent, it was felt that the clinical condition was entirely satisfactory for thyroidectomy to be performed.

**Operation**—Subtotal thyroidectomy was performed August 12, the greater part of both lateral lobes being excised, leaving a small remnant of thyroid gland in the tracheo-esophageal groove on each side.

**Histopathologic Report**—The specimen consisted of thyroid gland tissue in two pieces, each measuring 4 by 3 by 2 cm. The gland was firm in consistency and on being sectioned presented a somewhat beefy appearance. There were no discrete nodules. Microscopic sections revealed areas of marked hyperplasia with poorly stained colloid. The cells were of the high columnar type and, in certain areas, more than two layers deep. Other parts presented involuted areas with dilated acini, little colloid, flattened epithelium and occasional areas of lymphocytic infiltration. The histologic appearance was that of hyperplasia of the thyroid with involution.

**Subsequent Course**—September 21, sixteen days after dismissal from the hospital the patient was seen by one of us (H M M), at which time the patient stated that almost immediately after he left the hospital marked tingling in the hands and feet and frequent spastic contractures of the fingers, toes and muscles of the calves of the legs developed. This occurred even at rest but was aggravated by activity. Driving an automobile had become almost impossible because of the frequent spasms of the leg muscles. He had gained 5 pounds (2.3 Kg), slept well and felt perfectly well in every other way. The patient recalled that during his postoperative period at the hospital he had noted slight, intermittent tingling in the extremities but those symptoms were so mild and evanescent that he did not mention them at any time.

His attending physician (G K), who had seen the patient because of these complaints shortly after dismissal from the hospital, diagnosed postoperative parathyroid tetany and prescribed calcium gluconate and later calcium lactate<sup>1</sup> in doses of two teaspoonsfuls (8 Gm) three times a day. The symptoms were not relieved, however, and the carpopedal spasm was, in fact, apparently becoming more and more pronounced.

Examination September 21 revealed no evidence of thyrotoxicosis, the staring expression was gone and there was no exophthalmos. The pulse rate was 84 per minute, the blood pressure 115 systolic, 90 diastolic. The Chvostek and Trousseau signs were markedly positive, indicative of moderately severe parathyroid tetany.

Urinalysis was negative and the blood count was normal. The serum calcium (Kramer and Tisdall method) was 9 mg per hundred cubic centimeters of blood and the serum phosphorus (Bell and Doisy method) 5 mg per hundred cubic centimeters of blood.

Because of the subjective and objective manifestations of tetany, despite the normal concentration of serum calcium at this time, the dose of calcium lactate was increased to three tablespoonfuls (45 Gm) a day, and lactose in doses of 1 drachm (4 Gm) three times a day was prescribed in an attempt to lower the phosphate level of the blood. One capsule of cod liver oil and viosterol, three times a day, was also given.

October 6 the patient reported that despite strict adherence to the prescribed therapeutic regimen he had experienced no relief, annoying and frequently severe tetany having occurred almost continuously. Examination again confirmed the existence of tetany: the Chvostek and Trousseau signs were still

<sup>1</sup> The calcium medication at this time and throughout the period of observation was given between meals.

markedly positive. Solution of parathyroid (Collip) was added to the previous therapeutic regimen in doses of 0.5 cc (50 units) daily, with the suggestion that it be increased to 0.75 cc (75 units) daily if necessary. The patient was taught to administer the injections of the solution of parathyroid himself.

Feb. 21, 1938, the patient was still complaining bitterly of the disability caused by tetany. Despite the daily use of 75 units of solution of parathyroid, plus the large doses of calcium lactate, lactose and halibut liver oil and viosterol taken, he had had, he complained, a great deal of tetany in the hands, legs and, more recently, also in the muscles of the throat and larynx. There were, in addition, prims in the muscles all over the body, he tired easily, had a tendency to drowsiness in the daytime and was gaining weight, the weight having risen from 142 pounds (64.4 kg.) before operation to 177½ pounds (80.4 kg.).

Examination again revealed signs of marked tetany, with pronounced positive Chvostek and Trousseau signs. He had become quite obese and the face was pudgy. There was a distinct exophthalmos of slight degree and puffiness about the upper eyelids. There were no clinical manifestations to suggest either myxedema or hyperthyroidism, however. The basal metabolic rate at this time was minus 5 per cent. The serum calcium was 6.2 mg., serum phosphorus 5.5 mg. and blood cholesterol 200 mg. per hundred cubic centimeters of blood. A blood count was normal.

The dose of calcium lactate was increased to six tablespoonfuls and was administered in divided doses six times a day. Cod liver oil, in doses of a tablespoonful three times a day, was given in place of halibut liver oil and viosterol capsules, but since the patient did not tolerate cod liver oil well he resumed the halibut liver oil and viosterol medication after several days. He continued the ingestion of lactose and the subcutaneous injections of solution of parathyroid in doses of 0.35 cc (35 units) twice a day.

The symptoms of tetany continued practically unabated, however, and were becoming more and more burdensome to the patient. He complained of much general weakness, in addition lacrimation associated with definite proptosis of the eyes and persistent edema of the upper lids had developed. Again there were no indications of hyperthyroidism or

TABLE 1—Calcium and Phosphorus Concentration in Blood Serum Before and After Institution of Treatment with Dihydrotachysterol

Date	Serum Calcium, Mg. per 100 Cc.	Serum Phosphorus, Mg. per 100 Cc.	Dihydrotachysterol, Daily Dose	Symptoms of Tetany
9/22/37	9.0	5.0	None	Marked
2/22/38	6.2	5.5	None	Marked
4/7/38	6.0	5.5	None	Marked
4/12/38	6.0	7.4	None	Marked
4/14/38	7.1	6.6	None	Marked
4/15/38			1 cc	Marked
4/16 and 17/38			0.5 cc	Marked
4/18/38	10.0	6.7	0.5 cc	Slight
4/19/38			1 cc	Very slight
4/20/38	10.0	7.0	2 cc	None
4/21 and 22/38			2 cc	None
4/23/38 8 a. m.	11.0	6.0	{ 2 cc	{ None
4/23/38 1 p. m.	10.1	6.9		
4/23/38 10 p. m.	10.8	7.2		
4/29/38	9.0	6.2	1 cc	None
6/7/38	8.1	6.6	10 drops every other day	None

myxedema. The skin presented numerous dry, scaly areas over which there were numerous minute, dry, papules.

Owing to persistence of tetany and our inability to control its manifestations despite a seemingly adequate intake of calcium, halibut liver oil and viosterol, and solution of parathyroid, the patient was readmitted to the hospital April 5 for closer observation and for a trial of dihydrotachysterol if necessary.

While he was in bed for several days and receiving one and one-half tablespoonfuls of calcium lactate six times a day and one capsule of halibut liver oil and viosterol twice a day as well as a low phosphorus diet, spasms of the muscles of the face, hands feet and glottis continued. There was definite hypocalcemia and an increased concentration of phosphorus, the values ranging from 7 to 7.5 mg. of calcium per hundred

cubic centimeters of blood, and of phosphorus from 7.6 to 7.4 mg. per hundred cubic centimeters of blood (table 1). After a period of ten days without any indication of the slightest improvement, treatment with dihydrotachysterol in addition to the medication previously prescribed was instituted in the dosage given in table 2.

After three days of treatment with this drug, during which time he had consumed a total of 13 cc of dihydrotachysterol, the blood calcium concentration reached a level of 10 mg. and the blood phosphorus a level of 6.7 mg. per hundred cubic

TABLE 2—Course of Dosage of Dihydrotachysterol	
Date	Dosage
4/10/38	3 cc daily
4/16 to 4/18/38	0.5 cc daily
4/19 to 4/20/38	7 cc daily
4/21 to 4/24/38	2 cc daily
4/24 to 5/2/38	1 cc daily
5/21/38 to date	10 drops every other day

centimeters of blood (table 1). He felt much improved, there being but few symptoms of tetany.

Four days later, after an intake of an additional 15 cc of dihydrotachysterol, he was practically entirely relieved of tetany except for slight spasm of the fingers of the right hand in the morning, on arising, this lasting but a minute or so, after which he could get around and exercise without precipitating tetany. He was dismissed April 24 entirely relieved of his tetany, taking six tablespoonfuls of calcium lactate, two halibut liver oil and viosterol capsules, and 1 cc of dihydrotachysterol daily.

Since dismissal from the hospital he has remained entirely free from tetany and has been able to resume his former occupation. The skin has resumed a normal appearance and texture and the blood calcium concentration has remained normal, although the blood phosphorus level, when last seen June 7, was 5.6 mg. per hundred cubic centimeters of blood. On examination he presented the faintest Chvostek reaction on both sides, which disappeared after several consecutive attempts to elicit it, the Trousseau sign was absent. He still complained of excessive lacrimation, and exophthalmos, measuring 25 mm. on the right and 26 mm. on the left, was still present. He was also found to have hyperopia with astigmatism in both eyes, for which adequate correction with glasses was prescribed.

COMMENT

Dihydrotachysterol (C<sub>24</sub>H<sub>400</sub>) is derived from tachysterol, a chemical fraction of irradiated ergosterol which exerts a specific and profound influence on the concentration of calcium in the blood. It is available under the designation A-1-10 in the form of a clear oily solution which is stable indefinitely and is suitable for peroral administration. The use of dihydrotachysterol for the treatment of postoperative parathyroid tetany was introduced first by Holtz,<sup>1</sup> and among the clinical reports of its use are those of Snapper,<sup>2</sup> Campbell<sup>3</sup> and Arnold and Blum.<sup>4</sup>

Like solution of parathyroid, dihydrotachysterol causes a rise in the calcium level of the blood, but unlike the relatively transitory effect of solution of parathyroid the action of dihydrotachysterol begins more slowly and is much more prolonged, the action of a single dose extending at times over many days. Because of this prolonged action of dihydrotachysterol it has found a most useful place in the clinical management of various forms of postoperative tetany. More important still is the fact that peroral administration

2 Snapper, I. A-1-10. Bericht über Erfahrungen mit A-1-10. Klin. Wochenschr. 17:104-108 (Jan. 20) 1934.

3 Campbell, D. Treatment of Parathyroid Tetany. J. Intern. Med. 1:369-372 (Oct. 16) 1935.

4 Arnold, C. H. and Blum, H. Control of Hypoparathyroidism. W. J. Surg. 11:516-555 (Sept.) 1936.

1 Holtz, I. A-1-10. Bericht über Erfahrungen mit A-1-10. Klin. Wochenschr. 17:104-108 (Jan. 20) 1934.

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of a small amount of the drug can, as in our case, effectually control the disturbance of parathyroid insufficiency even when all other recognized means previously available including the use of solution of parathyroid, are entirely ineffectual. Solution of parathyroid must moreover, be given by injection, whereas dihydrotachysterol is effective when taken by mouth. Another advantage of the latter drug is that, once the blood calcium level has been restored to normal, frequent administration is unnecessary, small maintenance doses sufficing to prevent recurrences.

In the case reported here, treatment with large doses of calcium lactate, lactose, halibut liver oil and viosterol and solution of parathyroid was without the slightest effect on the clinical symptoms. The patient's manifestations of tetany were in fact progressing despite these measures and he had reached a state of marked disability, not to say danger, with the appearance of spasm of the glottis just before the administration of dihydrotachysterol was begun. By the fourth day of the administration of this drug however, the symptoms of tetany were strikingly anchored and within six days all manifestations of tetany, except the slightest symptoms for a minute or so on rising had disappeared. The rapid control of all the clinical manifestations of parathyroid insufficiency, as well as a return of the blood calcium and phosphorus levels to normal, was strikingly dramatic and most gratifying both to the patient and to ourselves. The therapeutic effect in our case was not less dramatic than that of insulin in the control of diabetes. It has been particularly gratifying to observe the continued maintenance of the improvement attained by the administration of as small a dose of dihydrotachysterol as ten drops every other day. The disappearance of the trophic cutaneous changes which had begun to appear was not only gratifying in itself but suggested also that by maintaining complete control of the parathyroid insufficiency indefinitely we might possibly also avert the development of cataracts, which otherwise appeared as another threatening menace.

Whether such perfect control of parathyroid insufficiency as was effected in our case by dihydrotachysterol can be uniformly achieved in every instance of parathyroid tetany remains to be learned from wide experience with this drug.

The toxic effects of overdosage with dihydrotachysterol have been reported to be essentially the same as those of overdosage with parathyroid extract and other calcium mobilizing factors. The manifestations of overdosage are languor, anorexia, nausea and vomiting, and, if more pronounced, there appear also headache, stupor, ataxia of the lower extremities, thirst, albuminuria and exanthems. These symptoms are associated of course, with hypercalcemia, which may range upward from 13 mg of calcium per hundred cubic centimeters of blood. The toxic manifestations of overdosage generally yield to cessation of further administration of the drug, bed rest, a liberal intake of fluids, and laxatives. Control of the symptoms of overdosage and a return of the calcium level of the blood to normal may require a number of days. Close observation of the patient and frequent determinations of the calcium concentration of the blood at the start of treatment

and at intervals thereafter are essential to avert overdosage, because the drug has some cumulative action. It is probably best to keep the calcium level of the blood at the lower border of normal, that is, between 9 and 10 mg per hundred cubic centimeters. By careful observation and frequent checking of the calcium and phosphorus concentrations in the blood in our case we have aimed at and achieved complete control of the parathyroid insufficiency without inducing hypercalcemia and its attendant toxic manifestations.

#### SUMMARY

The case reported is one of postoperative parathyroid tetany, refractory to treatment and progressively more disabling, despite the use of large doses of calcium, halibut liver oil and viosterol and solution of parathyroid, in which the symptoms were promptly and entirely relieved and the metabolic effects of the parathyroid insufficiency were satisfactorily controlled by means of dihydrotachysterol.

The therapeutic effect of dihydrotachysterol in the control of parathyroid insufficiency in our case was not less dramatic than that of insulin in the control of diabetes.

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## SYPHILIS AND THE LAW

WITH A DISCUSSION OF THE FALSE POSITIVE  
BLOOD SEROLOGIC TEST

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AND

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PHILADELPHIA

The United States, following its well known predilection, is on the edge if not actually near the crest of a wave of legislative enactment in a newly discovered though very old public health field that of venereal disease control. It therefore behooves the physician who wishes to understand, influence and cooperate to be informed on many as yet little appreciated aspects of the problem.

#### THE LAW IN ENACTMENT AND IMPLICATION

Law on the question of the transmission of infectious disease rests fundamentally on police powers conveyed by the legal enactments establishing state boards of health and supported by favorable decisions in the courts on issues involving quarantine and the protection of the public against the dissemination of infection. On this broad legal base rests a structure of local ordinances varied occasionally by legislative supplements from higher sources, so to speak, as in more sweeping types of laws governing groups such as food handlers and barbers. In many instances the local ordinances thus far tend to concern themselves principally with special groups of public employees such as policemen and firemen, in whose selection and welfare the state exercises some medical power. Rules adopted by private industrial concerns would not find place among existing laws because of their lack of connection with the police power, but they have nonetheless substantial force by way of the hiring and firing or job control

7 Since our report was submitted for publication MacBryde has reported seven cases in which the symptoms of tetany and the chronic hypercalcemia were controlled with dihydrotachysterol. MacBryde C. M. The Treatment of Parathyroid Tetany with Dihydrotachysterol. J. A. M. A. 111:304-307 (July 23) 1938.

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of the employable population. The most recent type of enactment, essentially a product of the widespread public agitation and interest caused by a campaign against syphilis, has taken on both a broader sweep and a more sketchy disposition of powers and responsibilities. Amateur and unguided lay legislative handiwork can easily be recognized in some of the marital and pregnancy enactments now in existence. It is not improper to point out that medical persons unfamiliar with the diseases which it is planned to control by legislation, and even public health officers in similar situations may be responsible for confusion, injustice and unenforceability in the laws or regulations to which their efforts give birth.

#### PURPOSES OF LEGISLATIVE ENACTMENT

All law, and public health law in particular, should be an expression of educated public demand and should arise not from waves of fear, sentiment, hysteria or propagandist activity but from the broad base of intelligent comprehension of the problem involved. Yet law may also subserve an educative function. Probably the fairest statement of a practical relationship between educated demand and educational possibilities is that a law should be drawn by educators and educated or expert persons for purposes of teaching as well as for the function of enforcement and protection. In the case of syphilis there exists a sufficient body of expert knowledge as to what constitutes public health protection and a sufficient unanimity of opinion on treatment control to make the framing of sound legislation practically<sup>1</sup>. Such a statement could hardly be made, under existing knowledge, for example, of a disease like gonorrhea or venereal lymphogranuloma.

World experience with venereal disease control by law also affords some important sidelights on the background of legislative enactment. The United States is at the moment drawing its practice largely from Scandinavian example. The Scandinavian plan of venereal disease control is probably the oldest in the world, the most thoroughly systematized, and rests on the firmest foundation of national character, national homogeneity and national intelligence of any body of health legislation in the world. It is essentially an enforcement plan which takes education for granted. It is perhaps to be expected that from Scandinavian sources the legislatively minded will draw inspiration which unfortunately is not always as effective in a new

milieu as its proponents expect, it is not received by nor has it the educational and constructive effect on a different type of mind that those who frame it desire. In contrast with the Scandinavian technique and reaction stand the experiences of countries like Great Britain and the Netherlands, in which law and enforcement play a negligible part. Successive surveys of the situation in Great Britain and the Netherlands have disclosed results apparently practically equal to those of the Scandinavian countries. The inference that among such peoples as the British and the Dutch practically no fabric of legal enactment is necessary to secure adequate venereal disease control, at least in the field of syphilis, is as important for us as is our Scandinavian model. While the comparisons drawn, for example, by the recent British commission under Colonel Harrison<sup>3</sup> between Scandinavian and Dutch-British practice lack some of the absolute control features which might be desired, particularly in the direction of a long standing statistical summarization of the years preceding active public health interest in venereal disease in Britain, and to an even greater extent in the Netherlands, it is a fair inference that figures which show an almost identical trend when placed side by side and yet which are obtained by two apparently diametrically opposite methods of approach deserve careful study by framers of syphilis laws. It is a matter for real questioning whether the patchwork population of the United States will learn more and learn it better under a regime of legislative definition and enforcement than they would under an intensive application of educational methods through the press, through medical authorities and through public health agencies, lay and official, and most of all through the educated patient himself.<sup>4</sup>

Since it seems for the moment almost inevitable that the legislating technique will for a time have the upper hand in this country, it may be well to indicate the principles that the law must recognize with respect to syphilis if it is to remain at all in harmony with the known practicalities of the situation, medically speaking, as well as from the standpoint of public health.

It would seem, first of all, that laws regulating the control of syphilis should take account of the enormous variability in individual cases and the positive necessity for expert medical interpretation wherever a serious question arises. Laws governing syphilis will tend to be too specific and drawn in too great detail. So far as they preserve the right of the state to allow its public health officers to decide by individual local or official regulation in a flexible manner the processes of enforcement and judgment, subject to cooperative interpretation by the court, they are likely to be good. So far as the enactments tend to define in days and weeks and to specify in degrees of positiveness and negativeness of specific tests, they will tend to run into difficulties both in the infliction of injustice on individuals and in unenforceability in the light of expert testimony in the courts. It is therefore worth while for any one who contemplates the advocacy of legislation for the control of venereal disease to read with care the model of a venereal disease control law prepared as long ago as 1921

1 See articles by  
Moore J. J. Treatment is a Factor in the Control of Syphilis. *Ven. Dis. Inform.* (supp. 3) 1937 p. 84.  
Stokes J. H. Cole, H. N. Moore J. J., and others. Cooperative Clinical Group Studies in the Treatment of Early Syphilis. *Clinical Manifestations and Diagnosis* *ibid.* 1: 165 (May) 1932. *Results of Treatment in Early Syphilis* *ibid.* 1: 207 (June), 253 (July) 1932. *Standard Treatment Procedure in Early Syphilis* *ibid.* 1: 149 (April) 1934.  
Moore J. J. Cole H. N. O'Leary P. A. and others. Cooperative Clinical Group Studies in the Treatment of Latent Syphilis. *General Considerations*, *ibid.* 1: 317 (Aug.) 1932. *The Clinical Outcome of Treatment* *ibid.* 1: 351 (Sept.) 371 (Oct.) 1932. *Clinical Progression and Relapse Wassermann Positivity and Death* *ibid.* 1: 349 (Nov.) 1932. *Course of the Blood Wassermann in Treated Latent Syphilis* *ibid.* 1: 407 (Dec.) 1932.  
Cole H. N. with Ussilton Lida J. and Moore J. J. and others. Cooperative Clinical Group Studies in the Prevention and Treatment of Congenital Syphilis. *Syphilis in Pregnancy* *ibid.* 1: 39 (Feb.) 1936. *Latent Syphilis Interstitial Keratitis* *ibid.* 1: 89 (April) 1937.  
Cole, H. N., with Ussilton Lida J., and Moore J. J. and others. Cooperative Clinical Group Studies in the Treatment of Cardiovascular Syphilis *ibid.* 1: 91 (April) 1936.  
O'Leary P. A. Cole, H. N. Moore J. J. and others. Cooperative Clinical Group Studies in the Treatment of Central Nervous System Syphilis. *Asymptomatic Neurosyphilis* *ibid.* 1: 15 (March) 1937. *Tabes Dorsalis* *ibid.* 1: 367 (Nov.) 1938.  
2 Clarke C. W. Control of Syphilis and Gonorrhea in Scandinavian Countries and Great Britain. Report of New York City Commission to Investigate Prevention and Control of Syphilis in Scandinavian Countries and in Great Britain. *Am. J. Syph. Gonorr. & Ven. Dis.* 20: 7 (July 2) 1936.

3 (a) Harrison I. W. Ward D. C. L. Ferguson I. and Rorke Margaret. Report on Antivenereal Measures in Certain Scandinavian Countries and Holland. Reports on Public Health and Medical Subjects No. 83. London His Majesty's Stationery Office 1938. (b) The Work of the Venereal Diseases Schemes in England and Wales. *Brit. J. Ven. Dis.* 11: 1 (Jan.) 1938.  
4 Ingraham Louise J. The Persuasive Approach with the Infectious Syphilis Carrier. *J. A. M. A.* 107: 1990 (Dec. 12) 1936. Stokes J. H. The Public Health Doctor and the Syphilis Problem. *J. Social Hyg.* 21: 313 (Oct. Dec.) 1935.



by the American Social Hygiene Association.<sup>5</sup> This law in its essentials does little more than define the venereal diseases as infectious and communicable, call for their reporting for statistical purposes and relegate the control of the diseased patient to competent medical authority. Since the infectious person is deprived of certain fundamental rights, provision must be made by the state as depriver for a restoration of those rights following the administration of adequate treatment. Since such treatment is by inference the condition on a restoration of full individual rights, it must be provided regardless of the economic status of the individual, in other words, free. The same provision applies in the model law to diagnosis, both clinical and laboratory. They must be freely available to all. Having thus placed the status of the infected person below that of the non-infected and provided for a free means of restoration to full or normal status, the state may then, and only then, proceed to enforcement, namely, the isolation of the infected person during his period of infectiousness, if necessary, without his own volition if he is recalcitrant or negligent. An additional very proper and necessary provision in sanitary and *ipso facto* in venereal disease control law is power to investigate the source of infection. This implies of necessity, and in the modern acceptable laws is provided for specifically by an authorization to compel, the examination of an individual reasonably suspected of being infected with a venereal disease. The alternate to refusal is isolation or quarantine.

Precisely at this point will come some of the difficult questions of interpretation in individually contested cases, if past history in this type of legislation is any guide. Generally speaking, the police power of the public health officer has been maintained by the courts when persons of doubtful reputation have been involved. Another practical situation of serious implication for the ultimate value of law in this field arises here. Anticipating failure of support from the courts on the purely medical issue of infectiousness, there has been a marked tendency on the part of some public health authorities to shift from the sanitary to the moral ground in controlling persons with venereal disease, remanding the individual to custody for criminal conduct as distinguished from public health necessity. The ultimate implications, both for education and for enforcement, of this obvious shift from the public health to the moral point of view, especially in the field of venereal disease, already so gravely encumbered with sexual stigma, is a matter for serious thought. It should influence not only the drawing of legislation but the reaction of both public health officers and courts toward its enforcement. The fact that morals charges in general hold in the practice of the court against women but cannot be made to hold against men (or at least have not been made to do so) introduces still another element of injustice and public health inadequacy into the legal practice in this field.

Let it be accepted, then, that a proposed law should be drawn in sufficiently general terms to permit an adequate exercise of individual expert medical judgment and provide for public health expediency in the individual case without invading the province of morals. In thus allowing adequate exercise of expert medical judgment it is a further though unfortunate necessity

that some provision must be made for the prevention of evasion through connivance between patient and physician. This contingency is well met in the New Jersey law,<sup>6</sup> for example, which grants to the health officer of the jurisdiction power of review over medical decisions in individual cases, and even power to appoint his own medical examiner to check the original findings.

Within this framework of legal and philosophic generalities one may now proceed to put a venereal disease control law to work. The medical principles with respect to syphilis which all law enforcement must recognize are essentially these:

First, no single test or single procedure uncontrolled or unchecked should be allowed to make a diagnosis of syphilis. This applies even to the dark field identification of *Spirochaeta pallida*, a procedure on which even the reasonably experienced may make serious mistakes and over which some form of control of expertness in judgment should be exercised. It should be further a clearly defined principle that serologic syphilis and clinical syphilis from the standpoint of public health are by no means identically significant. There exists a serologic syphilis which has virtually no public health significance, and there exists a clinical syphilis without serologic confirmation which is of the highest importance from the standpoint of the transmission of the disease. Framed briefly for everyday use, such a principle might read that the positive blood test is never an arbiter of the question of infectiousness versus noninfectiousness, and the negative blood test may be found under any and all circumstances to be without any significance whatever. It follows, therefore, that law and regulatory practice in the control of syphilis which makes the result of the blood test, checked or unchecked, false or true, the arbiter of decisions involving the civil rights and individual freedom of persons cannot stand critical review in the courts of a liberty loving and intelligently guided people. Such a law is subject to constant though variable miscarriage and abuse not only through the shortcomings of the laboratory procedures on which it rests as such but through misinterpretation which takes no account of clinical facts. The congenital syphilitic man or woman, particularly, who has reached adult life with an irreversibly positive blood reaction for syphilis can suffer all the penalties of the law with little or no justification. The patient with a primary lesion still in the seronegative stage or an infection reduced to temporary invisibility and serologic negativity by inadequate treatment can be a public danger of the first magnitude and yet remain entirely outside the control of a law so drafted.

A second principle based on the characteristics of syphilis as a disease and one which when confronted in its full meaning is extremely embarrassing to venereal disease control officers is the definition of infectiousness and noninfectiousness. Deeply though we all desire it, it must be conceded that no absolute definition of noninfectiousness and no means of infallibly attaining it exists at the present day. There will always be in practice patients who have had sufficient treatment to exceed a reasonable standard of control of infectiousness, who are still periodically relapsing and periodically infectious. Conspicuous in this uncontrolled and uncontrollable group is the woman with syphilis. As with gonorrhea, the definition of noninfectiousness may

<sup>5</sup> Social Hygiene Legislation Manual publication 312 New York Am. Social Hyg. A 1921 p. 63. Johnson Bascom. State Laws and Regulations of State Boards of Health Which Deal with Venereal Diseases J. Social Hyg. 24: 514 (Nov.) 1938.

<sup>6</sup> The Venereal Disease Control Law chapter 253 N. J. P. L. 1918 as amended by chapter 261 N. J. P. L. 1933 (section 7) New Jersey State Department of Health circular 154 (revised) August 1933.

be tantamount to the definition of cure, and cure by present methods be undemonstrable or even unattainable save over a period of years amounting to a lifetime. In this field again, public health practice finds itself obliged by the practicalities of the situation to deal with averages and mass results rather than to be too finicky about the details or even the occasional injustice done an individual person. It is therefore one of the first duties in research on syphilis to attempt to define broad categories of infectiousness and noninfectiousness. To this end the United States Public Health Service with the assistance of the Cooperative Clinical Group has been particularly active. Even though one is driven to the point of saying that the standards of noninfectiousness as secured by treatment must be identical with the expectancy standard for cure, one has not uttered something absolutely unpractical. The standard of cure has a 90 per cent validity, with a little more than one third more treatment required than the so-called 20-20 or minimum standard of treatment for infectiousness. Somewhere between the minimum and the maximum within the next several years one may expect a public health median to be drawn beyond which the exceptions will be few and far between and not difficult to provide for by appropriate special judgment and methods, much as in the case of the "typhoid Marys."

Let it then be clearly realized that special legislation for the control of venereal disease should not be written to depend purely and simply on laboratory tests. The factor of expert medical judgment must be drawn into the phraseology in a way to provide for a necessary latitude in interpretation, yet without permitting escape of the individual through a loophole of professional ignorance or connivance.

Finally, a group of facts connected with syphilis which as yet has received virtually no consideration in legislative enactment and which perhaps can be left out of the main framework of law entirely is that of the damaged goods aspect of the disease. Syphilis is, in an as yet not clearly defined proportion of cases, a reducer of efficiency and a producer of hazard and disability in life, in industry and in the social order at large. The person who has a syphilitic infection may fail his family at the critical juncture of its life history, he may fail his fellow workers in an executive post, he may fail the public at the head of a fast-moving train, he may fail a co-worker at a critical or dangerous point in industrial machine and other processing, he may even fail a patient as his physician or surgeon.

Inclusive law on venereal disease control might well take account of these relationships within the broad field of industrial syphilis.<sup>7</sup> If it does so, the protection of the worker against the very understandable but sometimes overexercised disposition of the employer to protect himself from the injured or defective employee, the sometimes hysterical desire of the clientele or the public to be protected from imaginary risks, the unwillingness of the employee to sustain the risk of refusal of employment or discharge from a job already satisfactorily held merely because of the identification of concealed and possibly industrially unimportant disease must all have equal weight.

#### THE MARRIAGE AND ANTEPARTUM TESTING TYPE OF LAW IN THE LIGHT OF THESE PRINCIPLES

At this writing nine states have actual laws regulating venereal disease with respect to marriage, and fourteen additional states in 1938 considered bills to amend their marriage laws or to impose various restrictions. In only four of the latter states have such bills been passed and become laws. An excellent digest of today's legal situation on this front is given by Bascom Johnson.<sup>9</sup>

The barrage of questions to which syphilologists have been subjected by state health officers suddenly confronted with the obligation to enforce insufficiently studied legal enactments indicates quite clearly some of the difficulties likely to be encountered. It is obvious that a law in an individual state is not sufficient to meet the situation. Until legal enactment becomes general throughout the country, evasion must inevitably be expected. Since it is extremely difficult to define the amount of treatment which cures syphilis and impossible at this writing to define exactly what cure is, marriage legislation should limit itself to the use of the term "noninfectiousness" if it proposes to withhold license to marry as long as a person can be regarded as capable of transmitting the disease. The practical difficulties in the way of even such a seemingly modest requirement are well realized by the public health authorities of this country, and they have not yet been adequately met.

While marriage laws in respect to the transmission of venereal disease, similar to those which are being enacted by the various state legislatures in this country, have been in existence in the Scandinavian countries for a number of years information as to their effectiveness is not apparently readily available. One gains the impression from the report of the survey conducted by the British Ministry of Health<sup>10</sup> that the penal code invoking punishment for exposing others to risk of infection through marriage or otherwise is seldom invoked and that when action is taken the proceedings are abandoned before sentence is passed in a large proportion of cases.

Realists in the matter of marriage legislation directed toward preventing the transmission of an infectious disease must continue inevitably to draw the distinction between marriage *de facto* and marriage *de jure*, which must be part of the everyday thinking of the syphilologist. The fact that sexual intercourse has preceded application for the certificate is such a commonplace that it is a question whether the mere withholding of its issuance until a medical examination is performed has more than a small fraction of the preventive significance which is attached to it. As a freer or more indiscriminate sexual practice tends to prevail, the virtue of marriage legislation will diminish, and it will be relegated to the function assigned to it by Hall<sup>10</sup> in an examination of marriage laws a number of years ago—that of an educational agent. It becomes essentially a chance for a fatherly talk with the doctor who draws the blood.

Here, however, the American medical profession will confront squarely its clinical obligations to the disease.

<sup>7</sup> Stoke, J. H. The Control of Syphilis. A Critical Examination of Some of Its Problems. *Ven Dis Inform* 17: 315 (Nov.) 1936. *Clinical Problems in Syphilis Control Today* (supp. 3) 1937 p. 34.

<sup>8</sup> Sayers, R. R. Syphilis Control in Industry, supplement 140. *Public Health Reports* 1938. Gehrmann, G. H. Syphilis Control in a Chemical Industry. *Am J Syph Gonorr & Ven Dis* 22: 625 (Sept.) 1938.

<sup>9</sup> Stokes, J. H., Beerman, H., and Ingraham, N. R., Jr. Syphilis in Industry. A Review of Problems and Policy. *Am J M Sc* 196: 600 (Oct.) 1938.

<sup>9</sup> Johnson, Bascom. Laws Relating to Venereal Disease and Marriage. Twenty Six States. *J Social Hyg* 24: 409 (May-June) 1938. *Premarital and Prenatal Examination Laws* *ibid* 24: 477 (Nov.) 1938.

<sup>10</sup> Hall, F. S. Medical Certification for Marriage. An Account of Administration of Wisconsin Law as It Relates to the Venereal Disease. New York. Russel Sage Foundation 1925.

Certain it is that the decision as to the advisability of marriage in the case of syphilitic persons in many individual cases cannot be left to the ignorance of some practitioners or even to specialists in other fields. It is therefore necessary that those charged with enforcement make known to the public in some satisfactory fashion the existence and whereabouts of referee authorities to whom persons with doubtful or individualizable cases may go for opinion. This part of a state mechanism in the control of venereal disease is too easily overlooked by public health officers and should be made a matter for critical study and organization.

The ultimate question as to whether the state can on any serologic grounds at least, and perhaps even on any combination of clinical and serologic grounds, definitely and finally, or even indefinitely withhold permission to marry must ultimately be decided by the courts. As syphilologists we must take a definite stand against the validity of purely serologic criteria in decisions of this sort. In fact the showdown may find us astride the fence as to whether individual cases can ever reach a clearcut decision by any method of refereeship. If the law is pushed to this extreme at any point public health policy with reference to the control of infectious disease will have a critical review such as it has never sustained in all its past.

#### COLLATERAL FACTORS IN HEALTH AND VENEREAL DISEASE CONTROL LAWS

The operability and effect of venereal disease control legislation is materially influenced by a number of considerations, some of which become evident only on an actual attempt at enforcement of previously framed legislation or ordinance. An excellent example and one of the oldest so far as American practice is concerned, is the so-called food handlers' law, which is in existence and enforced with varying degrees of effectiveness and ineffectiveness in a number of states and cities in this country. From a collection of this legislation examples of practically every good, bad and indifferent mode of framing can be drawn. The usual procedure is to lump together those engaged in occupations having personal contact as an essential part of their activities and those engaged in the handling of food. The New York State law as circularized to district state health officers makes no mention of food handlers and limits its positive listing by specification to any occupation involving intimate contact with children or as nurse, domestic servant, barber, hairdresser, chiropodist, manicurist, bath attendant or masseur.<sup>11</sup> A provision requiring isolation for syphilis of any patient who conducts himself so as to become a menace to public health is perhaps sufficiently broad to cover many special groups. The New York City regulation, however, more broadly drawn and approaching by way of the general principles governing the control of infectiousness, forbids any person in an infectious stage of a disease from eating or drinking in any hotel, restaurant, drugstore, saloon or other public eating or drinking place. As to occupations, it specifies the manufacture of foods, drinks, beverages, cigars, tobacco, liquor, smoking pipes, cigar or cigaret holders and toothbrushes intended for human use.<sup>12</sup> The New

Jersey law as amended in 1933<sup>13</sup> again uses the broad provision that no person with a venereal disease in an infectious stage shall conduct himself in such a manner as to expose others to the infection. Under this heading specific prohibitions of employment are provided for those who are engaged in the preparation, manufacture or handling of milk, milk products or other foodstuffs. Such persons shall not be employed or permitted to work in any dairy, creamery, milk depot or any other place where milk or its products are produced, manufactured or sold, or in any other place or establishment where foods are exposed or handled. No person having a venereal disease in the infectious stage shall engage in the nursing or care of children or of the sick, or in any other occupation of such a nature that his infection may be transmitted to others. The blanket rider in the last sentence certainly gives plenary authority for use and abuse. The Pennsylvania state law, one of the older types lists occupations from which persons may be excluded because of infectious disease and merely includes syphilis among the number. The periodic control with reference to health of individuals employed, for example barbers, in the state of Pennsylvania apparently lies with the Bureau of Professional Licensing, which with respect to syphilis acts under the following quotation: "Such applications shall be accompanied by an affidavit which shall be made by a practicing physician and shall set forth that the applicant was examined, that a test of his or her blood was made, and that he or she is free from all contagious and infectious disease."<sup>14</sup> The vagueness of such a statement has, of course, its advantages and disadvantages from the standpoint of its enforceability, if not of the employees' protection.

The Massachusetts state law<sup>15</sup> provides an example of definite control of employability by suspension rather than by exclusion or discharge. In the specified occupations of barber, hairdresser, manicurist, waiter (or waitress), nursemaid, domestic, nurse and so on, an infectious patient may be ordered by the physician to discontinue his occupation until, in the opinion of the physician, his infectious lesions are healed. Failing cooperation on the part of the patient, the physician may refuse to assume further responsibility and the name, address and additional information regarding the patient become thereupon reportable to the state department of health.

It will be apparent that these various types of regulations range from forms which place no responsibility on the physician actually in charge of the sick person to those which place a large or even the entire responsibility on him. It may be said generally that legislation or regulation which arbitrarily specifies the indefinitely prolonged unfitness of a person for an occupation because of the presence of a disease whose infectiousness can be determined only for the individual case at the time in question is an arbitrary and possibly unenforceable type of law. That is, its enforcement is conditioned on nonprotest, and a serious contesting of its medical validity would probably lose the state its case. Regulation that places the responsibility on the physician in charge of the individual case has at least an element of fairness and, though applied by the law to

11 New York State Sanitary Code chap. II, reg. 26.

12 Sanitary Code and Regulations Relative to Reportable Diseases and Conditions and Control of Communicable Diseases. Section on the Examination, Treatment, Isolation and Detention of Persons Affected with Venereal Diseases adopted July 23, 1918 and amended Oct. 22, 1935 regulation 6 Prohibited Acts and Employment.

13 Klein C. C. (Chief Registrations and Renewals Bureau of Professional Licensing Harrisburg Pa.) Personal communication to the authors.

15 Regulations Governing the Reporting of Gonorrhea and Syphilis approved and adopted at a meeting of the Department of Public Health Oct. 8, 1929 amended Jan. 14, 1930 and Jan. 14, 1936 (sec. 6).

occupations in which infectiousness has far less significance than the promulgators of the law imagine, is nonetheless the more desirable type of legislation.

Some excellent illustrations of the great importance which must attach to the discretion and energy of the individual health officer and the cooperative attitude of the courts can be seen in any general study of this question. The city of Newark, N. J., for example, has a food handlers' law<sup>16</sup> calling for periodic reexamination which under the direction of an able enforcement officer has proved exceptionally workable. The devices employed for securing cooperation from uneducated persons have perhaps some slight elements of the theatrical, but in a case of this sort the means has apparently been justified by the end. The use of subpoena-like documents ornamented with the city seal as a means of giving the essential punch to an otherwise harmless summons is an excellent example of executive ingenuity. It must be clear, however, that the necessity for using such devices is a weakness rather than a strength in any type of legislation, and the effect on the courts and particularly on justices scrupulously determined to preserve the value of existing legal forms cannot always be good. It follows, therefore, that one of the first and most important influences in health law enforcement is a species of understanding between courts and health officers as to the best method for meeting the hygienic purposes of the law with due regard for the rights and liberties of the individual. The questionable value of routine food handlers' examinations in controlling the dissemination of syphilis and the other communicable diseases under the usual circumstances is well portrayed by Best,<sup>17</sup> who lists the reasons for abandoning this practice in New York City in 1934, after eleven years' active trial, as follows: 1 The average physician's examinations cannot be considered reliable. 2 The cost of adequate examination with attendant laboratory procedures is prohibitive and not commensurate with the public health benefits obtained. 3 Even though complete examinations were made, there is no assurance that the food handler will remain free of communicable disease during the tenure of certification. 4 The value of this procedure in preventing the spread of a communicable disease such as syphilis is much overrated.

Those whose experience with the field is more than casual realize that one of the chief values of the food handlers' law is to control a social group in which promiscuous sexual activity is notably frequent, and a body of individuals given to wandering and hence to dissemination of whatever infection they may carry to the public at large. One of us, during the Irvine administration of public health venereal disease policy in Minnesota, found the food handlers' law of the greatest utility in controlling waiters and waitresses not because they were food handlers but because of altogether different and far more serious activity. The instrumentality of the barber and the dining car waiter (for years practically the only individual in railroad personnel who was subject to any serious effort to recognize syphilis) in the spread of the disease is certainly questionable to say the least. Gross and improper extensions of the spread of the law when it is freed from the individual case are not hard to find. For example

A young laboratory worker, a highly trained chemist concerned purely with testing procedures, having no actual contact with milk or dairy products in which industry he was employed, lost his position on the discovery in routine serologic testing under a state law that he gave a positive Wassermann reaction. The facts of the situation made known to us by the physician who had had charge of the boy since birth were that he had a prenatal infection for which both father and mother had been adequately treated after his birth. The boy himself had had an interstitial keratitis with good recovery but with the serologic irreversibility so often accompanying this complication. His health was entirely satisfactory, his disease non-infectious, his occupation one which gave him absolutely no contact with food or with persons likely to contract a transmissible disease were such existent. There could be no more complete *reductio ad absurdum* for a blanket legal provision based on blood testing than the injustice done this particular type of individual, yet a ruling of the state attorney general cited by the company which discharged the employee absolutely closed the door on further discussion.

To be sure, public sentiment and concern with the transmissibility of syphilis will for a time aid in the enforcement of enacted legislation. This very assistance and cooperativeness of public sentiment may serve as a boomerang when a sufficient number of illustrations of the injustice and unwisdom in a poorly drawn law become known.

Under the legislation of the past decade, enforcement when projected into the courts has usually been at the expense of what might be called the relatively down and out types—persons of no reputation and questionable or "floating" standing in the community against whom it was relatively easy to secure authority from a court for summary action such as detention and quarantine. It is inevitable with the enormously wider spread of the new legislation that enforcement will be called on to deal with persons of character, standing and resource, and it is desirable that such persons contest the law in apparently contestable cases and compel interpretation by the courts of the many important principles embodied. Among the first of the issues in which legislation affecting syphilis is likely to be involved is the right to uncover health facts about an individual which do not concern a transmissible condition. It cannot be too constantly borne in mind that infectiousness in syphilis is not synonymous with positive blood tests or noninfectiousness with negative. The frank purpose of the existing marriage law is, of course, to reveal infectious syphilis, but most of the legislation is so drawn as to lay emphasis rather on the uncovering of the disease than on its identification in an infectious stage. The question as to whether any person may be obligated under any conception of civil liberties to undergo testing or examination for the mere existence of disease (and particularly disease implying, rightly or wrongly, moral turpitude) has had some consideration in the courts, and there have been decisions which have denied to a plaintiff the right to oblige a person under trial to undergo either physical examination or blood test to determine his status with respect to syphilis. It will therefore be doubly necessary, in order to protect legislation for the control of infectiousness in syphilis against adverse judicial decisions, to place the responsibility for the interpretation of the blood test and infliction of consequences not with the law itself but with the physician or a properly authorized public health representative. Without such a provision the issue as to whether a person's body is his private property and individual bailiwick will quickly

<sup>16</sup> Foodhandlers Licenses Ordinance Newark New Jersey Department of Health as adopted by the city commissioner Dec 19 1933 and amended Jan 30 and Nov 9 1934.

<sup>17</sup> Best W. H. Is Routine Examination and Certification of Food Handlers Worth While? *Am J Pub Health* 27 1003 (Oct) 1937.

become serious. It has also long been recognized by claim and damage authorities that, when a case involving syphilis is a contributory factor in compensation is brought before a jury, it is fundamentally bad policy and likely to lead to adverse decision to force the evidence of syphilis in the injured person before a jury for adjudication. The jury apparently tends to take the view that in attempting to attach syphilis to the issue the defending attorney is endeavoring to besmirch the reputation of the plaintiff and to deprive him of just compensation on a character irrelevancy. It is therefore a matter of sentiment as well as legal judgment to just what point the health authority can afford to sustain projection of such issues into the courts.

The question of secrecy and confidence, always important in medical matters, has a double importance in all that concerns venereal disease. The mere statement in the law that the record of a test will be filed in confidence with the state health authorities can be received with only qualified assurance. The access to such records is usually too widespread and the ability of persons without authority, by misrepresenting themselves as physicians or of physicians influenced by motives of curiosity and the like to secure information can hardly be satisfactorily guarded. Grapevine communication has the fluidity of electricity in these matters and it is as we have sometimes seen by personal observation, practically impossible to trace to its source what was nonetheless an indubitable leak. Not even the sequestration of records in a safe deposit vault under a single responsible control has prevented the forging of a patient's signature by a physician in behalf of the life insurance company which desired information on a blood test. There is, moreover, the ancient question of the privilege of communication and record. In a discussion of this matter by Wood,<sup>18</sup> it is made clear that the issue is a "practical rather than a legal one." Under acts of the Pennsylvania assembly in 1907 for example hospitals, which are common sources of bootleg information on syphilis, have no right to give data from their records disclosing communications with physicians attending a patient in a professional capacity or information which would tend to blacken the character of the patient without the patient's consent. The sole exceptions are civil cases brought by the patient for damages on account of personal injuries. The constant abuse of this law, exemplified by correspondence between social service agencies, for example, in which positive serologic reports are bandied about without regard to the responsibilities involved or the protection of the person concerned, is characteristic and certain to encounter serious difficulties if a wave of legal resort and interpretation once gets under way. While this confidential privilege may be waived by the patient, and such waiver might conceivably be made a stereotyped part of a contract relationship as it now so generally is in life insurance policies, it is almost certain that any court which respects the civil rights of individuals will refuse to sanction the incorporation of such blanket waivers into marriage licenses and documents of similar purport. It must be clear, therefore, that aside from the various great practical difficulties of an absolutely leaktight official filing and recording mechanism there may be serious difficulty with the question of professional privilege before venereal disease legislation is far advanced in its career.

Syphilis and the job, already mentioned briefly in the discussion of foodhandlers' regulations, presents many collateral aspects of interest for lawmakers. The right to make public an item in an employee's physical condition whether determined by physical examination or diagnostic test, has not as yet been subject to contest in the court so far as we know. The one thing that could most certainly bring it to contest in the court would be the excluding of employees from work for nonsignificant syphilitic infection. As early as the late war, from the standpoint of medical control, it was reported that the labor organizations of one of the largest industries in the country had taken a definite, though not public, stand against routine medical examination and testing for syphilis, notwithstanding that all concerned could recognize its great importance as a health hazard in the particular work involved.

Two cases very well illustrate the principles governing a situation of this sort.

An assistant cook in one of the large city hospitals was discharged by his chef with the statement that the dismissal was given because the patient had a positive blood reaction for syphilis (food handlers and similar legislation in the state of Pennsylvania). The man was told that when he had received enough treatment to give him a negative reaction he would be reemployed. Reinstatement was refused even after the patient had had considerable treatment, and the head of the clinic was privately given the explanation that the individual was rated as inefficient and was discharged for that reason, the positive blood reaction being merely a pretext. Inquiry into the individual's reputation in his job seemed to indicate that he was efficient rather than inefficient and that the motive back of the discharge was one of personal jealousy. His serologic reaction ultimately became negative, but no reinstatement has occurred to date.

This case illustrates the misuse of the law governing infectious syphilis in extending application to noninfectious syphilis, the arbitration of the individual issues, medical merits and personal rights in the case by an incompetent arbitrator—the chef in charge of the kitchen, the misuse of a positive serologic reaction as a pretext for a discharge actually based on other and personal grounds.

A kitchen worker attached to the staff of a college training table who without preliminary medical examination had been employed by the college for six months and proved to be thoroughly efficient was then subjected to a routine physical and serologic examination and the blood reaction was found to be positive by the state laboratory. As was proper under the circumstances, he was referred to the college medical clinic having charge of syphilis and was found to have a seropositive latent infection of probably not less than twenty-six years' duration, the patient being at this time 46 years of age. Before it was possible to work up the case or have a competent medical opinion on his status, the nurse attached to the training house squad discovered in some way that the patient had been referred to a syphilis clinic for study and without waiting for further information took the matter to the lay superintendent of employees in this group. The lay superintendent and nurse, again without referring the matter to the physician who had originally recognized the presence of syphilis in the employee, proceeded directly to the syphilis clinic in an effort to obtain information as to whether this employee had syphilis. Information was properly refused them on the grounds that they were laymen and that the patient was privileged in the matter of communication. Thereupon these two lay persons, considering further reference of the matter to medical authority unnecessary, took it on themselves to discharge the employee on the ground that he had syphilis and that his association with food handling work on the training table made him a public health menace. Thereupon the clinic in which the man's infection was under study went back to the physician in charge of the case with

<sup>18</sup> Wood C. B. Legal Status of the Medical Record. Bull. A. Record Librarians of North America. June 1932.

this report, and by conference with him and with the cook in the kitchen succeeded in securing the employee's reinstatement, since his syphilitic infection was absolutely without significance for the transmission of the disease.

In view of the state law under which this case would come to jurisdiction at the hands of the attorney general or the court the action of the clinic would have been overruled, since the law in this particular state was mandatory with reference to the discharge of seropositive persons who had anything to do with an occupation or industry concerned with food handling. The obvious justice of the situation would therefore have miscarried completely after a career of grapevine detective work and unauthorized summary action by noncompetent persons typical of possibilities in such situations as this.

Before proceeding to a consideration of the false positive serologic reaction in relation to syphilis laws, we shall summarize the principles thus far brought forward.

1 Legal enactment dealing with the control of syphilis should place the power of decision as to infectiousness, public industrial hazard or liability to become a public charge (the only proper case for legal control) in the hands of a physician, empowering him to waive responsibility for the patient's noncooperation by report to the state health authority.

2 The equipment of the physician for such responsibility must be made a matter of general medical concern and education and the law must provide for appeal to a recognized authority either by patient or by health officer to adjust an individual decision if such is necessary.<sup>19</sup>

3 The differentiation of the detection of infectiousness from mere uncovering of the disease in latent or harmless form can thus be preserved.

4 Provisions for the changing status of the individual with the institution of treatment, especially in terms of its effect on the blood test, should not be incorporated in the law. In their place the decision as to fitness should be individualized and left to the physician and health officer, acting together with a referee authority.

5 "Food handler" and similar class industrial legislation is an anachronism and like all types of occupationally founded discrimination in venereal disease control should be displaced by comprehensive legislation based on (1) control of infectiousness and (2) precise definition of industrial and public liability, protective of the rights of both employee and employer.

6 The practicalities involved, including the difficult issues of the privileged record, professional confidence and health status of the individual in whom infectiousness is not an issue, will for a time, at least during experimental regulation, probably best be dealt with by conference between the physicians concerned, the public health officers and the courts.

7 The wisdom of devices saving of "bluff" in enforcement, while probably real, should be carefully considered as a matter of public policy.

8 Increasingly serious questioning and contesting of health officers' and doctors' decisions in the courts may be expected and invited as the social level of those affected rises above the down and out and the "demonde."

9 Secrecy and the preservation of confidence are more real and difficult issues in venereal disease detection and control work than health officers and law framers are apt to realize. The mere enactment of confidential status does not secure it in the strict sense

of the term. It is oftener a matter of personnel. Violation or misuse of the professional relation may be made specifically and severely punishable (compare dissenting remarks by N. A. Nelson to Ramsey's section report "Public Health Control of Syphilis," Washington, December, 1936).<sup>19</sup>

10 Enactments made under public pressure, hysteria and misconception will sustain serious setbacks and induce equally misconceived opposition and reaction if injustice and violation of personal confidence and personal rights become frequent and widely known.

11 In matters involving the job current practice quite largely fails to discriminate between infectious or disabling syphilis and harmless syphilis.<sup>20</sup> In our case material there is evidence of grapevine telegraph, action without authority, disregard of medical knowledge and supervision, misapplication of medical therapeutic principles by laymen in supervisory capacities and use of results of blood tests as pretexts for personal and unfair discriminations.

## THE LAW AND INTERPRETATIONS OF THE SEROLOGIC TEST WITH SPECIAL REFERENCE TO THE FALSE POSITIVE

### THE SEROLOGIC TEST FOR SYPHILIS AS A BASIS FOR DECISION

It must be obvious from the foregoing discussion that the dependability of serologic results, and hence the quality of serologic test performance in syphilis, is critically important in all forms of legal regulation. The familiar medical tendency to regard a test tube procedure as having something of the oracular and indisputable in it is shared by laymen and lawmakers. It must be clear that a law which makes either the positive or the negative serologic test for syphilis the basis for important decisions, such as eligibility to marry, will have a validity and enforceability fundamentally dependent on the reliability of the procedure employed. A law drawn so as to make test results crucial and which uses them as a substitute for well rounded medical and expert syphilologic judgment works a fundamental injustice and is likely to be brought to book in the courts.

### INTERPRETATION OF THE POSITIVE SEROLOGIC TEST FOR SYPHILIS

For a number of years the serology of syphilis has been dominated by the laboratorian. With a knowledge of clinical syphilis based principally on the scattered facts of the history of the infection and clinical signs sent to him on report sheets, the performer of tests for the presence of syphilis has been obliged to attempt, often reluctantly, the alinement of his results with clinical facts. As the serologists, working against this thin background of clinical information, sought to increase the sensitivity and yet preserve the specificity of newly devised procedures, elements of personal equation and interpretation have unquestionably further played a considerable role. It has been difficult for serologists to accept the idea of a considerable margin of nonspecificity, especially in tests of their own devising, and it has been equally difficult for them to see called into question both the false positive and the false negative trends which are inseparable from any long time per-

<sup>19</sup> Nelson, N. A. in discussion of section report by Ramsey, G. H. The Public Health Control of Syphilis. Ven. Dis. Inform. (supp. 3) 1937, p. 78.

<sup>20</sup> Moore, J. E. Syphilis and Unemployment. editorial Am. J. Syph. Ven. Dis. 21: 339 (Mar.) 1937.



formance of serologic tests for syphilis. It was therefore of particular interest that, at the recent assembly of serologists and laboratory directors for the consideration of the problem of national serologic standardization (Hot Springs, Ark., Oct. 20-21, 1938), the syphilologists delegated to attend it, without previous consultation on the matter, joined in a vigorous demand for the revision of current concepts of the meaning and validity of the positive serologic test. The technical false positive had already had, to those familiar with the work, a sufficient airing in the reports of two government inspired national cross checkings of laboratory procedure in this country.<sup>21</sup> The results of these conferences have really shown that no justification for the diagnosis of syphilis was to be found in a number of cases in which the diagnosis had been based on what proved to be a single false positive reaction. So much importance attaches to this finding that the serologic committee reemphasized the fact that a serologic diagnosis of syphilis, unsupported by history or clinical evidence, should never be made on the basis of a single positive blood reaction. If a positive reaction is obtained in such a latent case, it should be repeated in the same laboratory or another laboratory utilizing two or more different tests.

While many state and local laboratories achieved results that are at least comparable to the results achieved in the laboratories of the originators of the methods, in some of these laboratories the results obtained were considerably inferior to those obtained with control tests and were inadequate for diagnostic purposes. After a careful review of five official evaluation studies of tests for syphilis, Nagle and Willett<sup>22</sup> concluded that no efficient test can possess less than 99 per cent specificity (excepting certain few diseases, especially malaria and leprosy) and 65 per cent sensitivity, and that ideally the specificity should approach 100 per cent even at the sacrifice of sensitivity.

The discussion of the doubtful positive reaction was illuminated by such as that of Kahn, for example, who was inclined from his personal observation to rate a two plus Kahn result as doubtful rather than positive. The recent establishment of the fact that leprosy,<sup>23</sup> malaria<sup>4</sup> and certain febrile illnesses including subacute bacterial endocarditis<sup>24</sup> and infectious mononucleosis<sup>6</sup> are all capable of giving rise to biologic false positive results in laboratory tests for syphilis is an illustration of current revision. The work of Barnett and Kulchar<sup>25</sup> on syphilitic reagin in normal blood and their apparent confirmation of the existence of a false positive provocative effect following intravenous injection of neoarsphenamine are genuine landmarks in rein-

terpretation. The latter observation is of particular interest because the attempt by Strickler and his associates,<sup>26</sup> now nearly two decades ago, to demonstrate the contention that Barnett and Kulchar have now established by more exact measurement was at that time laughed at and pounced on by clinicians and serologists alike. It was therefore particularly interesting that the trend of the discussion from the clinical standpoint at Hot Springs should have been so definitely toward the necessity for revision of our conception of the positive and especially of the doubtfully positive serologic test.

Within the past ten months there have appeared within the practice of one of us, nine typical illustrations of the complexities of the serologic interpretative problem. In a relatively small practice this is a large proportion, and the short period of time in which the material was presented probably reflects the growing acuteness of the problem under the wave of serologic testing now sweeping over the country. Brief abstracts of some of these cases and the decision reached in each will illustrate better than mere discussion the problem that confronts the public and the profession in this field today.

**CASE 1**—A chemical engineer aged 24 was placed on treatment for syphilis by his plant physician when found to have a two plus Kahn reaction on blood obtained while the patient was suffering from a rather severe sore throat. He was given an injection of neoarsphenamine and a week later a second injection. The second injection was followed by a sharp febrile episode with a profuse erythematous eruption, during which a second two plus Kahn reaction was obtained. He was told that the eruption was his secondary rash and advised to continue treatment. The examination of the patient and the critical study of the attendant circumstances, including an examination of his fiancée, made it reasonably clear that the patient did not have syphilis. The fiancée had been exposed once (the only time the patient had ever had intercourse) without acquiring the disease, though the patient was presumably in the acutely infectious stage. The rash associated with the febrile episode, which conforms in practically every detail to the Milian eighth day erythema, known to be associated with the second injection of neoarsphenamine in patients carrying some other type of infection than syphilis, disappeared in two days. While no evidence of syphilis has since been recognized, even following the most searching examination, the patient was nonetheless advised to follow through the Cooperative Clinical Group standard treatment for early syphilis<sup>29</sup> as a safety first measure.

**CASE 2**—A housewife aged 25 had a macular eruption of the chest and arms in January 1938. Serologic tests (Wassermann) performed in a private laboratory on two separate specimens of blood were reported three plus and two plus during the presence of this eruption, the Wassermann reaction of the spinal fluid being reported negative with a negative colloidal gold reaction. At this time the husband had a negative reaction. An abortion at three months was induced by the attendant physician, who told the patient that the fetus could not escape infection. The eruption which was said to have lasted three or four weeks, was apparently not seen by a dermatologic consultant. Following two injections of neoarsphenamine and three injections of bismuth subsalicylate the patient presented herself for reconsideration of her problem and the continuance of her treatment. There were no longer any evidences of the disease and no attendant circumstances confirmed the presence of the infection. Serologic reactions, most of them to Kolmer, Kline, Kahn and Eagle tests performed in a state laboratory and the laboratory of the syphilis clinic, were completely negative. A

21. Cumming H. S., Hazen, H. H., Sanford A. H. and others. The Evaluation of Serodiagnostic Tests for Syphilis in the United States. *J. A. M. A.* 103: 1705 (Dec.) 1934. footnote 25. Parran Thomas Hazen H. H., Sanford A. H. and others. The Efficiency of State and Local Laboratories in the Performance of Serodiagnostic Tests for Syphilis. *Ven. Dis. Inform.* 18: 4 (Jan.) 1937.

22. Nagle N. and Willett J. C. What Did Five Official Evaluation Studies of Tests for Syphilis Reveal? *Am. J. Syph. Gonorr. & Ven. Dis.* 22: 231 (March) 1938.

23. Hazen H. H., Parran Thomas Sanford A. H. and others. The Occurrence in Leprosy of Positive Serodiagnostic Tests for Syphilis. *Ven. Dis. Inform.* 17: 253 (Sept.) 1936.

24. Taussig A. E. and Orgel M. N. Kahn Test in Malaria. *J. Lab. & Clin. Med.* 22: 614 (March) 1937. Hazen H. H., Senear F. E., Parran Thomas and others. Serologic Evidence of Syphilis in Malaria Patients. *Arch. Derm. & Syph.* 37: 431 (March) 1938.

25. Cumming H. S., Hazen H. H., Sanford A. H. and others. The Evaluation of Serodiagnostic Tests for Syphilis in the United States. Report of Results. *J. A. M. A.* 104: 2083 (June 8) 1935.

26. Bernstein A. False Positive Wassermann Reactions in Infectious Mononucleosis. *Am. J. M. Sc.* 196: 79 (July) 1938.

27. Barnett C. W., Kulchar G. V. and Jones R. B. Quantitative Provocative Reactions in Normal and Syphilitic Sera Following the Injection of Neoarsphenamine. *Am. J. Syph. Gonorr. & Ven. Dis.* 22: 712 (Nov.) 1938.

28. Strickler A., Munson H. and Sidlick, D. Positive Wassermann Test in Nonsyphilitic Patients After Intravenous Therapy. *J. A. M. A.* 75: 1488 (Nov. 27) 1920.

29. Stokes J. H., Cole H. N., Moore J. E. and others. Standard Treatment Procedure in Early Syphilis. *Ven. Dis. Inform.* 15: 149 (April) 1934.



bismuth provocative procedure was carried through (interval since last treatment, one month) with completely negative results. The patient was told that her treatment should be continued as for a secondary syphilis<sup>29</sup> even though the clinical and serologic response, the total absence of signs and confirmatory circumstances all suggested that she had been the victim of false partial positive reactions during an intercurrent eruptive condition.

**CASE 3**—A musician aged 32 voluntarily seeking a premarital examination (it turned out subsequently that he had been married the week before) had two moderate but definitely positive Wassermann reactions (Kolmer) in one of the best serologic laboratories in the country. Unwilling to accept this result, his physician subjected the situation to review by one of us with a resulting picture of serologic confusion as follows: a complete negative, followed by a weak positive and negative reaction in the laboratory which had originally found him definitely positive, a complete negative reaction in the laboratory of the University Syphilis Clinic, and a negative spinal fluid examination. A bismuth provocative effect was then obtained in which the Kolmer reaction increased from negative to strongly positive on two successive weeks in two laboratories, the Kahn reaction from negative to strongly positive in one laboratory, the Kline reaction from negative (one plus) to three plus and again negative, and the Eagle reaction from negative to partially positive. This group of results was rated as sufficient to establish the existence of an infection, and the patient was instructed to continue treatment. Painstaking investigation of the background and collateral factors disclosed only one suspicious circumstance. Eight years before the patient had had enlarged cervical lymph nodes following a "cold," with surgical removal, accompanied however by a negative serologic reaction of the blood. Clinical examination for congenital as well as acquired syphilis was completely negative.

**CASE 4**—A student aged 18 received a four plus Wassermann report as part of a physical check-up by his own physician. Immediately afterward a hospital in a different city gave the Wassermann and Kline reactions as negative, and a urologic clinic reported the Wassermann reaction a weak positive, the Kahn a weak positive and the Eagle positive. Examination of this patient by the syphilologist disclosed only a somewhat increased prominence and thickening of the right clavicle suggestive of a Higoumenakis sign, which was probably due to the fact that for three years he had carried a rifle on this shoulder two hours a day. Clinical examination for syphilis, including examination of the mother, was completely negative. Kolmer, Kline and Kahn reactions at the University Syphilis Clinic laboratory and the Kline reaction at the state laboratory were also negative. The initial serologic reaction was adjudged falsely positive and no further treatment was advised.

**CASE 5**—A pregnant wife volunteered to have a blood test made as part of an antepartum examination and a negative result was obtained. But the husband, who volunteered for a test at the same time, obtained a report from the state laboratory on two occasions five weeks apart of a negative Kline and a strongly positive Kolmer reaction. In the interval another hospital laboratory had reported the Hinton reaction negative and the Kolmer reaction negative. The patient, with whom one of us had been acquainted professionally for more than a decade, then underwent a complete examination in the University Syphilis Clinic laboratory, covering a period of five weeks and including five successive tests, which was clinically negative for syphilis (the patient was an eczema, asthma, hay fever subject) and in which the spinal fluid and a bismuth provocative procedure gave negative results. The state laboratory once more reported a partially positive Kolmer reaction but all other tests gave negative results. The patient was told that there was no convincing evidence of syphilitic infection and to report again in six months.

**CASE 6**—A woman aged 29 was denied a license to marry in a neighboring large state because her physician did not wish to assume the responsibility incurred by a report from the state laboratory of a titer of two plus, three plus and 34 units by

the state Wassermann technic in three tests over a period of five weeks. The Wassermann and Kahn reactions at a large hospital in a neighboring state were negative on two occasions three days apart. On close inquiry it appeared that the titrated state laboratory tests were taken while the patient was menstruating, when the period was just over and just at the end of the next succeeding period. The negative reactions were obtained between the periods. A complete examination of the patient disclosed no clinical evidence of the disease and no reason for suspecting its existence. Serologic reactions of the blood were negative between her periods in the laboratory of the University Syphilis Clinic. There was a remote possibility of congenital infection implied in the death of siblings in infancy but there was nothing clinically to support it. A history of some form of arthritis and an inconstant soft systolic murmur in the third left interspace were the only additional possibly significant signs. She was advised to have a blood test taken at the middle of each succeeding four lunar months, this to be followed by examination of the spinal fluid if any trace of positiveness appeared. She was warned (for she had married in another state in the meanwhile) to avoid pregnancy and to have her situation reconsidered should pregnancy occur.

#### HOW TO GO ABOUT CHECKING THE REPORT OF A POSITIVE SEROLOGIC REACTION

1 The first inquiry should be into the source of the report and the methods used. It is axiomatic, nowadays, that the report of a serologic reaction is worth only as much as the reliability of the laboratory from which it emanates and the responsibility and skill of the performer. It is not to be expected that small private laboratories or even large state laboratories operating without interlaboratory check and without clinical control will be able to render the most trustworthy reports obtainable. States in which a machinery for the serologic testing of applicants for marriage licenses or for pregnant women has been set up, or industrial organizations in which an attempt is made to provide an intramural laboratory service, should study and conform to the standards about to be set up by the United States Public Health Service.

2 The time at which blood is drawn for the test and all attendant circumstances, including particularly the presence of intercurrent and especially febrile infections, must be taken into account in interpreting test results.

3 No single positive report should ever be accepted without confirmation. Repetition of the tests in the same laboratory by the same procedure is the least searching form of check. The performance of two or even three standard test procedures may provide additional interpretative evidence, but the difficulties of the interpretation increase with the number of tests and a corresponding degree of experience and expertness becomes desirable. The sending of the blood to several laboratories is likely to increase the confusion and multiply the interpretative difficulties, though it is a proper check when conducted under sufficiently experienced direction. Nonstandard or individual modifications of standard serologic tests for syphilis (for this country the Kolmer, Kahn, Kline, Hinton, Eagle procedures may be regarded as standard) are likely to lead to confusion and uninterpretable results. This is especially true of the older multiple antigen and cholesterinized procedures.

4 Clinical examination in the doubtful case must be searching and conducted by one who is experienced in the recognition of individual, relatively unfamiliar signs such as the Moon molar and other dental anomalies, the facies of prenatal syphilis, the less obvious evidences of early cardiovascular and neurosyphilitic involvement.

It should be emphasized that the history of primary and secondary lesions taken as a routine has a margin of error ranging from 30 to 60 per cent or even higher and is practically worthless in women

5 An examination of the spinal fluid should be conducted when, in the opinion of a reasonably expert reviewer of the evidence, it is actually necessary to do so. Provocative procedure being open to suspicion at least so far as the arsphenamines are concerned, serial repetitions of the test will have to be substituted. The bismuth provocative procedure even though resorted to in the foregoing cases, likewise has elements of uncertainty probably shared by all provocative procedures and is very much in need of reappraisal. Observation is, of course, a necessary element in any decision and absolutely essential if the weight of evidence pro and con approaches "fifty-fifty," so to speak.

6 A "no case" or negative decision inevitably involves some elements of subliminal or intuitive thinking. The necessity for a genuine acquaintance with the patient whose problem is under review, with his family, with all those who may have been drawn into the syphilitic infection from the standpoint of contact, family relationship and so on, may compel one to resort to epidemiologic case finding methods.

7 The decision to treat on suspicion, while it seems an obvious resort, is nonetheless one for serious deliberation. Particularly is this so in women, for the problem of the infected woman is already uncertain enough from the standpoint of her ability to transmit the disease in a subsequent pregnancy,<sup>30</sup> and the uncertainty can be multiplied many times by half-hearted or incomplete resort to treatment. The effects of treatment on serologic tests are unreliable as evidence in doubtful cases, so that the purpose of treatment is rather the protection of the individual and his contacts than the settlement of his diagnosis. It should be emphasized again and again that therapeutic tests on doubtful genital and secondary lesions can be interpreted only by experts and are of doubtful justification and validity at that. All in all, it is probably better, if the decision is made to treat, to ask the patient to go through with the full standard therapeutic regimen for the phase and stage of the disease in which he would be were the evidence of infection indubitable. Only in this way can he be given the best assurance that modern management of syphilis affords that he will be free of complications and fit for normal responsibilities.

#### SUMMARY

From the foregoing presentation it may be regarded as reasonably evident that legislation calculated to make the recognition of a syphilitic infection a basis for conduct of any kind cannot be framed so as to place sole or even major dependence on any laboratory procedure, including a blood test. It is essential that the individual autonomy and judgment of the physician be invoked and preserved. It is the duty of the medical profession, the medical schools and public health authorities to concentrate on the development of a mechanism of adequate complete examination and expert refereeship as a necessary supplement to any attempt to control syphilis by law.

<sup>30</sup> Cole H N with Usilton Lida J and Moore J E, and others. Cooperative Clinical Group Studies in the Prevention and Treatment of Congenital Syphilis. Syphilis in Pregnancy. Ven Dis Inform 17:39 (Feb) 1936.

## DIABETIC GANGRENE OF THE FACE

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Gangrene of parts of the body other than the extremities is to be considered a rare complication of diabetes mellitus. Gangrene of the nasal septum and turbinates in diabetes has been described both in America<sup>1</sup> and abroad. Bulger<sup>2</sup> has described gangrene of the right half of the tongue in diabetes, Riven<sup>4</sup> a disseminated cutaneous lesion which he termed diabetic dermatitis gangraenosa, Elkin<sup>5</sup> diabetic gangrene involving the vulva, and Sturgis<sup>6</sup> diabetic gangrene of the lip.

My purpose in this report is to present the little known association of diabetes mellitus and staphylococcal gangrene of the face. A search of the literature reveals only three cases<sup>7</sup> involving the cheek, two of which closely resemble clinically the conditions to be described here. The clinical picture has been noted only casually, and laboratory and pathologic reports are either scanty or lacking. This complication of diabetes mellitus presents some interesting features regarding differential diagnosis and prognosis.

#### REPORT OF CASES

**CASE 1—History.**—A white man aged 47, a landscape contractor, admitted Jan 10, 1937, complained of swelling and redness of the right side of the face, with fever and malaise. He died January 17.

The present illness dated back to one week before admission when a head cold developed, associated with a running nose. About the same time, or shortly thereafter, he noted that the right side of the face had become slightly reddened. There was no history of trauma. The condition of the face became worse and three days before admission the right side of the face became definitely swollen and markedly red, his right upper eyelid began to swell and he felt feverish. The day before admission his right eye was closed entirely, small blisters began to appear on the lids, and on the day of admission these began to discharge pus. He was sent to the hospital by his physician with the diagnosis of erysipelas, which was confirmed by the admitting staff, and was admitted to the contagious ward with this diagnosis.

The past history revealed nothing of any moment except long-standing obesity and a known diabetic condition for the past five years. The diabetes was readily controlled by diet and by 5 units of insulin in the morning and 10 units at night. He had not seen his physician for several months previous to his present illness.

**Examination.**—The patient was obese. On physical examination he was lying in bed and was apparently quite uncomfortable. The entire right side of the face was covered with a reddened lesion which was somewhat elevated. The borders were not sharply defined. The right eyelids were edematous, the eye was closed and the upper lid exuded creamy pus from a small area. The skin of the left eyelids showed beginning redness. The rest of the examination was essentially negative.

Dr Millett was formerly resident physician at Meadowbrook Hospital. From the Medical Service of Dr Ernest Dickey, Meadowbrook Hospital.

Dr Frank L. Meleney of the Presbyterian Hospital, New York, rendered valuable aid in interpreting the clinical data and in reviewing the final manuscript.

1 Bowers C H. Diabetic Gangrene in the Nose. J A M A 82:1325 (April 26) 1924. Connell E S. Diabetic Gangrene in the Nose. J Mississippi M A 21:297 (Aug) 1924. Bulger<sup>2</sup> Morris<sup>10</sup>.

2 Van Noorden and Isaac. Die Zuckerkrankheit ed 8. Berlin Julius Springer 1927. p 295.

3 Bulger H A. Diabetic Gangrene of Orbit and Nares. J Missouri M A 26:304 (Jan) 1929.

4 Riven S S. Dermatitis Gangrenosa—A Complication of Diabetes Mellitus. Am J M Sc 189:550 (April) 1935.

5 Elkin C W W. Occurrence of Diabetic Gangrene in an Unusual Location. J A M A 102:2182 (June 30) 1934.

6 Sturgis. Diabetic Gangrene of the Lip. Boston M & S J 124:261 1891.

7 Brooks G P. Diabetic Gangrene of the Face. Brit M J 2:539 (Sept 31) 1929. Bowers<sup>1</sup> Brier<sup>11</sup>.

The temperature was 103 F (rectal), pulse rate 124 and respiratory rate 28.

**Laboratory Reports.** Analysis of the urine showed albumin 2+, sugar 2+ and no acetone or diacetic acid. The microscopic examination was negative.

Analysis of the blood showed 84.5 per cent hemoglobin. The differential count of the white blood cells gave 30,600 leukocytes, with polymorphonuclear leukocytes 89 per cent, lymphocytes 9 per cent and eosinophils 2 per cent. Nonprotein nitrogen was 38 mg per hundred cubic centimeters and sugar 278 mg. The Wassermann and Kahn reactions were negative.

Cultures of material taken from the nose and throat yielded staphylococci. Eye smears showed staphylococci and gram positive rods.

**Course.**—During his stay in the hospital the patient went rapidly downhill. The temperature ranged between 101 and 104 F. The diabetes was difficult to control both by diet and by insulin. On the second hospital day the left cheek became involved. On the third hospital day the right cheek rather suddenly became purplish, and several small blisters and bullae formed which contained clear fluid. That night they broke and the next day these areas began to discharge pus. A direct smear revealed staphylococci. The lesions were treated locally by boric acid compresses and ultraviolet radiation. At no time did the patient complain of pain.

Two days before death the blood sugar advanced to 470 mg. He became comatose. Urinalysis showed sugar only 2 plus with no acetone. A blood culture taken two days before death showed 200 colonies of *Staphylococcus aureus* per cubic centimeter. The entire right cheek was a mass of purplish green slough. The patient died on the eighth hospital day.

**Necropsy.**—Permission for necropsy was obtained and this was performed fifteen hours after death by Dr. Joseph Lane of the department of pathology.

The pertinent changes were a wide area of edema and cellulitis over the entire right side of the face which was of a suffused purple-gray bearing areas of ulceration and necrosis in places. The lungs showed bilateral acute fibrinopurulent pleurisy and complete collapse of the left lung with emphysema, while the right lung showed many subpleural abscesses with a confluent lobular pneumonia involving all its lobes. Microscopic examination of the lungs revealed pulmonary congestion, edema and focal abscess formation and diffuse necrosis and patchy pneumonia. Smear of the abscesses revealed staphylococci.

**CASE 2—History.**—A white woman aged 55, a housewife, admitted March 19, 1937, complained of redness and swelling of the right side of the face and fever. She died March 22.

The present illness dated back six days before admission. The patient noted a small "boil" on the inside of the left nostril. There was considerable pain. The lesion was treated conservatively with hot boric acid soaks and opened spontaneously with free drainage and relief of pain.

The next day her lip and the skin of the nose on the right side began to feel warm, turned red and began to swell. By evening it had spread to the right cheek. This was accompanied by fever and malaise. A diagnosis of erysipelas was made by the local physician and on the following day the patient was admitted to the contagious ward of Merdowbrook Hospital.

The past history revealed a known diabetic condition for several years. She had taken as much as 15 units of insulin three times a day plus a diet for the control of the diabetes. Three weeks before admission she was seen by her physician, at which time she was on a strict diet with no insulin and was told that there was a small amount of sugar in the urine. She was told also that she had had high blood pressure for the past two years.

**Examination.**—The patient was obese. When she was being examined she was lying quietly in bed, apparently acutely ill. There was a dull red swelling extending over the right cheek and down the submaxillary region of the neck. The lesion was slightly raised and the borders were not sharply demarcated. There were two small crusts just within the left nostril of an apparently almost healed furuncle.

The temperature was 103.4 F (rectal), pulse rate 100 and respiratory rate 25.

**Laboratory Reports.** Analysis of the urine showed sugar 3+, acetone 3+.

Analysis of the blood showed 100 per cent hemoglobin. The count of the white blood cells gave 14,000 leukocytes, with polymorphonuclear leukocytes 76 per cent, lymphocytes 12 per cent, monocytes 12 per cent. The Wassermann and Kahn reactions were negative.

Cultures of material taken from the nose and throat yielded staphylococci.

**Course.**—The patient was treated vigorously for diabetic acidosis with insulin and intravenous saline and dextrose solution until the urine became acetone free. The next morning the chemical examination of the blood revealed sugar 115 mg, urea nitrogen 14.5 mg, creatine 1.5 mg. The lesion was treated locally with boric acid soaks, and sulfanilamide 15 grains (1 Gm) every four hours was given by mouth.

In spite of treatment the local lesion became worse. At no time did the patient complain of any pain. The right portion of the upper lip to the midline and the adjacent skin of the cheek began to assume, rather suddenly, a purplish gangrenous hue on the second hospital day. The patient became semicomatose. The urine showed only a 2 plus sugar and no acetone, and the blood sugar was 286 mg per hundred cubic centimeters. A blood culture taken at this time revealed a heavy growth of *Staphylococcus aureus*.

On the third hospital day the cheek and lip were definitely gangrenous, while the red lesion had spread to the right ear and down the right side of the neck. There was a slight discharge of pus from the center of the gangrenous area on the cheek. The patient died that afternoon.

Permission for necropsy was not obtained.

#### COMMENT

The diagnosis of diabetic gangrene of the face offers little difficulty once gangrene appears. Early it is mistaken for erysipelas. Brooks<sup>7</sup> and Ardeschir<sup>8</sup> specifically mention the resemblance of the lesions to erysipelas early in the course of the cases seen by them. The case described by Bulgei<sup>9</sup> might very well have been diagnosed as erysipelas from the description of the lesion before gangrene developed. When gangrene develops, the lesion resembles the entity described by Meloney,<sup>10</sup> which he called hemolytic streptococcus gangrene of the skin, and must be differentiated from it. This also resembles erysipelas in its early stages, but in these cases a hemolytic streptococcus can almost always be recovered.

Diabetic gangrene of the face does not even remotely resemble the carbuncle seen in cutaneous infections in patients with diabetes. The dramatic change *en masse* of an erysipeloid lesion in a diabetic patient to a dusky, cyanotic purple area with or without the development of blisters or bullae and the subsequent breakdown of tissue with the discharge of pus is the typical course of events.

Unlike diabetic gangrene of the extremities, age apparently plays no role in this type of gangrene. The youngest patient on record was 4 years of age, followed by one 8 years and two 10 years of age. The oldest was 65 years of age.

The underlying mechanism producing the gangrene must be quite distinct from that causing gangrene of the extremities in elderly diabetic patients, in whom chronic obliterative arterial disease is of prime importance. There are several factors to be considered in a discussion of the causes of this type of gangrene. There is devitalized tissue in a patient who is susceptible to infection because of his diabetic condition. Trauma

<sup>8</sup> Ardeschir, K. Diabetic Gangrene of the Nose. *Lancet* 1:1756 (June 26) 1926.  
<sup>9</sup> Meloney, F. J. Hemolytic Streptococcus Gangrene. *Arch. Surg.* 317 (Sept.) 1924.

to the skin, however slight, with the ever present staphylococcus, may be a precipitating factor. An acute arteritis, together with inflammation and edema in a small space, can conceivably lead to thrombosis of the small branches supplying the skin, with subsequent necrosis of the tissue and ensuing gangrene.

The organism found in our two cases was *Staphylococcus aureus*, which was recovered from the facial lesions and blood stream in both, and from the metastatic abscesses in the lungs of the patient who came to necropsy. The staphylococcus was obtained on smear from the vulva in Elkin's case, and a hemolytic *Staphylococcus aureus* was obtained on culture from the facial lesion in Bulger's case. Riven obtained pure cultures of *Staphylococcus aureus* from the blebs in his case of diabetic dermatitis gangraenosa.

From the standpoint of prognosis, gangrene involving parts of the face in diabetes is not necessarily fatal. Patients with lesions which involved the nasal septum and turbinates, the hard palate, the eyelids, the skin of the nose and ears and even the lip have recovered. Bulger<sup>3</sup> cites the case of an elderly physician with gangrene of the right half of the tongue who was living in good health five years after the excision of the gangrenous area. Only one case involving the septum and turbinates ended fatally (Bower's case 1 which was in the preinsulin era). All cases involving the cheek, including the two cases herein reported, were fatal.

The complications encountered in the cases presenting lesions involving the cheek are dependent on the route followed by the infection through the veins draining the area. If the drainage is into the general circulation, septicopyemia and metastatic abscesses are the result. However, should the infection drain into the veins leading inside the skull, cavernous sinus thrombosis, meningitis and abscess of the brain may follow. These complications are usually fatal. Complications reported with lesions on other parts of the face are the results of spread by continuity of tissue. Morris's<sup>10</sup> case involving the turbinates and septum was complicated by the involvement of the adjacent sinus and the third, fourth, ophthalmic branch of the fifth, and the sixth nerves. Brier's<sup>11</sup> case involving the skin of the ear and the area anterior to it was complicated by involvement of the fifth and seventh nerves. Ardeslir's<sup>8</sup> case of gangrene of the skin of the nose was accompanied by destruction of the underlying cartilage of the alar nasi.

Treatment in these cases is both general and local. General treatment consists of combating the diabetes and its complications with insulin, dextrose and fluids. The toxemia can be attacked by forcing fluids. *Staphylococcus* bacteriophage and antitoxin, if available, can be tried against the septicemia. Transfusions and other supportive measures must be instituted. The local treatment, except when the lesion involves the cheek, is to promote drainage and remove slough. For lesions on the cheek the policy of nonintervention seems to be the accepted surgical procedure, although the results obtained by this form of treatment are uniformly fatal. Roentgen irradiation may be tried directly over the affected area.

## SUMMARY

1 Two cases of diabetes mellitus and staphylococcal gangrene of the face reported were fatal.

2 There is a close resemblance of the facial lesion to erysipelas in its early stages and to hemolytic streptococcal gangrene of the skin in its later stages. The differential diagnosis is made by studying the organisms involved.

3 Internists and surgeons should both be aware of this complication of diabetes mellitus from the standpoint of prognosis.

4 Diabetic gangrene of the face is not necessarily a fatal disease unless the cheek is involved, with subsequent spread of the infection into the general circulation with metastasis and death.

## IMMUNIZATION AGAINST PERTUSSIS

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The prevention of pertussis is today one of the main problems of the pediatrician and school physician. Isolation of the patient as a means of preventing the spread of this disease has in general been ineffective. The nonspecific character of the cough during the catarrhal stage—which Lawson<sup>1</sup> has shown is the most infective period—makes early diagnosis virtually impossible. The cough plate is the only means of making an early diagnosis. By it atypical cases are also discovered. There are many of the latter, as the more general use of cough plates now indicates. Valuable as this procedure is, it is obviously impracticable to take plates of all children and adults with coughs. A decreased morbidity and mortality from pertussis—which now is responsible for more deaths than any other epidemic disease with the exception of influenza—can be expected only when a potent immunizing agent is obtained.

Evidence on the value of pertussis vaccine is notoriously conflicting. Since the introduction of vaccine made from freshly isolated (phase I) strains by Meyer and his associates<sup>2</sup> and by Madsen,<sup>3</sup> several favorable reports have appeared. The numerous encouraging reports of Sauer<sup>4</sup> and of some others<sup>5</sup> using the Sauer vaccine (a phase I vaccine) have stimulated widespread interest. The excellent controlled field study at Grand Rapids under the leadership of Kendrick<sup>6</sup> has provided unequivocal evidence that

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1 Lawson G. M. Epidemiology of Whooping Cough. *Am J Dis Child* 46: 1454 (Dec.) 1933.

2 Meyer A. H., Kristensen M. and Sorensen E. *Acta paediat* 4: 21 1924.

3 Madsen Thorvald. *Boston M & S J* 192: 50 (Jan 8) 1925.

4 (a) Sauer L. W. Whooping Cough. *J A M A* 100: 239 (Jan 28) 1933. (b) *J Pediat* 9: 120 (July) 1936. (c) Municipal Control of Whooping Cough. *J A M A* 109: 487 (Aug 14) 1937. (d) Present Status of Preventive Inoculations Against Whooping Cough. *Am J Dis Child* 54: 979 (Nov) 1937.

5 Daughtry Denmark, Leila. Studies in Whooping Cough. *Am J Dis Child* 52: 587 (Sept) 1936. Kramer J. G. *J Pediat* 12: 160 (Feb) 1937.

6 Kendrick Pearl and Eldering Grace. *Am J Pub Health* 26: 8 (Jan) 1936. Kendrick Pearl. *J Pediat* 9: 117 (July) 1936. Kendrick Pearl and Eldering Grace. A Controlled Study in Pertussis Immunization read at the annual meeting of the American Public Health Association, Kansas City, Mo. Oct 25 1938 to be published.

10 Morris A. G. Gangrene of the Middle Turbinate and Sequestration of the Nasal Septum. *New York State J. Med* 24: 987 (Dec.) 1924.

11 Brier A. J. Diabetic Gangrene of Face and Ear Complicated by Fifth and Seventh Nerve Involvement. *J A M A* 103: 1704 (Dec.) 1934.

immunization can be accomplished with phase I strains. On the other hand, Doull, Shibley and McClelland,<sup>7</sup> using a phase I vaccine prepared in a slightly different manner, failed to confirm the results of Sauer and Kendrick. Furthermore, Seigel and Goldberger,<sup>8</sup> using a commercial preparation of Sauer's vaccine, found that under conditions of intense and prolonged exposure protection was not clearcut.

The following field study was undertaken in an attempt to contribute evidence to this perplexing problem. In size and detailed investigation it is not comparable to the studies of the Grand Rapids group<sup>6</sup> or to the Cleveland group.<sup>7</sup> It is, however, well controlled and is sufficiently large for statistical analysis.

#### MATERIAL

Only infants and little children from 6 months to 30 months of age were studied. The majority were under 1 year. All were attending the Stanford University

the "test" group until the day after the last injection. Four instances of systemic reaction to the vaccine were observed. Fever lasted for one day.

The parents of infants in the injected or "test" group and of those in the control group were instructed to notify the clinic of any known exposure to pertussis. They were also requested to bring the patient in any time that any cough developed. The members of both groups were seen in the clinic or in the home at intervals of from three to six months. When patients were lost they were declared out of the group as of the day last seen. When pertussis developed the patient was declared out of the group as of the day of onset.

The criteria of exposure which were used were as follows:

1 The test or control infant must have played with a coughing child in the first three weeks of pertussis for at least one hour indoors.

TABLE 1—Results in Test and Control Series for Entire Period of Study

		Number			Net Strength <sup>10</sup>	Child Months at Risk <sup>11</sup>	Exposures			Cases	Escapes	Communicability Rate per Cent	Attack Rates per Cent		
		New	Lost	Total			Known	Unknown	Total				Per Net Strength	Per Child Month at Risk	Crude
October 1935 through March 1936	Test	46	0	46	23.0	124.0	0	0	0	0	0				
	Control	40	0	40	20.0	145.0	0	0	0	0	0				
April 1936 through September 1936	Test	28	0	74	60.0	375.5	1	0	1	0	1	0	0	0	
	Control	30	4	66	55.0	327.0	1	2	3	3	0	100.0	5.45	0.91	
October 1936 through March 1937	Test	40	0	118	98.0	608.0	6	1	7	4	3	57.1	4.08	0.66	
	Control	37	9	94	81.0	503.0	1	1	2	1	1	50.0	1.23	0.20	
April 1937 through September 1937	Test	39	29	128	123.0	740.0	13	0	13	2	11	13.4	1.62	0.27	
	Control	40	20	114	109.0	621.0	7	5	12	10	2	83.3	9.26	1.61	
October 1937 through March 1938	Test	34	14	148	138.0	828.0	5	0	5	1	4	20.0	0.72	0.12	
	Control	37	46	103	108.5	726.0	8	0	8	8	0	100.0	7.37	1.10	
Total October 1935 through March 1938	Test			197		2,665.5	25	1	26	7*	19	26.9		0.26	3.30
	Control			182		2,322.0	17	8	25	22	3	88.0†		0.94‡	1.03§
Subsequent observations through July 1938 bring totals to	Test	14	?	211			28	1	29	9	20	31.0			4.06
	Control	0	?	182			21	11	32	29	3	90.6‡			1.09§

\* On the basis of child months at risk one would expect twenty five cases in the vaccinated group not seven.

For the period October 1935 through March 1938

† Difference in communicability rates = 61.1 per cent with standard error = 13.9 per cent

‡ Difference in attack rates per child month at risk = 0.63 per cent  $\pm$  0.18 per cent

§ Difference in crude attack rates = 8.48 per cent with standard error = 2.73 per cent

For the entire period of observation

† Difference in communicability rates = 50.6 per cent with standard error = 12.4 per cent

‡ Difference in crude attack rates = 11.7 per cent with standard error = 3.0 per cent

Well Baby Clinic. Beginning in October 1935 a number of infants were injected every month. Each month a similar number of infants of the same age distribution was selected by chance. These served as controls. No attempt was made to select infants with older brothers or sisters who had not had pertussis.

The vaccine used was an unwashed suspension of freshly isolated phase I strains of *Haemophilus pertussis* grown on human blood Bordet-Gengou medium.<sup>9</sup> It was first standardized to contain 10,000 million organisms per cubic centimeter. Later the suspension supplied contained 20,000 million organisms per cubic centimeter. A total dose of 80,000 million organisms was used, i. e. 8 cc. of the first product and 4 cc. of the second product. This dose was divided into 20,000 million, 30,000 million and 30,000 million organisms and given at weekly intervals. (Occasionally the intervals were longer.) No child was considered to have entered

2 The test or control infant must have played with a coughing child in the first three weeks of pertussis at least two hours outdoors.

3 If the duration of the contact was less than this, the parent must have seen the coughing child cough directly into the exposed child's face from a distance of less than 2 feet. (There were only two such transient exposures that resulted in escape—one in the test group and one in the control group.) No child in this study was known to have been exposed more than once.

4 An "unknown exposure" is one that must have occurred when pertussis develops in a child without any known exposure.

The criteria for the diagnosis of pertussis were (1) typical whooping cough with whooping and post-tussive vomiting (cough plates and blood counts were not done in all obvious cases), (2) cough without the typical picture but in which positive cough plates were obtained.

It will be noted that three "possible" cases are included in the tables—two in the test group and one in the control group. These attacks of cough were not typical of pertussis. Cough plates were negative in

<sup>7</sup> Doull J. A., Shibley G. S. and McClelland J. E. *Am. J. Pub. Health* 26: 1097 (Nov.) 1936.  
<sup>8</sup> Siegel Morris and Goldberger Esther W. *Active Immunization of Tuberculous Children Against Whooping Cough with Sauer's Vaccine* J. A. M. A. 109: 1088 (Oct. 2) 1937.  
<sup>9</sup> Supplied by the Cutter Laboratories, Berkeley, Calif.

two of them and the third child was not seen until she had recovered from her cough. They are included, however, because their histories are suggestive.

Table 1 classifies at intervals of six months the number of children entering each group and the number leaving each group. It also shows the "net strength"<sup>10</sup> of each group in each six month interval and the "child months at risk"<sup>11</sup> during each interval. It is evident that the number of controls lags somewhat behind the number of test children. The child months at risk for the control group likewise lags behind that for the test group except in the first six month interval. Control children were found somewhat more difficult to follow.

### RESULTS

The results are summarized in table 1. The data are complete through March 1938. During the four months from April 1 to Aug. 1, 1938, some additional exposures and cases occurred but the follow-up data are incomplete and the figure for child months at risk during this period is unknown.

In the two and one-half year period from October 1935 through March 1938 there were in the test group twenty-six exposures followed by nineteen escapes and seven cases of pertussis, two of which are questionable. The ratio of exposures to cases—communicability rate—is therefore 26.9 per cent. For the same period of time there were in the control group twenty-five exposures followed by three escapes and twenty-two cases (one of which is questionable), giving a communicability rate of 88 per cent. The difference in these rates is 61.1 per cent with a standard error of 13.9 per cent. The standard error is less than one third of the difference, i. e., the difference is significant. The four subsequent months of observation, until August 1938, slightly increased the communicability rates in both groups, yielding a difference in rates of 59.6 per cent with a standard error of 12.4 per cent. This difference is likewise significant.

The wide difference in the ratio of exposure to disease in these two strictly comparable groups constitutes proof that the vaccine protected most of the children who received it. The difference in the attack rates in the two groups is obviously corroborative, being also statistically significant. Comment is unnecessary. The communicability rate is a more important index than the attack rate.

A comparison of the type of exposures in the test and control groups is made in table 2. A familial exposure is the most rigid test of immunity. In each group nine familial exposures happened to occur. Six vaccinated children escaped and a seventh had "bacteriologic whooping cough" without paroxysms or vomiting.

The three children who were attacked had been vaccinated at least eighteen months previously. The majority who escaped had been vaccinated for one year or less.

The three escapes occurring in the control group occurred after exposure of one day or less.

There were eleven instances of cases occurring without known exposure in the control group and only one

occurring in the test group. It is probably fair to assume that as many unknown exposures actually did occur in the test group as in the control group, for the child months at risk were somewhat greater in the test group. This assumption would increase the number of exposures in the test group from twenty-nine to thirty-nine. The ratio of attack to disease would thus be from nine to thirty-nine and the communicability rate 23.0 per cent.

A classification of the types of cases noted is shown in table 3. The "mild cases" were all verified by positive cough plates or hyperlymphocytosis. The "atypical cases" were diagnosed only because positive cough plates were obtained. The "possible" cases were unproved atypical cases, as was previously mentioned. Perhaps they should be omitted. Such an omission would alter the figures in favor of the test group.

No deaths occurred during the study. Only three cases of atypical pertussis occurred in the test group—two of these after familial exposure of one week

TABLE 2—Classification of Exposures

		Resulting	
		Cases	Escapes
Familial exposure for one week or more			
In test group	9	3*	6†
In control group	9	9	0
All other known exposures			
In test group	10	5	14
In control group	12	9	3
Unknown exposures			
In test group	1	1	
In control group	11	11	

\* Vaccination performed 18 months, 16 months and 20 months previously; one of these cases was atypical.

† Vaccination performed 5 months, 5 months, 8 months, 12 months, 12 months and 20 months previously.

TABLE 3—Types of Cases

	Severe	Typical	Mild	Atypical	Possible	Total
Test group	0	3	2	2	2	9
Control group	3	20	4	1	1	29

or more. These three children had been vaccinated fourteen months, eighteen months and twenty months previously. Twenty-three typical or severe cases occurred in the control group.

### COMMENT

The foregoing remarks with regard to type of exposures and type of cases enhance the evidence obtained by a simple comparison of the communicability rates in the two groups. This evidence implies that the vaccine used conferred complete protection on some of the children and partial protection on others. Typical pertussis was seen in only three vaccinated children. They had been vaccinated more than one year previously.

We believe that annual reinjection with a small amount of vaccine is advisable. A solid antibacterial immunity of duration comparable to artificially produced antitoxic immunities cannot be expected. It has not been realized with typhoid or plague vaccines. Until a test of immunity against pertussis is devised, annual or at least biennial reinjection with a fractional dose would therefore seem empirically reasonable.<sup>12</sup>

12. A small number of children in the test group were reinjected with 40 billion organisms in April, May and June 1938. It so happened that none of these have been exposed since reinjection.

10. "Net strength" is a value used by Doull and his associates<sup>7</sup> which consists of the number registered at the end of the preceding six month period minus any in whom pertussis has developed plus one half of the newly enrolled and minus one half of those lost.

11. Child months at risk is the product of the number of children enrolled and the months during which they were enrolled. (A child enrolled for the full six months of each interval would furnish therefore six child months at risk.)

The time required after the administration of vaccine for the development of immunity is not known. Sauer<sup>13</sup> believes that three months is necessary. Schermerhorn<sup>13</sup> has recently presented evidence from Kendrick's study indicating that protection develops more rapidly. Madsen<sup>3</sup> has also held this opinion. In our small field study the following observations have some bearing on this point.

In the vaccinated group

A prolonged familial exposure beginning fourteen days after completion of vaccination resulted in an escape.

A transient indoor exposure nineteen days after completion of vaccination resulted in an atypical case.

A similar exposure twenty-six days after completion of vaccination resulted in a possible case.

An outdoor exposure four months after vaccination resulted in a mild case.

Two prolonged familial exposures five months after vaccination resulted in escapes.

This information is recorded without comment because of its brevity. No conclusions are drawn.

The dose of 80,000 million bacterial organisms used in this field study is that advised by Sauer<sup>14</sup> for children under 3 years of age. It is also essentially that used by Kendrick and Eldering<sup>6</sup>. Silverthorne<sup>14</sup> has recently observed almost perfect protection with a dose of 120,000 million organisms. It would seem that the quantity used is of great importance. Sauer's recommendation of a dose greater than 80,000 million organisms for older children seems rational. It is obvious that a determination of the proper dosage can only be empirical until a test for immunity is developed.

The results herein reported have been paralleled with the same vaccine in the same community by those of Singer-Brooks<sup>15</sup>. In a slightly larger vaccinated group she found a communicability rate similar to ours.

#### SUMMARY

Immunization against pertussis was attempted in a well baby clinic. Two hundred and eleven infants were vaccinated with an unwashed phase I vaccine in a total dose of 80,000 million organisms. One hundred and eighty-two infants were followed as controls.

During a period of thirty-four months there occurred twenty-nine exposures in the vaccinated group followed by nine cases and twenty escapes. During the same period thirty-two exposures occurred in the control group followed by twenty-nine cases and three escapes. The difference of 59.6 per cent with a standard error of 12.4 per cent in the resultant communicability rates was statistically significant.

Of the nine cases occurring in vaccinated children only three were typical. In these instances vaccine had been administered fourteen months or more previously. The other six cases occurring in vaccinated children were mild, atypical or questionable. Of the twenty-nine attacks occurring in the control children three were severe and twenty were typical. No deaths occurred in either group.

These observations indicate that the vaccine used conferred either complete or partial protection on the great majority of those inoculated.

Annual reinjection with a fractional dose of vaccine is advisable.

Since this manuscript was submitted one case has occurred in the test group. One case and one escape have occurred in the control group. The current communicability rate in the test group is 28 per cent as compared to 85 per cent in the control group.

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## Clinical Notes, Suggestions and New Instruments

### AN OUTBREAK OF ANTHRAX INFINCTION IN MINX WITH INFECTION OF A RANCH OWNER

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Anthrax infection in cattle, sheep, goats and horses has long been recognized as a potential source of human infection, and appropriate measures have been taken to protect the public against this danger. As a result of such measures, the incidence in human beings has been greatly lowered, perhaps to an irreducible minimum in many parts of the world. The anthrax bacillus is also known to be pathogenic for rabbits, guinea pigs, rats and mice, while dogs, swine, cats, birds and cold blooded animals are relatively insusceptible. The susceptibility of the mink, as far as can be learned, has not previously been reported.

In recent years the artificial breeding of minks has become an industry of considerable importance, and ranches of from 100 to 2,000 minks are widely scattered through the country, especially in the Northern states. Standard diets for these animals include fish and meat, usually horse meat because of its low price. Foxes, which are of even greater commercial importance than minks, are also large consumers of inexpensive horse meat, but no reports concerning their susceptibility to anthrax are available.

Several unusual hazards for man are associated with the occurrence of anthrax infection in minks. In the first place, the common practice of removing the pelts from any animals which die suddenly makes ranch workers extremely liable to infection, since this operation is carried out with bare hands and arms, often with the continuity of the skin broken as a result of mink bites and other types of trauma. Mink skins taken off under these conditions have in the past been sold without restriction. It seems probable that this practice introduces a serious hazard not only for the subsequent handlers of the pelts and garment workers but also for the ultimate consumer. The contact of infected mink fur with the unprotected skin in the region of the neck must be regarded as particularly dangerous.

For these reasons it seems desirable to report the following experience, which occurred incidentally to the routine microscopic examination of mink tissues for the diagnosis and control of mink distemper.

Oct. 29, 1938, a ranch owner brought to the laboratory a number of dead minks which he said were in excellent health on the preceding evening but had died suddenly with convulsions and bloody diarrhea. During that day and the two following days he lost fifty-eight animals, representing more than half of his herd. Distemper and most other common causes of death in minks were ruled out on the basis of this clinical picture. It was felt that botulism was a strong possibility, since this disease has been previously reported in minks and as a very remote possibility equine encephalomyelitis was considered, because of the recent epidemic of that disease in horses and human beings in the locality.

Autopsy was done on one mink, and all tissues, including the brain, were fixed in solution of formaldehyde. Bacteriologic studies were not made at this time. The only obvious

13 Schermerhorn L. J. Round Table Discussion at the Meeting of the American Academy of Pediatrics. Del Monte Calif. June 1938. *J. Pediat.* 13: 279 (Aug.) 1938.

14 Silverthorne L. N. and Frazer D. T. Canad. M. A. J. 38: 556 (June) 1938.

15 Singer-Brooks Charlotte H. Round Table Discussion at the meeting of the American Academy of Pediatrics. Del Monte Calif. June 1938. *J. Pediat.* 13: 292 (Aug.) 1938.



gross pathologic changes were a small amount of blood in the large intestine, a greatly enlarged, deep red spleen and cerebral congestion.

Five days later, examination of hematology and eosin stained sections of tissues from this animal showed enormous numbers of large square ended bacilli in the blood vessels of all organs. Since the tissues of this mink were fixed only a few minutes after death, the diagnosis of anthrax seemed likely and the mink rancher was warned of this probability. Unfortunately, he had pelted the last of his dead animals only a few hours previously.

The carcass of one of his minks was obtained, as were also three minks from another ranch on which a number of deaths with an apparently identical clinical picture had occurred. The postmortem picture of all four of these minks was identical with that just described, except that in one animal the spleen was much smaller, opaque yellowish white and caseous in appearance, apparently as a result of total infarction. The blood and tissues of all four animals contained large numbers of anthrax bacilli. Pure cultures of the anthrax bacillus were obtained from the spleens of all four animals, and two of these cultures proved fully virulent for mice and guinea pigs.

The dietary factor common to these two ranches and to a third ranch on which similar deaths occurred was found, on investigation, to be horse meat bought from the same dealer. A large piece of this meat, which had been buried by the rancher who brought in the first dead minks, was unearthed for study. After it had been cut in two and the cut surface seared, small fragments were removed for culture and animal inoculation. Smears and paraffin sections showed many typical anthrax bacilli. Cultures were positive for anthrax and injection into guinea pigs produced typical anthrax infection and death within forty-eight hours.

The dealer from whom the horse meat was purchased was quoted as having said that he killed a sick horse, which he used for making fertilizer, and later killed and butchered on the same floor an apparently well horse, the meat of which he sold to the mink ranchers. It is perhaps theoretically possible that meat from a healthy animal might become infected in this manner, but it seems more likely that the apparently well horse was in reality infected. In any case it was clear that the minks on two ranches and probably also on a third ranch had died of anthrax from the ingestion of infected horse meat purchased from this dealer.

The ranch owner first mentioned, three days after pelting the last of his minks, noticed a small lesion developing on the dorsum of his right hand. This lesion, when first seen, November 6, was 5 mm in diameter, with a dark red, rather scablike center and a raised, almost white periphery. There were several abrasions on the hand and arm. Although there was no redness and but little tenderness or surrounding edema, the presence of minute blebs, visible only with a hand lens, around the elevated margin of the lesion, together with the history outlined, raised a strong suspicion of anthrax infection. Immediate hospitalization was advised.

After he entered the Peter Bent Brigham Hospital, the appearance of the lesion became typical of anthrax within thirty six hours, and a definite bacteriologic diagnosis was made by withdrawing fluid from a bleb with a fine capillary pipet. Under conservative treatment, with the administration of 600 cc of serum in repeated doses and two injections daily of 0.6 Gm of neoparsphenamine, the patient made a complete recovery, which was uneventful except for a moderately severe serum reaction, with urticaria of forty-eight hours' duration. There was no febrile reaction at any time and only slight enlargement and tenderness of the axillary lymph nodes.

The frequency of anthrax infection in minks in the past and the chances of its occurring on a large scale in the future cannot be definitely stated at present. Sudden loss of a large number of minks on a ranch is by no means an infrequent occurrence, and since the possibility of anthrax in these animals has apparently not been pointed out before, it is probable that this infection has occurred in the past without being recognized and that infected pelts have been sold without the knowledge of seller, purchaser or ultimate consumer. Occa-

sional human infections of this origin may also have escaped recognition. It is of interest that the carcass of one of the fifty-eight dead minks aforementioned, which in all probability was heavily infected with anthrax bacilli, was submitted by the local veterinary to the veterinary department of a large commercial laboratory. The report returned was a frank admission that a diagnosis had not been made, in spite of careful study.

In view of the probability that the experience detailed does not represent an isolated occurrence, it is suggested that state boards of health or other proper authorities might advisedly take steps to safeguard those engaged in the mink industry, as well as the general public, against the dangers implied. The important steps would appear to be (1) more careful inspection of slaughterhouses selling horse meat to fur farms, (2) a warning to fur farmers not to pelt animals dying suddenly until the possibility of anthrax infection has been excluded and (3) burning or careful disinfection of carcasses, pelts and other contaminated objects when the diagnosis of anthrax has been established.

#### FRACTURE-DISLOCATION OF AXIS AND ATLAS IN AN INFANT

R D PADULA MD AND E J TRACEY MD NORWALK CONN

Extensive search of the literature has failed to yield any report of a condition similar to the one to be described. Treatment of the condition is evidently rare, probably owing to the small number of infants relative to the general population, to their sheltered lives and to the great opportunity for death to follow the injury before treatment can be applied. We have found our case interesting from the standpoints of cause, diagnosis and therapy.

#### REPORT OF CASE

A 4½ months old, poorly nourished white boy was rushed into the emergency room of the hospital by an excited father, who asserted that the boy had just been severely shaken by him. The house physician present at once recognized that the child was dying. He sent the nurse into the halls to look for the nearest attending surgeon, while he went about examination of the infant's chest and the administration of oxygen by means of a funnel. One of us (R D P) was immediately available. No abnormality of the chest was reported, respiration was irregular and poor, and there were cyanosis and generalized tonic spasm. Traction on the head with counterforce to the pelvis abolished spasm and allowed apparently normal respiration, while relaxation of traction resulted in a return of signs of pressure on the medulla and the cord.

Clinical opinion was that probably fracture dislocation of the atlas and axis existed. While traction and countertraction were carefully maintained, the infant was wheeled to the x-ray department, where lateral and oblique views were taken. These showed an anterior dislocation of the axis in relation to the atlas and fracture of the spinous process of the third cervical vertebra.

Treatment was instituted without interruption of the stretching of the neck. A halter for the head was fashioned of adhesive tape; the patient was laid on a firm mattress with the head of the bed elevated, a small pillow was placed under the shoulders to aid in maintaining hyperextension, and countertraction was maintained at the pelvis. This treatment continued for two weeks (during much of which time oxygen was used and the tent was always in place). Then clinical and x-ray evidence showing that reduction was maintained, a plaster Thomas collar was applied. After three weeks this was replaced with a leather and steel collar, which was permanently discarded after four weeks. At the time of writing, three months after injury the patient has apparently completely recovered from the trauma. Motion of the neck is normal and there are no neurologic signs.

#### COMMENT

This child cried till its father became so provoked that he grasped it by the pelvis and shook it severely. The forceful hyperextension and hyperflexion of the neck produced not only

From the Norwalk General Hospital

the fracture-dislocation but, in the opinion of the neurologist, a traumatic encephalitis due to punctate hemorrhage of the brain

Stress is laid on the value of history in the diagnosis of this condition. The objective signs presented were those common to a large number of conditions not the result of trauma, so that it is hardly likely that the correct diagnosis would have been made in this case had not the history of trauma led to the application of traction to the head, with the result that an almost dead patient began immediately to revive.

This case illustrates the value of care to prevent undue motion during x-ray examination and other diagnostic procedures wherever a fracture is suspected, especially in the spine and more especially in the cervical portion of the spine. Had traction been interrupted in this case during transportation about the hospital or during x-ray examination, it is believed that the patient would not have survived.

#### SUMMARY

In an infant, fracture-dislocation of the atlas on the axis would probably not have been diagnosed except by the aid of the history of trauma.

Where signs are such as can result from intercranial pressure or from pressure on the cord, and their degree is such that life is imminently threatened, fracture-dislocation in the cervical region should be considered, traction applied to the head may be life saving.

The value of splinting fractures during transportation and x-ray examination has been illustrated.

Definitive treatment of fracture-dislocation of the atlas on the axis by conservative means has resulted in an apparently complete cure in a 4½ months old child.

502 West Avenue—637 West Avenue

#### A CASE OF HYPERCHROMIC MACROCYTIC ANEMIA REFRACTORY TO LIVER EXTRACT

ABRAHAM MAHLER M.D. AND DAVID GREENBERG M.D. NEW YORK

This case of hyperchromic macrocytic anemia was fatal and is being reported here to illustrate some interesting features in differential diagnosis.

#### REPORT OF CASE

A woman aged 62 was in fairly good health except for hypertension until five months before admission to the hospital. At that time she noted unusual dyspnea on exertion, pallor and weakness, all of which increased rapidly within the following three months. Her physician found severe anemia with a high color index in the face of a normal gastric acidity, the figures being total acid 75 and free acid 58. X-ray examination of the gastrointestinal tract was negative. Since liver therapy and other measures did not yield a favorable response, she was referred to the hospital. Here one of us (D.G.) elicited the additional fact that she had received radiation therapy eight or ten times to the left breast for a bloody discharge from the nipple some ten years previously. The patient could barely speak from weakness and was unable to elaborate any further on this history.

On examination in the hospital, the following relevant conditions were noted. Very marked weakness and pallor, with moderate jaundice, were present. The temperature varied between 100 and 101 F. The red cell count was 1,350,000 and hemoglobin was 34 per cent, giving a color index of 1.26. Leukocytes numbered 6980 and the differential count showed neutrophils 64 per cent, lymphocytes 34 per cent, eosinophils 1 per cent. Blood platelets numbered 40,000. The smear showed anisocytosis with many macrocytes. There were hyperchromia and polychromasia. There were poikilocytes, normoblasts and macroblasts. The reticulocyte percentage was 6, the patient having had liver therapy before admission to the hospital.

From the medical service of Dr. David Greenberg, Jewish Memorial Hospital.

Bone marrow, by sternal puncture, showed increased megaloblastic activity with diminished numbers of normoblasts. Leukoblastic activity was normal. The number of megakaryocytes was diminished.

The icteric index was 23. The van den Bergh test gave a delayed direct reaction. Urobilinogen in the urine was increased. The fragility test showed beginning hemolysis at 5 and complete hemolysis at 4.

Bence Jones protein was absent from the urine. There was no nitrogen retention and no diabetes mellitus. There was no glossitis or atrophy of the tongue and no definite evidence of involvement of the spinal cord. The spleen, liver and lymphatic glands were not enlarged. There was no gross or occult bleeding from the gastrointestinal tract. The feces showed no ova or parasites. Pelvic examination revealed no bleeding or evidence of a malignant condition. There was no bleeding from any of the mucous membranes, nor was there evidence of a malignant growth anywhere that might have accounted for the anemia.

The patient on admission and every few days thereafter received a blood transfusion of from 250 to 500 cc. The transfusions did not halt the downward trend. Concentrated liver extract intramuscularly was given daily in doses of from 1 to 6 cc throughout her period of hospitalization, which was three weeks. There was a reticulocyte response up to 14 per cent after seven days of liver extract. This was encouraging, but the bone marrow failed to follow through with an increased output of red cells. On the contrary, each few days brought a steady decline in red cells and hemoglobin content, so that one week before death the red cells numbered 560,000 and the hemoglobin was 17 per cent, the color index 1.5, and the leukocytes numbered 11,700 with 74 per cent neutrophils.

#### COMMENT

The tentative diagnosis in the very beginning of our study was pernicious anemia, for this was indeed a severe macrocytic hyperchromic anemia, with evidence of destruction of the red blood cells, increased activity of the megaloblastic marrow and the usual alterations of the red cells in the peripheral blood. However, the presence of hydrochloric acid in the stomach, the absence of lingual signs, the absence of definite neurologic changes, the absence of the usual leukopenia and granulocytopenia and, above all, the failure to respond to hemopoietic principle all served to show that this macrocytic anemia was not pernicious anemia.

It is now generally accepted that the hemopoietic principle is absolutely necessary for the physiologic maturation of the megaloblast. An inadequate supply of it results in a macrocytic hyperchromic anemia. It is formed in the stomach by the action of the intrinsic factor—an enzyme hemopoietin secreted by the gastric mucosa—on the extrinsic factor which is present in proteins. It is not formed in pernicious anemia because of the failure of the gastric glands to secrete the intrinsic factor. This failure to secrete intrinsic factor is practically always associated with a failure to secrete free hydrochloric acid.

Since in the case reported here there was normal gastric acidity, it is safe to assume that there was no deficiency in hemopoietic principle.

In spite of a normal gastric acidity and normal production of hemopoietic principle, the bone marrow may still be unable to mature the megaloblast, and a hyperchromic macrocytic anemia may result because of a deficient delivery of the hemopoietic principle to the bone marrow, which may occur in the following three situations:

1 Diminished absorption from the intestine. Examples are sprue, idiopathic steatorrhea of adults and intestinal parasites, such as fish tapeworm.

2 Defective storage in the patient's liver. Examples are cirrhosis of the liver, acute toxic hepatitis and acute yellow atrophy.

All the clinical conditions listed under 1 and 2 were effectively ruled out by the absence of supporting history, physical signs and laboratory data. Furthermore, they were all ruled out by the failure of our patient to show a favorable physio-

logic response to adequate dosage of parenteral liver extract, for the marrow in all these conditions does respond to liver extract

3 Defective utilization of the hemopoietic principle by the bone marrow even though enough of it is made in the stomach, enough absorbed from the intestine and enough stored in the liver

This is a definite clinical syndrome and was named achrestic anemia by Israëls and Wilkinson.<sup>1</sup> It is a fatal hyperchromic macrocytic anemia. Like pernicious anemia it has a megaloblastic marrow with similar changes in the red cells of the peripheral blood, but it differs in that the leukoblastic function of the marrow is usually normal, so that there is no leukopenia or granulocytopenia. Furthermore, there are no achlorhydria, no changes in the tongue, no digestive disorders, no involvement of the nervous system and no enlargement of the spleen or liver. The reaction to the van den Bergh test varies. It is usually negative and occasionally delayed direct or indirect. Finally there is no physiologic response to adequate administration of liver extract beyond a transient reticulocytosis. There is an adequate supply of hemopoietic principle in the patient's liver, for extracts made from such a liver post mortem are just as effective as commercial liver extracts in the induction of remission in pernicious anemia. The bone marrow of these patients is deprived of hemopoietic principle in spite of an adequate supply in the liver. According to Israëls and Wilkinson these patients are unable to utilize the hemopoietic principle for any one or a combination of the following three reasons:

1 Failure to mobilize the hemopoietic principle from the tissue stores

2 Deficiency of some undiscovered factor

3 Utilization prevented by an inhibiting factor

Our case fits into this syndrome—achrestic anemia—very well and that diagnosis is highly probable. Final proof can be obtained only by extracting the patient's liver post mortem and showing that it contains an adequate supply of hemopoietic principle, and further demonstrating the absence of a lesion of the bone marrow which irritates the erythropoietic tissue resulting in increased megaloblastic activity, such as myeloid leukemia. The latter was ruled out by the absence of an enlarged spleen, the absence of immature granulocytes in the peripheral blood and the presence of normal leukoblastic tissue in the marrow.

Finally it is necessary to consider whether maturation of the megaloblast was disturbed or impeded by previous radiation therapy. The effects of radiation are shown classically by leukopenia with granulocytopenia, thrombocytopenia and dys-hemopoiesis. The red blood cells show but little evidence of regeneration. They are normal in size and show but little polychromasia or poikilocytosis. Hemorrhagic phenomena are prominent as well as are tendencies to necrosis of the mucous membranes. However, in the individual case not all the elements of the marrow need be injured simultaneously or equally. It is conceivable that a susceptible marrow might be injured by radiation therapy in a selective manner, causing dyshemopoiesis without dysmyelopoiesis but with depression of the megakaryocytic function, thus giving the picture found in our case. Rhoads and Barker<sup>2</sup> in a recent paper described cases of aplasia showing macrocytosis with alteration in the shape of the red blood cells varying from normal to profound. Whitby and Britton<sup>3</sup> as well as Lescher and Hubble<sup>4</sup> find a high color index. Some of these cases of aplasia therefore may be confused with hyperchromic macrocytic anemias because the precursor cells are produced normally but their maturation is interfered with.

The final diagnosis in this case therefore rests between this somewhat unorthodox conception of aplasia and the picture of achrestic anemia with which this case harmonizes so well. The weight of evidence, in our opinion, strongly favors achrestic anemia as described by Israëls and Wilkinson.

1166 Grand Concourse

- |             |                                    |                            |     |
|-------------|------------------------------------|----------------------------|-----|
| 1           | Israëls M C G and Wilkinson J F    | Achrestic Anemia           | J A |
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| 2           | Rhoads C P and Barker W H          | Refractory Anemia          | J A |
| M A         | 110 794 (March 12) 1938            |                            |     |
| 3           | Whitby L E H and Britton C J C     | Disorders of the Blood     |     |
| ed 2        | London J & A Churchill 1937, p 352 |                            |     |
| 4           | Lescher F G and Hubble Douglas     | Idiopathic Aplastic Anemia |     |
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## Special Article

### CONFERENCES ON THERAPY

#### THE CHOICE OF DRUGS

NOTE—These are actual reports, slightly edited, of conferences by the members of the Departments of Pharmacology and of Medicine of Cornell University Medical College and the New York Hospital. The questions and discussions involve participation by members of the college staff, students and visitors.

DR HARRY GOLD It is a major accomplishment in drug therapy to be able to select wisely from a host of preparations of the same fundamental drug, each differing from the other in minor properties and in major claims. At least three factors constitute the basis for selection: (1) sound pharmacologic evidence, (2) clinical experience which meets high standards of scientific evidence and (3) cost. This morning we shall have time to consider choice in but few of the major groups of therapeutic agents. Dr Eggleston will consider choice among the digitalis preparations and the purine bases.

#### DIGITALIS, PURINE BASES

DR CARY EGGLESTON Today well standardized, reasonably uniform and trustworthy preparations of digitalis are commercially available in considerable numbers. Experience and pharmacologic studies seem to indicate that our choice of digitalis bodies should largely be limited to one for oral administration and one for intravenous administration, with immeasurably less emphasis on the problem of the choice, today at least, of one for parenteral administration other than intravenously.

Pharmacologic evidence shows quite definitely that there is no digitalis body for oral administration which is superior to digitalis leaf itself. Some of the partially purified extracts of digitalis are equally valuable, equally potent and equally useful, but for the most part they are considerably more costly to the patient, and so far as I am aware there is no satisfactory evidence to support the claim that they are in any way superior to digitalis leaf. An accurately standardized digitalis leaf, which is obtainable from any one of several manufacturers, is about all that is needed for oral administration. However, one should be certain of accurate standardization and that there are no false claims by the manufacturer and no slips from the straight and narrow path. We had an experience of a serious slip on the part of a manufacturer, which we feel was probably intentional and which resulted in considerable digitalis poisoning in the course of an experiment. We laid a little too much faith at the door of this manufacturer and accepted his statement as to the standardization of the digitalis. As a matter of fact, he was consciously supplying a preparation of digitalis that was more active than the standard of potency which he claimed and which he published on his labels. But any accurately standardized powdered leaf is likely to be thoroughly satisfactory for oral administration.

For intravenous administration there are a good many available digitalis extracts, most of which are more or less complex in composition. The most satisfactory in clinical tests appears to be not a digitalis extract but crystalline strophanthin-G or ouabain. This preparation has the advantages of solubility, small dose and relative uniformity, being a crystalline preparation.

Its dose is minute. The single dose should not exceed 0.5 mg. given to a patient who has not previously been digitalized within a brief period of time, say from ten days to two weeks. The complex digitalis extracts, among which are the proprietaries and specialties such as digifolin and digitan, may be used. I myself feel that very definite preference should be given to the crystalline strophanthin.

For intramuscular or subcutaneous injection there is, in my personal opinion, no satisfactory preparation because all the digitalis bodies which are in any way potent in their cardiac activities are more or less considerably irritant to the subcutaneous tissues. Furthermore, those which are sufficiently soluble in aqueous menstrua or in menstrua containing very small amounts of alcohol are generally composed of those portions of the digitalis glucosidal content which are rather untrustworthy in their absorption. Finally the digitalis bodies are for the most part not very well absorbed from the subcutaneous tissues irrespective of their composition. I have had the misfortune to witness rather serious necrosis of tissue and ulceration from the administration of digitalis bodies subcutaneously. Since, therefore, there is no particular advantage to the patient from the administration of digitalis bodies subcutaneously or intramuscularly, other than ouabain intramuscularly, in point of rapidity of action and certainty of absorption, it would seem to me to be wiser largely to limit our administration of digitalis either to the oral route or to the rectal route when the oral route is not available because of nausea or vomiting or similar factors, and the intravenous route in emergencies.

Digitalis is reasonably cheap if one uses preparations of the whole leaf which are official in the U. S. Pharmacopeia. It is often rather costly if one uses the proprietaries or specialties, which, as Dr. Gold has said, possess claims that are quite out of proportion to the merits of the preparation.

As to the xanthine derivatives I can speak with less confidence. It appears from evidence available as though most of the soluble xanthine derivatives were possessed of essentially the same actions, differing primarily in the intensity of the action and secondarily in their tendency to promote gastrointestinal irritation and to be ill tolerated by the gastrointestinal tract. It would be very nice were it possible to say that this preparation rather than one of the others was much less irritant to the gastrointestinal tract. There would not be much problem for choice. It has been my experience that choice must be directed to a considerable extent by the individual patient's ability to take the preparation. All the soluble xanthine derivatives are capable of irritating the gastrointestinal tract and producing digestive disturbances, even nausea and vomiting. Some seem to possess this disadvantageous feature to a lesser extent than others. The calcium double salt of theobromine appears to be one of these. In efficient doses aminophylline is often very well borne by the gastrointestinal tract. Theobromine with sodium salicylate is at times well borne. There are other occasions on which each of these is rejected by the gastrointestinal tract. Therefore we must, I think, make our selection by the effective but crude method of trial and error in any individual patient.

As for their potency, the theophylline derivatives appear to be more potent as diuretics than theobromine or than the other xanthine derivatives. That is about all I feel that we are justified in saying.

I should like to intrude on a subject that is coming up in a few minutes and while I am on my feet mention the question of morphine and other opium derivatives for hypodermic administration. It has been my observation and my experience that none of the substitutes for morphine possess any significant advantage over morphine itself for subcutaneous administration. Some are more potent, as for example dilaudid. They all have similar disadvantages in their capacity to produce nausea and vomiting and their high degree of toxicity in overdoses. I myself think that morphine, our old standby, in the majority of cases serves every desirable end in the opiate class for parenteral administration.

#### HORMONES OR ENDOCRINES

DR. EPHRAIM SHORR. Let us consider first the disturbances of the thyroid gland. The reasons for the early therapeutic success with the thyroid hormone lay in its oral efficacy. There has actually been little advance in its clinical application since 1892, when it was suggested that the fresh thyroid of a sheep fried slightly and served with currant jelly was an excellent mode of administration of the gland. Today we modify its administration only to this extent, that we defat and dry the gland and insist that the preparations adhere to definite standards of iodine content. It is not the purpose of this clinic to discuss the various indications for the use of thyroid substance and I will content myself with saying that, wherever there is an indication for thyroid therapy because of thyroid insufficiency uncorrectible by other means, the preparation of choice is any one of the dried thyroid substances which conform to the standards of the U. S. Pharmacopeia. Crystalline thyroxin is also available, but except for experimental purposes and for intravenous use when such seems unavoidable I do not think it has any place in general therapy. It is much less reliable when given orally than the desiccated thyroid preparations. A word of caution should be said with regard to the rapidity of thyroid replacement. In long-standing myxedema the readjustment to the higher level of cardiac activity should be brought about very slowly to avoid cardiac embarrassment.

It should be remembered that, unless thyroid insufficiency is due to atrophic changes in the gland, the gland is capable of elaborating its own thyroid hormone if given sufficient amounts of iodine. To permit this to occur it is merely necessary to administer relatively small amounts of iodine by means of any one of a number of iodine preparations. That used in this clinic is the syrup of hydriodic acid, which contains about 13 mg. of iodine in each cubic centimeter. One cc. a day is adequate. This preparation is more palatable and more convenient to take than compound solution of iodine (Lugol's solution). Furthermore, it is a personal gesture against the erroneous notion that the form of iodine contained in compound solution of iodine makes the latter superior to other iodine preparations.

The amount of thyroid hormone needed for complete replacement therapy in genuine myxedema is surprisingly small. It is indeed a rare case which will need more than 3 grains a day, and many do very well with less. The daily dose is best administered at one time and it serves no purpose and certainly causes inconveniences to divide the dose as is often done.

Quite distinct from the use of thyroid in replacement therapy is its use as a drug. We should be careful to separate clearly these two uses. There are undoubtedly those who function better when taking small amounts

of thyroid as a stimulant to activity I cannot, however, escape the impression that the thyroid hormone is used far too frequently for this purpose and that a more careful consideration of the factors underlying the fatigue for which it is given would reward both the physician and the patient with a more fundamental solution of the problem.

When one is dealing with the overactivity of the thyroid gland which occurs in Graves' disease, iodine is of course the most valuable therapeutic agent whatever mode of therapy, conservative or surgical, is chosen. Here again relatively small amounts of iodine (say 15 to 30 mg a day), appear to be adequate, although much larger amounts are usually given and with apparent safety. It is not my impression that, when small amounts of iodine fail to bring about the desired therapeutic effects, anything is ever gained by increasing greatly the amount of iodine administered.

In the treatment of the diseases of the adrenal cortex, of which Addison's disease alone is susceptible of endocrine therapy, two therapeutic agents are available. The first and cheapest of these is sodium chloride. In amounts of from 10 to 20 Gm a day, best by mouth when tolerated, parenterally if necessary, sodium chloride is often able to bring about considerable relief from the symptoms of Addison's disease. In some cases of a milder sort it alone may suffice. In more severe cases the preparations of the adrenal cortical hormone must be used in addition. There are available several such preparations, some more potent than others. A serious deterrent to their use is their costliness. This problem may be solved by the synthetic preparation of effective hormone which gives promise of being shortly available. An oral preparation adsorbed on charcoal is also available, but there is little evidence that it contains, in the amounts which can be given at present, enough of the hormone to serve for complete replacement in Addison's disease. It is not unlikely, however, that the hormone will eventually be given orally, since there is good evidence that it is effective by that route in animals.

Parathyroid insufficiencies can be dealt with very effectively by well standardized and commercially available extracts of the parathyroid gland. Treatment with this extract, the chemical constitution of which is still unknown, should be supplemented by the vitamins influencing calcium absorption and utilization, such as vitamin D, and by dietary measures to increase calcium intake and absorption. Remember that most of the cases of parathyroid insufficiency in adults occurring either spontaneously or after thyroidectomy can be effectively controlled without the use of parathyroid extract simply by means of a high calcium intake and vitamin therapy.

When we turn to the pituitary gland we find available the pituitary hormone pitressin, from the posterior lobe, the use of which in diabetes insipidus is extremely effective in bringing about relief from the marked diuresis. Pitressin is effective not only parenterally but also intranasally.

The state of the hormones of the anterior lobe of the pituitary is as yet still quite unsatisfactory. A variety of fractions, all with supposedly specific functions, have been prepared. Their chemical nature is quite uncertain and their therapeutic uses except in a few conditions which I shall discuss briefly are still largely dependent on animal rather than clinical investigation.

There is as yet little evidence for the gonadotropic activity of such hormones in women. In males they are useful to assist in the descent of the testis in cryptorchidism if the failure of descent is not due to anatomic defects. They are also of value in hypogonadism, in which they are capable of increasing the growth of the testis and secondarily of the penis. These gonadotropic principles of the anterior pituitary are, however, no more effective in these two conditions than the pregnancy urine extracts or the placental extracts, which apparently contain a similar principle or principles. These preparations are usually standardized in rat units. In cases of undescended testis it is customary to give from 200 to 500 rat units subcutaneously three times a week. It is generally agreed that a six months trial of such therapy should be given before resorting to surgery. It may well be that some of the cases that failed to respond with these customary doses may respond to higher doses of a thousand rat units three times a week or more. Avoid excessive gonadal development in youngsters, since such sexual precocity may bring on new problems.

In the impaired development of the gonads of the eunuchoid type it is generally necessary to employ large amounts of the hormone. As much as from 1,000 to 3,000 rat units three times a week may be necessary. Because of the protein content of these preparations, tolerance to these higher doses should be brought about slowly, otherwise unpleasant symptoms, such as local pain, general malaise and fever, may result. Gonadotropic hormones extracted from mare serum give promise of effectiveness, but not enough work has been done as yet to say more than this for the present.

The male hormone is now available in crystalline form as testosterone propionate. Two reliable preparations of this hormone are commercially available in 5, 10 and 25 mg amounts. The most definite indication for their use is the failure of sexual function which occurs after surgical castration. This is, of course, replacement therapy. Sexual function can be restored in such cases with the administration intramuscularly of 25 mg three times a week and in some cases 10 mg three times a week. The effects are obtained only as long as treatment is continued. This hormone can also be used to assist in the development of the external genitalia in male gonadal insufficiency. It also brings about increased sexual function in these cases. But it must be recognized that it is preferable to rely more on the gonadotropic hormones, which can induce testicular growth, so that the patient may then elaborate his own hormone. The two types of hormones may be used in conjunction with benefit in this condition.

Whether or not the male hormone will be of benefit in that rather vague state in the male which corresponds to the female menopause is a matter for further study. I have had no success in treating cases of psychic impotence. Strangely enough, the male hormone promises to be of some use in women, for there is evidence that it is effective in controlling menorrhagia.

When we turn to the female sex hormones we find a much more satisfactory situation. There are three naturally occurring and commercially available estrogenic hormones. These are the ketohydroxy, the dihydroxy and the trihydroxy estrin. Of these I have found only the ketohydroxy and the dihydroxy estrins therapeutically effective. These estrogenic hormones

like the thyroid hormone, are effective by mouth as well as when given intramuscularly. The intramuscular route is however the more efficient. The amounts necessary for complete replacement in the menopause vary from about 1,000 rat units three times a week to as much as 5,000 rat units daily. From this great difference from patient to patient it is apparent that each patient must be considered as an individual therapeutic problem from the aspect of dosage. I might suggest as an average dose 2,000 rat units three times a week. There are various methods of gaging the completeness of replacement therapy. That employed in this clinic is the development of a follicular vaginal smear. It is our practice to maintain replacement therapy for a period of from four to six weeks and then stop. Treatment is resumed when symptoms reappear. Patients should be warned about the possibility of pseudomenstrual bleeding on stopping treatment and reassured as to its significance. When these hormones are given by mouth, approximately twenty times the amount given intramuscularly are needed to produce an equivalent effect. In comparing the various commercial preparations as to effectiveness we have found that the rat units offer a more reliable index than the international units indicated on the labels. The estrogenic hormones are also useful in bringing about the development of secondary sex characters in states of primary amenorrhea. In such cases our procedure is to give enough hormone over the course of two weeks in each month to produce a follicular smear. This is usually followed by a pseudomenstruation and in time by the development of a typical feminine conformation.

There remains one other female sex hormone to be discussed, the hormone of the corpus luteum, which is commercially available as a synthetic preparation. Unfortunately its clinical use has not been extensive enough for us to know very much about what it may do. There is good reason to feel, from studies which have shown its abnormally low production in habitual abortion, that it may well be useful in maintaining pregnancy in such conditions. Its scarcity and costliness have usually resulted in its use in much too small amounts to be effective. To judge from the level of excretion, it is hardly likely that we can anticipate proper replacement with this hormone in amounts less than 10 mg a day.

I hope I have not sounded too pessimistic a note regarding many of the newer glandular preparations. I feel that extraordinarily rapid strides have been made during the past few years.

#### ARSENICAL AND BISMUTH PREPARATIONS

DR WALSH McDERMOTT. It takes so long for anything to happen to anybody with syphilis that the exact evaluation of any drug is a thing that must not be made too quickly. Arsphenamine has been out for only twenty-eight years and we still don't know all the things that it can do. In the clinic we use only six drugs: three trivalent arsenicals, one pentavalent arsenical, one heavy metal, potassium iodide. The three trivalent ones are arsphenamine, neoarsphenamine and mapharsen, mapharsen being used only extremely rarely in certain special cases. We believe arsphenamine to be the drug of choice in the treatment of early and latent syphilis. We feel that neoarsphenamine should not be used unless there is a definite indication for it. We use neoarsphenamine only in people who either have

cardiovascular syphilis or have had some reaction to arsphenamine. Before arsphenamine is given it must be neutralized. We give it by the gravity method, and that is cumbersome in private practice, in fact, that is what has limited its use. However, recently one company has put out a preparation of arsphenamine and gives along with it the exact amount of sodium hydroxide in individual ampules so that it is almost as easy to administer arsphenamine in private practice as it is to use neoarsphenamine, and the comparison between the two drugs from the point of view of therapy shows a high score on the side of arsphenamine. Mapharsen we use only in some patients who cannot take one of the other two drugs. We feel that mapharsen, which is an arsenoxide derivative, presumably the active principle of arsphenamine, may prove to be a very valuable drug. We know it will kill spirochetes. We do not know what it will do to the central nervous system or to the cardiac system, and it will take years of patient investigation before we shall be able to discover this. It does cause much fewer minor reactions and can be used for people who have trouble with the other drugs.

The reactions are important matters in the anti-syphilitic drugs. Between arsphenamine and neoarsphenamine there is practically no difference as far as the major reactions go, which we consider as jaundice, skin reactions and blood dyscrasias. The minor reactions, namely gastrointestinal upsets, headache and nitritoid reactions, are more common with arsphenamine. When you are administering these drugs it is very important to be sure that the patient has not eaten before taking it and does not eat for three hours thereafter. To some patients who have had skin eruptions we have been able to give mapharsen although they have very definite sensitivity to the other arsenicals, but that is not the case in all patients by any means. Also in people with jaundice after recovery we are able to go ahead with an arsenical drug, but there you have to consider each case separately. Tryparsamide is a pentavalent arsenical which has value only in disease of the central nervous system. It can be used in any case of syphilis of the central nervous system in which there is a lesion that would constitute a contraindication to one of the trivalent arsenicals. By that I mean it can be used in cases of combined central nervous and cardiovascular syphilis in full doses for the central nervous system syphilis without in any way damaging the status of the cardiovascular syphilis. When you are giving tryparsamide you must be sure to give some treatment with the other anti-syphilitic drugs to prevent progression of syphilitic lesions aside from the central nervous system disease. The dangers to the eye in tryparsamide treatment are grave, so that its administration in private practice is very hard unless you have a patient who can be seen in an eye clinic or by an eye specialist any time you wish.

We use bismuth compounds in place of mercury. There are fewer reactions after them locally, in the kidney, and in the mouth. We have those reactions from bismuth compounds but they are not so frequent or so pronounced as after mercury. Furthermore, all the available evidence seems to show that bismuth compounds are more effective therapeutically than mercury. We use an insoluble preparation of bismuth, the insoluble suspension of bismuth subsalicylate in oil. The reason we believe in an insoluble preparation is that



we wish to create a certain steady low level of bismuth in the blood, and it is cheapest. It is cheaper for the patient and cheaper for us. The soluble bismuth compounds have to be given two or three times a week, and you get a fluctuating level of bismuth in the blood. The minor reactions are the things that are more common. We classify them euphemistically as minor, but they are not minor to the patient. Nausea and vomiting may be minor to us, but to the patient on a sixty-eighth street bus it is major and so you have to be careful about such things, but you can by changing the dosage and sometimes the drug do a great deal. The dose we use of arsphenamine is 0.4 Gm in a man and 0.3 Gm in a woman, of neoarsphenamine it is 0.6 Gm in a man and 0.45 Gm in a woman, of mapharsen it is much less, 60 mg in a man. The tryparsamide dosage is way off from the others, being 3 Gm for a normal dose.

We have read in the papers recently about the accident resulting from improper neutralization and that is something those of us who handle these drugs wake up in the night worrying about. We take the utmost precautions here, keeping the two drugs in different parts of the clinic, but even so we keep in mind the necessity of checking the procedure at every point.

#### LIVER AND IRON PREPARATIONS

DR PAUL REZNIKOFF: If a patient needs liver we give him liver, and if a patient needs iron we give him iron, not a mixture of the two. However it is not quite as simple as that. Most patients can take iron in almost any form, either reduced iron, ferric and ammonium citrate, or ferrous sulfate, but we have been using ferrous sulfate because it is cheaper, it can be given in effective dosage without gastrointestinal disturbance in most patients, and actually it is administered in smaller doses because it is probably more easily absorbed. The ordinary type of ferrous sulfate we use here comes in tablets. Each of these tablets contains about 60 mg of iron. Originally it was thought it was necessary to give to an iron-deficient patient 1 Gm of iron a day. I think that is more than is necessary. We think now an adult patient with iron deficiency, anemia, can get along perfectly well with 0.5 Gm a day. That would mean about nine of these tablets or three tablets three times a day, and because iron may upset the gastrointestinal tract we give it after meals.

There is another type of ferrous sulfate which is even more easily tolerated, and that is the elixir. A dose of 4 cc contains 0.12 Gm of ferrous sulfate and you must remember that ferrous sulfate is only one-third iron. The other types of iron are effective but have to be given in large amounts as a rule. Iron and ammonium citrate has to be given in daily doses of about 6 Gm and reduced iron of about 1 to 3 Gm to have a comparable effect. There are about 500 iron products that have been on the market, and I don't think it makes very much difference which one is used. We have in this hospital experimented with the ferrous gluconate. Our original idea was to see if we could get a parenteral type, but it is not practical to give iron parenterally because iron is a substance that has to be given daily for a long period, at least a month in most cases, and after patients have been injected daily for a month, and it does not make much difference how much care is taken in the process, they will have a great many marks which make it unpleasant. Therefore I think we might say that today we use ferrous

sulfate in some type or other, three doses daily after meals, so that the adult patient is receiving a total of at least 0.5 Gm of iron as iron a day. One way of diminishing gastrointestinal disturbances with iron is to start with a small dose and increase daily to approach an optimum.

Liver extracts have recently been standardized on the basis of a unit system. Those working with parenteral liver extract—the most effective way to treat a patient—felt the need of a dosage in units as in the case of insulin. They spent a long time trying to develop a unit. They now have a unit, which is defined as the amount of liver extract daily which in at least three patients with pernicious anemia under standard conditions will produce a standard reticulocyte response. Patients differ and the unitage is made to depend on the particular patients that have been studied. Since the strength of the unit is variable, we must give very large doses and use the effects in our patients as our guide. Therefore our policy is to do this. A patient with a relapse is given a large dose of liver extract, from 15 to 30 units a day for four consecutive days. Then the patient continues to receive this dose two or three times a week, that is, after the reticulocytes have returned to normal and the red cell count has begun

#### Wholesale Druggists' Prices, 1938

Proprietary (per Ounce)		Nonproprietary (per Ounce)	
Phenacetin	\$0.62	Acetophenetiden	\$0.16
Aspirin Bayer	0.75	Acetylsalicylic acid	0.13
Veronal	3.00	Barbital	0.56
Atophan	2.75	Cinchophen	0.35
Duotal	1.10	Guaiacol carbonate	0.30
Urotropin	0.25	Methenamine	0.15
Tolysin	2.00	Neocinchophen	1.04
Luminal	6.90	Phenobarbital	0.57
Trional	1.90	Sulfonethy imethane	0.70
Sulfonal	1.70	Sulfonmethane	0.55
Diuretin	1.85	Theobromine with sodium	
Aristol	1.80	salicylate	0.25
		Thymol iodide	0.45

to rise. By the method of trial and error we determine the maintenance dose which will keep the patient at a normal red blood cell count, 4.5 million for women and 5 million for men.

One other thing which I have time to call to your attention is this. While it is more convenient to give fewer cubic centimeters per dose, liver extract loses potency in the process of refining. For example, the 10 cc product we used to have at the New York Hospital, derived from 50 Gm of fresh liver, was as potent as the concentrated 3 cc or 1 cc derived from 100 Gm. However, to insure adequate dosage we give our patients more than the estimated minimum requirement, since we know of no deleterious effects of very large doses and since the excess potent fraction is not destroyed or excreted but is stored.

DR GOLD: Mr. Clarke who is head of the hospital pharmacy has had to grapple with many practical problems in the selection of drugs, and he will tell us of some of his experiences in this connection.

#### COST OF DRUGS

MR DONALD A. CLARKE: The two considerations which play an important part in our selection of preparations in the hospital pharmacy are price and quality. I have assembled a few of the figures on costs which help to give some idea as to where these matters stand with respect to some of the more common medicines that are prescribed.



In this table are listed the comparative costs of some of the proprietary and nonproprietary preparations of the same drug. The prices were obtained from one of the outstanding wholesale drug supply houses in New York City. Please note how much we pay for a protective name. For example, veronal costs five times as much as the same drug under the U S P official name barbital, luminal, twelve times as much as the same drug under the U S P official name phenobarbital. Among other barbituric acid compounds similar differences in price are encountered. Interesting relations may be seen by using a dose of 0.1 Gm of soluble phenobarbital as the basis for comparison. This is the U S P preparation and this dose costs the patient 0.2 cent. A similar dose of amytal sodium costs more than ten times as much, the same for oral sodium, of alurate sodium more than twelve times as much, of pentobarbital sodium fifteen times as much and of seconal about twenty times as much. I believe that these doses are fairly comparable. There are differences in the actions of these compounds, but there may well be numerous instances in which the very costly preparations are prescribed when all the therapeutic effects that are necessary can be obtained from the much cheaper phenobarbital.

Theobromine with sodium salicylate is a U S P preparation which is relatively inexpensive, but if you fail to write the official name and instead order it under the protected name, diuretin, this material will cost your patient more than seven times as much. These are matters to which attention has been called repeatedly. A recent publication called "The Costs of Medicine" by Rorem and Fischelis, under the auspices of the Committee on the Costs of Medical Care, gives an extensive discussion of this subject.

The digitalis preparations also provide useful data with regard to cost. The patient pays 0.6 cent for 1 cat unit (1 cc) of the U S P tincture of digitalis but less than one-half as much (0.3 cent) for a similar dose (1 cat unit) of a good standardized digitalis leaf in tablets. Compare the latter with the proprietary preparation digitan (Merck), digitoline (Ciba) and digalen (Hoffman-La Roche) in ampules. These cost, for the same amount of the drug, namely 1 cat unit, fifty, fifty and thirty times respectively as much as the digitalis leaf.

Dr Eggleston referred to morphine and its substitutes and stated that the substitutes appear to afford no special advantages over morphine itself. In the light of this, the difference in the cost of morphine and some of its substitutes becomes more important. A dose of morphine for hypodermic injection in the form of an ampule of pantopon costs about ten times as much as a similar dose of morphine sulfate, and in the form of an oral tablet it costs about six times as much as an oral tablet of morphine sulfate. A hypodermic dose of dilaudid ( $\frac{1}{16}$  grain tablet) also costs about six times as much as a therapeutically equivalent dose of morphine (one-fourth grain tablet).

Among liver preparations for the treatment of pernicious anemia, wide differences exist in the cost of comparable doses. For example, a daily dose of one of the concentrated parenteral preparations costs only 4 cents, whereas a daily dose of one of the preparations for oral administration costs as much as 40 cents. However, the cost to the patient may be less in the latter case than in the former, because in the one instance an injection is necessary and this may require

the daily services of a physician, whereas in the case of the oral material such frequent attention of the physician is not necessary.

In the field of the glandular products the point that appears necessary to emphasize is the very high cost of adequate doses of potent materials. Several examples of approximate costs of treatment may be cited. The cost of adrenal cortical substance is prohibitive. One of the patients in the clinic who requires 18 cc daily for replacement in Addison's disease is receiving a dose of a preparation costing about \$8 a day. The gonadotropic hormone preparations are also extremely expensive. The preparation known as follutein costs about \$12 for 5,000 rat units, and a course of treatment often calls for 500 units three times a week, as Dr Shorr has indicated. Antutrin-S is even more expensive, \$4 per thousand rat units. The male sex hormone, the crystalline testosterone propionate, costs \$12 for three ampules of 25 mg each and, as you have heard, as much as 25 mg three times a week is sometimes necessary in replacement therapy. The female sex hormones amniotin and theelin cost about \$1 per average dose of 2,000 rat units, or about \$3 a week in a course of treatment which may run over a period of several weeks. The synthetic preparation of the corpus luteum which is now available costs \$7.50 for 10 mg. You can readily calculate what the total cost to the patient will be if, as Dr Shorr suggested, a daily dose of 10 mg is necessary for replacement over a period of months of pregnancy.

DR GOLD: I am afraid we have run over the hour, and unfortunately have no time for questions. If somebody feels an irrepressible urge to put a question, however, it may be possible to have it answered.

STUDENT: How can a physician practicing outside secure the digitalis put out by the New York Heart Association?

DR EGGLESTON: He cannot. Those preparations are limited to use by clinics which are members of the Heart Association. However, there are preparations manufactured on the same general principles which have proved trustworthy over periods of years.

STUDENT: Would you tell us what preparations those are?

DR EGGLESTON: There are several. One is the preparation made by Lederle, a powdered digitalis leaf which has stood the test of experience over a period of years and is alleged to be made according to the requirements of the New York Heart Association. Another similar preparation is made by Schieffelin & Co.

STUDENT: Do you use the same dosage with these?

DR EGGLESTON: Yes, the same dosage.

DR WALTER MODELL: What about the relative cost of bulk ether as compared with that of small cans of ether?

DR MCKEEN CATTELL: Certainly you can reduce the cost of ether for anesthesia to about one fourth by using bulk ether in 27 pound drums instead of the quarter pound cans. It used to be thought that ether deteriorates quickly, but the work which has been going on in our laboratory shows that ether does not deteriorate even during several weeks after the metal container has been opened repeatedly. There are several large hospitals which are now using bulk ether for anesthesia entirely satisfactorily.

## Council on Pharmacy and Chemistry

### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEITCH Secretary

**EPINEPHRINE** (See New and Nonofficial Remedies, 1938, p 230)

**EPINEPHRINE U S P-UPJOHN**—Marketed in vials containing 0.065 Gm (1 grain)

Manufactured by the Upjohn Company Kalamazoo Mich  
*Solution Epinephrine 1 1000 Upjohn* Each cubic centimeter contains epinephrine 1.0 mg sodium chloride 7.0 mg sulfur dioxide (as sulfurous acid) not more than 0.6 mg chlorobutanol not more than 5.0 mg dissolved in distilled water saturated with carbon dioxide Marketed in packages of 1 cc ampules and 10 cc vial

**SCOPOLAMINE HYDROBROMIDE** (See New and Nonofficial Remedies, 1938, p 377)

**SCOPOLAMINE HYDROBROMIDE-MERCK**—A brand of scopolamine hydrobromide-U S P

Manufactured by Merck & Co Inc Rahway N J  
*Scopolamine Hydrobromide Crystals Merck* Marketed in vials of 1.5 and 15 grains  
*Scopolamine Hydrobromide Powder Merck* Marketed in vials of 1.5 and 15 grains

**CAFFEINE WITH SODIUM BENZOATE** (See New and Nonofficial Remedies 1938 p 156)

*Ampuls Caffeine with Sodium Benzoate 2 cc* An aqueous solution containing in each 2 cc caffeine with sodium benzoate U S P 0.5 Gm (7½ grains)

Prepared by The Maltbie Chemical Co Newark N J

**THIAMIN CHLORIDE** (See THE JOURNAL, July 16, 1938, and the Revised Supplement to New and Nonofficial Remedies, 1938, p 23)

**Thiamin Chloride-Abbott**—A brand of thiamin chloride-N R

Manufactured by Abbott Laboratories North Chicago No U S patent or trademark.  
*Tablets Thiamin Chloride Abbott 0.33 mg* Each tablet contains 100 international units of thiamin chloride  
*Tablets Thiamin Chloride Abbott 1.0 mg* Each tablet contains 300 international units of thiamin chloride  
*Tablets Thiamin Chloride Abbott 3.3 mg* Each tablet contains 1000 international units of thiamin chloride  
*Ampoules Solution Thiamin Chloride Abbott 0.66 mg* Each ampule contains 2000 international units of thiamin chloride  
*Ampoules Solution Thiamin Chloride 1.0 mg 1 cc* Each ampule contains 300 international units of thiamin chloride  
*Ampoules Solution Thiamin Chloride 10.0 mg 1 cc* Each ampule contains 3000 international units of thiamin chloride

**SOLUTION OF FORMALDEHYDE** (See New and Nonofficial Remedies, 1938, p 248)

**SOLUTION OF FORMALDEHYDE-MERCK**—A brand of solution of formaldehyde U S P

Manufactured by Merck & Co Inc Rahway N J

**BISMUTH SUBSALICYLATE** (See New and Nonofficial Remedies, 1938, p 142)

*Bismuth Subsalicylate in Oil Suspension* A suspension of bismuth subsalicylate in peanut oil each cubic centimeter containing 2 grains (0.13 Gm) of bismuth subsalicylate U S P (equivalent to 75 mg of Bi metal) and 0.03 Gm (3 per cent) of chlorobutanol Marketed in bottles containing 30 cc 60 cc and 100 cc  
Prepared by the Diarsenol Company Inc Buffalo N Y No U S patent or trademark

**PROCAINE HYDROCHLORIDE** (See New and Nonofficial Remedies 1938, p 74)

**PROCAINE HYDROCHLORIDE-THE UPJOHN CO**—A brand of procaine hydrochloride-U S P

Manufactured by The Upjohn Co Kalamazoo Mich No U S patent or trademark.  
*Ampoule Solution Procaine Hydrochloride ½ cc with Epinephrine 5 cc* Each cubic centimeter contains procaine hydrochloride U S P 0.005 Gm epinephrine 0.05 mg sodium bisulfite 1.6 mg benzoic acid 0.06 mg sodium chloride 8.5 mg normal hydrochloric acid 0.0007 cc dissolved in distilled water and saturated with carbon dioxide

*Ampoule Solution Procaine Hydrochloride 2% with 1 epinephrine 1 cc* Each cubic centimeter contains procaine hydrochloride, U S P 0.02 Gm epinephrine 0.05 mg sodium bisulfite 2.6 mg benzoic acid 0.3 mg sodium chloride 8.3 mg normal hydrochloric acid 0.0016 cc dissolved in distilled water and saturated with carbon dioxide

*Ampoule Solution Procaine Hydrochloride 2% with 1 epinephrine 3 cc* Each cubic centimeter contains procaine hydrochloride U S P 0.02 Gm epinephrine 0.05 mg sodium bisulfite 2.6 mg benzoic acid 0.3 mg sodium chloride 8.3 mg normal hydrochloric acid 0.0016 cc dissolved in distilled water and saturated with carbon dioxide

*Solution Procaine Hydrochloride 1% with 1 epinephrine 30 cc Vials* Each cubic centimeter contains procaine hydrochloride U S P 0.01 Gm, epinephrine 0.02 mg sodium bisulfite 2.1 mg benzoic acid 0.2 mg sodium chloride 8.4 mg normal hydrochloric acid 0.00125 cc chlorobutanol not more than 5 mg dissolved in distilled water and saturated with carbon dioxide

*Solution Procaine Hydrochloride 2% with Epinephrine 30 cc Vials* Each cubic centimeter contains procaine hydrochloride U S P 0.02 Gm epinephrine 0.05 mg sodium bisulfite 2.6 mg benzoic acid 0.3 mg sodium chloride 8.3 mg normal hydrochloric acid 0.0016 cc chlorobutanol not more than 5 mg dissolved in distilled water and saturated with carbon dioxide

## Council on Foods

### ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED

FRANKLIN C BING Secretary

#### CELLU BRAND RED CHERRY JUICE

*Distributor*—Chicago Dietetic Supply House, Inc, Chicago

*Description*—Canned red cherry juice packed without added sugar

*Manufacture*—Selected ripe red cherries are picked washed, chilled by immersion in cold water and macerated. The semi-liquid material is run through a hydraulic press. The juice is then pasteurized cooled, filled by the so-called vacuum process into enamel-lined cans, sealed under vacuum and processed

*Analysis* (submitted by distributor)—Moisture 87.7%, total solids 12.3%, ash 0.3%, fat (ether extract) 0.6%, protein (N × 6.25) 0.5% crude fiber none, carbohydrate, (by difference) 10.9% invert sugar 9.0%, sucrose 0.1%

*Calories*—0.5 per gram, 14 per ounce

#### MRS PALEY'S BABY FOOD—STRAINED ASPARAGUS

*Manufacturer*—Paley Sachs Food Company, Houston, Texas

*Description*—Canned, sieved asparagus, slightly seasoned with salt

*Manufacture*—Selected canned white asparagus is sieved, filled into glass jars, vacuum sealed and heat processed

*Analysis* (submitted by manufacturer)—Moisture 93.3%, total solids 6.7%, ash 0.8%, fat (ether extract) 0.4%, protein (N × 6.25) 2.2%, reducing sugars as dextrose 12%, sucrose 0.4%, crude fiber 0.7%, total carbohydrates other than crude fiber (by difference) 2.6%, calcium (Ca) 0.015%, phosphorus (P) 0.0037%, iron (Fe) 0.0035%

*Calories*—0.2 per gram, 6 per ounce

#### CELLU BRAND APRICOT JUICE

*Distributor*—Chicago Dietetic Supply House, Inc, Chicago

*Description*—Canned apricot juice packed without added sugar

*Manufacture*—Selected, tree-ripened apricots are sprayed with water, sorted pitted preheated and pressed through coarse mesh cloth. The juice which contains some of the insoluble solids of the pulp, is filled into cans and processed without preheating in special vacuum sealing machines. No toxic spray materials are used on the growing fruit

*Analysis* (submitted by distributor)—Moisture 88.4%, total solids 11.6%, ash 0.5%, fat (ether extract) 0.4%, protein (N × 6.25) 0.5%, crude fiber 0.04%, carbohydrates other than crude fiber (by difference) 10.2%, invert sugar 4.7%, sucrose 4.2%

*Calories*—0.5 per gram 14 per ounce

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 25, 1939

## DIAGNOSIS OF GONORRHEA BY CULTURE

Ordinarily the diagnosis of acute gonorrhea presents few great difficulties. In the chronic forms, however, and when the infection is located extragenitally, prompt and accurate diagnosis is sometimes not so easy. Early and accurate identification is important not only from the point of view of treatment but also in the control of the disease.

One of the most satisfactory additions to diagnostic methods is the use of culture mediums in the determination of the presence of gonococci in chronic or atypical lesions. Recent experience with this procedure seems to indicate that the best method of culturing the gonococcus so far devised is by the use of a chocolate agar incubated in an containing 8 per cent carbon dioxide as described by McLeod and his co-workers<sup>1</sup> with or without the help of the oxydase reaction or slight modifications of this technic. Using a variation of McLeod's procedure with a chocolate agar made from a Douglas agar base and the incubation of duplicate cultures at 34 and 37 C in 10 per cent carbon dioxide, Carpenter and his colleagues<sup>2</sup> examined the cervix and urethra of 245 adult female patients, making also smears in each case. From both methods eighty, or 32.7 per cent, proved to be positive. In all, 843 cultures with smears were submitted to the laboratory, of which 223 were positive by either the cultural or the smear method. Of the 223 bacteriologic examinations reported as positive the cultural method revealed gonococci in 205, or 91.9 per cent, of the specimens, while the organism was found in smears in only 107, or 48 per cent. In eighteen instances positive smears were obtained when cultures were negative. The use of the two methods simultaneously, therefore, increases the

positive diagnoses enormously over the use of the smear method alone, and not inconsiderably over the cultural method alone. These investigators concluded, therefore, that both methods should always be used. Stout and Todd<sup>3</sup> followed the McLeod procedure in the examination of ninety-three cultures from various sources. They obtained twenty-two positive cultures, or 23.6 per cent. In the analysis of their results they found the cultural method superior to the smear in twelve, or 15.6 per cent, but failed to obtain growth in thirteen cases in which there were gram-negative diplococci present in the smears. Jacobsen and her co-workers<sup>4</sup> attempted the isolation of the gonococcus in 100 cases of chronic female gonorrhea. Plated culture mediums were directly streaked from the urethra and the endocervix with sterile cotton applicators and within two hours were placed in an incubator kept between 35 and 37.5 C. Most of the cultures were incubated in lots of from six to eight in air-tight Novy jars in which from 8 to 10 per cent carbon dioxide was produced by mixing sulfuric acid with a solution of sodium bicarbonate. The routine mediums used were plain blood agar, chocolate agar, amniotic fluid agar, testicular agar, chocolate agar with a Douglas agar base, and ascitic fluid agar with a Douglas agar base. They also concluded that Douglas agar with heated blood is the medium of choice and that the presence of carbon dioxide in the incubator atmosphere is more important than the presence of moisture for the primary isolation of gonococci by culture. Their analysis also indicated that cultures are superior to direct smears. In addition they felt that the gonococcus fixation tests were superior to either cultures or direct smears. Reitzel and Kohl<sup>5</sup> have also been successful in culturing gonococci from various lesions either on hormone brain broth or on brain heart infusion with the addition of ascitic fluid. Similar successful reports have been appearing with increasing frequency in the foreign literature.

Although there is nothing new in the attempt to culture gonococci from the tissues, recent methods have improved the possibilities. At present the necessary technic and equipment restrict the application of cultural methods of diagnosis, but still further simplification may well increase its applicability. Finally it must be emphasized that the cultural examination for gonococci is not necessary when such organisms can be readily identified by smear but that in the more difficult cases both smear and culture and possibly complement fixation tests enormously increase the number of cases of gonococcal infections properly identified.

1 McLeod J W Coates J C Happold F C Priestley D P and Wheatley Bertha Cultivation of the Gonococcus as a Method in the Diagnosis of Gonorrhea with Special Reference to the Oxydase Reaction and to the Value of Air Reinforced in Its Carbon Dioxide Content *J Path & Bact* 39 221 (July) 1934

2 Carpenter C M Leahy Alice D and Wilson K M A Comparison of the Results of the Smear and Cultural Methods for the Diagnosis of Gonococcal Infections in Adult Females *Am J Syph Gonorr & Ven Dis* 22 55 (Jan) 1938

3 Stout B F and Todd D A Observations and Notes on the Culture of Gonococcus *Texas State J Med* 34 211 (July) 1938

4 Jacobsen Frances Mason H C and Arnold Lloyd Laboratory Diagnosis in Chronic Gonorrhea of the Female *J Lab & Clin Med* 23 729 (April) 1938

5 Reitzel R J and Kohl Cordula The Identification of Gonococci in Complications of Gonorrhea *J A M A* 110 1095 (April 2) 1938

## DERMATOMYOSITIS

Dermatomyositis is rare in appearance and mysterious in origin. So closely does it resemble other conditions in some respects that doubt has been expressed that it is an entity. Dowling and Freudenthal,<sup>1</sup> after citing three cases, summarize the clinical picture of dermatomyositis. Occasional prodromes appear as patches of erythema or Raynaud-like symptoms, during which the diagnosis is impossible. Usually the condition begins with erythema and swelling of the face and eyelids, sometimes extending to other regions. This phase may last for months but is succeeded by more persistent cutaneous changes resembling lupus erythematosus and spreading from the face to the neck, thorax, shoulders, arms and elsewhere. In severe cases early and extensive muscular weakness occurs and usually acute swelling and pain. An intermittent fever is usually, although not always, found at this stage. Histologically the epidermis is thinned with diminished or absent rete pegs, sclerotic connective tissue and diminished elastic fibers in the sclerotic areas.

In a case of dermatomyositis recently reported by Hendry and Anderson,<sup>2</sup> the symptoms began with a roughness or chapping of the hands followed by itching in the back of the neck and flexor aspects of the elbows and knees and swelling of the hands and feet. Later there was severe weakness, stiffness of the shoulders and elbows and difficulty in swallowing, and the skin had a violet blue tint. The legs were weak but obvious wasting was not apparent. Microscopic examination of some muscle and skin removed by biopsy revealed the interstitial tissue of the muscle extensively infiltrated by mononuclear cells in relatively large foci, comprising a small portion of plasma cells. The adjacent muscle fibers were more or less atrophic. Changes in the skin and fat were characterized by a scanty round cell perivascular infiltration. In another case reported at the same time by Sheldon and his collaborators<sup>3</sup> weakness, edema and changes in the voice were again prominent symptoms. The general color of the patient was pale, but over the bridge of the nose, both eyelids and the upper parts of the cheeks was a swollen area covered with a bright red erythema. This patient died. Portions of voluntary muscle from various parts of the body showed an intense edema with some localized increase of fibrosis of the areolar tissues normally lying between the muscle bundles. Accompanying this edema was a degenerative process of the muscle fibers themselves, indicated by fragmentation and a hydropic type of degeneration of the muscle fibers. The process elsewhere in the body was described in short as a generalized reticulo-endotheliosis, although the changes in the

muscles were apparently due to inflammation and degeneration, few endothelial cells being found. Sheldon and his colleagues therefore suggest that the basis of dermatomyositis is a reaction of the reticulo-endothelial system, usually local but occasionally generalized, and due to some cause as yet unknown.

In a case reported by Lane,<sup>4</sup> the close similarity between dermatomyositis and lupus erythematosus disseminatus is brought out. The clinical course in this case, however, differed from lupus in that the pain and tenderness were in the muscles and tendons rather than in the joints. Without exception the redness, edema, fever and leukopenia could easily have been mistaken for that of lupus erythematosus. Lane feels, furthermore, that these diseases may be closely related etiologically. Although satisfactory progress is being made in the understanding of the clinical manifestations and pathologic anatomy of dermatomyositis, the etiologic factors remain elusive.

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*Current Comment*

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## ORAL POLLEN PREPARATIONS

Early last year THE JOURNAL published a statement from the Chicago Society of Allergy in reference to oral pollen preparations placed on the market by some pharmaceutical houses. The Chicago allergists urged others to sound a note of warning not only because of the probable numerous disappointments which might occur following the use of oral pollen preparations but also because of the possible dangers inherent in any new and unproved method of treatment. A year previously THE JOURNAL, in *Queries and Minor Notes*, emphasized that self-administered therapy of this type is likely to lead to disappointments. Elsewhere in this issue appears a new communication from the Chicago Society of Allergy.<sup>1</sup> The society is to be commended for its stand against the exploitation of a product for oral administration in the treatment of hay fever which may be not only not beneficial but a decided economic loss to the patient. The difficulty of regulating dosage because of the difference in rate of absorption from the gastrointestinal tract alone is a serious objection to this mode of therapy. It will require considerable evidence to show by passive transfer work that pollen is absorbed in the doses intended. At present oral pollen preparations for the treatment of hay fever are apparently being promoted by Allergy Research Laboratories, Phoenix, Ariz., Pollen Laboratories, Phoenix, Ariz., Hollister-Stier Laboratories, Spokane, Wash., G. H. Sherman Company, Detroit and Eli Lilly and Company, Indianapolis. The Council on Pharmacy and Chemistry of the American Medical Association has accepted no pollen preparation proposed for oral administration.

<sup>1</sup> Dowling G. B. and Freudenthal W. Dermatomyositis and Poikiloderma Atrophicum Vascularis. *Brit J Dermat* 50: 519 (Oct) 1938.

<sup>2</sup> Hendry, A. W. and Anderson T. E. Dermatomyositis. *Lancet* 1: 80 (Jan 14) 1939.

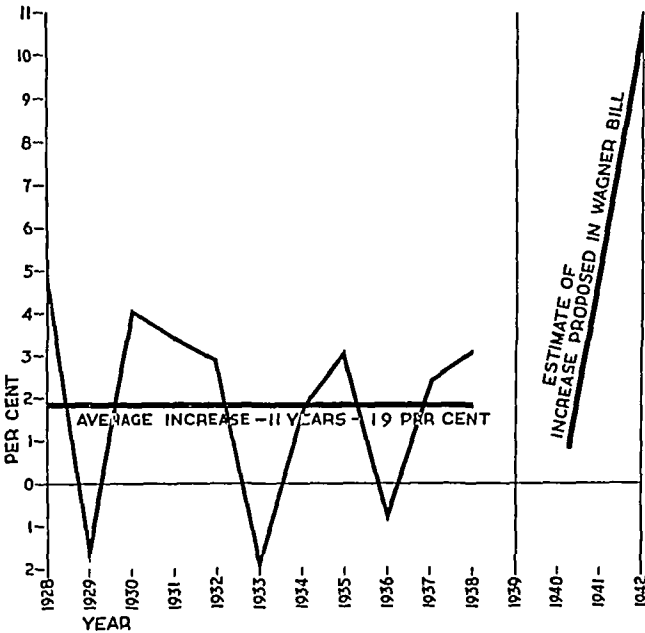
<sup>3</sup> Sheldon J. H. and others. Acute Dermatomyositis. *Lancet* 1: 87 (Jan 14) 1939.

<sup>4</sup> Lane, C. W. Dermatomyositis. *South M J* 31: 287 (March) 1938.

<sup>1</sup> Illinois News page 1171.

THE WAGNER BILL AND GENERAL HOSPITALS

Section 1201 of the Wagner bill, S 1620, authorizes the appropriation in successive years of eight, fifty and one hundred million dollars, respectively, for the construction and improvement of general hospitals. Under section 1203 (a) (1), financial participation by the states is required. Naturally the extent of this participation will vary from state to state. Assuming, however, that the contributions of the federal government will be on a fifty-fifty basis,<sup>1</sup> there will be available for the construction and improvement of government-owned general hospitals \$16,000,000 in the fiscal year ending June 30, 1940, \$100,000,000 in 1941 and \$200,000,000 in 1942. Taking \$4,000 as the average cost per bed of general hospitals - this bill would make



Average rate of increase in number of beds in general hospitals and estimate of increase proposed in Wagner bill

provision for the addition of 4,000 general hospital beds in 1940, 25,000 general hospital beds in 1941 and 50,000 general hospital beds in 1942. These figures relate only to government-owned hospitals and do not include such enterprises, public or private, as may be undertaken without the stimulus of a federal subsidy. From the accompanying chart it will be seen that over the eleven year period 1928-1938 inclusive the average rate of increase in the number of beds in general hospitals was 1.9 per cent. The increases in number that are proposed in the Wagner bill amount to a total of 79,000 beds, 16.2 per cent, in three years, or an average rate of increase of 5.4 per cent. In 1938 the general hospitals of the country were filled to 68.9 per cent of their capacity, 31.1 per cent of the beds were unused. Wherein lies the justification of the proposal to multiply threefold the normal increase of hospital facilities?

DISTINGUISHED SERVICE MEDAL

The second medal to be awarded for distinguished service to scientific medicine will be presented at the opening general meeting at the St. Louis session on May 16. The recipient of this medal is chosen by a process of selection which insures choice of an outstanding physician and scientist. Any physician who wishes to nominate a candidate for the Distinguished Service Medal may send his nomination to the chairman of the committee, Dr. E. L. Henderson of Louisville, Ky. This committee sends five nominations to the Board of Trustees of the American Medical Association, which then selects three names from the five. The three names are presented to the House of Delegates at the opening of the meeting, which will on this occasion be Monday morning, May 15. The House of Delegates votes immediately and the recipient of the honor is presented with the medal on the following night. Last year the first medal was awarded to Dr. Rudolph Matas, distinguished surgeon of New Orleans. Other candidates nominated to the House of Delegates included Dr. Simon Flexner and Dr. Ludvig Hektoen. By this award the American Medical Association indicates its recognition of scientific advancement as one of the main functions of organized medicine. Fellows of the Association can cooperate by sending to the chairman of the committee the names of those whom they believe to be entitled to such an honor, together with a record of their services to science.

FLORIDA TELEPHONE DIRECTORIES

The users of Florida telephone directories published by the Southern Bell Telegraph and Telephone Company may now know whether a person listed therein as a doctor is a doctor of medicine, an osteopath, chiropractor or naturopath, or a practitioner of any other method of healing. In the alphabetical list in the directory, after each name of a doctor of medicine appears the suffix "Dr. Phys.," and a similarly identifying suffix after the name of each cult practitioner listed. The classified section in the directory is arranged similarly to differentiate between the practitioners of the different methods of healing authorized by law in Florida. This change in the method of listing practitioners in the telephone directories followed the enactment of a law that requires every practitioner of the healing art to place and keep in a conspicuous place at each entrance of his office or usual place of business words or abbreviations denoting the particular kind or branch of healing in which he is lawfully entitled to engage. This law was considered as having established as a matter of public policy the desirability of public disclosure of the type of practice in which each practitioner engages. The telephone company, to further the public policy, and at the request of the medical profession of Florida, revised its methods of listing practitioners in its directories, a procedure it had theretofore hesitated to undertake. The Florida Medical Association with the cooperation of the telephone company has thus succeeded in eliminating a potential source of misinformation and danger for those who resort to telephone directories to ascertain the method of practice pursued by any practitioner.

<sup>1</sup> National Health Conference July 18, 19 and 20 1938 p. 39  
<sup>2</sup> National Health Conference<sup>1</sup> The Interdepartmental Committee uses \$3,500 as the average cost per general hospital bed

# ORGANIZATION SECTION

## CANADIAN EXPERIMENTS IN MEDICAL ECONOMICS

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General Secretary of the Canadian Medical Association  
TORONTO

For a period of two thousand years and more medicine has been engaged in building its structure. Generation after generation has given to the world men of science, men of learning, men of courage, who have been willing to forget self to sacrifice and to die if necessary in order that the ever accumulating knowledge of health and disease might more deeply penetrate the unknown, looking to the day when speculation regarding the ills of man would be replaced by complete understanding.

During this long period medicine has been on the march, sometimes marking time, sometimes standing easy, but in the main marching forward never backward. There is none among us who will say that victory has been won on all fronts. On the contrary, we will readily admit that what has been accomplished is but a prelude to what lies before. Nevertheless, accomplishments there have been, and multitudes of people scattered throughout the world are living testimonials to scientific achievements in the field of endeavor of which the members of our profession are disciples.

As we contemplate what has taken place in the development of our scientific knowledge, we should also direct our attention to what has concomitantly taken place with regard to our place in the social universe.

There was a day not so long ago when our knowledge and our dispensation of it were neither called in question nor disputed. "The doctor says so" was all sufficient. The doctor's public confidently and complacently accepted his advice and followed his instructions. The doctor was satisfied to have it so. He gave no thought to the situation's ever being subject to change. Indeed, many doctors will neither admit nor recognize that changes are taking place in the public mind. Such doctors, however, are like the foolish virgins, their lamps are without oil. Good and true servants though they be, they are proceeding blindly and if left to flounder by themselves will be wrecked on the reefs of change which they can not or will not see.

What is it that has happened?

What is all this talk about change in the public mind?

Who are the busybody bunglers in our own ranks who continue to stir up trouble for the profession?

Why can we not carry on as our forefathers did and their forefathers before them?

Leave us alone and let us practice scientific medicine in our own way.

But, alas, we cannot stop our fellow men from thinking and speaking and acting, any more than we can turn back a raging prairie fire. Perhaps, if one may continue the analogy, we should plow some furrows and burn a few patches here and there, so that the prairie fire may be brought under control. Perhaps too the burned-over ground might bring forth results to satisfy all who dwell thereon. In any event we must deal with situa-

tions as we find them and not with academic discussions. The facts are before us.

Great masses of people of high and of low estate, and in increasing numbers, are thinking and saying that they know better than do the doctors how medicine should be practiced. So far as one knows they do not question the doctor's willingness to treat rich and poor alike, but they do question his ability to determine the modus operandi by which his professional skill shall be made available, particularly to that great middle class of the population commonly described as average and low wage earners. From all this turmoil there has emerged not a new science but a most lively and active interest in a branch of our profession which we describe as medical economics.

Medical economics has been defined as "the science that investigates the conditions and laws affecting the production, distribution, consumption and cost of the various types and kinds of medical services that promote and preserve the health of the people." If we accept this definition as one which broadly covers the subject, it will be seen that the medical profession has every right and indeed every obligation to investigate and define the conditions and laws which have to do with the various types of medical service to which the public is entitled, looking to the preservation of the health of the people at the optimum level.

Speaking for myself, I am not willing to admit for one moment that the medical profession as a body is incompetent to determine how best the public shall be served. On the contrary, it is my firm belief that, given the opportunity to act in a corporate manner, the medical profession is equal to any task which properly comes under its purview. I say advisedly that we are equal to the task, but I think that one should be just as emphatic in saying that we are equal only so far as we are willing to assume the task.

What is the task?

Briefly put, I think it is this. To provide adequate medical care for all the people at a price which is fair to all the people, including those who render the service. That is our task.

Is it? Well, if it is not our task it certainly belongs to somebody, because the public has a right to expect and demand medical services at a price within its competence to pay, and if we should prove ourselves unwilling or unable to organize on a basis to meet the public's proper demands we deserve to become enmeshed in plans not of our making or choosing. But, may I repeat, the members of the medical profession are capable of meeting the situation, and meet it we must and will.

If I interpret correctly the attitude of the American Medical Association, which represents a very large section of medical opinion in the United States, it has affirmed over and over again its willingness and indeed its anxiety to do all in its power to see to it that no citizen of the United States is deprived of medical care, no matter what his financial station may be. Organized medicine in Canada has taken a similar stand, and yet

there are people both in the United States and in Canada who, for reasons best known to themselves, appear to get vicarious pleasure out of assailing the medical profession and questioning its sincerity. Evidence is not lacking that the medical profession has been subject to much buffeting in days which have gone, and we may expect to face many storms in the days that are to come. With proper perspective, however, we shall emerge into calm and peaceful waters, having full confidence in our ability to steer the ship to a secure haven.

Admitting, if I may, that there is an urge on the part of great masses of the public for some change to be brought about in medical practice, how best may we proceed to study the merits of the case, if merit there be? Accuracy is often born of trial and error. It is my view that we should accept all reasonable opportunities to demonstrate by trial, and possibly by errors too, well conceived plans whereby groups of persons may receive medical care, but the all-important consideration is this: The plans should be devised, worked out and put into operation with the fullest collaboration of the medical profession. Keeping this thought in mind I wish to present the attitude of the Canadian Medical Association with regard to the subject under discussion and to outline as briefly and concisely as possible some Canadian experiments in the field of medical economics.

As is well known, many persons hold to the belief that state medicine or health insurance or some modification of one or both, governmentally applied, is the answer to the whole problem. We as a profession know equally well that this is far from the truth. We know that state medicine or health insurance, partially or wholly under government control, is in effect in forty countries. It has been my privilege to visit many of these countries and to study the vast majority of health insurance plans now in operation. I say with all confidence that I do not know of one scheme or plan now in effect in any country that I would wish to see introduced into Canada.

The Canadian Medical Association has not authorized an expression of opinion either in favor of or opposed to the institution of health insurance in Canada, as our legal friends would say, the matter is still *sub judice*. But, for use in the event that some plan is proposed from outside the profession, which in actual experience has already occurred, the association has set forth what it believes to be necessary guiding principles by which it can carefully scrutinize and measure all such plans as are advanced. May I now present these principles:

1 That, in the provinces where health insurance is established, it be administered under an independent health insurance commission and that there be close cooperation between this commission and the provincial department of public health with a view to making full use of preventive services.

2 That a general health insurance board and local insurance boards be appointed, representative of all interested, to advise the responsible administrative authority.

3 That the professional side of health insurance medical service be the responsibility of the organized medical profession through the appointment of a central medical services committee and local medical services committees, to consider and advise on all questions affecting the administration of the medical benefit.

4 That the question of the establishment of local areas for health insurance administration be left to the decision of the individual provinces.

5 That the whole province be served by adequate departments of public health, organized on the basis of provision of individual health supervision by the health insurance general practitioner.

6 That there be a health insurance fund and that regional medical officers to act as supervisors and referees be appointed, paid and controlled by the central board or commission.

7 That medical care for indigents be provided under the plan, the government to pay the premium of the indigents, who then receive medical care under exactly the same conditions as the insured person.

8 That the plan be compulsory for persons having an annual income below a level which on investigation by competent local authorities proves to be insufficient to meet the costs of adequate medical care.

9 That the dependents of insured persons be eligible for the medical benefit.

10 That there be offered, on a voluntary basis, to those with incomes above the health insurance level, hospital care insurance and that this be administered as part of the health insurance plan, such hospital care not to include medical service other than hospitalization.

11 That the only benefit under the plan be the medical benefit.

12 That the medical benefit be organized as follows:

(a) Every qualified licensed medical practitioner to be eligible to practice under the plan.

(b) The insured person to have freedom of choice of medical practitioner and vice versa.

(c) The medical service to be based on the making available to all of a general practitioner service for health supervision and the treatment of disease.

(d) Additional services to be secured ordinarily through the medical practitioner.

(1) (a) Specialist medical service.

(b) Consultant medical service.

(2) Visiting nurse service (in the home).

(3) Hospital care.

(4) Auxiliary services—usually in a hospital.

(5) Pharmaceutic service.

(e) Dental service, arranged directly with the dentist or on reference.

13 That the insurance fund receive contributions from the insured, the employer of the insured and the government.

14 That the medical practitioners of each province be remunerated according to the method or methods of payment which they select.

15 (a) That the schedule of fees in any health insurance scheme be the schedule of fees accepted by the organized profession in the province concerned.

(b) That all schedules of fees be under complete control of the organized medical profession in each province.

16 That the contract-salary service be limited to areas with a population insufficient to maintain a general practitioner in the area without additional support from the insurance fund.

17 That no economic barrier be imposed between doctor and patient.

18 That the volume of work demanded from and the remuneration to members of the various professions be such as to assure a standard of service equal to or better than present day standards.

Does the setting forth of health insurance principles act as an invitation for health insurance legislation?

The Canadian Medical Association takes the view that, if governments—national or provincial—should take it on themselves to introduce legislation of a medico-economic nature, we, the members of the medical profession, should know in advance where we stand and under what conditions we would be willing to cooperate. We believe that a definition of policy predicated on sound thinking, and the keeping of a proper balance between medical ideals and medical practice, is desirable, and therefore, after several years of study and discussion within our component parts, there emerged these principles on which we believe that we may safely rest our case and if necessary base our will—



ingness to negotiate. We believe too that to be forewarned is to be forearmed. Time does not permit of a detailed analysis of these principles but it is our firm belief that a careful study of them will disclose that an earnest effort has been put forth to keep inviolate what we consider to be our inalienable rights in the realm of medical practice, while at the same time the rights of the public that great body whom we serve, have also been recognized and protected in a manner which should command respect and confidence. It will be observed that the medical profession has given ample evidence of its willingness to accept leadership and responsibility, an attitude of mind which the American Medical Association has so commendably recommended to its constituent societies and members for many years back as my memory serves me.

While I am on the subject of leadership in relation to medical economics, it would not seem out of place to say that the best conceived and executed plan which can be devised for adequate medical care for all the people, including the poor and needy, is but a poor stopgap for those in the lowest income group if nothing is done to provide work and wages and a decent standard of living for them. It seems to me that this is a field of thought and endeavor to which some well intentioned observers and social workers might give heed by way of diversion from their favorite pastime of assailing the medical profession for its alleged inability or unwillingness to provide adequate medical care for all the people.

#### HEALTH INSURANCE IN BRITISH COLUMBIA

One of the major Canadian experiments in medical economics, although it might be regarded so far as having come to naught, occurred in British Columbia, Canada's most westerly province. So much interest and attention have been directed to this experiment that I now propose to give the high lights of it as they concern the medical profession.

As far back as twenty years ago in March 1919 to be exact, the government of British Columbia appointed a select committee to inquire as to laws relating to mothers' pensions, maternity insurance, health insurance and public health nursing which were in force in other countries. Ten years later, in 1929, the government appointed a royal commission to inquire into all matters affecting maternity benefits and health insurance. In 1932 this commission reported and recommended the "early establishment in British Columbia of a suitable health insurance plan including Maternity Benefits." Nothing further was done until 1935, when the government issued a draft of a plan of health insurance. This draft bill was sent broadcast throughout the province. The public was asked to study it. Then there followed the setting up of a public hearings committee to receive expressions of opinion from public bodies, including the medical profession. Some of the points, both favorable and unfavorable, concerning the original draft bill which are of interest to the medical profession, follow.

1 The medical profession became aware of its provisions when the bill became public property.

2 It included cash benefits, which do not belong in a health insurance measure.

3 It included the indigent, for whom medical services were to be paid for by the government.

4 It provided for the insured a complete medical service with hospitalization, nursing and dental services.

5 It included all employees earning \$2,400 a year or less and also their dependents.

6 There was to be paid for complete medical services, including hospitalization, nursing and dental services, not less than \$10 and not more than \$13.20 per insured person a year, plus 5 per cent of the total annual expenditures on medical benefits for services of a general character.

7 The health insurance fund was to be formed by

(a) collecting from the employer 2 per cent of his pay roll applicable to insured persons,

(b) collecting from the employee 3 per cent of his wages,

(c) a contribution by the government of sufficient funds to cover the cost of medical benefits provided for indigents, plus half the cost of administration "provided that the contribution of the Province shall not be greater than \$1,200,000 in any one year."

The reaction of labor to the draft bill was on the whole favorable, although there was some objection to the 3 per cent levy on wages and a certain number urged that the upper income limit of \$2,400 a year should be removed entirely.

Industry protested that economic conditions in the province were such that it could not meet the additional tax which would be levied.

The medical profession, while objecting specifically to a number of the provisions in the bill (reference to which will be made later), strongly urged that, before any such legislation was enacted, a more intensive study be made not only in British Columbia but throughout Canada as a whole as to the need for legislation of this character.

In the spring of 1936 the legislature of British Columbia presented a radically altered bill, practically all the alterations being, in the opinion of the medical profession, of a retrograde character. Here are some of them.

1 The government agreed to advance \$50,000 for organization purposes, and there its financial responsibility ceased, obviously an actuarially undetermined piece of financing.

2 The indigent were excluded, with no alternative provision being made for them or their dependents outside the act. In other words, the indigent were left on the doctor's doorstep.

3 Many classes of low wage earners were excluded, including casual laborers, domestic servants, farm laborers and all employees earning \$10 a week or less.

4 Old age pensioners and widow pensioners were excluded from the benefits.

5 Contributions to the fund were greatly reduced,

(a) from the employer 2 per cent instead of 3 per cent and

(b) from the employee 1 per cent instead of 2 per cent, a reduction in funds that made the act still further actuarially questionable.

6 A complete medical service was still to be provided, including hospitalization and one half of the drug bill, although the financial basis had been gravely lowered.

7 Remuneration of the medical profession was to be "at the rate of not less than \$4.50 per annum per insured person eligible to receive benefits."

From a medical point of view, the act was clearly undesirable and unacceptable.

Although the party in power regarded the act as a government measure, it had a stormy passage through the legislature, finally emerging on March 31, 1936, to become effective on a date to be fixed by proclamation. After the passing of the act a health insurance commission was appointed, with very wide powers. The commission invited the medical profession to assist in working out details which would be satisfactory to both sides. Realizing that the legislature had spoken, the medical profession had no option but to attempt to make the best of the situation, but finally, after many con-

ferences, the committee representing the medical profession advised the commission that it could not accept the provisions of the act or work under it. It was decided to ask the entire medical profession to vote on the subject. When the ballots were counted, it was disclosed that 622 doctors had voted against accepting the scheme while thirteen had voted in favor of it. Fourthly, the medical profession announced in the public press that it could not undertake to provide medical services under the act, and on February 19 the premier of the province announced the postponement of the operation of the health insurance act, sine die. Three years has passed and the act remains inoperative. From the point of view of the medical profession, certain facts stand out and definite conclusions may be drawn.

1 The provincial government failed to secure the approval of the medical profession to the medical provisions incorporated in its health insurance act. This was a grave error because not only must the cooperation of the medical profession be obtained before any such act can be operated successfully but a government if it is to frame a satisfactory act should consult the medical profession at the outset and, to a large degree, be guided by medical advice. It is the right of the medical profession to be consulted and it should stand by that right.

2 A complete health insurance plan costs money, and no such plan will be successful if undertaken on a financial shoestring; furthermore, no scheme will be satisfactory or complete that does not (a) adequately remunerate those rendering service and (b) make provision for the indigent, old age pensioners and all low wage earners who are unable to provide medical services for themselves.

The British Columbia medical association is a division of the Canadian Medical Association, and the fight of the doctors in that province for economic justice and security was a fight in which the doctors throughout Canada felt themselves to be engaged. Consequently the Canadian Medical Association whole-heartedly supported the medical profession of British Columbia in the stand which it took. It is my firm conviction that the hope of doctors for fair treatment in any country must to a large degree rest in the organized medical profession, whose interests are neither selfish nor parochial but public spirited in the broadest sense of the term.

#### MUNICIPAL DOCTOR SCHEME

During the past twenty-five years there has developed in the province of Saskatchewan a plan which is known as the municipal doctor scheme. The story of the beginning and growth of this plan is a story of the origin of a unique system of socialized medicine which has served a definite purpose in providing medical services which it is alleged could not easily have been obtained through private practice.

For the purpose of local government, the province is divided into geographic units of from six to twelve townships, each township being an area 6 miles square. Units are authorized to fix a mill rate of taxation for the provision of medical services. In 1914 one of these rural municipalities had practically no crop and the local doctor was faced with the discouraging prospect of looking for a new field of endeavor or, as he viewed it, staying to starve. The municipality assumed the responsibility of taxation and guaranteed him \$1,500 for one year if he would stay. He did so, and thus began the scheme which today includes 121 doctors,

20 per cent of the 600 practicing physicians in the province, who are engaged either whole time or part time as municipal physicians. In 1919 legislation was enacted whereby a rural municipality might engage a physician on a salary not exceeding \$5,000 a year. In 1930 legislation permitted this salary to be increased to \$5,500 in some of the larger municipalities. In 1933 towns and villages in the province were extended similar taxing privileges, permitting them to engage physicians on a salary basis. In the main the contracts call for the provision of general medical services to include minor operations, maternity care, medical health inspection and immunization of school children. Practically all the contracts exclude major operations.

An analysis of this service brings out the following points with respect to remuneration for services rendered:

1 In a large group of municipalities, a capitation fee of as low as \$1.24 to as high as \$3.66 provides general medical services to a total of 77,421 persons for \$147,798.00, at an average per capita rate of \$1.94 a year.

2 In another group, of thirteen municipalities, including 116 townships, a capitation fee from \$1.29 to \$2.81 provides, in addition to general medical services, major operations within the competence of the municipal physician to perform, to a total of 30,964 persons for \$59,050, or an average per capita rate of \$1.91 a year.

3 In a third group of municipalities, the capitation basis varies from 92 cents to \$3.32 a year. A total of 34,276 persons pay a basic salary of \$39,630, or a capitation rate averaging \$1.74 a year.

One observer who has had an excellent opportunity to appraise the service has provided me with the following information:

#### Points in favor of the plan

1 A medical service is provided where otherwise there might have been none.

2 Pioneers who are developing the country have been guaranteed medical care, much to the advantage of the country as a whole.

3 The doctor is guaranteed a certain definite income, from which he can budget.

4 The plan tends to promote preventive medicine, in that it is to the doctor's advantage to keep his people well.

#### Points against the plan

1 It interferes with private practice in some areas.

2 It interferes with free choice of physician.

3 In many instances there is too much work for any one man to undertake.

4 The pay, although a burden on the municipality, is in the majority of instances inadequate for the work done.

5 Very few municipal doctors find time for post-graduate work or vacations.

6 A municipality is not a satisfactory unit for payment.

7 The doctor has no way of exacting remuneration from the municipality.

8 The scheme lends itself to doctors' bidding against one another for positions.

9 Municipalities on occasion allow a contract with a doctor to lapse, perhaps owing him considerable money, and then advertise for another incumbent.

10 The municipality may arbitrarily cut the salary, and the doctor can take it or leave it.

11 The doctor has no guaranty of tenure of office and therefore little protection such as would prompt him to buy property.

12 Arrears of salary in some instances exceed \$10,000, with little prospect of their being paid

A breakdown of one contract is shown in the accompanying table

According to the unit basis of cost of service, it is observed that the doctor was paid as follows

- 1 Office consultation (2 units), \$0.46
- 2 House call (3 units), \$0.69
- 3 Confinement (15 units), \$3.45
- 4 Major operation (50 units), \$11.50
- 5 Minor operation (10 units), \$2.30
- 6 Immunization (3 units), \$0.69

Why do well qualified medical practitioners accept these municipal doctor contracts? There are perhaps many reasons, but most emphatically it must be stated that the primary motivating influence is a desire to secure a guaranteed income while serving humanity in one's chosen profession. On the basis of remuneration received for work done, the plan should not be considered as providing adequate financial returns. Salaried appointments as municipal physicians would appear to leave much to be desired.

#### THE ONTARIO PLAN

Early in the recent depression through which the entire world has been passing, governmental authority in Canada decided that the unemployed and their dependents were entitled to food, fuel, shelter and clothing at the expense of the state. The medical profession contended that medical care for these less fortunate of our citizens was just as essential as food, fuel, shelter and clothing and that the state should not expect the doctor to contribute this service entirely at his own expense. In some parts of Canada this contention was heeded, and I shall now deal with the plan which was adopted in the province of Ontario.

Four years ago the Ontario division of the Canadian Medical Association entered into an agreement with the government of the province on the following terms:

For each person in the province in receipt of relief, including dependents (and at that time the number was approximately 400,000), the government agreed to provide the sum of 25 cents a month. The association in turn undertook to provide for relief recipients general practitioner services in the office and in the home together with domiciliary obstetric services. There was to be as complete freedom of choice of doctor and patient as obtains in private practice. No finer opportunity could have been afforded the medical profession to demonstrate its ability to carry out the very principles it had been advocating for years, namely that no third party should intervene in a plan of providing medical services to a cross section of the community.

Within thirty days the medical association, working through its fifty component branches, set up ninety-six medical committees, representing more than 4,000 practicing physicians, it being the duty of these committees in the respective areas to scrutinize and assess medical accounts and pass them on to the central administrative medical committee for final adjudication and payment. Rather than set up a special tariff for relief recipients, the association agreed to apply its regular tariff to the service, namely \$2 for an office call, \$3 for a house call and \$25 for a normal confinement, with additional allowances for mileage. It was of course recognized at the outset that the money available would not be adequate to pay assessed accounts in full, the profession did not expect that the taxpayers, of whom they form

a part, would be called on to pay 100 per cent of the medical bills for their less fortunate fellow citizens. Accordingly the plan adopted was as follows: Bills having been taxed, i. e. checked over as to their accuracy and fairness (and one should here interpolate that a very small minority of the profession were found to be unfair with their accounts), were then added up and the total was divided into the amount of money available each month, each doctor being paid pro rata according to the amount of his account and each month being considered a unit. At the end of two years the amount of money which the government agreed to pay was increased to 35 cents per relief recipient monthly, out of which the profession agreed to pay the druggists 6 cents a month for the necessary drugs and supplies.

What has four years of experience in providing medical care to this rather large number of people taught? I think a number of things of very definite interest and importance, certainly to Canada and perhaps to the medical profession in other parts of the world.

1 The profession has demonstrated that it can organize and conduct satisfactorily a plan of medical services on a group basis without any political, governmental or sociological interference.

#### Contract of a Municipal Doctor

Area covered	350 square miles
Population	2,800
Work done for the year 1936	
Office consultations	3,600
Country calls	800
Maternity cases	51
Minor operations	90
Major operations (within his competence)	15
Immunization	300 persons
Salary paid	\$4,500
Major operations (amount collected)	\$ 300
Total income	\$4,800
From this deduct	
For transportation (13,000 miles by car, 1,200 miles by snow plane, 250 miles by train)	\$1,550
For drugs	300
Net amount for services rendered	\$1,850
	\$2,950

2 The services available to a group such as that concerned demonstrated very clearly that morbidity quickly rises when resistance to meeting costs is removed. It was estimated at the inception of the scheme that morbidity might stand at somewhere between 6 and 8 per cent. What are the actual morbidity figures for this experiment? For the first year 12.78 per cent, for the second year 14.37 per cent and for the third year 15.40 per cent.

In respect of remuneration to the profession, the records show the following payments in relation to total accounts as taxed and approved: first year 45 per cent, second year 38 per cent and third year 51 per cent. (In the third year the 35 cents a month capita rate applied.)

Thus it will be seen that the doctors are contributing practically 50 per cent of the cost of medical services to this group. Moreover, information is now available as to the actual cost of such services, which information heretofore was not available in Canada.

What about the quality of the services rendered?

A short time ago, while engaged in preparing this paper, I directed this question to the minister in the government under whose regime general relief is administered. He assured me that, so far as the government is concerned, the service is highly satisfactory, that the

medical profession appears to be doing a splendid piece of work, that the relief recipients are satisfied with the care they are receiving and that the taxpayers who are providing the funds (over four years, approximately 4 million dollars) are satisfied that they are getting full value for their money

At no time has there been interference of any kind from any source with the administration of the scheme by the medical profession. Valuable statistics have been made available with regard to morbidity and service costs. A complete and unmistakable answer has been made to that section of the public who doubt the ability of the medical profession to organize and provide adequate medical care to a large group of people without the intervention of a third party. There is abundant proof of the satisfaction and confidence which has accrued to the profession in finding that it was able to discharge its responsibility to itself for the proper carrying out of this experiment in medical economics. If the profession can conduct an experiment of this magnitude for 400,000 people in the province of Ontario, I have not the slightest doubt that the profession anywhere on this great continent is capable of carrying out a plan of medical services for any section of the public so long as the administration is entrusted to the medical profession itself. The relationship between physician and patient has not been disturbed, and one cannot see why, in any scheme of group practice, that same relationship should not prevail. If medical science is to progress, if standards of medical practice are to continue to improve, if we are going to keep medicine pointing ever upward and onward to finer attainments and thus greater public benefit, we must see to it that we preserve against assault from every side a position of intimate relationship with the public whom we serve without the intervention of a third party.

#### CITY PLANS

In a number of cities in Canada somewhat similar schemes for medical relief have been devised.

For the past five years a complete medical service has been supplied in greater Winnipeg to those on relief. The average number has varied from 45,000 to 35,000. Treatment is provided in the office, home and hospital, dental, optical, x-ray and laboratory services are included.

A doctor, employed by the city, interviews all who apply for treatment, emergency patients excepted, and gives a permit to enable the patient to consult the doctor of his choice. The city reserves the right to have minor ailments, e.g. constipation and scabies, treated by the doctor controlling medical relief.

A board of four doctors, two employed by the city and two representing practitioners, decides disputed questions, grants or refuses authority for operations, unusual treatments and expensive laboratory or x-ray tests, and renders decisions on contested accounts. In many instances it seeks the assistance of a specialist or a consultant.

Accounts are rendered monthly by each practitioner on a reduced scale of fees. There is no capitation limit or fixed budget, but no doctor may collect more than \$150 a month.

In five years, disciplinary action has been requested for four practitioners of more than 300 who provide the service. There have been no cases of proved neglect by doctors, no tragedies and singularly few complaints by patients. Again the medical profession has supplied

the answer to the question of its ability to provide adequate medical care without the intervention of a third party.

#### VOLUNTARY HEALTH INSURANCE

In the field of voluntary health insurance an interesting experiment began in Ontario some eighteen months ago, when an organization known as Associated Medical Services was incorporated with the official blessing of the Ontario Medical Association, to offer complete medical, surgical, hospital and nursing service to those members of the community who were willing to budget for illness by paying regular premiums as follows:

Subscriber, \$2 a month  
First dependent, \$1.75 a month  
Second dependent, \$1.50 a month  
Third dependent, \$1.25 a month  
Fourth and other dependents, \$1 a month

During the first six months, 733 subscribers were enrolled. During the past twelve months this number has increased to 4,020. In one city in the province, 826 physicians of 950 have so far expressed their willingness to cooperate. There is of course free choice of doctor, and in all other respects the patient enjoys the same independence and freedom of action as obtains under ordinary private practice. The plan, organized and conducted by medical men on a nonprofit basis, appears to be giving complete satisfaction to an ever growing number of forehanded persons who desire to insure at a fixed premium against unpredictable costs of illness. Moreover, the relationship between doctor and patient is undisturbed, again emphasizing and proving the desirability and necessity of such confidential contact, and intervention, which is restricted to economics and not medical practice, appears in no wise to work a hardship but rather to solve for many persons a hazard which formerly produced much concern and often financial disaster.

#### CONCLUSIONS

Time does not permit of reference to other schemes being worked out in different parts of Canada. My only purpose in presenting a paper of this nature may be summarized as follows:

1 On behalf of the medical profession of Canada, I wish to say that organized medicine is fully conscious of the medical needs of the public and is willing and able to meet these needs.

2 The medical profession has demonstrated its ability to provide medical services for large groups of people under terms which give complete satisfaction to the recipients of the service and to the medical profession.

3 A critical analysis of various schemes already in existence discloses weaknesses in many of them which the profession properly recognizes and refuses to accept.

4 From experience in Canada I am confident that there is no need for persons outside the medical profession to assume that, unless they take it on themselves to arrange for adequate medical care for all the people, such care will be denied those who need it most.

5 And, finally, may I say that I bring you greetings from your colleagues north of the 49th parallel of latitude and wish to assure you that, like yourselves, we recognize that the interests of medicine know no geographic boundaries or other limitations and that, with you, we look forward confidently to never ending opportunities to serve our fellow men, not forgetting the high calling which is ours.

## OFFICIAL NOTES

ABSTRACT OF MINUTES OF MEETING  
OF BOARD OF TRUSTEES

The regular annual session of the Board was held at the Association headquarters on Feb 16 and 17, 1939. Space is not available for a complete report of the deliberations of the meeting, but a brief report is here given.

## APPOINTMENTS

The following appointments and additions were made to editorial boards of special journals, councils, bureaus and committees. Unless otherwise stated, the appointee succeeds himself.

*American Journal of Diseases of Children* Dr Horton Crisp, of Nashville to succeed Dr L R DeBuys, *Archives of Dermatology and Syphilology*, Dr Charles C Denme of Kansas City, Mo, to succeed Dr Martin F Luginan, *Archives of Internal Medicine* Dr Reginald Fitz, *Archives of Neurology and Psychiatry* Drs Louis Crumrine and S W Ranson, *Archives of Ophthalmology* Dr W L Benedict, *Archives of Otolaryngology* Dr Chevalier Jackson and Dr James A Babbitt of Philadelphia as additional member, *Archives of Surgery* Dr Wlaiman Walters and, as additional members, Dr Arthur W Allen of Boston, Dr Alfred Blalock of Nashville, Dr Lester R Dragstedt of Chicago and Dr W E Dandy of Baltimore, Council on Physical Therapy, Drs W E Garrey, W W Collett and John S Coulter, Council on Pharmacy and Chemistry, Drs David P Barr, J Howard Brown and C W Edmunds, and Dr Perrin H Long of Baltimore to succeed Dr E M Bailey, also as additional members Dr Elmer L Sevringhaus of Madison Wis, and Dr Stuart Mudd of Philadelphia, Council on Foods, Dr C S Ladd of Bismarck, N D, and Dr Tom D Spies of Cincinnati to succeed Drs E M Bailey (resigned) and Joseph Brennemann, Council on Industrial Health, Dr R T Legge of Berkeley, Calif, to succeed Dr Morton R Gibbons (resigned), Committee on Scientific Research, Dr Noble Wiley Jones, Committee for the Protection of Medical Research, Drs E C Cutler A C Ivy and William Pepper, and Dr John H Rice of New York to succeed Dr M C Winternitz.

The following physicians were appointed to represent the American Medical Association: Dr Roger I Lee, a member of the Board of Trustees, to represent the Association at the meeting of the British Medical Association in Aberdeen, Scotland, in July 1939, Drs Arthur W Booth and Thomas S Cullen, members of the Board of Trustees, to represent the Association at the meeting of the Canadian Medical Association in Montreal, the week of June 19.

## DATE FOR NEW YORK SESSION

The week of June 10, 1940, has been selected as the date for the New York session of the Association.

ADVISORY COUNCIL ON MEDICAL EDUCATION,  
LICENSURE AND HOSPITALS

The Board authorized the publication of an editorial on the proposed establishment of an advisory council on medical education, licensure and hospitals, and on the expressed willingness of the Council on Medical Education and Hospitals to participate in such a conference provided the House of Delegates so authorizes.

## CONFERENCES WITH RELATED ORGANIZATIONS

A conference between the Board of Trustees of the American Medical Association and representatives of the American, Catholic and Protestant hospital associations was held on Tuesday, February 14, and the Board voted to invite representatives of certain other related organizations to meet with it in the future to consider plans of medical service for the American people.

ADVISORY COMMITTEE TO COUNCIL ON MEDICAL EDUCATION  
AND HOSPITALS

Dr W S Leathers and Dr Herman Weiskotten were added to the Advisory Committee to the Council on Medical Education and Hospitals and have accepted appointment. The committee now consists of Drs S S Goldwater, Paul Titus M T MacEachern, W P Wherry, J R Neal, Donald C Balfour, C B Pinkham, Herman Weiskotten and W S Leathers, and Father Alphonse Schwitalla.

## IMMIGRATION OF EUROPEAN REFUGEES

Authorization was given for the publication of an editorial in *THE JOURNAL* giving information obtained by the Bureau of Legal Medicine and Legislation relative to the number of refugee physicians admitted to the United States since 1930, and the names of the two committees which have been established to investigate the refugee problem and which have received grants from the federal government for such investigations.

## COMMITTEE ON AMERICAN HEALTH RESORTS

A Committee on American Health Resorts, consisting of Drs Bernard Fantus (chairman), Chicago, W S McClellan, Stratton Springs, N Y, E M Smith, Hot Springs, Ark, M B Jarman, Hot Springs, Va, and W P Holbrook, Tucson, Ariz, has been appointed.

## REVISION OF "PERIODIC HEALTH EXAMINATION"

Authorization was given for the revision of "Periodic Health Examination" and for the selection of a committee to handle the revision.

## APPROPRIATIONS

Appropriations for the conduct of the work of the various councils, bureaus and committees, as well as the usual appropriations for medical and therapeutic research, were made.

SPECIAL ISSUE OF ARCHIVES OF PATHOLOGY IN HONOR  
OF DR S B WOLBACH

Authorization was given for the publication of a special issue of the *Archives of Pathology* in July 1940 to commemorate the sixtieth birthday of Dr S B Wolbach, who has been a member of the editorial board of that periodical since its establishment in 1926.

COOPERATION WITH NATIONAL CONGRESS OF  
PARENTS AND TEACHERS

The Board authorized the printing of the usual number of medical record forms for the summer round-up of school children by the National Congress of Parents and Teachers.

## EDUCATIONAL CAMPAIGN IN SYPHILIS

The Board expressed its approval of the educational campaign in venereal diseases conducted by the U S Junior Chamber of Commerce in St Paul in 1937, and of similar campaigns for the control of syphilis by the U S Junior Chamber of Commerce in other cities if conducted along similar lines with the approval of the local society.

## MISCELLANEOUS

Consideration was given to numerous other subjects and to routine matters.

REORGANIZATION OF JOINT COMMITTEE  
WITH NATIONAL EDUCATION  
ASSOCIATION

The Joint Committee on Health Problems in Education, in which the American Medical Association and the National Education Association have cooperated since 1911, held its twenty-eighth annual meeting at Cleveland, February 27 and 28. Dr Thomas D Wood, who had been chairman of the committee since its inception, announced his intention to resign at the 1938 meeting. The vice chairman, Dr Charles C Wilson of Hartford, Conn, immediately appointed a subcommittee to make plans for the future of the Joint Committee. Dr Wood's resignation was submitted in July 1938 to the president of the National Education Association, by whom he had been appointed, and was accepted. Dr Charles C Wilson was named acting chairman, pending reorganization of the committee.

At the meeting in Cleveland the committee was reorganized under the following general principles: 1 A Joint Committee shall be established of the two organizations as a whole and not of any department or section of either one. 2 It shall include no representatives of other health agencies and shall be strictly a joint committee of the participating organizations. 3 The committee shall consist of five representatives of each organization, who shall be appointed to serve one, two, three, four and

five years respectively for their first terms and for five year terms thereafter and shall not be eligible for more than two successive terms. 4 The committee shall have a chairman, a vice chairman and a secretary-treasurer, who shall be elected annually from among the members of the committee by the Hare system of proportional representation. The broad principles of rules of procedure were laid down and adopted. This reorganization had previously been approved in principle by the Trustees of the American Medical Association and the Executive Committee of the National Education Association.

After the consideration of routine business, the members of the committee voted to resign in a body, effective immediately on the appointment of the members of the new committee as provided in the reorganization.

The principal objectives of the committee were defined as follows: (a) to promote a better understanding between physicians and teachers, (b) to bring to bear on health problems in education the best thought in medicine and in pedagogy, (c) to identify health problems in education and endeavor to promote constructive solutions for them, (d) to seek publication of the conclusions of the committee through the columns of the periodical publications of the participating organizations whenever possible and to publish pamphlets principally as reprints or when special indications for such publication exist.

## RADIO BROADCASTS

The radio broadcasts by the American Medical Association and the National Broadcasting Company, under the title *Your Health*, continue as previously announced each Wednesday over the Blue network of the National Broadcasting Company at 2 p. m. eastern standard time (1 p. m. central standard time, 12 noon mountain time, 11 a. m. Pacific time).

Changes in this time will be necessary to take into consideration daylight saving time. Announcement of this change will appear in advance in *THE JOURNAL*. Owing to network conflicts the Chicago broadcast will not occur at 1 p. m. on Wednesday but there will be a rebroadcast from a recording over Station WENR at 8 o'clock each Monday evening. The program broadcast each Monday will be identical with the network program of the preceding Wednesday.

It has been necessary to curtail the length of the series by omitting the last two programs, which would have been broadcast June 14 and June 21. The series, therefore, will end with the broadcast scheduled for June 7.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

March 29	Animal Diseases Transmitted to Man
April 5	Don't Believe Everything!
April 12	Learning to Live

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Change in Status*—H. R. 4492, the Treasury Department Appropriation Bill, was amended in the Senate to increase from \$440,000 to \$700,000 the amount appropriated by the bill for carrying out the provisions of the National Cancer Institute Act. The bill, having passed the House and Senate, will go to conference at which House and Senate differences will be adjusted.

*Bills Introduced*—H. R. 4634, introduced by Representative Carter, California, provides that citizens of the United States who during the World War enlisted as and served in the status of civilian employees of the Signal Corps, United States Army, American Expeditionary Forces shall be considered as having served in the military service of the United States. H. R. 4652, introduced by Representative Voorhis, California, provides that in the administration of laws pertaining to veterans, retired enlisted men of the Army, Navy, Marine Corps and Coast Guard, who served during a war period as recognized by the Veterans' Administration and who have been honorably discharged from such service, shall be entitled to hospitalization and domiciliary care in Veterans' Administration facilities on parity with other war veterans. H. R. 4893, introduced by Representative Angell, Oregon, provides for the reorganization of agencies of the government. H. R. 4934, introduced (by request) by Representative May, Kentucky, proposes to authorize the appointment of female dietitians and female physiotherapy and occupational-therapy aides in the Medical Department of the Army. H. R. 4942, introduced by Representative Stefan, Nebraska, proposes to make it unlawful to sell certain spirits containing alcohol produced from materials other than cereal grains.

### DISTRICT OF COLUMBIA

*Bills Introduced*—S. 1805, introduced by Senator King, Utah, and H. R. 5067, introduced by Representative Randolph, West Virginia, propose to establish a lien for moneys due hospitals for services rendered in cases caused by negligence or fault of others.

### STATE MEDICAL LEGISLATION

#### Colorado

*Bills Passed*—The following bills passed the house March 15. H. 466, proposing as a condition precedent to the issuance of a license to marry that each party to a prospective marriage present a physician's certificate that he or she has submitted to such examination, including a standard serologic test, as may be necessary for the discovery of syphilis and that in the opinion of the physician the party either is not infected with syphilis or

is not in a stage of that disease which may become communicable, and H. 470, proposing to require every physician attending a pregnant woman to take or cause to be taken a sample of her blood within ten days of the first professional visit and to submit that sample to an approved laboratory for a standard serologic test for syphilis.

#### Delaware

*Bills Introduced*—S. 151 proposes that in any civil or criminal cause a licensed physician or a nurse shall not be allowed or compelled to disclose any information "which may be required [sic] while attending a patient in a professional capacity, and which is necessary to enable him or her to act in that capacity," except in the case of a patient under 16 when the information indicates that the patient has been the victim of a crime. S. 225 proposes that in the distribution of the assets of an insolvent decedent funeral expenses not to exceed \$400 and reasonable bills for medical attendance and for nursing during the last sickness shall be paid before any other claims against the estate.

#### Georgia

*Bill Passed*—H. 623 passed the house March 14, proposing so to amend the state constitution as to permit the county of Tift to increase its bonded indebtedness by \$50,000 to erect and equip a hospital "where medical and surgical treatment and care may be provided those in need of such."

#### Illinois

*Bill Passed*—H. 408 passed the house March 14, proposing to appropriate \$75,000 to the Department of Public Health for the purchase of pneumonia serum for distribution to the citizens of the state.

*Bills Introduced*—H. 391 proposes to require every physician or other person attending in a professional capacity a pregnant woman to take or cause to be taken a sample of her blood at the time of the first examination and to submit that specimen to a laboratory approved by the State Department of Public Health for an approved serologic test for syphilis. Such test may, on request of any physician, be made free of charge by the State Department of Public Health or the health departments of cities, villages and unincorporated towns maintaining health departments. S. 197 proposes that whenever in a civil or criminal proceeding issues arise on which the court deems expert evidence desirable it may appoint one or more experts, not exceeding three on each issue, to testify at the trial. The appointment of court expert witnesses, however, is not to preclude the parties from calling expert witnesses of their own, pro

vided the party calling an expert witness gives the court and the adverse party reasonable notice of the name and address of the expert to be called

#### Maine

*Bill Introduced*—S 378 proposes to authorize the court in a bastardy proceeding to order the complainant, her child and the putative father to submit to one or more blood grouping tests. The results of such tests will be admissible in evidence only in cases in which exclusion is established

#### Maryland

*Bill Introduced*—H 545 proposes to require every physician, pharmacist, dentist, hospital or nurse treating any person in Montgomery County for any injury which apparently has been caused by an automobile accident or by a lethal weapon to report the facts, as soon as practicable, to the county police

#### Missouri

*Bills Introduced*—H 605 purports by its title to amend the laws relating to midwifery by adding a new section, which would permit the State Board of Health to license a person to operate an "institution or establishment attempting to treat the sick or others afflicted with bodily or mental infirmities" by massage, exercise, steam, electrical or therapeutic baths, or rubbing with alcohol or other medicative substances, by and through the means of any system of remedial treatment consisting of kneading or rubbing [sic] the body, or by careful regulation of diet, food, etc., commonly known as Alimentary therapeutics, or by immersing, showering, massaging or washing the body or part of the body, by exposing the body to steam, vapor, hot air, or in which a current of electricity passes through the water, or in the application of hot sand or other heated material applied to the body, through or by any means whatsoever including a ray, electrical apparatus, mechanical contrivances, steam or electric cabinets or otherwise. H 604 proposes to enact a law regulating the manufacture, distribution or advertising of foods, drugs, cosmetics and devices

#### New Hampshire

*Bill Introduced*—S 30, to amend the medical practice act, proposes to restrict licensure to citizens of the United States

#### New York

*Bills Introduced*—S 1209 proposes to prohibit the retail sale and distribution, except on the written prescription of a licensed physician, dentist or veterinarian, of barbitol, sulfonethylmethane (trional), diethylsulfur diethylmethane (tetronal), carbromal, paraldehyde, chloral, chloral hydrate or chlorobutanol. S 1391 proposes to prohibit the performance of an operation the purpose or effect of which is to change or alter the skin or tissues of the fingers or thumbs so as to alter such person's finger patterns or fingerprints. The bill also prohibits the performing of any operation of plastic surgery on a known criminal the purpose or effect of which is to alter his personal appearance and make identification and apprehension difficult. A physician the bill proposes, must report immediately by telephone, if possible, to appropriate police officials all requests for operations which seem to come within the provisions of the bill. S 1424 and A 1927 propose to enact a law to be cited as the New York uniform food act to regulate the manufacture, distribution and advertising of foods. A 1982 proposes to authorize the formation of corporations to operate non-profit medical expense indemnity plans. A 1923 proposes to authorize medical societies to form non profit medical service corporations to operate non-profit medical service plans whereby medical treatment and care may be provided by the corporations to be formed or by physicians with whom they have contracted to such of the public as become subscribers to the plans under contracts which entitle each subscriber to certain medical care and treatment. At least a majority of the directors of such a corporation must be at all times members of a medical society but at least two directors must be laymen

#### Oklahoma

*Bill Introduced*—S 219 proposes to enact a law regulating the manufacture, sale and distribution of foods, drugs, cosmetics and devices

#### Ohio

*Bills Introduced*—H 565 and H 627 propose to authorize the sexual sterilization of epileptic, insane or feeble-minded inmates of state institutions

#### Pennsylvania

*Bills Introduced*—H 431 proposes to require every physician to notify the appropriate local health officer of every case of tuberculosis which comes under his professional observation. If that health officer learns that any person afflicted with tuberculosis is unable or unwilling to conduct himself in such a manner as not to expose persons with whom he may be associated to danger of infection, he may petition the court of common pleas of the appropriate county for an order directing the admission of such person to any approved hospital or institution established for the care of persons suffering from tuberculosis. The bill also proposes to make it the duty of the appropriate health officer to provide care, treatment, isolation or hospitalization to afflicted persons who are unable to pay for such care and treatment. H 440, to amend the workmen's compensation act proposes to make compensable as an "occupational disease" a contagious disease of any kind contracted by a person employed in or about any hospital to which persons having contagious diseases are admitted for treatment

#### Rhode Island

*Bills Introduced*—S 160, to amend the chiropractic practice act proposes among other things, that chiropractors "shall be entitled to the same rights and privileges pertaining to public health which may be imposed or given by law or regulation upon or to physicians qualified to practice medicine" except they shall not write prescriptions for drugs for internal medication," thus omitting the provision in the present law which specifically prohibits them from performing major surgery. H 809 proposes a system of compulsory and voluntary sickness insurance the benefits of which are to consist of cash and all forms of medical, dental and hospital service. Persons employed as farm laborers and persons employed by an employer having less than three employees in personal or domestic service are to be excluded from the compulsory insurance of the bill but are to be entitled to participate in the voluntary insurance. All other employees are embraced in the compulsory features of the bill

#### South Carolina

*Bill Passed*—S 330 passed the senate March 8 proposing to authorize the establishment and operation of a county hospital in the county of Charleston. The hospital is to provide medical attention and care for the indigent sick of the county and to provide hospitalization for others at such rates of pay as are commensurate with their ability to pay. The board of the hospital is also authorized to enter into contracts with any individual or corporation or professional organization for the furnishing of medical or surgical care on such terms and conditions as it deems advisable

#### Tennessee

*Bills Enacted*—S 411, nominally to amend the osteopathic practice act has been enacted as chapter 150, Public Acts 1939. It enlarges the legal scope of osteopathy, the present law which this act replaces permits a licentiate merely "to practice osteopathy" and seems not to permit a licentiate under it to practice surgery or to use drugs. The new law, however, provides that "Such certificate [referring to a certificate to practice osteopathy] shall entitle the person to whom it is granted to practice osteopathy in any county in this State, in all its branches, as taught and practiced by the recognized associated colleges of osteopathy, with the right to use such drugs as are necessary in the practice of osteopathy, surgery, and obstetrics, including narcotics, antiseptics, anesthetics and biologicals." H 836 has been enacted as chapter 102, Public Acts 1939, creating in the Department of Public Health a "Medical Care Division," to be headed by a licensed physician appointed by the governor. This division subject to the supervision of the Department of Public Health, is to administer and expend all sums that may be appropriated by the general assembly or made available by the federal government to the state, or from contributions from local units of government, or from other sources, for medical care in



accordance with any future act of the general assembly or of Congress "having as its objective the inauguration of a State and/or national program of medical care"

### Texas

**Bills Introduced**—Senate Committee Substitute for Senate 127 proposes to authorize the organization of corporations to operate non-profit hospital service plans whereby hospital care may be provided by such corporations, through hospitals with whom they have contracted, to subscribers to the hospital service plans. S. 352 to amend the provisions of the Texas workmen's compensation act which limits the period during which an employer must provide medical and hospital services to an injured workman to the first four weeks after an industrial injury, proposes to require an employer to provide such services where needed up to ninety-one days from date of injury.

### Wisconsin

**Bills Introduced**—S. 239 proposes that the provisions of the medical practice act shall not apply "to a total number of fifty medical physicians who may have been engaged in the actual practice of medicine or surgery in Germany, Austria, Czechoslovakia, or Poland" to whom licenses are issued in the manner

set forth in the bill. Briefly, the bill proposes that during the year commencing July 1, 1939, any physician residing in the state who may have, within the last ten years, been engaged in the continuous practice of his profession in Germany, Austria, Czechoslovakia or Poland may have a license issued to him by the board of medical examiners if he files an affidavit concerning his moral and professional character and the extent and nature of his practice in Europe and also presents an affidavit signed by at least two licensed physicians in the state concerning their knowledge of the applicant. The bill proposes that the number of licenses issued shall not exceed fifty for the year indicated and that no more than five such licenses may be issued in any one calendar month. A. 443, to amend the pharmacy practice act, proposes, in effect, to permit persons other than licensed pharmacists to sell aspirin, boric acid, camphorated oil, cod liver oil, iodine, milk of magnesia, mineral oil and peroxide. A. 436 proposes to provide for the sexual sterilization of feeble-minded, epileptic or insane inmates of state institutions. S. 251, to amend the law requiring male applicants for licenses to marry to present a physician's certificate as to freedom from venereal disease, proposes to require such certificates with respect to both parties to prospective marriages.

## WOMAN'S AUXILIARY

### Kansas

Mrs. Charles C. Tomlinson, president of the auxiliary to the American Medical Association, was the speaker at the meeting of the board of the auxiliary to the Kansas State Medical Society in Hays in December. Almost all of the nineteen members present lived more than a hundred miles away.

### Louisiana

The auxiliary to the Calcasieu Parish Medical Society distributed Thanksgiving baskets for needy families of Lake Charles. The auxiliary won over the American Legion Auxiliary in a radio quiz contest.

Col. Hollingsworth Barrett spoke on "Peace" at the November meeting of the auxiliary to the Caddo Parish Medical Society held in Shreveport.

The Orleans auxiliary is holding a series of lectures for members on the subject of socialized medicine, arranged on the advice of Dr. Shirley Lyons, president of the Orleans Medical Society.

### Minnesota

The auxiliary to the Hennepin County Medical Society sponsored the annual sale of articles made by patients of Glen Lake Sanatorium November 18 and 19. The proceeds, amounting to more than \$1,200, went to the patients who made the articles that were sold. At the December meeting each member and her guest gave a silver offering for "Sarahurst," a convalescent home for patients discharged from Glen Lake Tuberculosis Sanatorium.

The auxiliary to the Ramsey County Medical Society sponsored the play "The Dream of a Clown," given at the St. Paul Auditorium. The proceeds will be used for philanthropic purposes by the auxiliary.

The auxiliary to the Washington County Medical Society met at the home of its president, Mrs. J. W. Stuhr, November 8. Donations were given to the scout fund and to the high school "Radio Educational Project."

The auxiliary to the St. Louis County Medical Society held a rummage sale the proceeds of which were used for philanthropic activities.

Nearly 10,000 talks were written by Minnesota high school students on the subject "Tracking Down the Foe of Youth," a contest conducted by the Minnesota Public Health Association in cooperation with the woman's auxiliary of the state medical association. This was the eighth annual contest in which the auxiliary participated. Mrs. Martin Nordland, Minneapolis, former state president, represented the auxiliary on the committee of judges. The best talk from each high school, selected by a preliminary public speaking contest, was

entered in the state contest. From the manuscripts submitted, the judges selected the six talks that were presented in special broadcasts over WCCO the week of December 12.

### Mississippi

The auxiliary to the Central Medical Society met January 3 at the home of Mrs. B. J. Marshall, Whitfield. Mrs. Henry Boswell announced the anonymous gift of \$5,000 to establish the Preventorium Trust Fund. The Mississippi auxiliary has had as one of its projects the needs of the children at the state preventorium. It has provided funds for toys and handwork material. For years an essay contest on the preventorium and its work has been conducted in the junior high schools, a pamphlet arranged by the auxiliary and published by the state board of health being used as the source of information. This year at the close of the essay contest the auxiliary undertook to finish the trust fund, already started, to care permanently for the work they were financing. When this plan became public, a friend of the institution, a man who wishes to remain unknown, volunteered to create a perpetual fund to care for the needs of the children, which he has done. The auxiliary may now carry on its educational work and be relieved of its financial obligation.

The auxiliary assisted in the Christmas Seal Sale, having prepared several short talks which were sent to each auxiliary and each counselor and were given by members before clubs and church societies and over the radio.

### New Mexico

The auxiliary to the New Mexico Medical Society met at the home of Mrs. Harrison Brehmer in Albuquerque. Dr. L. Werner reviewed the book "The Country Doctor." At a later date it met at the home of Mrs. L. F. Elliott in Albuquerque. Christmas stockings were prepared for children at the Christina Kent Day Nursery.

### New York

Mrs. Milton Bergmann, president, spoke on the meaning of the caduceus before the auxiliary to the Medical Society of the County of Kings, December 13. Mrs. Edmund D. Clark, former president of the auxiliary to the Medical Society of the State of Indiana, was a guest. Another feature of the program was the showing of baby pictures of members of the auxiliary and an exhibit of their needlework and hobbies.

Miss Grace E. Allison, superintendent of the Samaritan Hospital, recently spoke on "Ideal Hospitals and Social Welfare" before the auxiliary to the Medical Society of the County of Rensselaer.

Mrs. Leslie Sullivan, president, auxiliary to the Medical Society of the County of Schenectady, was guest speaker before the auxiliary to the Medical Society of the County of Saratoga, December 5.

## Medical News

(PHYSICIANS WILL CONFIR A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATI TO SOCIETY ACTIVITIES, NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

ADDITIONAL MEDICAL COLLEGE NEWS AND ARTICLES APPEAR IN THE STUDENT SECTION, PAGE 1213

### ALABAMA

**New Regulations Governing License to Practice**—The Alabama State Board of Medical Examiners recently amended its rules governing the issuance of certificates of qualification to practice medicine. After the collegiate year 1938, any applicant for a certificate to practice will be required to serve at least one year of internship before such certificate will be issued. He will be permitted to take the examinations but the certificate will be withheld until the applicant complies with this requirement. Concerning graduates of European schools, the regulations read:

In the case of an applicant whether native born or foreign born who has graduated from a European School the following rules shall obtain:

- 1 Present a certified statement from the National Board of Medical Examiners of the United States setting forth that he has successfully passed all examinations written and oral required by this board; and
- 2 Either (a) present a certificate of qualification to practice medicine (a license) issued in the country of his nativity or in the country in which the medical school from which he graduated is located or (b) present a certificate setting forth that he has satisfactorily passed the federal examinations necessary to obtain licensure to practice medicine in the country in which the medical school from which he graduated is located.

All foreign born applicants shall first present at least first citizenship papers.

### CALIFORNIA

**Physicians' Art Exhibit**—The first annual exhibition of the Los Angeles Physicians' Art Society was held in the lounge of the Los Angeles County Medical Association recently. A special feature was a demonstration of stereoprojection of Kodachrome slides taken in Alaska by Dr. Orrie E. Ghrist. Officers of the society include Drs. Harold L. Thompson, president, and Katherine M. Close, secretary-treasurer.

**Society News**—Lee de Forest, Ph.D., Los Angeles, discussed "The Beginnings of Radio and the Application of High Frequency Current to Modern Medical Practice" before the Hollywood Academy of Medicine March 9.—Dr. William J. Kerr, San Francisco, discussed "A New and Rational Approach to the Etiology and Treatment of Angina Pectoris" before the San Diego County Medical Society, San Diego, February 14.—Dr. Rock Sleyster, Wauwatosa, Wis., President-Elect, American Medical Association, discussed aspects of the national medical problems before a joint meeting of the Los Angeles County and Southern California medical associations March 16.

### COLORADO

**Western Slope Spring Clinic**—The second annual Western Slope Spring Clinic, designed for physicians of Western Colorado and Eastern Utah, will be held at Grand Junction April 1-2, under the auspices of the Mesa County Medical Society. A clinical pathologic conference will be held Saturday. On Sunday the program will include the following speakers:

Dr. Carl W. Maynard, Pueblo. The Value of the Laboratory to the General Practitioner.  
Dr. Cuthbert Powell, Denver. Drainage of the Peritoneal Cavity.  
Dr. Roderick J. McDonald, Jr., Denver. Streptococcus Infections and Their Treatment.  
Dr. Frederick M. Heller, Pueblo. The Nephritides.  
Dr. Thomas Leon Howard, Denver. How Should the General Physician and Surgeon Evaluate Bladder Symptoms in Their Patients?  
Intermountain Clinic, Salt Lake City. Errors in Diagnosis and Treatment of Coronary Disease.

**Railroad Physicians' Meeting**—The tenth annual meeting of the Medical Association of the Missouri Pacific Railroad was held March 15-16 in Colorado Springs at the Antlers Hotel. The speakers included:

Dr. Charles O. Giese, Colorado Springs. The Practitioner and Pulmonary Tuberculosis.  
Dr. J. Sims Norman, Pueblo. Low Back Pain Associated with Spondylolisthesis.  
Dr. Casper F. Hegner, Denver. Surgery of Pulmonary Tuberculosis.  
Dr. John L. McDonald, Colorado Springs. Coronary Disease as an Industrial Problem.  
Drs. Harry C. Bryan, Colorado Springs and Lee B. Harrison, St. Louis. Pulmonary Tuberculosis. Missouri Pacific Employees—Results of Treatment for Fourteen Years.  
Dr. Oliver B. Zeinert, St. Louis.

In addition, there was a dental program and one presented by the section on ophthalmology and otolaryngology. At the

banquet Drs. George W. Bancroft, Colorado Springs, spoke on "Reconstruction of the Hip Joint", Hillel Unterberg, St. Louis, "Therapeutic Shock in the Psychoses," and Edward B. Liddle, Colorado Springs, "Renal Tuberculosis."

### DISTRICT OF COLUMBIA

**Graduate Courses in Ophthalmology—Pathology and Orthoptics**—George Washington University School of Medicine, Washington, will conduct a graduate course in ophthalmology April 10-15 as well as a practical course in surgery, pathology and orthoptics April 4-8. All requests for information should be addressed to George Washington University School of Medicine, 1335 H Street N.W.

### IDAHO

**Personal**—Dr. Charles R. Scott, Twin Falls, has been appointed superintendent of the State School and Colony for the Mentally Deficient, Nampa, succeeding Dr. D'Orr Poynter.

**Society News**—Dr. Charles H. Sprague, Boise, among others, discussed "Clinical Aspects of Pulmonary Tuberculosis" before the South Side Medical Society at Twin Falls January 12.—A recent meeting of the North Idaho District Medical Society was addressed in Lewiston by Dr. Frank C. Gibson, Potlatch, on "Fractures of the Jaw."

### ILLINOIS

**"The Family Doctor" at the Annual Meeting**—A health essay and poster contest under the title of "The Family Doctor" will be a feature of the annual convention of the Illinois State Medical Society in Rockford May 2-4. The contest is open to all high school students. Plans are also being made to hold a "Hall of Health" at the session this year.

### Chicago

**Hospital News**—Dr. Leo M. Davidoff, Brooklyn, lectured at Mount Sinai Hospital January 19 on "Pneumo-Encephalography and the Appearance of the Normal and Pathological Encephalogram."

**The Mary Redfield Plummer Lecture**—Clarence C. Little, Sc.D., director, American Society for the Control of Cancer and of the Roscoe Jackson Memorial Laboratory, Bar Harbor, Maine, will deliver the first Mary Redfield Plummer Memorial Cancer Lecture under the auspices of the cancer research committee of the Chicago Woman's Club March 29. His subject will be "Recent Advances in Cancer Research." The lecture is one in a series that has been sponsored for a number of years by the woman's club but was named in honor of Mrs. Plummer following her death last year. Mrs. Plummer was formerly parliamentarian of the club and one of the pioneer workers in cancer among club women.

**Symposium on Syphilis**—The clinical program committee of the venereal disease commission of the Chicago Medical Society has arranged to utilize the vast clinical material at the Municipal Hygiene Clinic, 27 East Twenty-Sixth Street, for presentation in the various phases of the subject of syphilis. The first of a series of monthly programs will be held March 27. Dr. Alexander S. Hershfield, consultant, Municipal Social Hygiene Clinic, will deliver the first lecture on neurosyphilis and present cases. Drs. Hyman H. Goldstein, Chicago State Hospital, and Victor C. Gonda, clinical professor of psychiatry, Loyola University School of Medicine, will carry on the discussion. The meetings, which are free, will be in the nature of a graduate course, according to the Chicago Medical Society Bulletin.

**Allergists Oppose Oral Pollen Treatment**—The following resolution has been adopted by the Chicago Society of Allergy. The members of the Chicago Society of Allergy, partly from their own experience and partly from a survey of both the published and some of the unpublished experimental and clinical results of oral pollen therapy, believe that the evidence of beneficial effect is at present not sufficient to warrant the commercial promotion of material for oral pollen therapy. Because of their controversial and contradictory nature, the published results of oral pollen therapy are inadequate to justify the commercial promotion of such a product. In addition, our investigation indicates that many men who have used oral pollen therapy have failed to publish their work because of the unsatisfactory results obtained. We therefore urge that the commercial promotion of oral pollen therapy should be deferred in the interest of the public and of the general practitioner until further experimentation now in progress has been reported.

**Dr Carl Beck Honored**—A dinner will be held March 28 in honor of Dr Carl Beck, formerly professor of surgery, Chicago College of Physicians and Surgeons, now the University of Illinois College of Medicine, in recognition of his seventy-fifth birthday and his completion of fifty years in the practice of medicine. A group of Dr Beck's friends is sponsoring the dinner at the Stevens Hotel at 7 o'clock. A native of Milan, Austria, Dr Beck took his degree in medicine at the Royal and Imperial University of Prague, 1889. He served as assistant in surgery and gynecology in the clinics at Prague, assisting first Professor Guessenbauer and later Dr Schauta, gynecologists of Vienna. He made several trips to America as stemmer surgeon in 1889-1890, settling in Chicago in the latter year to follow the general practice of medicine. He founded the St Anthony Hospital with the Sisters of Joliet. He is also a founder of the German Medical Society and the Bohemian Medical Society of Chicago. He is the author of "Principles of Surgery," 1905, and "The Crippled Hand and Arm," 1925, as well as of many articles in medical journals.

### KENTUCKY

**Personal**—Dr John L. Phyllan, Fort Thomas, was the guest of honor at a dinner recently at St Elizabeth's Hospital, Covington, celebrating his twenty-fifth year as a member of the staff. Dr Clifford N. Heisel, Covington, and Mr U. J. Howard, commonwealth's attorney of Kenton County, were the speakers. Dr James B. Mason, London, was recently elected president of the National Bank of London.

**Society News**—Dr Walter E. Vest, Huntington, W. Va., addressed the Boyd County Medical Society, Ashland, February 7 on the national health program. Dr Harrison H. Shoulters, Nashville, Tenn., addressed the Third District Medical Society in Bowling Green January 25 on medical economics and Dr James T. Gilbert Jr., Bowling Green, on "Diabetic Emergencies." Dr Emmet F. Horne, Louisville, addressed the Franklin County Medical Society, Frankfort, February 10, on "Critical Emergencies." Dr Thomas M. Marks, Lexington, presented a paper on epilepsy before the Montgomery County Medical Society, Mount Sterling, January 10. Dr Edward C. Ellett, Memphis, Tenn., addressed the Jefferson County Medical Society, Louisville, January 16 on "Dacryocystorhinostomy," as the guest of the Louisville Eye and Ear Society. Drs James Murray Kinsman and William M. Ewing, Louisville, addressed the society February 20 on "Practical Application of the Electrocardiogram" and "Primary Malignant Tumors of Bone" respectively. Dr Claude T. Wolfe addressed the Louisville Medical Surgical Society February 10 on "The Relation of Discs of the Nasal Accessory Sinuses to Eye Disorders."

### LOUISIANA

**Pneumonia Laboratory**—A laboratory for the study of pneumonia control will be established at the Louisiana State University Medical Center, New Orleans, under the direction of Dr Claude D. Head Jr., passed assistant surgeon, U. S. Public Health Service. Miss Helen Jarl, bacteriologist of the service, will be in charge. Once the unit is fully established, it will be maintained by the state, the public health service being responsible only for organization and for payment of the bacteriologist's salary, according to the *Tiger*.

### MASSACHUSETTS

**Personal**—Dr Morris Yoishus has resigned as clinical director of the Worcester State Hospital to enter the private practice of neurology and psychiatry; he had held the position for seven years, having been associated with the hospital for twelve. Dr Domizio A. Costa, Boston, has been appointed a member of the Massachusetts state board of registration in medicine.

**Mrs Roosevelt Guest Speaker**—Mrs Eleanor Roosevelt, wife of the President, will speak in Worcester Memorial Auditorium, April 27, under the auspices of the Worcester District Medical Society. The proceeds of the admissions will be used as the nucleus of a fund to finance the construction of a medical center building in Worcester to house the society's library and scientific activities.

**Special Society Meetings**—Dr Clarence Guy Lane discussed "Indications for the Use of Physical Agents in Dermatology" before the New England Society of Physical Medicine in Boston February 15. Among others, Drs Benjamin Castleman and Aubrey O. Hampton addressed the New England Pathological Society in Boston February 16 on "Correlation of Postmortem Chest Teleroentgenograms with Autopsy

Findings, with Special Reference to Pulmonary Embolism and Infarction." The New England Heart Association was addressed, among others, February 27, by Drs Roy L. Swank, Andrew Yeomans and Reno R. Porter on "The Reaction of the Cardiovascular System of Dogs to Intravenous Infusion."

### MICHIGAN

**New Deputy State Health Commissioner**—Dr Albert S. McCown, who recently completed a course at Johns Hopkins University School of Hygiene and Public Health, Baltimore, for a certificate in public health, has been appointed deputy state health commissioner, it was reported February 3. A graduate of Johns Hopkins University School of Medicine in 1918, Dr McCown has served as director of the child welfare department of the Washington state department of health and as director of the division on maternal and child health, Children's Bureau, U. S. Department of Labor, Washington, D. C. In his new appointment, Dr McCown will supervise county health programs and direct local health services, it was stated.

**Society News**—Dr Edwin M. Jameson, Saginaw Lake, N. Y., addressed a joint meeting of the Detroit Obstetrical and Gynecological Society and the Wayne County Medical Society February 6 on "The Problems of Pregnancy and Tuberculosis." The medical section of the county medical society and the Detroit Diabetic Association were addressed February 13 by Dr Irvine McQuarrie, Minneapolis, on "Significance of the Inorganic Metabolism in Diabetes Mellitus." Dr Plinn F. Morse, Detroit, discussed "Causes of Sudden Death" before the Ingham County Medical Society, Lansing, March 21. Dr E. Perry McCullagh, Cleveland, reviewed "Recent Trends in Clinical Endocrinology" at a meeting February 21.

**Graduate Conferences for Physicians**—Dr Benjamin W. Carey Jr., assistant professor of pediatrics, Wayne University College of Medicine, Detroit, will open a series of graduate conferences for physicians April 5, when he will discuss "Current Practice in the Treatment of Pneumonia in Infancy and Childhood. Report of Studies of Types of Organisms Involved, of the Status of Specific Sera and of the Use of Pyridine-Sulfanilamide." Other speakers in the series include:

Drs Richard M. McKern, Cordon B. Myers, Daniel P. Foster, Samuel S. Altshuler, all of Detroit; Diabetes.  
Dr David Slight, Chicago, Relationship of Psychiatry to Private Practice.  
Dr Cyrus C. Sturgis, Ann Arbor, Menace and Treatment of Obesity.  
Some Common Sense Remarks.

A course in pediatrics will be presented at the Henry Ford Hospital, Children's Hospital of Michigan and the Herman Kiefer Hospital, all of Detroit, April 3-5. Both programs are sponsored by the Wayne County Medical Society, Detroit Department of Health, Wayne University College of Medicine, Michigan Branch of the American Academy of Pediatrics, Michigan Society for Mental Hygiene, Inc., and the Michigan Department of Health.

### MISSOURI

**The Jackson County Forum**—Dr Harold S. Diehl, Minneapolis, will be the speaker in the Jackson County Health Forum April 19, on "The Common Cold." Subsequent lecturers in the monthly meetings include Drs Oscar W. Bethea, New Orleans, Louis J. Karnosh, Cleveland, Rock Sleyter, Wauwatosa, Wis., Thurman B. Rice, Indianapolis, and Franklin C. Bing, Ph.D., Chicago. Father Alphonse M. Schwitalla spoke in January on "How a Medical School Makes Doctors." Dr William A. O'Brien, Minneapolis, in February on "Health Problems of Middle and Late Life," and Dr Morris Fishbein, Chicago, Editor of *THE JOURNAL*, in March on "Cancer." The forum was organized in January 1938 under the auspices of the authorities of the accredited hospitals of Jackson County with the approval of the county medical society. The monthly lectures are open to the public. The city cooperates by providing free of charge a hall in the Municipal Auditorium, and the public relations committee of the Jackson County Medical Society acts in an advisory capacity to the health forum in selecting their speakers and planning their programs.

### NEW JERSEY

**Personal**—Dr William J. Carrington, Atlantic City, president of the Medical Society of New Jersey, recently received the annual achievement award of the Atlantic City Press Club. The honor is granted each year to the citizen considered to have done most to publicize Atlantic City.

**Society News**—At a meeting of the Essex County Medical Society, Newark, March 9, the speakers were Dr Arthur R. Casili, Elizabeth, 'Organization and Function of a Cancer Clinic', Edward W. Sprague, 'Surgery in the Treatment of Cancer', and Milton Friedman, 'Radiation Therapy in Cancer'. Dr Harrison S. Martland gave a demonstration of cancer material through the episcopes.—Dr Robert A. Kilduffe, Atlantic City, addressed the Essex County Anatomic and Pathologic Society in Newark March 23 on clinical utilization of studies of the blood.—Dr Thomas M. McMillan, Philadelphia, addressed the Camden County Medical Society, Camden March 7, on 'Rheumatic Fever and Rheumatic Heart Disease'.

### NEW YORK

**Lead Poisoning Traced to Nipple Shields**—The death of an infant from lead poisoning traced to lead nipple shields used by the mother recently led the Public Health Council to adopt an amendment to the Sanitary Code prohibiting the sale or use of such shields. The state department of health conducted a survey of drugstores, hospitals and physicians. The information showed that the use of lead nipple shields is not common but that it is easy to procure them.

**Gastro Enteritis Outbreak**—About half the 200 occupants of an institution in Dutchess County were affected in a recent outbreak of gastro enteritis traced to raw milk. No cases developed after December 22 when a pasteurized supply of milk was substituted for the raw supply. Mastitis was found in twelve of twenty-four cows in the herd supplying the institution's private dairy, and culture of the milk yielded a variety of organisms, including *Bacillus coli* and *Staphylococcus aureus*. One of the milk handlers had a digestive disorder for several days prior to the outbreak but continued to handle the milking machine.

### New York City

**Rockefeller Physiologist Drowned**—Alfred George Jacques, Ph.D. assistant in general physiology at the Rockefeller Institute for Medical Research, was drowned February 20 near Hamilton Bermuda, while dredging in shallow water for biologic specimens. Dr Jacques, a native of England had been on the institute staff since 1926 except for one year when he was a teaching fellow at Harvard University. He was 42 years old.

**Medicomilitary Exhibit**—An exhibit on medicomilitary preparedness will be presented at the Seventy-First Regiment Armory April 10 under the auspices of the medical officers of the organized reserve of the metropolitan area. In addition to exhibits that were shown at the first event of this kind last year, there will be novel presentations by veterinary and chemical warfare officers. Exhibits that will be repeated from last year include the four-wheel drive ambulance that can climb a 45 degree grade in rainy weather, a convertible ambulance body that can carry five ambulatory or four litter patients, an airplane crash outfit, and an arctic rescue unit. National Guard officers and officers of the regular army, the medical and veterinary professions, medical students and nurses and the public are invited to attend. The Armory is at Thirty-Fourth Street and Park Avenue. The exhibit will be on view from 7:30 to 11 p.m.

**Society News**—The Cornell University College Alumni Association will hold its annual 'Spring Day' April 20.—Mr. Louis H. Pink, superintendent of the Insurance Department of the State of New York, addressed the Medical Society of the County of Queens February 28 on 'Voluntary Hospital and Medical Association and the State'. Dr. Joseph Harkavy gave a Friday afternoon lecture March 17 on 'Allergy in Relation to Internal Medicine'.—Speakers at a meeting of the New York Roentgen Society March 20 were Drs. William Harris, Robert I. Walter and Arnold L. Bachman on 'Treatment of Ovarian Carcinoma' and Jacob R. Freid and Henry Goldberg, 'Postirradiation Changes in the Lung: A Clinical Roentgenological and Pathological Study with Emphasis on the Late and Terminal Stages'.—Dr. Ramon Castroviejo addressed the Sociedad Medica Hispano Americana of New York February 28 on 'Ocular Surgery'.

### NORTH CAROLINA

**Personal**—Dr. Ballard L. Norwood Jr. now on duty at a CCC camp at Greenwood S. C., has been appointed health officer of Granville County to succeed Dr. Joseph A. Morris, resigned. Dr. Norwood will take a course in public health at the University of North Carolina before assuming the position July 1.

**Addition to Duke Hospital**—Plans for an addition of 200 rooms to Duke Hospital, Durham, were recently announced. The new building will add from 100 to 120 beds, bringing the hospital's capacity to more than 550 beds. The new unit will be five stories high, the first two floors to be devoted to the private clinics and the upper three to private and semiprivate rooms. It is expected that the building will be ready for occupancy in the summer of 1940.

**Mental Hygiene Meeting**—Drs. Lauren H. Smith, Philadelphia and Fredric M. Hanes, Durham, addressed the North Carolina Mental Hygiene Society at its third annual meeting in Durham February 24 on 'Community Aspects of Mental Hygiene' and 'The Role the Medical School Should Play in Promoting Mental Hygiene' respectively. Officers were elected as follows: Dr. William Rancey Stanford, Durham, president; Mr. John S. Bradley, Durham, vice president; and Harry W. Crane, Ph.D., Chapel Hill, secretary.

### OHIO

**Grant for Research**—The Commonwealth Fund of New York recently granted to the Institute of Pathology at Western Reserve University School of Medicine, Cleveland, \$8,360 to be used in studies of the chemistry of immunity. This work has been in progress for two years under the leadership of Enrique Eduardo Ecker, Ph.D., associate professor of immunology.

**Medical Library Association**—Dr. Carl H. Lenhart was reelected president of the Cleveland Medical Library Association at the annual meeting January 20 and Dr. Frank S. Gibson was made chairman of the board of trustees. Dr. Charles W. Stone, retiring chairman of the board, reported that the library now has more than 53,000 volumes, it subscribes to 444 journals in various languages and during 1938 had 12,828 readers. Dr. Louis J. Karnosh gave an address at the meeting entitled 'The Psychiatrist Considers Bibliomania'.

**County Society's Radio Program**—The Summit County Medical Society, Akron, is presenting a series of dramatized radio programs entitled 'The Durand Baby' over Station WADC in Akron which began Saturday, March 11. Local physicians accompany the dramatizations with a three minute summary of the educational features of the program. Actors are being obtained from the Radio Speech Department of the University of Akron. The scripts are furnished by the Bureau of Health Education of the American Medical Association. Additional series of dramatized programs are contemplated when 'The Durand Baby' series has been finished.

### PENNSYLVANIA

**Society News**—Dr. George J. Thomas, Pittsburgh, among others, addressed the Westmoreland County Medical Society at a meeting at the Mountain View Hotel near Greensburg, on recent developments in anesthesia.—Dr. Russell L. Cecil, New York, addressed the Cambria County Medical Society, Johnstown, March 9 on pneumonia.—Dr. Frank W. Burge, Philadelphia, addressed the Lebanon County Medical Society, Lebanon, March 14 on 'Trends in the Diagnosis and Treatment of Pulmonary Disease'.—Dr. Charles Mazer, Philadelphia, addressed the Lycoming County Medical Society, Williamsport, March 10 on 'The Uses and Abuses of Endocrine Products'.

### Philadelphia

**Society News**—At a meeting of the Philadelphia Neurological Society February 24 the speakers included Drs. Michael Scott and Ernest E. Aegerter on 'The Possible Role of Arsenic in Disturbances of the Nervous System Attributed to Avitaminosis, with Special Reference to Pellagra'. Ernest A. Spiegel, Philadelphia, and Norman P. Scala, Washington, D. C., 'Interference Phenomena Between Optokinetic and Labyrinthine Nystagmus'.

**Portrait of Henry Phipps**—An oil painting of Mr. Henry Phipps was presented January 20 to the Henry Phipps Institute of the University of Pennsylvania by members of the Phipps family. Thomas S. Gates, LL.D., president of the university, accepted the gift, which was presented by Dr. Charles J. Hatfield, associate director of the institute, on behalf of the donors. Dr. Esmond R. Long, director, reviewed the institute's scientific achievements.

**Annual Banquet**—The Northern Medical Association of Philadelphia held its ninety-third annual banquet, March 20, with Dr. David Riesman as toastmaster. The guests of honor

were Drs Isidore W Held, clinical professor of medicine, New York University College of Medicine, New York, George M Dorrance, professor of faciomaxillary surgery, University of Pennsylvania School of Medicine, Randle C Rosenberger, professor of preventive medicine and bacteriology, Jefferson Medical College, and Edward J G Beardsley, clinical professor of medicine, Jefferson Medical College. Dr Beardsley spoke on "Medicine—Yesterday, Today and Tomorrow."

**Auxiliary Sponsors Annual Health Institute**—The ninth annual health institute sponsored by the Woman's Auxiliary to the Philadelphia County Medical Society will be held April 11. The program is planned to indicate "Seven Stages of Health" with the following speakers

Dr Philip F Williams Prenatal Stage  
Dr Edward L Bruer Infant Stage  
Dr Howard Childs Carpenter Childhood Stage  
Dr Charles W Dunn Adolescent Stage  
Dr Charles L Brown Maturity Stage  
Dr Percil Brooke Bland Menopause Stage  
Dr Edward L Bortz After Sixty Stage

Dr Francis F Borzell, president of the Philadelphia County Medical Society, will preside at the morning session and Mrs Walter F Donaldson, Pittsburgh, president of the Woman's Auxiliary to the Medical Society of the State of Pennsylvania, at the afternoon session

### Pittsburgh

**Society News**—At a meeting of the Pittsburgh Surgical Society March 10 the speakers were Drs Stuart N Rowe, on "Treatment of Brain Abscess", John W Stinson, "Pulsating Tumor of the Orbit", James A Cowan Jr, Samuel R Haythorn and William H Guy, "Hemangiomas, Their Pathology and Technic of Removal", and George V Foster, "Technic of Fixation of Bone Grafts".—At a meeting of the Pittsburgh Academy of Medicine February 28 the speakers were Drs George E Martin, on "Primary Tuberculosis", deWayne G Richey, "Chemotherapy in Otolaryngology," and Harold W Jacob, "Considerations of Lymphoblastoma from a Radiologists Standpoint"

### TENNESSEE

**Graduate Lectures in Pediatrics**—The committee on graduate instruction of the Tennessee State Medical Association is sponsoring a course in pediatrics organized in the same manner as one on obstetrics recently completed. Instruction began February 20 in the first circuit, which includes the following towns: Bolivar, Brownsville, Covington, Jackson and Selmer. The course will cover the state in two years. The lecturer is Dr Willis H Thompson, Minneapolis. The subjects to be covered will be the growth and development of the normal infant, breast feeding, artificial feeding of the normal infant, difficult feeding cases, the premature infant, gastrointestinal diseases, prevention and treatment of contagious diseases, care of the allergic child, tuberculosis and congenital syphilis and respiratory infections. Dr John M Lee, Nashville, is chairman of the committee on postgraduate instruction. Contributing agencies that have made this work possible are the Vanderbilt University School of Medicine, Nashville, the University of Tennessee School of Medicine, Memphis, the Tennessee State Medical Association, the State Department of Health and the Commonwealth Fund of New York.

**Society News**—Drs James E Paullin, Atlanta, and James S McLester, Birmingham, addressed the Davidson County Medical Society, Nashville, January 26 on "Diabetes" and "Newer Knowledge of Nutrition and Vitamins" respectively.—Nashville physicians presented the program at a meeting of the Tri-County Medical Society (Henry, Weakly and Carroll counties) in Huntington February 7. Drs John O Manier on "Recognition and Management of Certain Vascular and Cardiac Emergencies", Charles M Hamilton, "Value of X-Ray Therapy in Ordinary Infections," and Leonard W Edwards, "Surgical Management of Peptic Ulcers".—Dr William J Cameron, Sweetwater, addressed the Monroe County Medical Society, Sweetwater, January 31 on "Physiology of the Ovary".—Dr John M Boylin, Bristol, Va., addressed the Sullivan-Johnson County Medical Society in Bristol February 1 on hypothyroidism.—Dr Harrison H Shoulders, Nashville, addressed the Memphis and Shelby County Medical Society January 17 on medical economics.—Dr Charles Gordon Heyd, New York, addressed the Nashville Academy of Medicine and Davidson County Medical Society February 7 on "Gallbladder Disease."

### VIRGINIA

**Personal**—Dr Robert B Hightower, who has been instructor in pediatrics under the auspices of the department of clinical and medical education of the Medical Society of Virginia, has resigned to accept a position as assistant director of school medical inspection in the District of Columbia.—Dr Reid White Jr, Lexington, who has been physician to Washington and Lee University for several years, has been appointed full time medical director.

**Hospital News**—Dr David L Harrell Jr, first assistant physician at the State Colony for Epileptics and Feeble-minded, Colony, has been appointed superintendent of a new institution at Petersburg for the care of the Negro feeble-minded. The new colony was to start operations January 1.—Dr George B Arnold, superintendent of the State Colony for Epileptics and Feeble-minded, Colony, has been appointed to the state advisory board on mental hygiene.—Dr James B Nichols, medical director of Catawba Sanatorium, Catawba Sanatorium has been named superintendent, a new position, according to a newspaper report.

### WEST VIRGINIA

**Pilgrimage to Pittsburgh**—The West Virginia Obstetrical and Gynecological Society will make its annual clinic pilgrimage April 3-4 to Pittsburgh. The group will visit operative clinics at Magee, Pittsburgh and Mercy hospitals and will hear a symposium on gynecology and obstetrics, led by Dr Paul Titus at St Margaret Memorial Hospital. They will also visit Allegheny General and Montefiore hospitals.

**Society News**—The Taylor County Medical Society was the first in the state to report all 1939 dues paid.—Dr Louis H Douglass, Baltimore, addressed the Kanawha County Medical Society, Charleston, February 14 on "Analgesia in Obstetrics".—Dr James Edwin Wood Jr, Charlottesville, Va., addressed the Raleigh County Medical Society, Beckley, February 16 on "Recent Advances in the Study of Hypertension and Their Influences on Therapy."

### GENERAL

**Physicians Wanted for CCC Duty**—Vacancies now exist in the Civilian Conservation Corps in the Eighth Corps Area wherein the services of civilian physicians can be utilized as contract surgeons. Applicants should be graduates of class A medical schools. Applications should be addressed to The Surgeon Headquarters Eighth Corps Area, Fort Sam Houston, Texas.

**Examinations in Internal Medicine**—Written examinations for certification by the American Board of Internal Medicine will be held in various sections of the United States on the third Monday in October and the third Monday in February. Formal application must be received by the secretary before August 20 for the October examination and by Jan 1, 1940, for the February 1940 examination. Application forms may be obtained from Dr William S Middleton, secretary, 1301 University Avenue, Madison, Wis.

**Committee to Aid Settlement of Foreign Physicians**—Announcement is made by Dr Laurence Farmer, executive secretary of the Emergency Committee in Aid of Displaced Medical Scientists, that a committee entitled "Central Committee for the Resettlement of Foreign Physicians," has been established at 165 West Forty-Sixth Street, New York City, with the objective of handling the problems of the practicing refugee physician. In association with this committee, the Emergency Committee in Aid of Displaced Foreign Medical Scientists will take over the question of placement of research workers engaged in full-time laboratory or clinical investigation.

**Meeting of Anatomists**—The fifty-fifth session of the American Association of Anatomists will be held in Boston April 6-8 at the invitation of Boston University School of Medicine, Harvard Medical School and Tufts College Medical School. Meetings will be at Harvard and headquarters at the Hotel Somerset. More than 100 papers will be presented and Friday afternoon will be devoted to demonstrations. Dr Stephen W Ranson, Chicago, will deliver his presidential address Thursday afternoon, April 6, on "The Hypothalamus as a Thermostat Regulating Body Temperature." The meeting will end with a general session at which the following invited speakers will appear: Dr George W Corner, Rochester N Y, on "Sus Mus and Rhesus: A Retrospect of Twenty-Five Years", Edgar Allen, Sc D, New Haven, Conn.,

"Some Recent Studies of Reproduction and Associated Inducements," and Carl G. Hartman, Ph.D., Baltimore, "Studies on Reproduction in the Monkey and Their Bearing on Gynecology and Anthropology."

**Associated Postgraduate Committees**—The Associated Postgraduate Committees, a national organization of the graduate committees of the state medical societies has drawn up a constitution and a set of by-laws to be acted on at its meeting in St. Louis May 17. The organization is a voluntary association of the state committees to assist each other in furthering graduate education among the entire medical profession and to cooperate with the Council on Medical Education and Hospitals of the American Medical Association and all other special organizations composed of members of the American Medical Association as well as with the U. S. Public Health Service, the U. S. Children's Bureau and other federal and state agencies who seek to give graduate instruction to the medical profession. The Associated Postgraduate Committees was organized during the annual session of the American Medical Association in Atlantic City in June 1937. At a meeting in San Francisco in June 1938 it was recommended that the Council on Medical Education and Hospitals of the American Medical Association continue the collection of information on graduate education, especially in regard to graduate instruction for practitioners, and that *THE JOURNAL* should be requested to emphasize the importance of graduate extension courses.

**International Congress for Microbiology**—The third International Congress for Microbiology will be held at the Waldorf Astoria Hotel New York, September 2-9, under the presidency of Dr. Thomas M. Rivers, New York. All persons interested in microbiology are entitled to become members of the congress on payment of a fee of \$5, and prospective members are urged to register in advance by mail. Scientific sessions of the sections of the congress will be held each morning; afternoon sessions of the whole congress will take place on Monday, Wednesday and Friday. Among those who will speak at the general sessions according to the preliminary program, are:

Dr. Paul G. Fildes, London Bacterial Nutrition  
Dr. A. J. Kluyver, Delft Bacterial Metabolism  
Prof. John R. Marrack, London Immunochemistry  
Prof. Eduard Reichenow, Hamburg Endothelial Development of the Malarial Parasite  
Wendell M. Stanley, Ph.D., Princeton N. J. Viruses  
Dr. Arne Tiselius, Uppsala Sweden Electrophoresis

Sections have been arranged for the following topics: general biology, variation and taxonomy, general biology, microbiologic chemistry and physiology, viruses and viral diseases, rickettsiae and rickettsial diseases, protozoology and parasitology, fungi and fungous diseases, medical and veterinary bacteriology, agricultural and industrial microbiology, and immunology. Inquiries should be addressed to the office of the general secretary, Dr. Martin H. Dawson, College of Physicians and Surgeons, Columbia University, 620 West One Hundred and Sixty-Eighth Street, New York.

### LATIN AMERICA

**Lectures in Havana**—A group of the faculty of Cornell University Medical School, New York, lectured at the University of Havana, Cuba, February 27 to March 7. The following lectures were presented:

Symposium on Diagnosis and Treatment of Peptic Ulcer: Drs. Arthur L. Holland, George J. Heuer and Sydney Weintraub  
Symposium on Diseases of the Biliary Tract: Drs. Weintraub and William DeWitt Andrus  
Intestinal Tuberculosis: Secondary Ulcerative and Hypertrophic: Dr. Edgar Mayer  
Surgery of the Common Bile Duct: Dr. Andrus  
Symposium on Diagnosis and Treatment of Chronic Ulcerative Colitis: Drs. Heuer and Thomas T. Mackie  
Diagnostic Methods in Gastroenterology: Drs. Holland and Weintraub  
Nutritional Deficiencies in Relation to Chronic Gastrointestinal Disease: Dr. Mackie  
Newer Concepts of the Therapy of the Intestinal Parasites: Dr. Wilson G. Smilie  
Symposium on Everyday Problems in the Differential Diagnosis of Chronic Pulmonary Disease: Drs. Mayer and Weintraub

### CORRECTION

**Average Census of Patients in Hospital**—Bryan Memorial Hospital, Lincoln, Neb., writes that it should have reported eighty patients as the average census for that hospital for the last year rather than sixty as was reported and published in the Hospital Number of *THE JOURNAL*, March 11, page 963.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Feb. 21, 1939

### The Action of Alcohol

In 1916 an advisory committee was appointed by the Central Control Board (liquor traffic) to consider the physiologic action of alcohol and particularly the effects on health and industry of beverages of various alcoholic strengths. The committee consisted of the pharmacologists Cushny and Dale, the physiologist Sir Charles Sherrington, the pathologist F. W. Mott, the psychologist William McDougall, the statistician Major Greenwood, and others who produced a report in 1918. On the dissolution in 1921 of the board, the government invited the Medical Research Council to reappoint the advisory committee, who produced in 1924 a second edition. With a continued demand for the report, further revision became desirable. A third edition has now been produced by Dale, Greenwood Mellanby, the psychologist C. S. Myers and Sir Charles Sherrington, in the form of a book of 175 pages, entitled "Alcohol, Its Action on the Human Organism." It is the most authoritative teaching extant on the subject and covers all the points which are still a subject of discussion. Following are some of the conclusions:

Alcohol is rapidly absorbed from the stomach and intestine and distributed by the blood to the different organs. A variable but always small proportion escapes unchanged in the breath and urine. The rest is slowly oxidized, disappearing from the blood at the rate of about 0.185 cc. per kilogram of body weight an hour. The energy liberated by the combustion of a moderate amount of alcohol can be used by the body, and therein lies the whole value of alcohol as a food. But in this value alcohol has no advantage over the much cheaper sugar and its action as a drug has to be considered. This is mainly on the nervous system. Alcohol has no practical value as a direct stimulant of the heart in cases of threatened failure. When it appears to promote recovery from fainting, this is due to its irritant action on the mucous membrane of the mouth and is comparable to the action of smelling salts. When, in conditions of more protracted cardiac weakness, alcohol has a beneficial effect, this is due mainly to its mildly sedative action, relieving the centers which modify the action of the heart from the disturbing influence of pain and anxiety. The mildly narcotic action of alcohol is the most important effect from the therapeutic point of view. It may relieve distress and promote sleep, but it must be prescribed with care and judgment. During convalescence or in a chronic illness it may improve the appetite.

### ALCOHOL AND ROAD ACCIDENTS

Alcohol impairs skilled movements, and this fact is most important in the driving of automobiles. Vernon made an experimental study, by means of an artificial motor-driving apparatus, on the effects of small quantities of alcohol (from 20 to 45 cc. in the form of whisky) taken on a practically empty stomach, on the driving capacity of various persons. He found that by far the majority drove more quickly and more erratically than in normal circumstances. For the most part they did not realize that they were driving faster, but one deliberately drove more slowly because he realized his reduced control and several drove for short distances with a rush and then slowed down before again driving faster. There was far greater variability not only in speed but also in accuracy and carefulness after alcohol had been taken. This was noticeable even after the amount of alcohol was reduced to



that contained in half a tumbler of mild beer (5 cc) Some persons were certain that they were driving better although they were driving worse Other experiments revealed not only an impairment of attention to signals and environment but also slower responses of the eyes, hands and feet There were wide individual differences in the mental effects, depending on the kind of alcoholic drink and previous habituation to alcohol

### Organization of Medical Services in War

In an address to representatives of the profession at the house of the British Medical Association, Dr Walter Elliot, minister of health, explained the medical arrangements which have been made for war The country had been divided into twelve regions, each controlled by a regional commissioner, who would have a staff of some magnitude On this staff would be a principal medical officer to supervise and control all the medical services in his area He would have a number of medical officers working under him, including a hospital officer The medical staff would see that supplies of bedsteads, bedding, dressings and drugs were available The ministry of health would collaborate with the central and local emergency committees of the British Medical Association The central committee had compiled a register comprising 95 per cent of the medical profession, showing each physician's special qualifications and experience and the type of war work for which he considered himself best suited The ministry of health, having under its supervision the organization of emergency hospital services, first aid posts and ambulance services, could earmark beforehand a certain proportion of physicians to their war time jobs There were five groups (1) physicians who could give full time service in the forces, (2) those required for hospital service, (3) those to control the first aid posts, (4) medical officers of government departments and local authorities and (5) medical boards for examination of recruits There would remain a number of general practitioners who would maintain the essential medical services for the civilian population Physicians engaged whole time in civilian casualty service would be paid at rates comparable to those of the army medical service Those serving at first aid posts would be paid at the rate of \$7.50 for two hours and \$15 for a longer period

### Society for the Protection of Science and Learning

The Royal Society in combination with the British Academy gave a reception to the scientists and scholars who have taken refuge in this country from the persecution on the continent and are under the care of the Society for the Protection of Science and Learning The guests were received by the president of the Royal Society, Sir William Bragg As usual with the receptions of the Royal Society, the ambassadors accredited to Great Britain were invited but not those of the two countries principally responsible for the persecution This reception is one of a number of meetings to be held in London and throughout the country to make known the work which is being done for the refugees Meetings under distinguished patronage have been held in the Great Hall of University College, London, and at the Universities of Oxford and Cambridge under the presidency of the vice chancellors In the *British Medical Journal* Prof Major Greenwood, FRS, makes an appeal on behalf of the Society for the Protection of Science and Learning He argues that scientists trained in different schools from ours have different points of view and bring here a new outlook What is good in their methods will be grafted onto our stock and the range of scientific work will be increased If we are to live under the menace of a world war, to shelter medical scientists is to add to our resources In the event of what is euphemistically described as "an emergency," the supply of technicians will fall short of the demand

and the new source of supply would be valuable Professor Greenwood draws a parallel with Huguenot persecution, by which France lost her keenest brains and nimblest fingers and other countries, particularly England, gained Huguenots introduced new industries and distinguished themselves in all the higher walks of life An example, among many others, is De Moivre, who came to England a poor refugee He was a great mathematician, and the time came when Newton was asked questions about his discovery of "fluxions" (the differential calculus) and replied "Go to Mr De Moivre, he understands these things better than I do"

### Medical Arrangements for a National Emergency

In the "Statement Relating to Defense" submitted to parliament, which shows that the estimate of \$7,500,000,000 given two years ago has been substantially exceeded, the medical arrangements are described as follows Plans have been completed for finding nearly 200,000 beds in existing hospitals and institutions within twenty-four hours after a state of emergency is declared by sending patients home and transferring them to other accommodations and by putting additional beds and equipment in the wards Another 100,000 beds will be obtained later by using parts of hospitals not at present used as wards For this purpose 50,000 beds and mattresses have been obtained and already are in process of distribution Orders have been placed for 200,000 blankets, and tenders have been asked for a further supply of beds Plans have also been made for linking the hospitals in war time and are being discussed with the hospital authorities The health departments' hospital officers have listed buildings and land adjoining hospitals suitable for expansion, and plans for new hospital units are under consideration

The government has accepted the recommendations of the committee on evacuation in favor of the transfer, within the limits of accommodation in less vulnerable areas, from densely populated areas of persons who could be spared An emergency scheme, prepared at the time of the crisis in September and modified in the light of experience then gained can be put into force at any time A circular letter has recently been sent to all local authorities in receiving areas asking for an immediate survey of available accommodations It is proposed that school children shall be evacuated under the supervision of teachers and other helpers, and young children with their mothers

By the end of the year 40,000,000 respirators for the public had been distributed to the local authorities During the crisis in September they were distributed to the public Large orders have been placed for the various types of equipment required for air raid personnel Discussions have taken place with the persons in charge of electricity, gas and water undertakings, with railway and transport companies and with the London transport board and dock and harbor authorities on the special measures to be taken for protection against air attack

### An Emergency Obstetric Service

An emergency obstetric service is being introduced in this country and has just come into force in London The object is to deal with the acute obstetric emergencies of patients who cannot be moved to a hospital without undue risk and who cannot be adequately dealt with by the consultant obstetric service of the borough in which they live The new service is designed not as an alternative to hospital treatment but solely for cases in which removal to a hospital would be dangerous It is anticipated that the majority of patients for whom it will be used will be suffering from postpartum hemorrhage, and the emergency unit will have available the apparatus for blood transfusion

In London the physician or midwife in charge will send a telephone message to the London County Council Ambulance



Service and ask for the emergency obstetric service, giving the patient's name and address and the nature of the emergency. The emergency unit, consisting of an obstetric surgeon, a midwife and the appropriate equipment, will be sent as speedily as possible to the patient's house. Should blood transfusion be necessary a supply of stored blood will be readily obtained from the council's hospitals. Midwives have the right to call out the emergency service only if they find it impossible to obtain a physician and they find the emergency grave. The local borough council will be responsible to the obstetric surgeon for an inclusive fee of \$26 for patients who cannot afford to pay his ordinary fee but reserves the right to ask the patient's husband to contribute a portion or the whole.

## PARIS

(From Our Regular Correspondent)

Feb 18, 1939

### Immunity in Venereal Lymphogranuloma

A contribution to the study of immunity possessed by different tissues toward the virus of venereal lymphogranuloma was presented by Dr Daminopetros of the Pasteur Institute of Athens at the January 24 meeting of the Académie de médecine de Paris. The author found that in venereal lymphogranuloma each receptive tissue has specific reactive powers which determine the character and evolution of the infection. This explains why involvement of the inguinal lymph nodes will heal in from six to eight months, whereas not only will proctitis persist for a much longer time but its evolution is much slower. A specific immunity of the female genital tract is the reason why localization there is comparatively rare in spite of a prolonged sojourn of the virus in the body. The systemic immunity following an involvement of the inguinal lymph nodes or of the rectum has no influence on the local lesions. This systemic immunity, as is shown by the cutaneous allergic reaction and the resistance of other potentially receptive tissues, is due to the direct action of the virus circulating in the blood. A virus the activity of which has been destroyed by the antigen injected subcutaneously or intravenously several times a week over a long period will not give rise to the general refractory state or the allergic cutaneous reaction and cannot protect the organism against an experimental infection.

The neutralizing products of the virus which circulate in the blood have a low threshold both in cases of proctitis and in cases of lymph node involvement when either the virus or the antigen is injected. Seroflocculation is distinctly positive only during the height of the inguinal infection. The serum of convalescents when injected subcutaneously and intraperitoneally into guinea pigs does not possess any preventive action toward an experimental infection. The injection of such serum subcutaneously, intravenously or even into infected areas appears to have no influence on the evolution of proctitis or lymph node involvement. On the other hand, the injection of the antigen into the infected tissues in cases of proctitis or lymph node involvement has a distinct curative influence and hence can be utilized in treatment. The author believes that the difference in the receptivity of various tissues is probably true for all types of infections.

### Multiple Electro-Encephalogram for Normal Persons

Prof Hans Berger of Jena read a paper at the International Psychologic Congress in Paris in 1937 in which he reported observations that only a single electro-encephalogram existed for the entire brain. This would mean that the bio-electric activity is the same in all parts of the cortex. At the January 24 meeting of the Académie de médecine de Paris, Prof A. Baudouin and his co-workers presented a paper in which their study of the question failed to corroborate the observa-

tions of Berger. They explored simultaneously two or three cerebral regions with the aid of the same number of amplifiers connected with a corresponding number of oscillographs. In the majority of the experiments the activities of the precentral and occipital regions were found to be independent, even though the two regions are the seat of alpha waves which coincide occasionally. Homologous regions of the two hemispheres may give rise to tracings which resemble one another but are without total concordance in the time of acceleration of alpha waves. Synchronism of the waves is noted for only short periods in triple electro-encephalograms (three recordings at three points of a hemisphere). The conclusion which can be drawn from these observations is that all cortical nerve areas have their independent electrical activities but that the latter are more or less coordinated. The frequency of cortical waves increases from a state of inhibition to one of activity in passing a state of physiologic rest.

### Certain Monkeys and the Influenza Virus

Various investigators have found that the ferret, mouse, rabbit, rat, guinea pig, hog and hedgehog are susceptible to the virus of influenza. At the January 24 meeting of the Académie de médecine de Paris Professor Levaditi reported the research of Dr Jean Vieuchange on inoculation of certain species of monkeys with the virus of influenza. This study was made before the author was aware of similar investigations by Dochez and his co-workers and by McIntosh and Selbie.

Although the experiments made by Vieuchange have not definitely solved the problem, the concordance of results permitted the following conclusions:

- 1 Inoculation of *Macacus rhesus* by the nasal route with the virus of influenza (human strain W S passed through the ferret and mouse) is followed by clinical and radiologic signs which indicate a generalized infection and a simultaneous pulmonary localization.

- 2 The saliva is virulent during the course of an experimental influenzal infection. There is also an invasion of the blood stream. It was possible to find the virus in the blood in one experiment on the seventh and sixteenth days after inoculation.

- 3 The animal serum acquires a marked neutralizing power toward the influenza virus.

- 4 If no clinical or radiologic signs are found after inoculation, it is justifiable to speak of a nonapparent infection, because the virus can be found in the saliva and blood of the monkey during the first few days. In one animal, which showed no signs of reaction after two inoculations, neutralizing properties were demonstrable in the serum.

### Program of Psychiatric and Neurologic Congress

The forty-third congress of the French Psychiatric and Neurologic Society will be held at Montpellier, in southern France, September 21-26. The president is Prof Henri Roger of Marseilles and the vice president Dr A. Porot of Algiers. The questions selected for special discussion are mental anorexias, immediate and late neurologic and psychiatric sequels of head injuries and follow-up studies of the criminal insane and of delinquents. Information with regard to the meeting can be obtained by writing to Prof P. Combemale, route d'Ypres, Bailleul, Nord.

### Election of Fellows in Académie de Médecine

At a recent meeting of the Académie de médecine, the leading medical society here, Dr Philip Pagniez of Paris was elected a fellow. Drs Castex of Buenos Aires, Argentina, and Nolf of Brussels were elected foreign associates. Dr Pagniez is attending physician to the public hospitals of Paris and has made important contributions to the study of epilepsy.

# BERLIN

(From Our Regular Correspondent)

Feb 6, 1939

## Statistics on Epidemic Encephalitis

Dr Nagel of the psychiatric clinic of Munich University has compiled comprehensive statistics relative to 362 patients admitted there during the years 1917-1937 with a diagnosis of epidemic encephalitis or a condition simulating this disease. Even without including the patients who were merely examined at the clinic, there were 63.5 per cent of males and 36.5 per cent of females. Cases of acute involvement exhibited a peak in 1918-1919, a second and highest peak in 1920 and a smaller peak in 1923. The months of greatest morbidity were January, February and March. Study of the distribution according to age showed persons in the second and third decades to be most often severely affected (34.6 per cent and 33.2 per cent, respectively). The mean age of the male patients was 23 and of the female patients 23½. With regard to the symptoms, this survey contributed nothing essentially new. It is noteworthy, however, that nearly one half of the patients suffering from the sequels of epidemic encephalitis were unaware that they had experienced a disease of this nature, and 14 per cent of the erstwhile patients could give no account of their illness. Furthermore, intercurrent illness was shown to be exacerbated by parkinsonism, in 36 per cent of the cases no interval was discernible between acute illness and the parkinsonian syndrome. At the time of release from the hospital, 76 per cent of the patients had to be classed as unfit for work, 21 per cent were transferred directly from the clinic to other institutions.

## Medical Problems in the Substratosphere

The substratosphere was recently discussed before the Berlin Medical Society by Professor Strughold, who holds a special commission as instructor in air medicine. Recent records for altitude (around 17,000 meters) attained by fliers were made possible by the respiration of oxygen and the wearing of clothing designed to counteract excessive pressure. Even altitudes reached in ordinary flight (from 6,000 to 10,000 meters) are important. The changes produced in bodily function by ascent to high altitudes make their clearest imprint on the reflex action, this has been proved by experimentation in the low-pressure chamber. The effect of altitude was observed to progress according to definite stages. The first manifestation is a weakening of the reflexes, this sets in simultaneously with compensatory action of the respiration and circulation after transgression of the threshold of reaction. After the threshold of disturbance has been passed the efforts of the organism to aid itself become inadequate and an exaggeration of reflexes ensues. At this stage respiration of oxygen is unqualifiedly necessary. After passage of a critical threshold the exacerbation of reflexes leads to altitude cramps, which, apart from central influences, are to be interpreted as disturbances of the normal reflexes. At this stage all manifestations are nullified by respiration of oxygen. First after the lethal threshold has been passed do the cramps reach an irremediable state, which is followed by altitude death. If at a certain level the respiration of oxygen was suspended, all the foregoing states were exactly recapitulated as in actual ascent. The time elapsing from the interruption of the oxygen till arrival at the threshold of disturbance is the time reserve, this is dependent on the altitude attained and on the work performed and it presents great individual differences. However, the time reserve of the experimental human subject apart from slight variations is mostly a constant value. Only after performance of work does it tend to diminish. In parachute jumping from great heights a knowledge of the concept of

time reserve is particularly necessary. Otherwise, as often happens, the parachute is unfolded at too great an altitude and the jumper does not reach the levels of more abundant oxygen until a period far in excess of his time reserve has elapsed. Accordingly it seems expedient that the flier who jumps from great altitudes should open his parachute first at a level in which oxygen is abundant. Thus he will be able to traverse the dangerously high levels at a greater velocity and within a period well under his time reserve.

## Misuse of Boric Acid and Iodine

Acting on orders from the reichspräsident, the national minister of the interior has issued two warnings for the protection of public health. The first has to do with the use of purgatives containing boric acid. Medicaments which contain boric acid either free or in compound ought not to be taken except under medical supervision. Boric acid and its compounds, which after repeated ingestion tend to accumulate within the organism because of their slow excretion, are by no means innocuous if ingested in quantities of more than a few fractions of a gram. Preparations containing boric acid together with urea or dextrose are no exception.

Secondly, the minister warned the public against the indiscriminate use of iodized foods and medicaments that contain iodine. Iodine and its compounds, even if consumed in minute quantities, can lead, in persons sensitive to iodine, to more or less serious disturbances of thyroid activity, with the usual consequences. Iodine and its compounds are present in many pharmaceuticals recommended for infirmities of age and arteriosclerosis, for example such products as iodized bonbons, bath accessories of many sorts and cosmetics. Other iodine-containing products are recommended for the prophylaxis of colds, and there are iodized foods, iodized salt for example, which is of definite importance in the prophylaxis of goiter where the disease is endemic. Unfortunately the minister made no mention of iodized tooth pastes. These dentifrices, so abundantly and altogether irrationally advertised to the German public represent a menace to public health, since it is impossible for the user to know the amount of iodine absorbed each day.

## Marriages

WILLIAM NELSON DONOVAN, Memphis, Tenn., to Miss Josephine Catherine Devigne of New York, January 14.

JOHN J. KOBES, Kearny, N. J., to Miss Mary C. Mullan of Buffalo, at Montreal, Que., Canada, Nov. 3, 1938.

WARREN CANDLER BAILEY, Milledgeville, Ga., to Miss Virginia Anne Holder at Jefferson, February 14.

HUGH FARRAR RIVES, Pine Bluff, Ark., to Miss Frances Corbett of Springfield, S. C., February 1.

REGINALD HENRY MITCHELL, Washington, D. C., to Miss Katherine Palmer Foote Dec. 11, 1938.

ARTHUR J. CATES, Knoxville, Tenn., to Miss Katherine Rhodes of Bristol, Va., Nov. 26, 1938.

ROLLIN A. DANIEL, JR., Old Hickory, Tenn., to Miss Ann Kelley of Whitesville, Ky., January 5.

JOHN HUIT DELLINGER to Miss Ann A. Gaujot, both of Pennington Gap, Va., Dec. 26, 1938.

ROBERT D. DRIPPS, JR., Philadelphia, to Miss Diana Rogers of New Castle, Del., February 11.

SIDNEY M. RECKLER, Denver, to Miss Sarah Carol Redman of Houston, Texas, February 24.

J. KELVIN BLEICH to Miss Carol Marjorie Rosenberg, both of Atlanta, Ga., March 11.

JAMES HARRIS DEW to Miss Martha W. Carmichael, both of Atlanta, Ga., February 18.

ROBERT CARTER DAVIS to Miss Hilda B. Brown, both of Atlanta, Ga., February 4.

MEYER VITSKY to Miss Sara Strauss, both of Richmond, Va., Dec. 27, 1938.

## Deaths

**Walter Hamilton Snyder** ☉ Toledo, Ohio, University of Michigan Department of Medicine and Surgery, Ann Arbor, 1891 in 1905 member of the House of Delegates of the American Medical Association, member of the American Academy of Ophthalmology and Oto-Laryngology, fellow of the American College of Surgeons, past president of the Toledo Academy of Medicine and Ohio State Medical Association, for many years president of the board of the Ohio Commission for the Blind, on the staffs of the Flower Hospital and the Lucas County Hospital, aged 68, died, Dec 29, 1938, of cardiac hypertrophy

**Beverley Randolph Kennon** ☉ Norfolk, Va., University of Virginia Department of Medicine, Charlottesville, 1893, past president of the Norfolk County Medical Society, member of the American Laryngological, Rhinological and Otolological Society, American Ophthalmological Society and the American Otolological Society, fellow of the American College of Surgeons, served during the World War, served at various times and capacities on the staffs of the Norfolk Protestant Hospital, Leigh Memorial Hospital, Norfolk General Hospital and St Vincent's Hospital, aged 67, died, Dec 27 1938, of coronary thrombosis

**John White McCammon** ☉ Cincinnati, Western Reserve University School of Medicine, Cleveland 1921, assistant professor of orthopedic surgery, University of Cincinnati College of Medicine, member of the Clinical Orthopedic Society and the American Academy of Orthopedic Surgeons, fellow of the American College of Surgeons, served in various capacities on the staffs of the Cincinnati General Hospital Jewish Hospital, Hamilton County Tuberculosis Sanatorium, Children's Hospital, Christ Hospital and the Cincinnati School for Crippled Children, aged 44, died, Dec 30, 1938, of acute coronary thrombosis

**Albert George Kern** ☉ Knoxville, Tenn., University of Pennsylvania Department of Medicine Philadelphia, 1901, member of the Southeastern Surgical Congress fellow of the American College of Surgeons, visiting surgeon to the Knoxville General Hospital Fort Sanders Hospital and St Mary's Memorial Hospital aged 63 died, Dec 5, 1938 in the New England Baptist Hospital, Boston of megacolon and acute gastric ulcer

**Maurice Joseph Sittenfield** ☉ New York, Bellevue Hospital Medical College, New York 1898 member of the American Association of Pathologists and Bacteriologists Radiological Society of North America, American College of Radiology and the American Radium Society, instructor in pathology, Columbia University College of Physicians and Surgeons, New York 1913 1920 and associate in pathology, 1920 1932 aged 61, died Dec 1, 1938

**Jonathan Harvey Winterbotham** ☉ Salina, Kan., Rush Medical College, Chicago, 1896 past president of the Saline County Medical Society, formerly county health officer and member of the state board of health, on the staffs of Asbury Protestant Hospital and St John's Hospital, aged 65 died, Nov 27, 1938, of cerebral arteriosclerosis

**William Franklin Shumaker**, Butler, Ind., Starling Medical College, Columbus, 1890, member of the Indiana State Medical Association, formerly county health officer and health officer of Butler, aged 73 died Dec 2, 1938, in the Sacred Heart Hospital, Garrett, following an operation for tuberculosis of the intestine

**James C Stewart**, Anna, Ill., St Louis College of Physicians and Surgeons, 1891, member of the Illinois State Medical Society and the American Psychiatric Association, formerly managing officer of the Alton (Ill.) State Hospital, aged 72, died, Dec 2 1938, of cerebral hemorrhage

**Carl Gay Davis** ☉ Hot Springs National Park, Ark., University of Arkansas School of Medicine Little Rock 1934, director of the clinic, U S Public Health Service, served during the World War aged 52, died Dec 3, 1938, in the Veterans Administration Facility, Fayetteville

**French S Holsberry**, Parsons, W Va University of the South Medical Department, Sewanee, Tenn., 1899, member of the West Virginia State Medical Association, formerly member of the board of education and county health officer, aged 66, died, Dec 3, 1938

**William Hermon Ballard**, New York, Memphis (Tenn) Hospital Medical College, 1910, served during the World War, acting assistant surgeon, U S Public Health Service, aged 52, died Nov 7, 1938, of heart disease following an operation for perirectal abscess

**Jennie May Coleman**, Des Moines, Iowa, State University of Iowa College of Homeopathic Medicine, Iowa City, 1898, member of the Iowa State Medical Society, aged 70, died, Dec 3, 1938, at the Iowa Methodist Hospital of diabetes mellitus

**Herbert Emil Koepke** ☉ Cadiz, Ohio, State University of Iowa College of Medicine, Iowa City, 1928, county health officer, aged 40, died, Dec 18 1938, in the Ohio Valley General Hospital, Wheeling, W Va, of uremia

**Jesse Cunningham Stille**, Ludlow, Pa., University of Maryland School of Medicine, Baltimore, 1912, member of the Medical Society of the State of Pennsylvania, served during the World War, aged 55, died, Nov 26, 1938

**John Ross Petty**, Au Gres, Mich., University of Michigan Department of Medicine and Surgery, Ann Arbor, 1899 for many years bank president, aged 70, died, Dec 20, 1938, of cerebral thrombosis and diabetes mellitus

**Daniel Nash Woodman**, North Haven, Maine, College of Physicians and Surgeons, Baltimore, 1893, member of the Maine Medical Association, aged 77, died, Nov 26, 1938, of melanotic sarcoma and diabetes mellitus

**Samuel Alexander McKeague**, Winnipeg, Man., Canada, Trinity Medical College, Toronto, Ont., Canada, 1884, L R C S, Edinburgh, and L R C P, Edinburgh, 1884, aged 80, died, Dec 9, 1938, of chronic myocarditis

**William Arthur Trader** ☉ Quincy, Ill., Chicago College of Medicine and Surgery, 1909, aged 52, on the staff of St Mary's Hospital where he died, Dec 23, 1938, of multiple myelomas and chronic myocarditis

**Frederic William Mitchell**, Cleveland, American College of Medicine and Surgery, Chicago, 1903, aged 60, died, Dec 5, 1938, in the Deaconess Hospital of injuries received in an automobile accident

**Thomas Miller Haskins** ☉ Tulsa, Okla., College of Physicians and Surgeons, Baltimore, 1886, Bellevue Hospital Medical College, New York, 1888, aged 79, was found dead in bed, Nov 8, 1938

**Lee Carr Laycock**, Alexandria, Ohio Physio-Medical Institute, Cincinnati 1882, aged 82, died, Dec 14, 1938, in the City Hospital, Newark, of agranulocytosis and myocardial insufficiency

**Maurice Erwin Miller**, Washington, D C., Jefferson Medical College of Philadelphia, 1895, aged 70, died, Dec 15, 1938, in Albuquerque, N M, of chronic myocarditis and acute pyelonephritis

**John Gabriel Speicher**, Coconut Grove, Fla., State University of Iowa College of Homeopathic Medicine, Iowa City, 1883, aged 78, died, Dec 3, 1938, of senility

**James A Houser**, Marion, Ind., Curtis Physio-Medical Institute, Marion, 1895, aged 75 died, Dec 5, 1938, of arteriosclerosis and coronary thrombosis

**William Herdie Randall**, Williamsport Pa Jefferson Medical College of Philadelphia, 1878, aged 82, died, Nov 18, 1938, of cardiovascular disease

**John Keyser**, Cincinnati, Cincinnati College of Medicine and Surgery, 1893, aged 75, died, Dec 9, 1938, of myocarditis, arteriosclerosis and uremia

**Stonewall Jackson**, Wadsworth, Ala Southern Medical College, Atlanta, 1889, aged 76, died, Dec 13, 1938 of carcinoma of the throat

**John Vinton Cocke**, Los Angeles, College of Physicians and Surgeons, Los Angeles, 1911, aged 55, died, Nov 21, 1938, of chronic hepatitis

**Mark F Hobson**, Wichita, Kan., Physio-Medical College, Cincinnati, 1879, aged 85, died, Dec 12, 1938, of influenza and bronchopneumonia

**John Burt Moore**, Modesto, Calif., Medical College of Indiana, Indianapolis, 1886, aged 78, died, Nov 14, 1938, of chronic arthritis

**William Parker Best**, Indianapolis, Eclectic Medical Institute, Cincinnati, 1888, aged 74, died, Dec 12, 1938, of Parkinson's disease

**D J Hunterston**, Ravenwood, Mo., Central Medical College of St Joseph, 1903, aged 83, died, Dec 2, 1938, of chronic myocarditis

**N R Fitch**, Bowling Green Ky Chicago Homeopathic Medical College, 1887, aged 75, died, Nov 30, 1938, of cerebral hemorrhage

**Alexander A Smith**, Dayton, Ohio, Toledo Medical College, 1903, aged 69, died, Dec 29, 1938, of coronary occlusion

**William W Longley**, Marianna, Ark (licensed in Arkansas in 1903), aged 83 died, Dec 30 1938, of myocarditis

## Correspondence

### THE POTENCY OF DIGITALIS STANDARDIZED ACCORDING TO U S P XI

To the Editor—There appears to be a growing confusion among physicians and others with regard to the changed relationships in the standardization and dosages of digitalis preparations made according to the requirements of U S P XI as compared with those of U S P X.

All U S P digitalis preparations manufactured prior to June 1, 1936, were standardized according to U S P X. Practically all clinical articles published between 1926 and 1938 are based on the administration of U S P X standardized digitalis. U S P X required all official digitalis preparations to be standardized on frogs by the one hour progressive dose method and to be adjusted to a toxicity of 0.006 cc (range 0.0055–0.0065 cc) of tincture per gram of frog or, in everyday language, the equivalent of 600 mg (range 550–650 mg) of standard digitalis leaf per kilogram of frog.

Digitalis preparations manufactured and standardized since June 1936 have been standardized according to the requirements of U S P XI.

These requirements are essentially that the preparation shall be standardized by the one hour progressive dose frog method to a toxicity equal to that of a tincture freshly made from the U S P reference standard digitalis powder. This reference powder in some twenty standardizations made personally in this laboratory in the past two and a half years has shown a mean toxicity of 350 mg per kilogram of frog by the official (U S P) one hour frog method.

What many physicians do not seem to recognize is that the digitalis preparations which they are now using have been standardized according to the requirement of U S P XI and are approximately 70 per cent stronger than were those which they have been accustomed to use for the past ten or twelve years and that the actual dosage of U S P digitalis preparations which they administer to their patients, either for digitalization or for maintenance, must be reduced to at least two thirds of the amount they have been previously accustomed to use. Unless this is done they will encounter frequent instances of digitalis overdosage—nausea, vomiting, excessively slow heart, ventricular extrasystoles, and the like—which will impair the efficiency of the heart.

Although never an official method, considerable standardization of unofficial digitalis preparations has been made in the past with the Hatcher-Brody cat method.

Comparative standardization of official (U S P) frog standardized digitalis preparations standardized according to U S P X (1926–1936) by the Hatcher-Brody cat method, showed that 1 cc of a U S P X tincture was approximately equal to 1 Hatcher-Brody cat unit.

Many clinicians thus developed the habit during the first ten to twenty years of transposing cubic centimeters of frog standardized tincture of digitalis directly to cat units and of controlling their dosage to patients in terms of cat units.

But since U S P XI tincture of digitalis is approximately 70 per cent stronger than the U S P X tincture was, the amount of digitalis activity commonly referred to as a cat unit (Hatcher-Brody) is now contained in 0.60–0.65 cc of a U S P XI standardized tincture or from 60 to 65 mg (1 gram) of powdered digitalis. Attention to this fact has recently been drawn by Fahr (*THE JOURNAL*, Dec 17, 1938, p 2269, footnote 5).

The situation is further complicated by the fact that both the U S P reference standard powder and the international reference standard powder, on which the U S P powder is based, were standardized by a modified cat method developed by Magnus and Van Wyngaarden which, through the use of arti-

ficial respiration and the like, enables the cat to tolerate a very much larger dose of digitalis than is possible by the original Hatcher-Brody method.

Edmunds, Moyer and Shaw (*J Am Pharm A* 26 290 [April] 1937), who standardized the U S P XI reference standard powder for the U S P Revision Committee, employed two types of standardization, (1) on frogs by several methods and (2) on cats by the Magnus-Van Wyngaarden method (Krafft-Lenz, *E J Pharmacol & Exper Therap* 29 407 [Oct] 1926; Van Wyngaarden *Arch f exp Path u Pharmacol* 112 252, 113 40, 1926). Edmunds and his associates found a toxicity by the one hour frog method of 391 mg per kilogram of frog and by the Magnus cat method that 1 cc of the reference standard tincture was approximately equal to 1 Magnus cat unit.

Failure on the part of clinicians and pharmaceutical manufacturers to keep clear the considerable difference between the amount of digitalis activity represented by the two cat units is responsible for much of the existing confusion.

Another factor in the confusion is that few, if any, of the manufacturers of unofficial digitalis preparations (which are not legally required to be standardized by the U S P frog method) use either the original Hatcher method or the later Magnus method but have adopted a modification of their own.

The approximate relationships which exist between the various units may, therefore, be summarized as follows:

- 1 U S P XI digitalis unit
  - = 0.1 Gm U S P XI digitalis powder
  - = 1.0 cc U S P XI tincture of digitalis
  - = 0.17 Gm U S P X digitalis powder
  - = 1.7 cc U S P X tincture of digitalis
  - = 1.7 cat units if determined by the Hatcher method the widely known clinically used cat unit
  - = 1.0 cat unit if determined by the Magnus method the little known international (League of Nations) cat unit

HAROLD N. WRIGHT, PH D, Minneapolis

Assistant Professor of Pharmacology,  
University of Minnesota Medical  
School

To the Editor—In footnote 5 of a recent article in *THE JOURNAL*, page 2269, I state "At present digitalis is standardized according to the U S P XI so that 0.65 cc of the tincture or 0.065 Gm (1 grain) of the powdered leaf is [equivalent to] 1 Hatcher-Brody cat unit. In the previous editions of the U S Pharmacopoeia, 1 cc of tincture or 0.1 Gm of the powdered leaf contained 1 cat unit. One tenth Gm (1½ grains) of the standard U S P XI powder is equivalent to 16 Hatcher-Brody cat unit." This statement has occasioned considerable confusion among both physicians and pharmacologists, as attested by letters which I have received after publication of this paper. The statement, therefore, needs some clarification.

I know of a number of cases of digitalis overdosage resulting from the fact that the attending physician prescribed digitalis that had been standardized in accordance with the directions of the U S P XI as if the drug had the same potency as digitalis standardized according to the directions of the U S P X. Most interesting of all is the fact that one pharmacologist overdigitalized himself with a U S P XI preparation, not knowing that he was using a digitalis from 50 to 60 per cent more powerful than the U S P X digitalis which he had been using for years. I am sure that many physicians have been spared overdigitalizing their patients because few pharmaceutical houses are as yet putting out digitalis standardized according to the U S P XI. Most pharmaceutical houses are still putting out digitalis standardized according to the U S P X. It is therefore imperative that physicians be warned that there are now two kinds of digitalis available in the drugstores. Most of it is standardized according to the U S P X, in which case approximately 100 mg (1½ grains) of powdered leaf to

10 pounds of body weight will accomplish nearly complete digitalization if given over a short period of time, i. e. from twenty-four to forty-eight hours. There are at the same time other preparations standardized according to the U S P XI. The latter preparations have a potency such that 65 mg (1 grain) of powdered leaf to 10 pounds of body weight will accomplish nearly complete digitalization.

The tenth Pharmacopoeia of the United States gives the following directions for standardizing digitalis: "Digitalis, in the form of tincture properly diluted and injected into the ventral lymph sac of a frog, has a minimum systolic dose (the minimum dose producing in one hour a stoppage of the ventricle of the heart in systole) not exceeding 0.006 cc of tincture for each gram of body weight of frog." The XI Pharmacopoeia prescribes the following: "The potency of digitalis shall be such that 0.1 Gm of it when assayed as directed shall possess an activity equivalent to not less than 1 U S P digitalis unit." In order to compare the potency of the two preparations it is necessary only to learn what is meant by 1 U S P digitalis unit.

In 1936 it was determined that a new standard for digitalis preparations was to be set up in conformity with the international or League of Nations digitalis standard. A so-called reference powder was then made up, and this reference powder is given to any authorized person who wishes to standardize digitalis preparations. Edmunds (*J Am Pharm* 1 26 290 [April 1937]) has standardized the U S P XI reference powder, using two methods. Using the so-called one-hour frog method, he finds that 0.000391 Gm of the powdered leaf per gram of frog stops the heart in systole in one hour. Making use of the Magnus cat method he finds that 1 cc of the standard reference tincture equals approximately 1 Magnus cat unit. It is now clear that the U S P XI standard reference powder has such a potency that 0.000391 Gm per gram of frog stops the heart within one hour, whereas U S P X required that 0.0006 Gm of digitalis per gram of frog stop the heart in one hour. In other words the potency of the U S P X official digitalis is 65 per cent of that of the U S P XI.

Many observers had noted that the U S P X digitalis had a standardization value of 100 mg equivalent to 1 original Hatcher-Brody cat unit. It is therefore desirable to know the relationship between the Hatcher-Brody and the Magnus or international cat unit. Approximately 16 Hatcher-Brody units equals 1 Magnus cat unit. Again we see that, standardized on cats, the digitalis prescribed by the tenth Pharmacopoeia is 63 per cent as strong as the digitalis prescribed by the eleventh Pharmacopoeia.

For the practicing physician, this means that in cases in which he had been using or is using 100 mg (1½ grains) of digitalis leaf or 1 cc of tincture standardized according to the tenth Pharmacopoeia he should prescribe 0.065 Gm (1 grain) of powdered leaf or 0.65 cc of tincture when using a digitalis preparation standardized according to the U S P XI.

GEORGE FAHR, M D Minneapolis  
University of Minnesota Medical School

To the Editor—The confusion concerning digitalis standardization is illustrated by a comparison of the opinions of two eminent authorities printed within a period of three weeks in THE JOURNAL.

On Dec 17, 1938, in "The Treatment of Cardiac Irregularities" George Fahr (page 2269, footnote 5) states: "At present digitalis is standardized according to the U S P XI so that 0.65 cc of the tincture or 0.065 Gm (1 grain) of the powdered leaf is 1 Hatcher-Brody cat unit. In the previous editions of the U S Pharmacopoeia 1 cc of tincture or 0.1 Gm of the powdered leaf contained 1 cat unit. One-tenth gram (1½ grains) of the standard U S P XI powder is equivalent to 16 Hatcher-Brody cat unit."

On January 7, in "Drug Therapy in Coronary Disease" Harry Gold (page 5) states: "A satisfactory dosage in the average case of auricular fibrillation or heart failure in coronary thrombosis is about 6 grains or 0.4 Gm (4 cat units) of digitalis leaf daily for three days." This implies that powdered digitalis assays 1½ grains to the cat unit.

The U S Pharmacopoeia, pages 397-398, makes no mention whatever of standardization of digitalis by the Hatcher-Brody or any other cat unit method. Supposedly digitalis is assayed by the frog method, the U S P reference digitalis powder (U S P, p 485) being used as a standard. Reference powder is supposedly equivalent to the international standard digitalis powder, of which 0.1 Gm is 1 international digitalis unit. That this ideal is not accomplished in practice is evident from the studies of Edmunds Moyer and Shaw (*J Am Pharm* A 26 290 [April 1937]) and Rowe and Pfeifle (*ibid* 27 182 [March] 1938). After having investigated many commercial products, these authors have arrived at quite different conclusions concerning the comparative potency of the commercial preparations, the U S Pharmacopoeial standard and the international standard powder. The latter authors conclude that the U S P XI standard is 150 per cent of the U S P X potency and 125 per cent of the international standard potency. The various digitalis products on the market seem to differ widely from one another as well as from the reference standards.

It seems evident that the problem is worthy of thorough elucidation, particularly since there seems to be no reference to the subject in the recent medical literature. Whatever data are available were found in the pharmacy publications.

Until the standard of potency is more satisfactorily established, it seems quite clear that the clinician must depend on presumably equal potency of the same manufacturer's product. So wide a variation in potency as 35 per cent between different preparations makes it urgent that each patient be advised to continue the use of a certain brand of digitalis throughout the period of therapy. Even preparations dispensed in cat unit dosage are not interchangeable, since cat unit values have been found to be duplicable only in the hands of the same assayer, if at all.

LEON LEWIS, M D, Newark, N J

## INVESTIGATIONS ON ANTIBODIES

To the Editor—What does the writer of the editorial mean when he says in "Recent Investigations on Antibodies" (THE JOURNAL, February 25, p 735): "The investigators, however, have for the first time applied quantitative immunochemical techniques to the problem of splenic immunity"? Does he not consider the techniques of Hektoen and Carlson quantitative or my work using such methods, qualitative? Has he seen my "A Study of the Origin of the Immune Bodies by the Method of Organ Transplantation" (*Proc Soc Exptl Biol & Med* 7 122-124, 1910)? Or more to the point, because more physiologic, has the writer of the editorial read the work (confirmed later by Preston Kjes using intermediate dilutions) entitled "The Relation of the Spleen to the Fixation of Antigens and the Production of Immune Bodies" by Luckhardt and Becht, *Am J Physiol* 28 257-274 [Aug 1] 1911)?

In these papers the spleen is shown to be related specifically with the formation of immune bodies (antigen used: goats corpuscles for hemolysins, hemagglutinins and hemopsonins, rats corpuscles for hemagglutinins and hemopsonins) but not exclusively so, since "asplenic dogs do not produce hemolysins hemagglutinins or hemopsonins (a) as rapidly nor (b) in as high a concentration as the corresponding control dogs." Since even asplenic dogs showed an immunity curve why make the statement "Possibly these investigations will lead to the recrudescence of interest in the supposedly obsolete hypothesis which pictured the spleen as the sole source of specific antibodies"? One would have to go back pretty far and brush aside a good

deal of evidence is inconsequential to find some one defending the hypothesis that the spleen was the "sole source of specific antibodies."

Some of the drug action referred to in this editorial can be readily explained on the basis of present day knowledge of splenic function. I would not say that it was all due to constriction and dilation of the spleen, but with the available evidence I would be inclined to think so and would mention this possibility rather than write that it was due to the "therapeutic stimulation of the parasympathetic." As a matter of fact, if the writer of the editorial and the investigators quoted had read the brief article in the *American Journal of Physiology*, Proceedings of the American Physiological Society, Baltimore, March 30, 31, April 1 and 2, 1938, pages 159-160, by J. Maurice J. Palitz (now in preparation for complete publication), the interpretations in my mind would certainly have occurred to them. As a matter of fact, a previously published abstract (*Am J Physiol* 116:118 [June] 1936) would have suggested it. With these data in mind the writer would, I believe, have written the editorial entirely differently. At present it has a flavor of occultism.

ARNO B. LUCKHARDT, M.D., Chicago

Department of Physiology, University of Chicago

### SULFAPYRIDINE IN PNEUMONIA

*To the Editor*—We have read with interest the instructive article on the treatment of pneumonia with sulfapyridine by Dr. Harrison F. Flippin and his associates (*THE JOURNAL*, February 11, p. 529).

The wide variation in free blood sulfapyridine observed by Flippin may be accounted for on one or more of at least three grounds: (a) variability in the time at which blood samples were taken in relation to drug dosage, (b) coincidental renal impairment of function and (c) individual variability in conjugation of the drug in the blood stream.

In December 1938 certain experiments were performed in our laboratories at Cold Spring Harbor which showed clearly the extreme variability in man of conjugation of sulfapyridine especially as it appears in the urine eighteen hours after the administration of a single 3 Gm. dose by mouth. Superficially there appeared no explanation for this result, since both subjects were normal men. One of us (D. A. B.) suggested, however, that the result might conceivably be due to differences in the basal metabolic rate; it was found on investigation that this hypothesis fitted the facts. The man in whom maximum conjugation occurred has a basal metabolic rate of  $\pm 30$ , the man in whom the least conjugation occurred having a subnormal basal metabolic rate. In these men the one with the higher metabolic rate excreted approximately 90 per cent of the material in conjugated form, whereas the one with the low metabolic rate excreted approximately 50 per cent of the material in conjugated form.

One of us (D. R. C.) then carried out an experiment at Cold Spring Harbor to determine whether or not this apparent effect of the metabolic rate could be confirmed in small animals. Nine rabbits were divided into three groups. The first of these groups (three rabbits) received a dose of 2,000 mg. per kilogram of the free acid in water suspension. The second group (three rabbits) received 2,000 mg. per kilogram of the free acid in water suspension after a preliminary intramuscular injection of 20 mg. per kilogram of sodium dinitrophenol. The third group (three rabbits) received 2,000 mg. per kilogram of the free acid in water suspension after the intravenous administration of an anesthetic dose of cycloidal soluble. The first group showed the usual blood concentration curves. The second group showed a hyperpyrexia and a significant increase in the ratio of conjugated to total sulfapyridine in the peripheral circulation. The third group did not show any significant change from normal.

We believe that this sheds some light on the apparent discrepancies between the blood levels and the therapeutic effectiveness. Further observations by clinicians and those to be published from our own laboratories will undoubtedly clarify the matter.

THE CALCO CHEMICAL COMPANY, INC.

DAVID A. BRACI, M.D.

DAVID R. CHIMNICK, M.D., PH.D.

Bound Brook, N. J.

### WRITING PRESCRIPTIONS FOR NARCOTICS

*To the Editor*—As a subscriber to *THE JOURNAL*, I should like to call attention to a matter which is causing me and many other careful pharmacists, I know, many a "headache." That is the careless way in which most physicians write prescriptions for narcotics. There is scarcely a prescription offered for compounding in my prescription department that is 100 per cent properly written. Most of them fail in at least two or three points. The name is often not properly written, the age is seldom given, and the physician's signature is often not properly signed.

To me this is an important point in the writing of narcotic prescriptions, and I believe that you would confer an important favor to both physicians and pharmacists by calling attention to this matter.

Following is the text of a circular issued by the Kings County Pharmaceutical Society.

#### NARCOTIC PRESCRIPTION REGULATIONS

- 1—Must be written in ink or indelible lead.
- 2—The full signature of the physician, as well as address and registry number, are required.
- 3—Name, address and age of patient (child, adult, etc., is not sufficient).
- 4—If the amount of narcotic prescribed is for an unusual quantity the disease must be indicated or the following designations may be used, Article 117, Exemption 1 (meaning, for an incurable disease), or Article 117, Exemption 2 (meaning, for an inborn patient).
- 5—The pharmacist may supply the physician with one ounce of an aqueous solution of a narcotic not over 10% strength, for his office use, provided the order is written on an official federal order blank.
- 6—The pharmacist may renew a prescription containing the exempt quantities of a narcotic, which are as follows: not more than 2 grains of Opium, 1 grain of Codeine and  $\frac{1}{4}$  grain of Morphine to the ounce.
- 7—A prescription for narcotics cannot be renewed on a physician's order to "Renew" nor can a telephone order be accepted. A new prescription must always be written.

Both the physician and the pharmacist are liable for any violation of the above mentioned rules.

For the protection of the patient, as well as the doctor and the pharmacist, we would suggest that the age of the patient be stated on all prescriptions whether or not for narcotics. Also that the directions be written on every prescription whether for internal or external use.

U. S. P. and N. I. Committee of  
The Kings County Pharmaceutical Society  
Brooklyn, N. Y.

J. O. E. NIVEN, Brooklyn

### PERIPHERAL VASCULAR DISEASE

*To the Editor*—In *THE JOURNAL* January 21, page 230, Ochsner and DeBailey discuss "The Rational Consideration of Peripheral Vascular Disease." This is an excellent study but should include the use of roentgen rays in the treatment of vasospastic conditions such as Raynaud's disease. According to some observers this method is of doubtful value, but according to others the same may be said of some of the methods described in this article. Those who have had greater experience in the use of roentgen rays for circulatory disturbances consider this a valuable modality in thromboangiitis obliterans particularly, and also in Raynaud's disease. A paper as exhaustive as this one, in my opinion, should have included a discussion of this form of treatment.

ABRAHAM S. ROTHEIMER, M.D., New York



## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### FURUNCULOSIS IN SHIFT METAL WORKERS

To the Editor—A white man aged 46, a sheet metal worker, has suffered from furunculosis since Sept. 18, 1938. For the most part the location of the furuncles has been limited to the upper extremities and the axillary regions. In addition, a widespread eczematoid dermatitis developed following the use of Neko soap. The latter condition has proved troublesome since the skin is now sensitive to many of the topical applications I had been using in the local treatment of the furuncles. The usual response to these applications is that of vesiculation. Among the chief offenders in this respect are ointments or solutions containing mercury, phenol and magnesium sulfate. The patient's general physical condition is good and outside of the conditions mentioned and a moderate hypotension there is nothing to note. Repeated examinations of the urine have been negative. The white blood cell count is slightly elevated but never has been higher than 14,000. The hemoglobin and the red blood cell count are within normal limits. The Kahn reaction is negative. In addition to the local treatment which consisted of incision and drainage when indicated, the use of boric acid compresses and magnesium sulfate compresses and various ointments, the patient has been given adequate amounts of cod liver oil, dicalcium phosphate, iron and copper, and vitamin B. About twenty injections of furunculosis vaccine have been given thus far according to the usual plan. Tinopronate Searle (metallic tin organically combined with a digestible protein base) was also tried but seemed to aggravate rather than benefit the condition. Kindly suggest treatment.

M D Illinois

ANSWER—Metal workers may be exposed to a variety of cutaneous irritants such as volatile solvents, antimony, arsenic, chromium, lime, soldering compounds, petroleum oil and grease. This query illustrates the difficulty encountered in offering advice about any industrial medical problem without precise knowledge of the materials or processes involved.

Furunculosis usually can be traced to petroleum oils, grease and tar, the sites of predilection being the arms and legs. Axillary involvement, therefore, is probably not of industrial origin unless it occurred by spread or secondary infection from the arms.

The exact composition of Neko soap is not known, but antiseptic soaps often contain mercury, phenols and benzoates, in themselves possible sources of dermatitis.

In addition to urinalysis, determinations of the blood sugar should be made, and if high levels are recorded appropriate treatment should be instituted. Local treatment should include incision and drainage together with the application of an antiseptic in proper dilution which has been found nonirritating by preliminary patch tests. A 2 per cent solution of formaldehyde or a 1 per cent solution of sodium benzoate may be useful. Autogenous vaccines are preferable.

If the patient does not respond to the treatments suggested, ultraviolet rays obtained from an alpine sun lamp or X-rays may be tried. Other methods of treatment suggested are colloidal manganese, recommended by Gardner; injections of 15 per cent rectified turpentine and 5 per cent ethyl aminobenzoate and quinine hydrochloride in olive oil, recommended by Levine and Rose; and autohemotherapy consisting of 10 cc of venous blood intramuscularly, recommended by Nicolas, Gate and Dupasquier.

### CALCIUM AND VITAMIN D IN DIET

To the Editor—A child about 3 years old showed improvement as a result of calcium therapy given concurrently with vitamin D preparations. Are there any indications for stopping the use of calcium while improvement in general health continues?

M D New Jersey

ANSWER—As the amounts of vitamin D and of calcium prescribed for the child are not stated and the indication for prescribing these substances have also been omitted, a specific answer to the question is not possible.

Calcium requirements for children have been investigated by Sherman (Chemistry of Foods and Nutrition, New York, Macmillan Company, 1927, p. 311; Sherman, H. C., and Hawley, E. Calcium and Phosphorus Metabolism in Childhood, *J Biol Chem* 53:375 [Aug.] 1922) and his results have been confirmed by others. Any child who is not allergic to milk should be able to ingest in his daily diet all the calcium that is needed to maintain health or to restore deficiencies in the bones or other parts of the organism. However, it is frequently difficult to supply adequate amounts of vitamin D

unless vitamin D supplements are used. The dosage of vitamin D should be limited to a reasonable therapeutic or prophylactic requirement. It is possible to create a toxic state from chronic overdosage of either calcium or vitamin D, and hypervitaminosis D is becoming recognized as a true clinical entity. Overdosage from calcium salts taken by mouth may produce gastrointestinal irritation evidenced by gastric distress, nausea, vomiting and diarrhea. The real dangers of calcium overdosage are those which result from prolonged hypercalcemia and these include a disturbance of conduction in the heart, ventricular fibrillation and tachycardia and, if serum calcium concentration is maintained at about 15 mg per hundred cubic centimeters in experimental animals, fatal results may be produced (Cantrow, Abraham, Calcium Metabolism and Calcium Therapy, Philadelphia, Lea & Febiger, 1931, pp. 135-137). Joseph Goisman and Edward L. Compere (The Healing of Fractures of Atrophic Bones, *J Bone & Joint Surg* 20:587 [July] 1938) found that fractures of bones in either young or old rats on mineral-deficient diets did not heal more promptly or more adequately when large amounts of vitamin D, of calcium or of both substances were added to the basic diets than did those in rats which had been on a normal basic diet previous to fracture; in some instances these supplements seemed to retard bone repair.

### CONGENITAL VARICOSITIES OF LEG

To the Editor—An obese woman aged 28 was born with an extreme varicose condition of the entire right leg up to her waist. Please give me the name of the best knit hose for her to wear and the company which makes them. The elastic hose that she has worn has been unsatisfactory. Would it be safe to operate on such an extensive involvement of veins?

M D Oklahoma

ANSWER—The description does not mention any change in the size or temperature of the affected right limb as compared with the other. However, it seems that this is a congenital vascular anomaly, which usually consists of multiple arteriovenous communications although occasionally a diffuse hemangioma may be present.

An elastic stocking made to order and reaching all the way to the groin may be obtained through any one of the surgical supply houses in larger cities. It may give some protection and subjective relief. However, an effort should be made to stop the progress of this vascular anomaly by surgical methods. This involves operations in multiple stages and should be undertaken only by men experienced in this type of surgery. Some of these patients unless actively treated develop an elephantiasis or because of the gradually diminishing circulation to the toes show gangrenous patches. If an arteriovenous communication is present, this may throw an increased load on the heart so that cardiac dilatation and even failure may result.

### LOCALIZED MELANOSIS AFTER IRRITATION

To the Editor—A boy 15 years old has several areas on the face about 1.5 cm in diameter which seem permanently discolored. This is the result of a practical joke last summer when at camp some other lads daubed his face with strong iodine. The areas are stained a dark brown and do not seem to fade. Is there any escharotic paste that could safely be used in the attempt to remove these blemishes or what could you suggest?

M D New York

ANSWER—A stain remaining for months after the application of tincture of iodine is due to increased production of melanin, iron free skin pigment, as a response to the irritation. Persons whose skin produces pigment readily are apt to have such mementos of various kinds of irritation. They occur frequently after the use of mustard plasters. During the relatively slight exposure to light during the winter months they will fade just as freckles do. If it is desirable to hasten this process, the time honored freckle lotion containing one part of mercury bichloride in 500 parts of 50 per cent alcohol may be dabbed on several times a day until an inflammatory reaction results, when the treatment is stopped and exfoliation awaited, which is expected to produce a blanching. From 5 to 20 per cent lactic acid in water may be used in the same way, but this is painted on at longer intervals with care to cover only the pigmented spot. Well adapted to small areas such as those described is the application of carbon dioxide snow for a few seconds under light pressure. Five seconds, even less in some cases, causes an exfoliation and this is the most easily controlled method, giving the quickest results. One application is made and the result awaited. If not sufficient to produce a reaction, a stronger application can be made a few days later.

A warning goes with advice such as this. There is always a risk that the irritation intended to remove the pigment will have the same result as that which caused it to occur.



### DETERIORATION OF MILD PROTEIN SILVER AND STRONG PROTEIN SILVER

*To the Editor*—In THE JOURNAL Oct 8 1938 page 1466 in a special article by Henry W E Walther on local urinary antiseptics under the discussion of silver preparations occurs the statement all these solutions should be made freshly every day or two since they deteriorate on standing and they should be kept in amber colored bottles Beckman in Treatment in General Practice in writing on the treatment of gonorrhea states It is popularly believed that they [strong protein silver and mild protein silver] both deteriorate rapidly That this is not true has recently been shown by Pilcher and Sollmann (1924), who found that (a) strong protein silver solutions become poorer in ionic silver and therefore less efficient but not sufficiently so to become of much clinical importance even in one year (b) Mild protein silver on the contrary becomes richer in silver ions and therefore more antiseptic but also more irritant The changes in mild protein silver solutions start rapidly so that a week might modify the clinical response How do you reconcile this difference of opinion among authorities? Who is right?

J A MILLSPAUGH MD San Pedro Calif

**ANSWER**—The difference of opinion arises probably from the use of different criteria Those of Pilcher and Sollmann were based on the checking of yeast fermentation, while those of Walther were based on clinical traditions, which it would be difficult to substantiate objectively However, there is no serious disagreement between the two statements as to mild protein silver This may become irritant inside of a week and progressively more so with time The difference in the statements as to strong protein silver solution is greater, but it would be difficult to judge decrease of antiseptic action clinically Perhaps the "caution" is based largely on the possibility of bacterial or mold infection of the solution with standing Exposure to light might also reduce the ionized silver to inactive forms

### CORNEAL GRATTS

*To the Editor*—Please advise whether there is a well authenticated case of transplantation of the cornea in which there was any vision two or three months following operation

A L COYLE MD Pittsburgh

**ANSWER**—There have been well authenticated cases in which a disk comprising the full thickness of the cornea, was transplanted with good vision for from three months to periods of more than one year after operation Publications by Castroviejo of New York, Filatov of Philadelphia and Elschmig of Prague, list many such cases Transplantations of the whole cornea, however, have not been successful and any form of transplantation is apt to be successful only when the entire cornea is opaque Apparently a portion of the clear cornea at the periphery is necessary for the persistence of a clear corneal graft

### TUBERCULOUS OSTEOMYELITIS OF STERNUM

*To the Editor*—About one year ago a friend of mine returned from a neighboring country where he had undergone a surgical operation consisting in the incision of an abscess located in the anterior chest wall at the junction of the plate and process of the sternum I found histologic as well as bacteriologic evidence of the tuberculous etiology of the lesion The roentgenograms showed a zone of rarefaction in the region mentioned Thereupon I indicated a treatment with iodized oil recalcification heliotherapy and cleansing of the wound surface The wound which at that time measured about 1 inch in diameter and presented some discharge closed following this treatment and cicatrized completely after seven months Contrary to my advice the patient took strenuous exercises with the upper extremities whereupon the wound reopened to an extent of 3 mm in diameter with slight uppuration closing sometimes and reopening again In despair he asks me to remove the bone focus As my experience is contrary to such a measure I would appreciate your opinion

JOSE PEREZ LORIE MD Habana Cuba

**ANSWER**—In tuberculosis of the bone in which secondary infection has not occurred, every effort should be made to secure healing by medicinal management without drainage of accumulated pus Once an abscess has been drained, secondary infection is almost certain to occur This complicates the picture seriously, converting the tuberculous osteomyelitis into a mixed infection osteomyelitis In such cases, especially in the ribs and sternum, it is necessary to excise the affected bone, pack the wound with antiseptic gauze and permit it to heal by granulation

In the case under consideration it is likely that surgical excision will eventually be necessary In this sort of lesion, recent communications have reported success from instillations of cod liver oil It might be well to try this treatment for several months before resorting to surgery

Osteomyelitis of the sternum is likely to be a difficult condition to treat surgically Being cancellous bone it presents the same problems as does osteomyelitis of the skull After one has apparently excised all infected tissue, the infection may spread in the cut surface of the bone, necessitating repeated operations and wider and wider excisions For this reason it

is advisable to be radical at the first operation, to remove the bone well beyond the infected area, to treat the cut bone edges with bismuth iodoform paste and in the postoperative period until the wound is well healed, to keep it thoroughly irrigated with diluted solution of sodium hypochlorite In several cases of this kind in which the infection continued to extend the maggot treatment has been used with some success Wide excision of bone and thorough antiseptics during the postoperative period are important factors in the surgical treatment

### TRIGEMINAL NEURALGIA

*To the Editor*—A white man aged 50 weighing 240 pounds (109 Kg) has been suffering from a trifacial neuritis for the past three years These areas are especially painful to touch so that even washing the face is a painful task I have used every method possible to find a focus of infection His sinuses and teeth are negative to x-ray examination but even so I have had him have the extraction of several suspicious teeth with an apparent slight temporary relief I have given him every medication possible including salicylates cinchophen and Oxotate B I have used all types of physical therapy, including short wave diathermy Triethyl chloride has been given as inhalations for pain but the only partial relief he gets is with soluble phenobarbital 1½ grains (0.1 Gm) by mouth Will you please suggest a cause some means of diagnosis and a treatment as the only other treatment I can think of is the injection of the ganglion.

MD Louisiana

**ANSWER**—According to the diagram sent by the inquirer the patient suffers from pain in the area of distribution of the ophthalmic and maxillary divisions of the right trigeminal nerve Because the pain does not cross the midline to the left side of the face, because of the initiation of pain by cutaneous stimulation and because foci of infection are not present about the head, the diagnosis of major trigeminal neuralgia (tic douloureux) is probably accurate It is not mentioned whether or not there are discrete dolorogenic zones which set up the pain when stimulated by touching or washing the face, nor is it stated whether there are signs of other cranial nerve involvement which would suggest the presence of a lesion of the paratrigeminal area The cause of trigeminal neuralgia is generally conceded to be unknown Permanently successful treatment consists of section of the trigeminal root proximal to the gasserian ganglion, by way of a subtemporal, extradural approach Alcohol injections offer uncertain and at the best only temporary relief from the pain of trigeminal neuralgia

### EXTREME LORDOSIS AND DELIVERY

*To the Editor*—What is the prospect of a normal delivery for a primipara aged 23 with a normal pelvic measurement but whose pelvis is tilted backward with an extreme lumbar lordosis and whose right thigh cannot be abducted or flexed at all?

MD Illinois

**ANSWER**—An accurate answer cannot be given from the information at hand Lumbar lordosis, depending on the degree, may cause changes in the pelvis resulting in increased pelvic inclination If the diseased vertebrae are the lowest lumbar, the inlet of the pelvis may be roofed over by the spinal column and the head cannot enter the inlet A decision can be reached only after thorough x-ray study Preparation for the delivery should include hospitalization It is possible that a test of labor will be advisable All plans should visualize a possible delivery by cesarean section

### THUMPING IN EARS

*To the Editor*—When I lie down in bed I can hear as my heart beats a constant regular thumping in both ears and can easily count the number of heart beats per minute by this It is quite disturbing to me. I can find nothing in my literature relative to this condition

MD Kentucky

**ANSWER**—In the absence of any organic disease such as hypertension, valvular cardiac disease or hyperthyroidism the awareness of the heart on lying down in a quiet room is of no great significance It occurs in many normal persons, especially those who are of the so called nervous disposition

### ANTERIOR PITUITARY LIKE SUBSTANCE AND HEART

*To the Editor*—Could the administration of antuitrin S to a boy of 10 years (adiposogenital dystrophy) have any possible deleterious effect on the heart?

MD Idaho

**ANSWER**—No investigative work has been found in the literature concerning the influence of anterior pituitary-like substance on the heart and no deleterious effect on the heart even when large doses have been continued for as long as a year have been noted It would appear that if reasonable dosage is administered no harmful effects on the heart will result

## Council on Medical Education and Hospitals

### ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Thirty-Fifth Annual Meeting held in Chicago Feb. 13 and 14, 1939

(Continued from page 1098)

DR. FRED MOORE, Des Moines, Iowa, in the Chair

### COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

FEBRUARY 13—AFTERNOON

### SYMPOSIUM ON THE SMALL HOSPITAL

#### The Community Hospital

MR. BARRY C. SMITH, New York. This paper will be published in full in THE JOURNAL.

#### The Small Hospital Organization and Management

DR. MALCOLM T. MACLEACHERN, Chicago. In the present discussion I shall mean by the small hospital one which cannot, for various reasons, supply within itself complete diagnostic and therapeutic facilities. Usually its bed capacity is less than fifty, but under some circumstances a hospital of seventy-five or a hundred beds may justly be placed in the small hospital class. Not many governmentally owned hospitals fall into this class. Occasionally a community may through its organized government build and maintain such a hospital but usually the small hospital is owned and operated by a church, a fraternal order or the community through some organization other than the community government and is spoken of as a voluntary hospital. Such institutions constitute a large percentage of all hospitals.

Good organization is as essential in a small hospital as in a large hospital. Many elements are involved, and the end result sought is the complete and efficient care of the patient. Only through good organization can the hospital fulfil its functions in the community. A constitution and by-laws will define the purposes of the institution specify its government and state in general terms the means by which it is to be maintained and operated.

Every hospital must have a governing board which is directly responsible for its operation. Whether the members are designated as trustees, directors, governors, supervisors, commissioners or members of a hospital trust, their duties and responsibilities are the same. Regardless of the size of the hospital, they represent the community in the management of the institution. They are therefore responsible for seeing that the hospital renders the best possible service to the sick at the least cost consistent with efficiency. They determine the policies of the institution with relation to community needs, direct the administrative personnel of the hospital and provide adequate financing. The governors cannot personally perform their many duties but must delegate practically all the actual work to others.

The first concern of the governing board in thus delegating responsibility is to secure adequate medical care for the patients, and this is done by appointment of a medical staff. In the small community it may be impossible to secure physicians who are qualified to treat all types of disease, and herein lies one of the limitations of the small hospital. It should limit its voluntary admissions to patients with types of disease which the members of its medical staff are qualified to treat. In an emergency it may be forced to admit others, but if possible these should be given only temporary care and whenever practical outside assistance should be secured.

It is also necessary to build up an organized personnel who will carry out the orders of the medical staff. This personnel will consist of nurses, dietitians, technicians and various others. It may not be sound policy to employ separate persons to perform each of the functions implied, it is usually necessary to find persons who are qualified to perform several functions.

The small hospital is rarely justified in employing a purchasing agent and storekeeper, yet there must be control of both purchase and issue. Usually the director controls purchasing and places some reliable employee in charge of stores. Accounting demands a trained accountant, but often this person will also act as telephone operator and information clerk and possibly perform other duties. Controlling all this organization is a director, or superintendent, responsible directly and solely to the governing board. This officer is not, as in the larger hospital purely an administrator but will perform many duties which in the larger institution are delegated to subordinates. The governing board is composed largely of persons who are not medically trained and hence are not qualified to interpret properly the professional results. It must rely on medical assistance, and for this purpose it is usual to appoint a joint advisory committee.

The governing board varies from two or three to an indefinite number of members. Most careful consideration should be given to their selection. Only persons who are actually interested and are both able and willing to devote their talents and sufficient time to the work of the hospital in its community endeavors should be given the honor and privilege of membership. The various interests in the community should be represented such as business, women's clubs, church and fraternal organizations and, if the community is an industrial one, organized labor. If the hospital is a recipient of tax funds, there should be a representative of the governmental agency which is directly responsible to the taxpayer. Professional interests should be represented also, but many authorities regard it as inadvisable to have a physician in active practice as a member of this body. In some instances a physician is elected by the local medical society or by the medical staff of the hospital, but even then he sometimes assumes an unwarranted attitude of authority in the management of the hospital. Occasionally there is a tendency on the part of the medical representative to express his personal judgment in matters which come before the board rather than the collective or group opinion of the body he represents. It is believed by some hospital bodies which desire the medical point of view represented on the governing board that it is best to appoint a physician who has retired from active practice but who keeps abreast of the advances of modern medicine.

The method of selection will vary with the ownership, but in every case it should be provided that those appointed to the governing board may perform their duties without undue influence from any outside source. When the hospital is owned and operated by the community through its governmental agency it is undesirable to have that agency directly operate the institution. The man who enters politics incurs obligations which he cannot ignore, and the result in the hospital is too often incompetence or inefficiency. In an institution in which human life and alleviation of suffering are at stake, no degree of incompetence or inefficiency can be tolerated. If the hospital is owned and operated by the community through a joint stock company incorporated not for profit or through any other form of community organization, the members of this organization will elect the governing board of the hospital. The same is true of hospitals owned by church or fraternal organizations.

The organization of the governing board in a small hospital differs in no essential from that found in the large institution. Officers should consist of a president, a vice president, a secretary and a treasurer. These are elected by the governing body and perform the duties which are accepted as pertaining to the several offices. All committees report directly to the governing board.

The qualifications of the director of the hospital as stated by the American College of Hospital Administrators are applicable in their entirety to the director of the small hospital, but the person who is responsible for the management of the small hospital must be a much more versatile person than the one who is in charge of the larger institution, and the smaller the hospital the greater is the necessity for versatility. He must be able to fill any position and to do any piece of work, from firing the boilers in an emergency to performing the actual administrative duties of his or her own office.

The director, sometimes called the superintendent or administrator, is usually a woman and in all but a small percentage

of cases one who has had a basic training as a nurse. One reason for this is that the small hospital is not able to offer a salary that is attractive to a man, but of even greater importance are the duties involved. Of these, the chief is in the nursing department. The small hospital which does not conduct a school of nursing does not require a superintendent of nurses as a separate person. This is a position which is usually filled by the director in addition to her general administrative duties, and it is a position that cannot be filled satisfactorily by a man. The director has a varied relationship. She is, first, the representative of the governing board. The relationship to the medical staff is difficult to explain. In any institution there can be only one head, yet the nurse is always accustomed to take orders from the physician and to obey them without question. This is as it should be when the orders concern the treatment of patients. There is, however, a relationship in which the physician must submit to orders from the director, even though she is a nurse trained in all the customary relationships of nurse and physician. As an administrator, she should not be handicapped by the traditional relationship to the physician. In administrative matters she must give orders and they must be accepted without question by the physician. This dual relationship is perhaps more noticeable in her dealings with the radiologist and the pathologist than with other members of the medical staff. The administration must require the departments of these men to cooperate in making accounting possible. Equipment and supplies are usually purchased through the hospital, and the salaries of technicians and others are a part of the hospital pay roll. The heads of these departments are, however, physicians, and the director must not interfere with their professional activities. She is responsible for knowing whether the results are satisfactory, and this information is obtained through the medical staff. On the other hand, there are many administrative contacts, and in those the director is in the position of authority.

It is as important in the small hospital as in the large hospital to have a woman's auxiliary, because of the valuable assistance, financial and otherwise, that such an organization will render at all times. The small hospital can readily have an organized medical staff. Experience has proved that organized effort in conducting the medical work is absolutely essential, regardless of how limited a number of physicians may be privileged to practice in the hospital. Where there are only three or four physicians, the medical staff may exist in its simplest form, an undifferentiated group. Provision is made for the periodic election of officers, who function in an executive capacity in all matters pertaining to the medical work of the hospital. It is sometimes possible to establish clinical divisions. This tends to fix responsibility more definitely, stimulates scientific interest and facilitates the administration of the professional services. Usually the clinical departments of medicine, surgery, obstetrics and gynecology, and eye, ear, nose and throat may be organized. The responsibility of the hospital management must be emphasized in selecting the medical staff and a regular procedure followed in extending hospital privileges to any physician. Each physician should submit his qualifications in a written application, and these should be investigated by a credentials committee of the medical staff, which reports to the medical staff as a whole, with recommendations. When passed by the medical staff, the applicant is recommended to the governing board for membership in one of the staff divisions. It is considered advisable to extend hospital privileges for only one year with the understanding that, if the applicant's work and conduct have been satisfactory, further extension of privileges will be granted.

There are many ways of promoting cooperation between the medical staff and the governing board. The most satisfactory plan, which has been accepted by hospitals generally, is the organization of a joint conference or advisory committee, composed of duly selected members of the medical staff and the governing board, which meets regularly to discuss problems of mutual concern. The first step in the organization of a medical staff is to formulate complete by-laws, rules and regulations which set forth the type of organization and the duties, responsibilities and procedures. They should be approved by the medical staff signed by the chairman and secretary, and

submitted to the governing board for adoption. One of the major requirements of the approved hospital is that medical staff conferences be held at least once each month. Attendance at conferences should never be less than 75 per cent of the active medical staff. The attendance record of the individual member gives an excellent index of his interest in fulfilling his professional responsibility. Accurate minutes of all medical staff conferences should be prepared by the secretary of the medical staff. Every hospital, large or small, requires complete and acceptable medical records. In the small institution without interns or residents, the records may have to be written by the physicians themselves with whatever assistance the hospital can provide. A medical records department constitutes a major problem in many small hospitals. Physicians frequently fail to realize their responsibility, and the lack of a medical records consciousness on their part is regrettable. The appointment of a member of the medical staff as registrar of medical records or of an active committee on medical records to review the records daily, conscientiously and diligently, to see that they are kept up to a proper standard, is essential. The records should be filed in a conveniently located record room and should be regarded as the permanent property of the hospital, to be released only on order of the attending physician with the patient's consent or by order of a court.

All hospitals should be responsible for adequate clinical laboratory facilities for their patients. These should include as a minimum a small practical clinical laboratory where the essential examinations immediately necessary in assisting the clinician in making or confirming his diagnosis may be made. Too much stress cannot be placed on the importance of routine examination of all tissues removed at operation. Every piece of tissue should be sent to a qualified pathologist for macroscopic examination and a report. A microscopic examination should be made of all tissues at the discretion of the pathologist for further elucidation of the diagnosis. Investigation has shown that the larger accredited clinical laboratories are usually willing to cooperate with the small hospital in providing this necessary supplementary service at a cost that is not prohibitive, and certainly every patient in a modern hospital is entitled to this important service. In the small hospital some difficulty may be experienced in providing supervision and competent technical personnel for the clinical laboratory. Each hospital offers an individual problem, which in most instances can readily be solved. It is desirable for the hospital to have the part time services of a well trained clinical pathologist.

Every hospital should have at least a portable x-ray unit for an emergency service, particularly for the nonambulatory patient. In all instances the department should have medical supervision, for the responsibility of interpreting x-ray films constitutes medical roentgenology and is the work of a physician.

What must the small hospital do in the way of providing services such as metabolism tests, electrocardiography, oxygen therapy and physical therapy? Generally speaking, unless the hospital has a recognized, competent and complete service in these special features, some arrangement should be made with a nearby hospital which can provide them.

The financing of the small hospital offers perhaps one of its greatest problems. Indeed it is hardly conceivable that a hospital with an average occupancy of from thirty to forty patients could provide sufficient funds from its earnings to carry on an adequate service. Supplementing the ordinary revenues with gifts, donations, subsidies and endowments is always desirable. The director may have to be the business manager also, but he will delegate the details of accounting, bookkeeping and collections to a qualified accountant or bookkeeper. He usually oversees purchasing and supplies.

The hospital, though small, requires the usual utilities, which one speaks of as light, heat and power. An engineer will be necessary. Maintenance is an important function which is usually assigned to the engineer and includes repairs, plumbing, electrical service, cleaning, painting and upkeep of grounds. The hospital may have its own small laundry and render a satisfactory service in the care of the linen. On the other hand, it may find a contract with a commercial laundry more convenient and economical. Finally there are the housekeeping activities, which are common to all hospitals and in the case of

the small hospital cannot always be directed or supervised by a trained housekeeper. Often these duties will be assumed by the director of the hospital or one of the staff of nurses. Sometimes, and indeed more commendably, the housekeeping activities are supervised by the dietitian, who combines the duties of her department with those of the housekeeping department.

It is quite possible for the small hospital everywhere to meet at least minimum requirements in the care of the sick and injured, either within its own organization or through supplementing the medical and other services from larger institutions nearby.

### The Principles of Hospital Planning, with Special Reference to the Small Hospital

DR WILLIAM HENRY WAISB, Chicago. An intelligent approach to a hospital planning program can be made only by a careful survey of the actual needs for hospital accommodations in the particular community. Public interest, convenience and necessity are primary considerations which, while given little or no attention in the past, will have to be carefully weighed in the future to avoid the uneconomic duplication of facilities now existing in some communities. The population trends of the community should be carefully studied to secure some idea of future increases which may make additional accommodations necessary. The value of a hospital, large or small, will depend on the caliber of the professional men who compose its medical staff, which is the backbone of the institution. A survey therefore should appraise the professional credentials and standing of the doctors who are to constitute the staff. Needless to say, if a community does not have a sufficient number of reputable practitioners to staff a hospital properly, and others cannot be readily secured, it would be folly to proceed further with the project.

After the completion of a survey, the report should be submitted to whatever local agencies may be interested such as the hospital council, if there is one, the council of social agencies, the local medical society and the chamber of commerce. If the project receives the stamp of approval of such bodies, the sponsors may proceed with the assurance that it is launched on firm foundations and will command public interest and support. If it does not command such approval, it would be wise to defer action until every reasonable objection can be met.

No individual or group, whatever the motives, is justified in foisting on a community a hospital which is intended to be supported by voluntary contributions without first ascertaining the real need for and desirability of such an institution and securing unmistakable public approval. A hospital that is established without these precautions is not in the public interest and may become more of a liability than an asset.

Urgent reasons impel those who are charged with the responsibility of establishing a hospital to select architects who have had extensive experience in this specialty, who maintain an organization and facilities adequate to carry through such a complex undertaking and who possess the other attributes of personality and character so essential in the delicate and varied relationships involved.

The utilization of the services of a qualified medical consultant commences with the original survey of a hospital project, the report of which should embrace sufficient information for the formulation of a comprehensive planning program. The qualifications of a medical consultant on hospital planning are exacting and his success depends on his ability to coordinate and apply all available information bearing on a particular project, to understand thoroughly all the technical details of professional service and to transmit and interpret these to the architect in a comprehensible manner. The consultant should be skilful in analyzing community needs and in devising socially sound and economically feasible ways to meet them. The consultant is not an architect or an engineer, and a definite understanding of his own limitations in these respects is essential to harmonious relationships.

The preparation of final working drawings for a hospital is a time consuming task which should not be commenced until all major problems of planning and design have been satisfactorily settled and this work can proceed uninterruptedly. The completeness of plans and perfection of design may be of

little avail unless competent building contractors are engaged, since the application of the professional skill of the architect is so dependent on the character and ability of the contractors. It is therefore in the interest of the owners to delegate exclusively to the architects the responsibility of selecting contractors considered worthy and capable of bidding on the work. Competition of course is always desirable, but bidding ought to be limited to those firms whose organizations, credit and qualifications are comparable. After bids have been accepted, contracts awarded and work started, there should be required the most rigid compliance with the plans and specifications, and it is the duty of the owners to support the architect in the endeavor to enforce his rulings in any controversy that may arise.

A hospital may be financed from taxation, from a private bond issue, from small voluntary contributions or from specific bequests. Whenever it is possible to utilize the voluntary contribution method there is a greater likelihood of enlisting the enthusiastic interest and support of the community. In the case of the tax financed hospital, it is strongly urged that efforts be made to have enacted an enabling statute setting up a board of trustees so as to remove the institution as far as possible from the stifling effect of partisan political manipulation. The establishment of a community hospital by the floating of a bond issue by private groups is justified only when no other method is feasible and the project is widely endorsed by all the professional and social agencies in the community. It seems to me that if a community really wants a hospital it will establish one by voluntary contributions or bring it into existence through the electorate, and I believe that there is never justification for any group pretending to be eleemosynary to saddle the burden of capital charges deliberately on the prospective patient without his knowledge and consent.

In considering the costs of hospital construction it should be assumed that the structure will be built of fire resisting materials. There are two common methods of roughly computing these costs prior to ascertaining the more exact estimates readily obtained after plans are completed: (1) the cubage method and (2) that based on the cost per bed. Calculating costs on a cubage basis, it is necessary to determine the number and type of beds to be provided and the number of cubic feet that must be reserved for each bed. That is to say, one must calculate not only the actual cubic space occupied by the bed itself or the private room but also that of the halls, stairways, elevator shafts, service rooms, surgical and obstetric suites, x-ray rooms and laboratories, administrative offices, kitchens, storage rooms and other space not used for beds, which often closely approximates 70 per cent of the modern hospital for the acutely ill. Cubage allowances run from 5,000 to 8,000 cubic feet per bed and, using the median of these, one may assume that it is possible to build a general hospital for acutely ill patients with an allowance of 6,500 cubic feet per bed. In estimating cubage for multistoried buildings it is customary to allow not less than 12 feet between floors, which will allow for ceilings of adequate height on all floors.

Hospital construction costs differ in various communities according to the labor and material markets, and further variations result from the differing abilities of architects in the selection of materials. At present in most parts of the northern section of the country a small general hospital can be constructed for approximately 55 cents a cubic foot, but the factors affecting cost are so constantly changing that too much reliance should not be placed on that figure. A fifty bed hospital therefore, with an allowance of 6,500 cubic feet per bed, at a cost of 55 cents a cubic foot, will cost \$178,750 for construction, or a cost per bed of \$3,575. This would include a low pressure heating plant and a laundry room built into the structure. To these figures must be added the fees of the architect and consultant, which will usually be about 6 per cent of the total cost of the project, and the cost of the furnishings and equipment. To provide a fifty bed hospital with modest furnishings and the minimum of equipment required to conduct a modern hospital, an outlay of not less than \$40,000 will be necessary. Summing up the items mentioned, there is a cost of \$229,475, which increases the cost per bed to \$4,589. This does not include any landscaping, walks or roads that might be required,

although when these are not too elaborate their cost can be met within the amount stipulated. I have not considered a nurses' home, the cost of which would be considerably lower per bed than the hospital.

The foregoing data when intelligently used will furnish sufficient information for an approximate calculation of costs early in a hospital project, but unless all the factors mentioned and others are considered, misleading figures will result. I have merely attempted to indicate methods and principles of computing preliminary estimates, and again I emphasize the point that truly accurate information on the cost of a hospital is that obtained only after a project is completed and all factors affecting costs are presented.

### Housing the Small Medical Center

CARL A. ERIKSON, Architect, Chicago. I shall limit myself to hospitals of thirty beds and less. Intended of course to care for the community sick, they have two collateral purposes. One is that by pooling its resources the community is able to provide itself with needed medical equipment, such as x-ray apparatus, laboratories and surgical facilities, far beyond the resources of any individual doctor. By means of the small hospital the community also centralizes its medical skill, represented by doctors, nurses and technicians. These purposes of the hospitals in smaller communities are a very important reason for their construction.

Records show that the small hospital generally seems to have more beds than it needs. The occupancy for 185 hospitals of less than thirty beds according to the 1938 American Medical Association records was but 54 per cent. These were the only hospitals in each of 185 villages and towns in Illinois and six surrounding states. Small hospitals care for all classes of patients. The relation of total admissions to average occupancy was calculated for the 185 hospitals and found to be 40, and for 109 nonproprietary hospitals the relation was 38, the figures for three of the leading voluntary hospitals in Chicago were 35, 38 and 39. Obstetric patients probably claim more beds than in the average city hospital. The records for the 185 hospitals indicate that such patients comprised 16 per cent of those admitted, whereas they comprised but 8 per cent for the nine largest Chicago hospitals. Surgical patients represented 33 per cent of those admitted in twenty small Saskatchewan hospitals, the 1936 records of all the Carolina hospitals ruled by the Duke Foundation show that 60 per cent of the patients were admitted for operations.

The housing of patients is complicated by the wide fluctuation in occupancy to which small hospitals are subject. To meet the economic and clinical needs, multiplied by 2 because of sexes, extreme flexibility in assignment of rooms is obviously needed. Preferably none of the rooms should contain more than two beds, and every private room should be large enough for two beds, about three fourths of the beds should be in two bed rooms and the remainder in private rooms. Such a hospital should be able to average 70 per cent capacity and operate for a short time at 110 per cent capacity if necessary. Twenty beds in this kind of hospital might average fifteen occupied beds without any more difficulty than a twenty-five bed hospital with a number of four bed or larger wards might have with the same annual average occupancy.

Too often the sponsors of small hospitals take as their model some larger hospital, lop off the unnecessary beds and shrink the rest a process that is unsatisfactory. It is very simple to assign 60 square feet to each bed in a two or four bed ward, it is something else to use it comfortably. The generally accepted minimum of 80 square feet per bed is none too large for practical operation, nor does it often permit anything more than the minimum distance between patients. The single room should preferably contain not less than 160 square feet, which will permit its use for two beds when needed. At least two rooms and preferably four in every hospital should have individual toilets, which will permit their use in isolation cases and at other times as private rooms. Convenience and accepted technique dictate that each room should have a wash basin if the building budget can be stretched that far. A closet or wardrobe should not be overlooked. A utility room and linen closet, a janitor's closet, toilets and a bath, simply equipped and detailed, are a necessary accompaniment of each group of patients' rooms.

The patients should be grouped together to form a single nursing unit, to divide them among two or more floors either increases nursing costs or decreases the nursing care. Each added floor of patients requires another set of baths, utility rooms and linen closets, at a corresponding cost.

A small reception room adjoining the entrance is a necessity, and it should be completely shut off from the hospital corridor. Administration must be of the simplest character, but a small office is a necessity and should adjoin the entrance and reception room. In view, however, of the limited nursing and administrative personnel and their varied duties, the nurse's charting desk should be so placed that it controls, when needed, the main entrance as well as all the patients' rooms.

The twenty-five bed hospital will average about one operation every day and one birth every four or five days, the ten bed hospital, one operation every third day and a birth every ten or twelve days. In the hospital as small as ten beds one operating room should be sufficient, supplemented when necessary by a medical service room. The twenty-five to thirty bed hospital should have an additional operating room. The operating rooms should be about 16 by 20 feet. Scrubbing can be done in the operating room and many surgeons would prefer this. A surgeon's dressing room and toilet are essential. The nurses' workroom should be large enough to make a really comfortable workroom, probably not less than 60 to 80 square feet of clear floor space, with cases, closets, sinks, work tables and sterilizers outside this area.

Opinions will vary as to the desirable equipment. Certainly there will be an x-ray machine and a laboratory, beyond that I hesitate to make any predictions. Most of the equipment, however aside from some forms of x-ray apparatus, is small and easily handled. The cardiograph, most forms of electrotherapy machines, the essential of basal metabolism apparatus, as well as many of the smaller x-ray machines, are readily portable. One room can be used for all of this equipment. To avoid cluttering up the room it should be possible to store the unused equipment in adjacent closets.

Without a balanced budget the small hospital cannot long exist, hence it must have a rigorously limited personnel. The duties of laboratory, x-ray and physical therapy technicians will have to be divided among the doctors or the nursing personnel or allotted to a single technician. A combination of a laboratory and the drug room in one seems feasible. I would suggest a third use for this room, that of x-ray dark room. All the diagnostic and therapeutic services should if possible be grouped together, as it makes for the best use of limited personnel. However, x-ray and physical therapy facilities should be readily accessible to outpatients. If they are all placed on the same floor with the patients, and that floor is close to the ground, there is no need for an elevator or large stairs and substantial economies in building and operation result.

A laundry may not prove to be an economy. The boiler room should be as simple and as largely automatic as possible. Cheap electric power and bottled gas have largely eliminated one of the former problems of the small hospital, how to get high pressure steam for sterilizing. Examination of the plans of many small hospitals discloses that most of the builders were not "store room conscious" at the time of planning, the management subsequently has no doubt become painfully so.

Two of the three functions of the hospital have been discussed, the third is the centralization of the medical personnel. The housing of nursing and technical personnel is essential, their skill must be on tap twenty-four hours a day to care for emergencies. They must therefore have quarters in or adjoining the hospital. Small hospitals do not have interns and few can afford to pay a resident physician, yet a doctor must always be on call. Probably in these days of the telephone and the automobile any doctor in a small community can get from his home to the hospital quicker than the resident in the large hospital gets to his patient from his quarters.

As a layman I would expect benefits from the association of public health activities with the curative medical practice of the small hospital. Some free outpatient work must be done at the hospital. It seems reasonable to assume that tuberculosis, venereal disease, pediatric, maternal, orthopedic and other governmentally supported clinics should be held at the community medical center. Also, if there is a public health officer, should

he not be close to these facilities and to the headquarters of the practicing physicians rather than at the county court house?

It is generally agreed that hospitals large or small should be of fireproof construction, but if the hospital has only one story, masonry outside and in the corridor walls, with a fire resistive first floor and wood ceiling joists and rafters plastered on wire lath may make an acceptable substitute.

The principles of construction are identical with those of the larger hospital but their application to the small one requires a bit of common sense, a flashlight is a part of the equipment of a night nurse may be just as efficient as a built-in night light, an infinitesimal portion of the cost. The finish should, so far as is practicable, be kept within the scope of the local craftsmen. Terrazzo and tile may prove expensive if the contractor and crew must come from distant points for a small job. Local resources in building material should be carefully canvassed and used to the utmost.

#### DISCUSSION ON THE SMALL HOSPITAL

EDGAR MARTIN, Architect, Chicago. Each community has its own hospital problem, different from and entirely independent of that of other communities. A hospital illustrative of the paper presented by Dr. Walsh contains 300,000 cubic feet. There are two five bed wards and thirteen private rooms, all of which are convertible into two bed wards and four special beds. This normally provides thirty beds. Depending on the intensity of use of the two bed wards, the capacity will be either twenty seven or forty beds and in an emergency the number of beds in the wards can be increased, the solarium can be used as a ward and the hospital can be expanded to a bed capacity of forty eight beds.

Every hospital room articulates with a subtility room. This arrangement does away with the commode and bedpan travel down the corridors. It is a little more expensive, but when the special facilities are provided the extra expense will be amortized in a short time by the saving in nursing charges. In a number of the private rooms the subtility room opens from a connecting corridor. A wide building is always less expensive than a long building, and there is an arrangement whereby a single door swings on a quadrant between two door openings, so arranged that on a patient's entering the bath the door closes off from the adjacent room and automatically locks. The patient on leaving automatically unlocks the door in the other room, and the toilet then is in a position for use by the other patient. While one patient is using the toilet, there are two doors closed between it and the adjacent room shutting out all sounds.

The need has been emphasized both by Dr. MacEachern and Dr. Walsh of the necessity of the departmentalization of the various medical services. Departmentalization is complicated in any hospital, but it is particularly complicated in the small hospital. The casualty department is the one department in no ratio to the bed capacity of the hospital. It is placed in a part of the building where the commotion and excitement that always attend accident cases will least disturb the routine services of the rest of the hospital. It has a secluded entrance, with adequate space for relatives and friends and for less injured patients who are waiting while the more seriously injured are being taken care of. A two table minor operating room is provided which articulates closely with the x-ray department, the splint storage room and the operating suite, and in the operating suite is a reserve orthopedic table for use in the case of fractures.

The obstetrics department is placed where the noise is less disturbing to the rest of the hospital and where absolute privacy is obtained. The waiting patients and the postdelivery patients are separated from the delivery suite. The nursery is so placed that the general public and relatives can view the babies without intruding on the privacy of the maternity patients. The nursery is equipped for infectious disease technic and has plate glass windows opening on the visitors space.

The administrative section is self contained, entirely outside the zone of medical and nursing care. The kitchen department is provided with full facilities for dietetics as well as general foods and food storage.

(To be continued)

## Medical Examinations and Licensure

### COMING EXAMINATIONS

#### STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL March 18 page 1099

#### NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS. Parts I and II. Medical centers having five or more candidates desiring to take the examination, May 12 (Part II only—limited to a few centers) June 19 21 and Sept 11 13. Ex. Sec. Mr. Everett S. Elwood 225 S. 15th Street Philadelphia

#### SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY. An Affiliate of the American Board of Surgery. Oral examinations for all candidates. St. Louis, May 13 14. Written. Various places throughout the United States. Sept. 9. Applications must be filed by July 11. Oral. Part II. Philadelphia Oct. 14 15. Sec. Dr. Paul M. Wood 745 Fifth Ave. New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY. Philadelphia Oct. 30 Nov. 1. Sec. Dr. C. Guy Lane 416 Marlboro St. Boston.

AMERICAN BOARD OF INTERNAL MEDICINE. Written. Various sections of the United States. Oct. 16 and Feb. 19. Formal application must be received before Aug. 20 for the Oct. examination and on or before Jan. 1 for the Feb. examination. Sec. Dr. William S. Middleton 1301 University Ave. Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY. General oral clinical and pathological examinations for all candidates. Part II examinations (Groups A and B) will be held in St. Louis May 15 16. Sec. Dr. Paul Titus 1015 Highland Bldg. Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY. Written. Various cities throughout the country. Aug. 5. Oral. St. Louis May 15 and Chicago Oct. 7. Sec. Dr. John Green 6830 Waterman Ave. St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY. St. Louis May. Applications must be filed with the Secretary on or before April 1. Sec. Dr. Fremont A. Chandler 6 N. Michigan Ave. Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY. St. Louis May 12 13 and Chicago Oct. 6 7. Sec. Dr. W. P. Wherry 1500 Medical Arts Bldg. Omaha.

AMERICAN BOARD OF PATHOLOGY. Richmond Va. April 3 4. Sec. Dr. F. W. Hartman Henry Ford Hospital Detroit.

AMERICAN BOARD OF PEDIATRICS. Cincinnati Nov. 15. Appointments must be made before July 15. Sec. Dr. C. A. Aldrich 723 Elm St. Winnetka Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY. Chicago May 13. Sec. Dr. Walter Freeman 1028 Connecticut Ave. N.W. Washington D. C.

AMERICAN BOARD OF RADIOLOGY. St. Louis May 11 14. Sec. Dr. Byrl R. Kirklin 102 110 Second Ave. S.W. Rochester Minn.

AMERICAN BOARD OF SURGERY. Part I. Simultaneously in various centers throughout the United States. April 3. Part II. New York May 8 and May 9. Sec. Dr. J. Stewart Rodman 225 S. 15th St. Philadelphia.

AMERICAN BOARD OF UROLOGY. White Sulphur Springs W. Va. May 26 28. Sec. Dr. Gilbert J. Thomas 1009 Nicollet Ave. Minneapolis.

### Michigan October Examination

Dr. J. Earl McIntyre, secretary, Michigan State Board of Registration in Medicine, reports the written examination held at Lansing, Oct. 12-14, 1938. The examination covered fourteen subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty-one candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Georgetown University School of Medicine	(1938)		85.9*
Loyola University School of Medicine	(1938)		78.7†
Northwestern University Medical School	(1937)		83*
Rush Medical College	(1937) 82.4 *	86.7 *	81.8*
School of Medicine of the Division of Biological Sciences	(1938)		87.1*
University of Louisville School of Medicine	(1937)		85.5
University of Michigan Medical School	(1936) 87.4	(1938)	81.7*
University of Minnesota Medical School	(1933)		78.9
Creighton University School of Medicine	(1937)		80.4
Cornell University Medical College	(1937)		82.2
New York Medical College and Flower Hospital	(1938)		81.2*
Duke University School of Medicine	(1937)		83
University of Cincinnati College of Medicine	(1937)		86.9*
Marquette University School of Medicine	(1938) 83.6 *	84.5†	
University of Wisconsin Medical School	(1937)		89.1
University of Western Ontario Medical School	(1936)		85.3*
McGill University Faculty of Medicine	(1937)		83.6*

\* License has not been issued.

† This applicant has completed the medical course and will receive the M.D. degree on completion of internship. License has not been issued.

### Maryland (Homeopathic) December Examination

Dr. John A. Evans, secretary, Board of (Homeopathic) Medical Examiners, reports the written examination held at Baltimore, Dec. 13-14, 1938. The examination covered nine subjects and included seventy questions. An average of 75 per cent was required to pass. Four candidates were examined, all of whom passed. The following school was represented:

School	PASSED	Year Grad	Per Cent
Hahnemann Medical College and Hospital of Philadelphia	(1937) 80	(1938) 86	90 94



## Book Notices

**Personality Structure in Schizophrenia. A Rorschach Investigation in 81 Patients and 64 Controls.** By Samuel J. Beck, Ph.D., Head of the Psychology Laboratory, Department of Psychiatry, Michael Reese Hospital, Chicago. With a preface by C. Macle Campbell, M.D., Nervous and Mental Disease Monograph No. 63. Boards. Price \$2. Pp. 98, with 12 illustrations. New York: Nervous and Mental Disease Publishing Co., 1938.

This excellent monograph reports a study of the fantasies produced by persons when exposed to the observation of outlines created by the "ink blot method" and a critical analysis of the verbalizations regarding what they fantasied as a reaction to this observation. The test was originally devised by Rorschach for the study of schizophrenia, and Beck, following Rorschach, uses the method to distinguish between the schizophrenic and other personality problems. This test, which is being utilized more and more for diagnostic and prognostic purposes, offers an objective approach to the whole problem of mental illness. The original work by Rorschach, who died in 1922, has been carried on by Oberholzer and his students and has been further influenced by Behn-Echenburg (who worked with adolescents), Schneider (with inhibited children), Pfister (with the feebleminded), M. Bleuler (with adult siblings), von Verschuer (with twins), Veit (with Parkinson's disease) and Munz (with personality types according to Kretschmer and others). In this country D. M. Levy, who worked with Oberholzer, brought the test to the Institute for Child Guidance in New York, where Beck began its application and soon developed into one of its foremost exponents and technicians. As Beck states, "What appears from the Rorschach experiment is that, in each kind of personality, whether it be healthy adult, problem child, depressed, hysteric, schizophrenic or any other, certain psychological processes hang together and the organization of these processes is the particular kind of personality. . . it is the structure so found in schizophrenia . . . and comparing it with that in individuals not so suffering that the present study attempted to inspect." Every psychiatrist and psychologist should familiarize himself with this test because it is certain to occupy a foremost position in any study of personality structure.

**La tuberculose pulmonaire chez les sujets apparemment sains et la vaccination anti-tuberculeuse.** Par L. Sayé, professeur de physiologie à l'Université de Barcelone. Paper. Price 60 francs. Pp. 256, with 88 illustrations. Paris: Masson & Cie, 1938.

This monograph contains some of the most modern and most needed teaching in tuberculosis literature. It may be compared to the back of a tapestry that is rarely ever seen. Sayé has turned the tuberculosis tapestry around so that the unseen side comes into better view. An extensive review of the literature interspersed with his own results makes up this report.

Tuberculosis in those apparently well is the seed from which an important part of clinical disease emanates and constitutes the unseen source of the disease that is the greatest barrier in the way of control and eradication. While all tuberculosis arises from an exposure to some open case, those who are exposed to known open cases present from five to six times as much clinical disease as is found in the general population. In one of the author's series 18 per cent of such cases were open. This introduction may be considered the principal theme of the work. It is a question first of contact, second of dosage, and then to a minor degree environment, age, race, sex and occupation. Owing to the fact that many persons with open tuberculosis are apparently well, they are one of the greatest problems of tuberculosis workers today.

Surveys of various authors within general populations reveal figures for tuberculosis in the apparently healthy that vary widely but are roughly proportional to the death rate of the particular group. It is roughly 1 per cent for countries like the United States and Germany and rises to about 2 per cent in most other European countries with a few exceptions, such as Poland, where it is over 3 per cent. In China it is between 7 and 8 per cent. These figures have been obtained by tuberculin and x-ray surveys on soldiers, students and various occu-

pational and social groups. Important are the figures for medical students and nurses. Nurses on the average have five to six times the general rate, but some tuberculosis services, especially some handled by Sisters of Charity, have rates as high as 12 per cent. In other places where antiseptic technique has been used it drops almost as low as the rate for the general population. The rate for medical students increases about four times that for other professional students, from the first to the fourth year inclusive.

The occupation is not as important as the contacts within the occupation and the public health intelligence of the groups. Prisoners have a high rate (9 per cent for the sixth decade) and Chinese students, Indians and Negroes have a high rate (from three to four times the average) while certain universities (Yale, Pennsylvania) have a low incidence of open disease (about half the general incidence) in spite of a relatively high infection rate. [This is presumably due to an elimination of heavy dosage by a knowledge of sanitary precautions.—Ed.]

The ages most affected include principally infants and young adults over other ages, while young females predominate over males. Many of the symptomless forms have been followed by x-ray and bacteriologic studies. With cultures and animal inoculations on sputum and particularly stomach washing, it has been found that persons who do not show symptoms may discharge bacilli for three or four years after healing has begun. The lymph nodes in skin and mucous types clear up within a year or two.

The diagnosis is best made with the x-rays and tuberculin, supplemented by cultures and animal inoculations on sputum and stomach washings. The author uses a combination of the Pirquet and Mantoux tests, stepping the latter up as high as 1 mg if necessary. Then for a diagnosis of latent or active disease the fluoroscope, paper films and finally, in doubtful cases, regulation films are used in order. By this progression the cost is kept at a minimum. There is a negative agreement of 47.3 per cent and positive agreement of 10.5 per cent (total 58.8 per cent) of films and fluoroscopic study. The films are superior by around 30 per cent with certain cases of each in doubt.

There is a small but important group in which there are no physical or x-ray signs but which are positive for tubercle bacilli. This may be due to small foci invisible on the roentgenogram, to bacilli present in apparently normal tissue, to lesions not yet developed, to lesions behind the heart, to ruptured lymph nodes, to cleared pneumonic or epituberculous lesions or to tuberculous bronchitis. A very few of such bacillary observations are nontuberculous or are extraneous bacilli. On rare occasions there may be positive clinical signs with all else negative.

Reviewing work of various authors, Sayé shows how prognosis is worse in primary lesions with large calcifications and is roughly dependent on the size of the dose and the age of the infected patient. In ulcerative lesions 79 per cent of patients are dead after fourteen years. [This perhaps does not include recent figures.—Ed.] There are 8 per cent of late exacerbations in primary lesions up to 25 years, 10 per cent of small exudative foci are open after three years. Prognosis is favorable in 63 per cent of early and moderately advanced cases, 34 per cent in moderately advanced and far advanced cases and 2 per cent in far advanced cases. [This again probably does not include the changes brought about by the intensive use of modern surgery.—Ed.]

The author's recommendations for treatment are generally sound, including a conservative extension of pneumothorax to include all types of open cases and the use of gold salts in the treatment of certain lymph node types of children. The author has been one of those to use gold salts with apparent success. Indications for pneumothorax in closed cases, in the author's opinion, is not well defined.

In the chapter on prophylaxis the author makes out an excellent case for BCG, citing figures that show an increase in protection of treated cases from four to ten times over untreated cases.

The book is recommended for physicians and tuberculosis workers.



**Thoracic Surgery** By Ferdinand Sauerbruch Professor of Surgery in the University of Berlin and Laurence O'Shaughnessy F.R.C.S., Hunterian Professor in the Royal College of Surgeons of England. A revised and abridged edition of Sauerbruch's *Die Chirurgie der Brustorgane*. Cloth. Price \$13.50. 1 p. 791 with 230 illustrations. Baltimore: William Wood & Company, 1937.

This moderate size volume is an entirely new work. It is a revised and abridged edition of Sauerbruch's three volume work "Die Chirurgie der Brustorgane" based on this author's knowledge and experience of surgery of the chest gathered during his work at the clinics of Zurich, Munich and Berlin. It first appeared in 1918 as a small single volume, in 1921 in two volumes, and in 1928 and 1930 in three volumes. Sauerbruch is unquestionably the foremost authority on chest surgery in Germany. Mr. O'Shaughnessy, a British surgeon specializing in thoracic surgery, worked for a considerable time in Professor Sauerbruch's clinic and the new volume was written by the two surgeons in collaboration. It contains the best in German surgical practice and, in addition the most recent advances and most valuable operative procedures developed in Great Britain and the United States. The volume is strictly down to date and presents in concise form the entire subject of thoracic surgery including the significant contributions of the last ten years.

A few chapters are somewhat disappointing. The section on surgical relief of cardiac ischemia reviews all the older work and includes the more recent operations, even O'Shaughnessy's operation (1936) in which a pedicled omental graft is sutured to the heart, and Lenzius's operation (1937) in which, after partial excision of the pericardium, the lung is attached to the heart. But these operations are not described in enough detail and are not illustrated. The same criticism applies to the surgical treatment of angina pectoris. Here no mention is made of total thyroidectomy, none of the operations are illustrated, no statistical information is given, and the authors conclude by stating that until the surgical treatment of angina pectoris can rest on a more secure anatomic and physiologic basis the successes obtained in a few isolated cases should not encourage its general adoption. White's experiences alone with paravertebral injection with alcohol of the stellate and upper five dorsal ganglions would seem to warrant more optimism.

Although it is impossible to compress into one volume all the valuable information contained in Sauerbruch's three volume system, this volume does contain most of the essentials and, in addition, much that has been learned since his last edition appeared in 1930. For this reason those surgeons who already possess this set will welcome having the work brought down to date, and for those unable to read German this volume will be unusually valuable.

**Spectrochemical Analysis in 1938. A Companion Book to 'Spectrochemical Abstracts 1933-38.'** By F. Twyman F.R.S. Cloth. Price 4s. 4d. Pp. 68 with 16 illustrations. London: Adam Hilger Limited, 1938.

Twyman, physicist to Adam Hilger Limited, manufacturer of optical instruments, has now presented to his fellow workers a "last minute" account of references pertaining to spectrochemical analysis. The monograph is divided into six sections and a subject index. Twyman makes a candid selection of the literature. The second chapter, on quantitative spectrochemical analysis with the microphotometer, is of importance because it is the field which receives most attention at present. Chemists, physicists and biologists interested in this branch of science need this booklet on their study table.

**Chemie und Technik der Gegenwart** Herausgegeben von Dr. H. Carl, Dozent an der Universität Leipzig. Band XIV. Vitamine und Hormone und ihre technische Darstellung. Teil 3. Darstellung von Hormonpräparaten (ausser Sexualhormonpräparaten). Von Dr. Erich Vincke. Boards. Price 7.50 marks. Pp. 162 with one illustration. Leipzig: S. Hirzel, 1938.

The third volume of the series on vitamins and hormones is about the technical preparation of the hormones other than sex hormones. A portion of the book is concerned with a discussion of general methods of preparation, with suitable references. There is a brief general description of methods of preserving materials and extracting the active principles with various solvents. Then follow chapters devoted to individual products,

with a brief discussion of the chemistry, methods of detection and estimation and detailed description of methods of preparation. There is also a brief discussion of the clinical use of some of the products. At the end of each chapter there is a list of articles in the scientific literature followed by a separate tabulation of important patents in various countries. There are a number of useful tables throughout the book which provide a list of commercial preparations of each hormone that are available.

**Kliniske Studier over dissemineret Sklerose og beslægtede Lidelser Af Mogens Ellermann** [Clinical Studies on Disseminated Sclerosis and Related Diseases]. Denne Afhandling er af det lægevidenskabelige Fakultet antaget til offentlig at forsvares for den medicinske Doktorgrad. København: Paper. Pp. 233. Copenhagen: A/S Oscar Fraenckel & Co., 1937.

This excellent monograph is based on 122 cases of multiple sclerosis and thirty-four cases of related diseases (lethargic encephalitis and disseminated encephalomyelitis), with brief records of all cases which were studied in Copenhagen clinics. There are separate chapters for each of the principal symptoms and syndromes encountered, such as sensory disturbances, ataxia, ocular symptoms, sphincter disturbances and psychic symptoms. In each such chapter a review of the literature is first given, followed by an account of the author's experience. There are lucid chapters dealing with the relationship and contrasts between disseminated sclerosis, lethargic encephalitis, encephalomyelitis and neuromyelitis optica. Every neurologist who can read Danish will be grateful to the author for this splendid compilation.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Malpractice Expert Witness Must Have Knowledge of Standards of Local Physicians**—The plaintiffs, husband and wife, sued the defendant for malpractice, alleging that he improperly, negligently and carelessly prescribed for the wife a remedy referred to as "phanodorn." The trial court entered a judgment of non-suit at the conclusion of the plaintiffs' evidence, and the plaintiffs appealed to the district court of appeal, second district, division 2, California.

It was incumbent on the physician, said the court, to apply that degree of care, skill, knowledge and attention ordinarily possessed and exercised by physicians under similar circumstances in the locality in which the treatment was administered. To justify submitting the issues to the jury, it was necessary for the plaintiffs to prove negligence or lack of care or skill on the physician's part by expert witnesses familiar with the practice concerning the patient's infirmities in the locality in which she was treated. Without such testimony no valid judgment could be rendered against the physician. To establish the negligence of the defendant, the plaintiffs presented as witness a physician who testified that he was a graduate of a medical college and that he had practiced in Los Angeles, the locality in which the treatment was rendered, since 1933. A hypothetical question was then propounded to him to which objection was made and sustained. The plaintiffs then rested their case without making any further effort to show the competency of the witness.

The district court of appeal held that the trial court did not err in sustaining the objection to the question propounded to the witness because it was not shown that the witness was familiar with the work and practices of other physicians in the community in which the treatment was given. In so holding the court relied on *McGuire v. Baird*, 9 Cal. (2d) 353, P. (2d) 915, in which the Supreme Court of California said:

The qualifications of a witness to testify in a malpractice case are definitely and clearly established by the decisions of the courts of this state. In the recent case of *Rasmussen v. Shickle*, 9 Cal. App. 2d 426, 430, 41 P. 2d 184, the court very aptly defined such qualifications in the following language: To qualify as such expert in a malpractice case against a

physician the witness must not only show himself to possess learning and knowledge of the subject of inquiry sufficient to qualify him to speak with authority on the subject but also a familiarity with the treatment and degree of care and skill of other practitioners in the locality in question sufficient to qualify him to say whether or not the defendant's treatment was consistent with what other physicians in the exercise of reasonable care might do under similar circumstances.

Since the plaintiff's case was not supported by the testimony of expert witnesses, the trial court, in the opinion of the district court of appeal, properly granted a motion for a non-suit—*Taylor v Fishbaugh (Calif)*, 79 P (2d) 174

**Workmen's Compensation Acts Strangulation of Pre-Existing Hernia Not Compensable**—The claimant's husband had suffered from hernia since childhood. While the hernia had troubled him frequently, he had worked as a miner for at least thirty years. On March 12, 1937, in the course of his employment in a mine, he assisted in moving a piece of slate weighing about 700 pounds. About thirty minutes later he complained of being sick and went home. His condition continued to grow worse and a physician was called, who caused the employee to be taken to a hospital where he was operated on for a strangulated hernia. A secondary operation was performed some days later, pneumonia developed and the employee died March 18. His widow, the claimant in the present case, filed a claim for compensation which was denied by the compensation commissioner. This denial was affirmed by the compensation appeal board and the claimant appealed to the Supreme Court of Appeals of West Virginia.

The workmen's compensation act of West Virginia provides that an employee may be compensated for hernia if (1) there was an injury resulting in hernia, (2) the hernia appeared suddenly, (3) it was accompanied by pain, (4) the hernia immediately followed an injury, (5) the hernia did not exist prior to the injury for which compensation is claimed. The act, in the opinion of the court, intended to bar compensation for hernia in cases in which the disability existed prior to an injury for which compensation is sought. It refers to "all claims for compensation for hernia," and to obtain compensation therefor certain things must definitely be proved to the satisfaction of the commissioner, the first being "that there was an injury resulting in hernia." It cannot be said, the court concluded, that a hernia resulted from an injury in a case, such as the one at bar, in which the hernia had existed from childhood.

For the reasons stated, the denial of compensation was affirmed—*Jordan v State Compensation Commissioner (IV Va)*, 197 S E 20

## Society Proceedings

### COMING MEETINGS

American Medical Association St Louis May 15 19 Dr Olin West 535 North Dearborn St Chicago Secretary

Alabama Medical Association of the State of Montgomery April 18 20 Dr D L Cannon 519 Dexter Ave Montgomery Secretary

American Academy of Tuberculosis Physicians St Louis May 13 14 Dr Arnold Minnig 638 Metropolitan Bldg Denver Secretary

American Association for the Study of Goiter Cincinnati May 22 24 Dr W Blair Mosser 133 Biddle St Kane Pa Secretary

American Association for the Study of Neoplastic Diseases Detroit April 6 8 Dr Eugene R Whitmore 2139 Wyoming Avenue NW Washington D C Secretary

American Association for Traumatic Surgery Hot Springs Va May 8 9 Dr Ralph G Carothers 409 Broadway Cincinnati Secretary

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# Current Medical Literature

## AMERICAN

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Titles marked with an asterisk (\*) are abstracted below.

### American Journal of Ophthalmology, St. Louis

21 1315-1426 (Dec.) 1938

- Eye Lesions in Experimental Infections with Special Reference to Arthritis C. Berens, D. M. Angevine, I. Cuy and S. Rothbard New York—p. 1315
- Lectures on Motor Anomalies. IV. The Etiology of Strabismus A. Bielschowsky, Hannover, N. H.—p. 1329
- Chemical Pathogenesis of Catarract A. C. Krause Chicago—p. 1343
- Treatment of Concomitant Convergent Strabismus. Results Secured by Atropine Occlusion and Correction of the Refractive Error E. A. Vorisek Chicago—p. 1356
- Sarcoma of the Iris. Case Report H. D. Rosenbaum St. Louis—p. 1360
- Bilateral Accommodation Paralysis and Unilateral Scotoma in Sphenoidal Sinus Disease. Case Report Norma B. Illes Houston, Texas—p. 1365
- The Speed of Picture Recognition and the Speed of Word Recognition in Cases of Reading Difficulty J. H. Ennes Boston—p. 1370
- The Problem of Statistics Relating to Blindness and the Blind H. Best Lexington, Ky.—p. 1376

### Annals of Surgery, Philadelphia

100 1-160 (Jan.) 1939

- Ligation of the Common Carotid Artery in Cancer of the Head and Neck W. L. Watson and S. M. Silverstone New York—p. 1
- \*Localization of Intracranial Lesions. Determination of Areas of Hyperpathia of the Scalp F. H. Lewy Philadelphia—p. 28
- Spinal Subarachnoid Injection of Absolute Alcohol for Relief of Intractable Pain W. Pitts and J. Browder Brooklyn—p. 33
- Recurring Peritonitis Following Operative Reduction of a Strangulated Inguinal Hernia. Cure Following Resection of the Damaged Loop R. H. Meade Jr. Philadelphia—p. 43
- Neurotation of the Intestine R. Marx Los Angeles—p. 49
- Intra-Abdominal Omental Torsion. Report of Three Cases G. C. Hederstad Stockholm Sweden—p. 57
- \*Splenectomy in Various Blood Disorders W. D. Andrus and C. W. Holman New York—p. 64
- Method for Transplanting the Adrenal Gland of the Dog with Reestablishment of Its Blood Supply. Report of Observations S. E. Levy and A. Blalock Nashville, Tenn.—p. 84
- Renal Caruncle. Case Report and Comparative Review H. M. Spence and L. W. Johnston Dallas, Texas—p. 99
- \*Efficacy of Coley's Toxin in Treatment of Sarcoma. Experimental Study A. Brunschwig Chicago—p. 109
- Multiple Dentigerous Cysts with Special Reference to Occurrence in Siblings R. H. Ivy Philadelphia—p. 114
- Pulsating Benign Giant Cell Tumors of Bone G. B. Mider and J. J. Morton Rochester, N. Y.—p. 126
- Treatment of Delayed Union and Nonunion of Fractures by Subcutaneous Drilling R. A. Griswold Louisville, Ky.—p. 135

**Localization of Intracranial Lesions.**—Lewy determined the relationship of areas of hyperpathia of the scalp to the localization of intracranial tumors, abscesses, subdural hematomas, arachnoiditis and meningeal scar formations. He gives a survey of the type of lesions found in 100 patients and the location of the seventy-nine tumors. The result of these examinations showed a correlation between the location of the area of cutaneous hyperpathia and the accompanying intracranial lesion. The exact shape of the cutaneous areas varies in different cases, and the relationship of the zones of the scalp to the underlying intracranial process is an approximate one. Although the area of hyperpathia does not represent the exact location of the tumor it gives a sufficient indication of the area at which the bone flap should be turned down. Statistics show that the majority of cerebral tumors exhibiting areas of hyperpathia of the scalp were tumors above, at or just below the surface of the brain, often involving the meninges directly or indirectly. One tumor although deep seated, was accompanied by an area of hyperpathia. A possible explanation for this exception is that the middle cerebral artery was embedded in the tumor. In tumors of the cerebellum and of the sphenoidal ridge the local-

ization could be outlined more accurately. The majority of the tumors of the posterior fossa affect in some way the cervical roots and cause a hyperpathia. However, deep seated cerebellar tumors, producing traction on the tentorium, show, in addition or exclusively, a circular hyperpathia over the forehead or above the eyes. In tumors of the sphenoidal ridge, a careful sensory examination, including electrical methods, may help in determining whether the first division of the fifth nerve is involved or whether the lesion encroaches on the second and third divisions in the neighborhood of the foramen rotundum and foramen ovale. Such a differentiation may change the surgical approach. Brief histories of six cases illustrate the specific field of application of this method.

**Splenectomy in Blood Disorders.**—Andrus and Holman state that the value of splenectomy in congenital hemolytic jaundice, thrombopenic purpura and Banti's disease is well recognized, although the part played by the spleen in the production of these diseases is not clear. This will continue to be true until these diseases can be reproduced in animals. The results of splenectomy in these three diseases amply justify its use, but attempts to expand its indication beyond these have been attended almost uniformly by a considerably higher mortality and by disappointing results so far as cures are concerned. The authors report a series of fifty cases in which splenectomy was done. By removing the spleen in hemolytic jaundice only a portion of the cells responsible, but fortunately a sufficient portion to restore a more nearly normal balance between blood formation and blood destruction in most cases, is removed. There were no operative deaths in seventeen cases, but two patients have died since operation. Patients with definite thrombocytopenic purpura in the acute form are not good operative risks and this fact will deter surgeons from operating on them except as a last resort. Various medical measures, particularly repeated blood transfusions, may arrest the hemorrhage or even bring about an enduring remission of the disease in some cases and the injection of ascorbic acid is sometimes capable of producing remarkable improvement or remission. However, in many cases even these measures fail and but rarely produce the really spectacular results often seen following splenectomy. There were no deaths from the operation on twelve patients, although one patient died five months after operation with persistent thrombopenia and anemia. It is possible that the diagnosis was wrong and that she should have been classified as having aplastic anemia. All the remainder are well and have practically normal erythrocyte counts from six months to four and one-half years after operation. Splenectomy was performed in two cases of atypical hemorrhagic purpura, atypical in that thrombopenia was absent. In one, a boy of 14, who had had symptoms of hemorrhage, purpura and the development of ecchymosis from slight trauma for eight months, an excellent result was obtained. The other patient was a woman of 39 who had had similar symptoms for many years. During the year which has elapsed since her operation she has shown no improvement. The removal of the spleen in Banti's disease seems definitely warranted in the early stages and may alleviate some of the symptoms over a considerable period. The benefit which results would seem to be due to the reduction of the amount of blood coming to the liver through the portal vein which follows splenectomy. The operation is attended with certain risks. In many of the cases the platelets reach high levels after operation and thromboses are common. There were no operative deaths in eight cases, but one patient died two years after operation of progressing cirrhosis with ascites. The longest time which has elapsed since operation is three and one-half years. Two patients have suffered recurrence of hemorrhage. In four cases of erythroblastic (Cooley's) anemia there were no operative deaths, but two of the children have since died, one eight months and one two years after operation, of progressive anemia and pneumonia. The other two children are living three and one-half and four years after operation, but both have erythrocyte counts of slightly over 3,000,000 cells, and hemoglobin values around 50 per cent. The authors have performed splenectomy in three cases of true aplastic anemia, in one frankly as an experiment in a patient who was rapidly becoming worse. The course of the disease was not altered by the procedure. She died nine days after operation from continued bleeding from the gums and vagina and with progressing anemia. While the two other patients

appeared to derive temporary benefit, both suffered a relapse and died, one seven weeks and one ten months after operation. Splenectomy was also performed on a child with nonhypoid histiocytosis. The operation apparently alleviated somewhat the discomfort caused by the spleen and temporarily relieved the purpuric manifestations but did not arrest the progress of the disease. Splenectomy was also undertaken in a case of leukemia. The man survived the operation but was not improved, and at postmortem, four months later, leukemia was established. In one case characterized by weakness, anorexia and vague pains of the upper part of the abdomen the preoperative diagnosis was Banti's disease. Splenectomy was performed and the patient reacted poorly after operation and died eight hours later with hyperpyrexia. Postmortem examination revealed sarcoma which had involved the spleen, liver, pancreas, kidney and mesenteric nodes. Another operative fatality occurred in an Italian boy, aged 12, who had suffered from weakness, vague indigestion and frequent epistaxis for about six months. Following paracentesis the child became jaundiced, the anemia became more marked and the fluid reaccumulated rapidly. Splenectomy was undertaken as a last resort. The jaundice increased rapidly after operation and the patient died with cholemia three days later. The post-operative diagnosis was nodular cirrhosis.

**Efficacy of "Coley's Toxin" in Sarcoma**—The effects of intraperitoneal injections of "Coley's toxins," of killed seven-day dextrose broth cultures of *Streptococcus erysipellatis*, *Bacillus prodigiosus* and *Bacillus coli*, were studied by Brunschwig on sarcomas of the subcutaneous tissues of rats, induced from the animals' own tissues by carcinogenic hydrocarbons. Transplanted neoplasms were not employed. No evidence of inhibition of the growth of the tumors was obtained. In a significant number of instances the tumors of injected animals exhibited a marked hyperemic and hemorrhagic reaction. It is assumed that this was a reaction to the injection of bacterial products, since such changes were not observed in control animals and were definitely of a different type, macroscopically, from the spontaneous degenerative changes sometimes observed in such neoplasms. These reactions, as indicated, did not appear to restrain the growth of the neoplasm.

## Archives of Dermatology and Syphilology, Chicago

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- Some Original American Contributions to Dermatology President's Address J H Mitchell Chicago—p 1  
Cutaneous Eruptions Among Industrial Workers Review of 2,000 Claims for Compensation J G Downing Boston—p 12  
Chronic Granuloma in Industrial Dermatology H E Miller, San Francisco—p 33  
War Gases and Industrial Hazards in Their Manufacture H N Cole J R Driver, S S Bowen and G Cooper, Cleveland—p 45  
\*Industrial Dermatitis and Melanosis Due to Photosensitization H R Foerster Milwaukee, and L Schwartz New York—p 55  
Medicolegal Complications in Dermatology Caused by Massachusetts Workmen's Compensation Act J H Blaisdell Boston—p 69  
Ulcus Vulvae Acutum (Lipschutz), Associated with Typhoid Fever C Berlin Tel Aviv Palestine—p 89  
Are There Paradoxical Serologic Reactions in Syphilis? R L Kalin Ann Arbor Mich—p 92  
Hidradenitis Suppurativa Abscess of the Apocrine Sweat Glands Study of Clinical and Pathologic Features with Report of Twenty Two Cases and Review of Literature H A Brunsting Toledo Ohio—p 108  
Tinea Nodosa of Scalp Hair in School Children of South Siam W H Kneidler Chiang Mai Siam—p 121  
\*Role of Sweat as a Fungicide with Special Reference to Use of Constituents of Sweat in the Therapy of Fungous Infections S M Peck H Rosenfeld W Leifer and W Bierman, New York—p 126

## Industrial Dermatitis Due to Photosensitization

Foerster and Schwartz observed that dermatitis and melanosis are common in industries in which tar and pitch are handled and that the preparations are important occupational hazards. These facts are not generally known in this country. More than 500 men were examined in four factories making electric conduits, more than half of whom had either melanosis or cutaneous lesions, chiefly dermatitis. The condition was confined to handlers of pitch or of pitch products, but those most intimately in contact with pitch were affected the least, while those who had the most severe dermatitis and the most intense pigmentation were outdoor workers. The pigmentation was diffuse and intense, considerably darker than ordinary sun tan, and it was confined to the surfaces exposed to sunlight. Pitch comedos and folliculitis on the face, neck, hands and forearms were commonly observed, and keratoses and papillomas were found occasionally. While some men were affected more

severely than others, apparently none sufficiently exposed were immune. Tolerance with persistent pigmentation developed in some men, but most of them had to be rotated between various jobs and some were so hypersensitive that they could not be employed in the daytime but worked satisfactorily on night shifts. The pigmentation was not permanent but it persisted at least for several months after the workmen were no longer exposed. On the basis of their investigation the authors conclude that pitch dermatitis and melanosis are the products of true photosensitization resulting from exposure to specific spectral bands of light. These conditions do not appear to result from chemical contact sensitization of the type of dermatitis venenata or from allergic predisposition and commonly occur in previously normal skin of normal subjects. The photosensitization occurs through local exogenous activity of a specific photosensitizer. The authors believe that these photosensitizing radiations predominate in the short wavelengths of the sun's spectrum, chiefly between 3,900 and 5,000 angstroms. Reactions may be obtained in the midultraviolet portion of the spectrum, apparently only after prolonged exposure to rays of wavelengths longer than 2,500 angstroms. Their investigations failed to establish definitely one specific ingredient of pitch or coal tar as the photosensitizing agent in pitch melanosis and dermatitis. However, they believe that the dermatitis and melanosis probably result from photosensitization by different ingredients of coal tar, possessing different fluorescent spectrums from those involved in the production of epithelioma and epitheliomatous conditions.

**Sweat as a Fungicide**—Peck and his collaborators studied the fungicidal power of human sweat and of its individual components. When this fungicidal power was established, an attempt was made to treat fungous infections by topical application of some of the ingredients, singly and in combination. The importance of such therapy does not lie in the fact that new and startling fungicidal agents are presented but in the fact that a more nearly physiologic approach to the therapy of fungous infections is proposed. According to their experiments, alkalinized thermal sweat had no fungistatic property until concentrated. Dilute heat sweat obtained from a Negro boy and not alkalinized was fungicidal at a  $pH$  below 7. Analysis of samples of sweat revealed the presence of propionic, acetic, caprylic (caproic) and ascorbic acids, as well as traces of urea and of uric acid. The authors state that artificial sweat made according to their analysis and to those reported in the literature was fungicidal. The role of lactic acid in the fungicidal action of the sweat was demonstrated. Sebum found in the contents of sebaceous cysts was neither fungistatic nor fungicidal. The fungicidal properties of sweat are due to its content of acetic, propionic, caproic, caprylic, lactic and ascorbic acid. These substances must be present in the proper concentration to exert a fungistatic or fungicidal effect. There seems to be a relation between the localization of fungous infection and the distribution of sweat on the surface of the body. Areas which are exposed to the greatest concentration of sweat seem to have less tendency to fungous infection. Topical applications of ingredients of sweat, such as mixtures of lactic, propionic, butyric and ascorbic acid in proper concentrations, have proved valuable in the treatment of fungous infections.

## Archives of Physical Therapy, Chicago

20 164 (Jan.) 1939

- \*Effect of Ultraviolet and Visible Rays on Animal Septicemia A J Nedzel and L Pincussen Chicago—p 5  
Therapeutic Value of Passive Hyperemia in Peripheral Vascular Disease K Harpuder and I D Stein New York—p 9  
Iontophoretic Medication in Ophthalmology Theoretical and Practical Aspects G Erlanger New York—p 16  
Physical and Biologic Aspects of Short Wave Diathermy A Hemingway Minneapolis—p 24  
Fractured Hips in the Aged Improved Prognosis Through Physical Therapy T P Brookes and F H Ewerhardt St Louis—p 29  
The Galvanic Vestibular Reaction S L Shapiro Chicago—p 33

**Animal Septicemia**—Nedzel and Pincussen studied the effect of ultraviolet and visible radiation on animals (white mice) infected with hemolytic streptococcus and irradiation of infected animals given bactericidal drugs for the purpose of studying their influence. One group of mice was not treated with any drug and another was given sulfanilamide mixed with food three

days before the hemolytic streptococcus was injected. Both groups were irradiated daily three days before the injections and daily thereafter. Two different sources of light were used: the mercury in quartz with its intense ultraviolet and some visible lines and the carbon arc lamp with its continuous ultraviolet and visible spectrum. The death rate of the infected but not otherwise treated mice rose relatively fast. In five days about 40 per cent of the animals were dead. This mortality rate was counteracted by the effect of irradiation, so that the percentage of deaths in those irradiated with quartz and carbon arc lamps dropped to 16 per cent. In the following days the death rate rose in all cases but less in the irradiated animals. The loss in weight of the surviving irradiated animals seemed to be higher in the beginning, but later they showed a better recovery. It is concluded that irradiation in these experiments has a beneficial effect. The animals given pitressin showed a favorable effect following irradiation. The death rate of mice infected with streptococci was cut in half irrespective of whether these were subjected to the mercury in quartz or carbon arc lamp. The loss in weight seemed a little greater in the carbon arc group. The few surviving nonirradiated animals did not show any loss of weight. Quartz lamp irradiation increased the death rate of the animals given sulfanilamide to a high degree in contrast to the carbon arc spectrum which did not depress the favorable sulfanilamide effect in the first few days. Later, however, the death rate is only about one half of that without irradiation. The effect of irradiation seems to be twofold: (1) physiologic effect on the blood vessels as in the pitressin experiments and (2) chemical effect, lessening the effectiveness of sulfanilamide.

### Archives of Surgery, Chicago

28 191 396 (Feb.) 1939

- The Blood in Thrombo-Angiitis Obliterans F. V. Theis and M. R. Freeland Chicago—p. 191
- \*Serum Therapy for Streptococcal Infection of the Nose, Throat and Ear and Its Complications Adele E. Shepler, Martha Jane Spence and W. J. MacNeal New York—p. 206
- Squamous Cell Carcinoma of Renal Pelvis C. C. Higgins Cleveland—p. 224
- Growth in Length of the Vertebrae S. L. Hays San Francisco—p. 245
- Posterior Dislocation of Lower Femoral Epiphysis in Breech Delivery M. S. Burman and M. J. Langsam New York—p. 250
- Endometriosis H. C. Clark Wichita Kan.—p. 261
- Leiomyosarcoma of the Urinary Bladder H. L. Kretschmer and P. Doerhing Chicago—p. 274
- Spinal Anesthesia Regulation of Height with Fractional Doses J. L. De Courcy Cincinnati—p. 287
- Fractures of the Upper Extremity and Shaft of the Humerus J. H. Heyl New York—p. 295
- Only Bone Graft for Ununited Fractures W. C. Campbell Memphis Tenn.—p. 313
- Oral Administration of Methylcholanthrene to Mice J. Van Prohaska A. Brunschwig and H. Wilson Chicago—p. 328
- Avulsion Fracture of the Great Trochanter H. Milch New York—p. 334
- \*Intestinal Obstruction Due to Gallstones Report of Ten Cases J. W. Dulin and F. R. Peterson Iowa City—p. 351
- Consequences of Instrumental Dilatation of the Papilla of Vater Experimental Study C. D. Branch, O. T. Bailey and R. Zollinger, Boston—p. 358
- Review of Urologic Surgery A. J. Scholl Los Angeles, F. Hinman San Francisco, A. Von Lichtenberg, Budapest Hungary, A. B. Hepler Seattle, R. Gutierrez New York, G. J. Thompson, J. T. Priestley Rochester Minn., E. Wildbolz Berne Switzerland and V. J. O'Connor Chicago—p. 372

**Serum Therapy for Streptococcal Infections**—Shepler and her associates treated thirty patients suffering from severe hemolytic streptococcus infection of the nose, ear or throat with streptococcus serum. Four of these cases were complicated by meningitis and in fifteen the blood yielded bacteria on culture. Three different kinds of streptococcus serum were used, together with other therapeutic measures (transfusions, sulfanilamide and bacteriophage in certain instances). There were seven deaths. Generalized meningitis with streptococci recognizable in the spinal fluid was present before serum therapy was initiated in three of the fatal cases. The authors have no evidence to indicate that established diffuse streptococcal meningitis can be controlled by the serum that they employed. In only one instance was there recovery after definite evidence of meningitis, and in this case, although the spinal fluid was clouded with abundant leukocytes, culture failed to disclose the

presence of streptococci in it. The other four deaths occurred in patients with streptococcal bacteremia but without meningitis. Among the twenty-three successful cases, streptococcal otitis media developed in two debilitated patients under treatment for staphylococcal osteomyelitis. One of the patients received serum, and the other received serum and sulfanilamide. There were two patients with mediastinitis and one with streptococcal empyema following pneumothorax for active pulmonary tuberculosis. In all three of these the activity of the streptococcus was adequately controlled. Two patients had streptococcal pneumonia complicated by voluminous empyema. One patient presented the classic symptoms and signs of septic thrombosis of the cavernous sinuses in the presence of a positive infection of the blood stream with hemolytic streptococci. Sulfanilamide, serum and bacteriophage all were brought into play in this case, with a successful outcome, apparently unique. The difficulties and dangers in the use of streptococcus serum are serious. For this reason streptococcus serum probably should not be used for streptococcal infections of moderate severity, which may be adequately controlled by the oral administration of sulfanilamide. When, however, a really grave situation arises in a case of streptococcal infection the proper use of the serum is definitely indicated. Certainly in the all too frequent streptococcal infections of the nose, throat, ear and mastoid the use of sulfanilamide or of serum or a combination of the two may be expected to control the infection and to obviate the necessity of surgical intervention.

**Intestinal Obstruction Due to Gallstones**—In the experience of Dulin and Peterson intestinal obstruction due to gallstones occurs with sufficient frequency to make it an important consideration in the diagnosis of acute abdominal conditions. This is particularly true when the patient has previously had typical attacks of gallstone colic. Also this type of obstruction may occur in a patient who has never had such an attack. The factors which make clinical diagnosis difficult are the similarity of the symptoms to those of an acute attack of gallstone colic and the lack of early physical or laboratory studies which would positively indicate the nature of the condition. In the authors' series of ten cases only three such diagnoses were made preoperatively. In one case a diagnosis depended on the disappearance of previously palpable stones in the gallbladder, in another a stone produced a negative filling defect in a flat teleroentgenogram. The diagnosis was made in only one case which presented the classic history of previous biliary colic followed by a sudden development of symptoms of acute intestinal obstruction. The authors believe that greater awareness of this condition and the more frequent use of the teleroentgenogram will aid in making not only more frequent preoperative diagnoses but earlier ones. While the teleroentgenogram may show only evidences of fluid levels within a dilated intestine, this observation is uncommon except when it is associated with paralytic ileus or mechanical obstruction. Diabetes mellitus was present in three of the ten cases. In two the diabetes was severe. In no instance, however, was it shown to contribute to the condition produced by the obstructing gallstone.

### California and Western Medicine, San Francisco

50 180 (Jan.) 1939

- Problems in the Diagnosis of Acute Appendicitis T. O. Burger and H. C. Torbert San Diego—p. 7
- Radiation Therapy in Acute and Chronic Inflammatory Conditions H. J. Ullmann Santa Barbara—p. 11
- Pruritus Ani C. R. Caskey Los Angeles—p. 14
- \*Renal Function in the Aged L. D. Huffman Hollywood—p. 16
- Medical Economic Problems H. W. Sawyer Fallon Nev.—p. 20
- Tuberculosis in San Quentin L. L. Stanley San Quentin—p. 25

**Renal Function in the Aged**—Huffman determined the renal function of sixty-seven persons 70 or more years of age. Serious degrees of impairment of renal function is not necessarily an accompaniment of old age. True nephritis was rare in the present group of subjects and, while slight degrees of nitrogen retention were not unusual, the classic picture of uremia was infrequent. The data indicate the frequent association of renal impairment and prostatic hypertrophy. Twelve of fourteen male school teachers had some palpable enlargement of the prostate. The gradations from a symptomless enlargement to complete obstruction may be almost imperceptible. When evi-

dence of renal impairment exists in the male it is obligatory to rule out obstructive uropathy before a diagnosis of true nephritis is made. The presence of albumin and casts and fixation of specific gravity of the urine in either sex clearly indicates that other functional tests should be employed before any conclusions are drawn regarding the renal status. There is usually adequate function if the excretion of phenolsulfonphthalein approaches 40 per cent in the first fifteen minute specimen and 60 per cent in the two hour specimen. Likewise, when the value of the urea clearance test in percentage of normal is 70 or more, good renal function is usually present. When values of urea clearance are 50 per cent of normal, some impairment is present and values from 50 to 70 per cent should be considered doubtful and other tests of renal function employed. When clearance studies show values less than 25 per cent, a dangerously low level has been reached in the aged person. The level of the nonprotein nitrogen of the blood may be of significance in showing renal impairment. Elevated values are regularly found when the urea clearance is 20 per cent of normal. It is difficult to analyze the factor of blood pressure as related to renal function in the aged. It is probable that vascular narrowing in the renal bed, incident to advancing years, necessitates a physiologic increase in the general blood pressure to facilitate the work of the kidney.

### Canadian Public Health Journal, Toronto

30 168 (Jan.) 1939

- Lay Pioneers in the Common Health H Rolleston, Haslemere Surrey, England—p 1  
Nutrition in Toronto E W McHenry Toronto—p 4  
The Motor Vehicle Accident Problem A H Rowan Toronto—p 14  
The Junior Red Cross 'An Idea Whose Time Has Come' Jean E Browne, Toronto—p 20

### Florida Medical Association Journal, Jacksonville

25 317 368 (Jan.) 1939

- Presacral Nerve Resection for Relief of Pelvic Pain J R Boling Tampa—p 331  
Some Observations on Fractures of the Hip C B Mabry, Jacksonville—p 334  
Management of the Diabetic Patient Case Reports G H Garmany, Havana—p 337  
Brief Remarks on Malaria J B Pomerance, Miami Beach—p 341

### Johns Hopkins Hospital Bulletin, Baltimore

64 182 (Jan.) 1939

- Spontaneous Mediastinal Emphysema L Hamman Baltimore—p 1  
Generalized Torula Infection Case Report and Review with Observations on Pathogenesis W P Longmire Jr and T C Goodwin Baltimore—p 22  
Granulomatous Myocarditis A F Jonas Jr Baltimore—p 45  
\*Preliminary Report of the Prophylactic Use of Sulfanilamide in Patients Susceptible to Rheumatic Fever Caroline Bedell Thomas and R France, Baltimore—p 67

**Prophylactic Use of Sulfanilamide in Rheumatic Fever**—Thomas and France carried out studies to ascertain whether sulfanilamide might prevent the occurrence of rheumatic recrudescences in susceptible patients by controlling the antecedent streptococcal infections. Thirty patients were chosen from the Cardiac Clinic of the Department of Medicine of Johns Hopkins Hospital. During the first winter, 1936-1937, the entire group were given sulfanilamide. Actually, eighteen of those chosen proved cooperative and the remaining seven afforded a control series. During the winter of 1937-1938 nineteen patients received sulfanilamide, seven of these had been in the original treated group. Twelve new controls were added and the eleven patients who received treatment the first winter, but not the second, formed a control group of a different type. The ages of the patients ranged from 14 to 36 years. Fifteen grains (1 Gm) of sulfanilamide daily divided into three doses was prescribed from November 1936 to June 1937. During the second winter the dose was increased to 20 grains (1.3 Gm) daily divided into two doses and was given from October 1937 to June 1938. None of the patients had a major attack of acute rheumatic fever or an acute beta hemolytic streptococcus infection while taking sulfanilamide. Five major attacks of rheumatic fever developed in four of the thirty control patients during the same period, one was hospitalized because of an acute beta hemolytic streptococcus

infection and three others had acute illnesses which might have been of a rheumatic character. The group studied is too small to permit definite conclusions, but the authors believe that their results are encouraging and warrant further investigation.

### Journal of Bacteriology, Baltimore

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- Comparative Resistance of Recently Isolated and Older Laboratory Strains of *Eberthella Typhosa* to the Action of Chloramine P Kabler G O Pierce and G S Michelsen, Minneapolis—p 1  
Nitrogen Metabolism of Certain Coliform Bacteria P L Carpenter Madison Wis—p 11  
Implantation of Oral and Intestinal Strains of *Lactobacillus Acidophilus* in the Albino Rat M J Pelczar Jr and I A Black, College Park, Md—p 51  
Study of Hemorrhagic Septicemia Pasteurellae C T Rosenbusch and I A Merchant Ames Iowa—p 69

### Kansas Medical Society Journal, Topeka

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- Diabetic Emergencies and Their Treatment A Marble Boston—p 1  
Pellagra in Kansas D V Conwell and L W Hatton Halstead—p 6  
Few Observations in Forty Nine Cases of Epidemic Parotitis E R Schwartz and M W Husband Manhattan—p 10  
Paralytic Ileus W Cox Wichita—p 12  
Convulsive Shock Therapy in Involuntary Psychoses G W Robin on Jr Kansas City, Mo—p 14  
Transfusion of Types 1 2 and 4 Blood into a Type 1 Recipient M A Walker Marie Carr Kansas City, and G A Pearson, De Soto—p 15  
Intestinal Obstruction Due to Submucosal Hematoma of the Jejunum in the Newborn R P Smith Kansas City—p 16  
Oil Soluble Anesthetics in Treatment of Anal Fissure L A Smith Topeka—p 17

### Michigan State Medical Society Journal, Lansing

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- \*Diagnosis of Pyuria in Childhood and Its Treatment with Mandelic Acid and Sulfanilamide H F Helmholt Rochester Minn—p 17  
Treatment of Impotence E W Hirsch Chicago—p 21  
Treatment of Compound Injuries with Particular Reference to the Hand S L Koch Chicago—p 27  
Treatment of Some Common Diseases of the Skin H Fox New York—p 32  
Poliomyelitis in Kent County Statistical Summary W Dixon and C Frantz Grand Rapids—p 36  
The Bone Marrow from a Clinical Diagnostic Point of View L D Stern Detroit—p 38  
Some Remarks on Experimental Psychology of the Kraepelin School E Amberg Detroit—p 43  
Submaxillary Stones Case Report J B Blashill Detroit—p 46  
Posterior Vaginal Enterocoele Report of Two Cases E G Krieg, Detroit—p 47  
Resume of Quinidine Sulfate Therapy E E Hammonds Birmingham—p 49

**Pyuria in Childhood**—Helmholtz states that sulfanilamide acts best in an alkaline urine. It is well to give from 10 to 15 grains (0.65 to 1 Gm) of sodium bicarbonate three times a day with the sulfanilamide in order to prevent acidosis. The dose of sulfanilamide that he has found to be sufficient in most cases of pyuria in childhood is 10 grains to 20 pounds (9 Kg) of body weight, if necessary the dose may be increased to 15 grains, as recommended by Long in the treatment of streptococcal infection. For short periods the dose may be increased to 20 grains (1.3 Gm) to 20 pounds of body weight. It is possible further to increase the urinary concentration of sulfanilamide without increasing its concentration in the blood by cutting down on the intake of fluids. The administration of large amounts of fluids and alkalization of the urine have been the standard treatment in acute cases of pyelitis, especially in infancy. In addition to this routine treatment, sulfanilamide can be given advantageously every four hours in the foregoing dosage. With the addition of sulfanilamide to the scheme of treatment the acute symptoms, high fever and restlessness may disappear at an earlier time than usual. Administration of the drug should be continued in the same dosage until there is no evidence of bacterial growth in a culture of the urine and continued for from four to six days after the urine has become sterile. If, at the end of a week the urine on culture is still sterile one may be quite certain that the patient has been cured. If the urine again shows bacteria, it must be assumed that bacterial growth in the urine was merely inhibited and that further treatment is necessary. Instead of 10 grains, 15 grains of sulfanilamide to 20 pounds



of body weight should be tried and the same process repeated. It is advisable in such cases to continue the same dosage for from eight to ten days after the first culture of sterile urine is obtained. Four days after discontinuation of the medication, the urine should be checked again. The same procedure is carried out in cases of subacute and chronic infections, with the exception that no effort is made to force fluids. A rapid recovery from both acute and chronic infections is likely when the infecting organism is a gram negative bacillus, *Escherichia coli*, *Aerobacter aerogenes*, *Salmonella*, *Proteus vulgaris* or *Proteus ammoniae*. The same applies to staphylococcal infection of the lower portion of the urinary tract. The excellent results obtained in treating infections with the bacillus *Proteus ammoniae* (encrusted cystitis) should be emphasized because it, in particular, has been resistant to methenamine and mandelic acid therapy and to the ketogenic diet. Since the author has used sulfanilamide it has become evident that *Streptococcus faecalis* is a much more frequent invader of the urinary passages than he had formerly realized. How frequently mixed infections occur should become evident with the continued use of sulfanilamide. If there are many, the success of sulfanilamide therapy will be decreased and this will necessitate treatment by means of a combination of sulfanilamide and mandelic acid. In the treatment of urinary infections by means of mandelic acid it is advisable to continue treatment for three or four days after a culture of urine has become sterile. Administration of the drug may then be discontinued and, after another interval of three or four days, the culture should be repeated, a sterile culture then indicates cure. Treatment by means of sulfanilamide is easier to carry out than is treatment by the ketogenic diet, methenamine or mandelic acid. It is successful in urine which is alkaline because of urea-splitting organisms, and it is successful in conditions in which the function of the kidney is reduced. Sulfanilamide is of no value in the treatment of infections with *Streptococcus faecalis*. Mandelic acid is of value in the treatment of all infections in which the urinary acidity can be reduced below 5.5 and the drug excreted in a concentration in 0.5 per cent.

### Military Surgeon, Washington, D. C.

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- A Guide to Spinal Anesthesia W. W. Nichol—p. 525
- Inactive Duty Training Course for Medical Reserve Officers G. P. Grabfield—p. 533
- The Divisional Medical Service with Special Reference to the National Guard and Army Maneuvers E. S. Linthicum—p. 536
- Eosinophilic Bodies in the Blood of Mumps H. H. Parsons—p. 541
- Evacuation of Casualties in Time of War K. J. Swenson—p. 544

### Minnesota Medicine, St. Paul

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- The Treatment of the Common Cold in Infants and Children R. L. J. Kennedy Rochester—p. 1
- Exposure of the Body to Unequal Temperature Factor in Pneumonia C. W. More Eveleth—p. 4
- Autogenous Streptococcus Vaccines in Treatment of Allergic Conditions with Special Reference to Their Use in Bronchial Asthma Report of Cases R. S. Ylvisaker Minneapolis—p. 6
- Acute Mastoiditis J. G. Parsons Crookston—p. 12
- The Problem of Gastrointestinal Hemorrhage A. M. Snell Rochester—p. 15
- Heart Disease in Pregnancy J. T. Borg St. Paul—p. 24
- Foreign Bodies in Cornea Care and Complications W. T. Wenner St. Cloud—p. 28

**Exposure of Body to Unequal Temperature**—More has noticed that many typhoid patients and children with pneumonia were those occupying beds or cribs placed so that the temperature on either side was uneven. For example, one side of the bed was next to a window with a source of heat coming from the other side. So emphatically was it impressed on the author that unequal temperature is an etiologic factor in pneumonia that, when building a small hospital, he had the windows and doors to the rooms and wards placed opposite each other, leaving ample wall space for beds without exposing the patients to unequal temperature. Pneumonia has never developed in patients entering the hospital early with typhoid and free from lung complications. At one time during an epidemic of typhoid the hospital ward was overcrowded and a patient occupying a bed next to a wall 22 feet from a double window was observed to be coughing. While examining the patient, the author distinctly felt a draft of air on the back

of his head and neck. There was a breeze coming through the top of the windows 22 feet away and was directed toward the ceiling by a contrivance at the top. The wind followed the ceiling and continued down the wall where the patient was. His position was immediately changed and he recovered promptly. The author has a patient who will sneeze if he leaves a warm room and walks outside while a cool breeze is blowing, and his nose will begin to discharge. But if he will turn round so that all parts of his chest are cooled equally, this condition soon stops. Some people are more susceptible to this unequal temperature than others. In children with pneumonia whose parents can not or will not protect them from unequal temperature, the pneumonia jacket, frequently changed, is most useful, chiefly it is believed because it maintains an equal temperature. Those advocating cold fresh air for children with pneumonia place them in cold rooms. Here the patient gets the benefit of the fresh air without exposure to unequal temperature. The author concludes that exposure of the body to unequal temperature is a predisposing etiologic factor in pneumonia as well as the cause of so-called "colds in the head," coryza, tonsillitis, pharyngitis and the like.

**Vaccines in Treatment of Allergy and Asthma**—Ylvisaker used autogenous streptococcus vaccines in the treatment of bacterial or infectious types of allergy (including fourteen cases of bronchial asthma, four of allergic rhinitis and one each of recurrent sinusitis, generalized eczema, chronic urticaria, conjunctivitis and iritis). The initial dose of vaccine varied from 25,000 to 100,000 organisms. Injections (fifteen intravenously and eight subcutaneously) were given from every three to five days. As the patient improved, the interval was lengthened to from five to seven days. The size of the dose was gradually increased until definite improvement was noted. No further increase was made as long as improvement or relief of symptoms was maintained. Any reaction following a dose called for a marked reduction in the next dose. If possible, the injections were continued over a period of at least six months so as to prevent recurrences. In several cases they have been continued for periods of from two to three years, with occasional rest periods of from six to eight weeks. Seventeen of the twenty-three patients treated obtained complete or nearly complete relief. Three cases of bronchial asthma failed to improve. The beneficial effects produced by the minute doses are probably due not to a foreign protein shock therapy but rather to a specific type of desensitization. The intravenous route of administration produces more prompt and precise results than the subcutaneous route. Severe reactions may be expected following intravenous administration if too large doses are used or too long an interval is allowed to elapse between doses. The beneficial effects of vaccines in allergic states, especially asthma, are not confined to the primary bacterial allergies but may also be of value in certain cases in which bacterial allergy is secondary.

### New England Journal of Medicine, Boston

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- The Teaching of the Medicosocial Aspects of Cases G. P. Reynolds Boston—p. 1
- Thyroid Surgery at a Large Municipal Hospital R. C. Cochrane Boston—p. 7
- \*Electrocardiographic Changes in Vitamin B<sub>1</sub> Deficiency C. C. Dustin H. Weyler and C. P. Roberts Providence R. I.—p. 15
- Jacket for the Treatment of Scoliosis H. G. Lee Boston—p. 22
- Hodgkin's Disease and Allied Disorders H. Jackson Jr. Boston—p. 26

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- A National Health Program W. F. Draper Washington D. C.—p. 43
- The Changing Private Practice of Medicine R. I. Lee Boston—p. 47
- The Chemistry of the Anaerobic Recovery of Muscle O. Meyerhof, Heidelberg Germany—p. 49
- The Vitamin C Status of Diabetic Patient Vilma Sebesta, Rachel M. Smith, Alison T. Fernald and A. Marble Boston—p. 56
- Cystocele Repair Factors Which Necessitate Changes in the Usual Procedure, with Suggested Technics J. R. Miller Hartford Conn.—p. 61
- The Fat Soluble Vitamins A. P. Meiklejohn Boston—p. 67

**Electrocardiogram in Vitamin B<sub>1</sub> Deficiency**—Dustin and his associates discuss six male patients with histories of unbalanced diets and clinical evidence of vitamin B<sub>1</sub> deficiency. All these patients showed abnormal electrocardiograms. They gave a history of the habitual use of alcoholic beverages,



usually beer, and concurrently a deficient diet. All entered the hospital because of swelling of the legs and some dyspnea. Two also had swelling of the abdomen. Only one patient complained of substernal discomfort. All but one patient received a diet high in vitamins and all received vitamin B<sub>1</sub> medication. In two the cardiac sounds showed notable changes with treatment, in one of these a gallop rhythm disappeared soon after entrance. In three there was a marked reduction in the size of the heart as treatment progressed. Only one patient had definite anemia, hypochromic in type, and this responded to treatment during the hospital stay. All patients lost from 8 to 28 pounds (3.6 to 12.7 Kg.) concurrently with the reduction of the edema. Only one patient received digitalis in addition to vitamin therapy. Electrocardiograms at rather close intervals were taken of each patient while he was under treatment. The common features seen on admission were increase in the electrical systole, according to Bazett's formula, a rapid rate and a tendency to low voltage, and in most cases a flattening of the T wave in leads 1, 2 and 3. The chest leads showed the least tendency to become abnormal. Subsequent records during treatment showed a slowing of the rate, an increase in the voltage and varying changes in the ventricular complexes. The changes in the ventricular complexes during treatment usually occurred within a few days. As treatment progressed, during the first week or two the electrocardiograms became more abnormal and then tended to return toward normal. The abnormal ventricular complexes changed more rapidly than would be expected in coronary disease. The changes in the T waves, as described, may be caused by several conditions, therefore it is necessary in interpreting electrocardiograms to know the existent clinical conditions.

### Northwest Medicine, Seattle

38 136 (Jan.) 1939

- Differential Diagnosis and Treatment of Diseases Associated with Enlargement of Spleen or Lymph Nodes. E. E. Osgood. Portland, Ore.—p. 6
- \*Allergy in Infants. Significance of First Allergic Manifestations. N. W. Clein, Seattle.—p. 9
- Bronchopneumonia of Mild Severity at University of Oregon. F. N. Miller and Marian G. Hayes, Eugene, Ore.—p. 12
- \*Prevention of Recurring Herpes. E. V. Ullmann. Portland, Ore.—p. 15
- Strangulated Hernia with Acute Hemorrhagic Infarction of Testicle in Infants. M. S. Rosenblatt and W. H. Bueermann. Portland, Ore.—p. 18
- Coccidioid Granuloma. K. E. Hynes. Sedro Woolley, Wash.—p. 19
- Massive Gastrointestinal Hemorrhage. T. T. Manzer, Seattle.—p. 21
- Disabling Complications of Scabies. S. D. Allison. Portland, Ore.—p. 23

**First Allergic Manifestations in Infants.**—Clein observed 100 allergic and 100 nonallergic infants, from private practice, from birth to 4 or 5 years of age. The feedings, examinations and observations were uniform in all infants. Seventy-one per cent of the allergic infants had allergic parents, 12 per cent of the nonallergic. Of the allergic infants 78 per cent showed some allergic symptoms before 4 months of age, 91 per cent by 1 year and 100 per cent by 2 years as follows: (1) rash (eczema) in eighty-five cases, occurring chiefly on the face, (2) vomiting (pylorospasm) in twenty-four and (3) colic (abdominal pain, gas or diarrhea) in sixteen. One or more of these symptoms were frequently present at the same time. The author suggests that egg yolk should not be added to the diet of allergic infants too early, as many are sensitized through the mother's milk or inherit the sensitivity. Specific attention to the diet and the environmental factors during childhood may prove to be important prophylactic measures in preventing or minimizing the major allergic diseases.

**Prevention of Recurring Herpes.**—Ever since his experiments with laryngeal papilloma and warts (1920-1923) Ullmann has wondered about the odd phenomenon that laryngeal papilloma, as well as most forms of warts, disappear at some time without any therapy. Warts and laryngeal papilloma are classed as diseases due to a filterable virus and show histologically inclusion bodies, as do all forms of herpes. The author cites four cases of recurring herpes which ceased to recur after vaccination for smallpox. He is at a loss as to whether this is a phenomenon of immunization or one of suggestion.

### Southwestern Medicine, El Paso, Texas

23 134 (Jan.) 1939

- The Family Physician as a Public Health Agent. M. K. Wylder. Albuquerque, N. M.—p. 1
- Diaphragmatic Hernias of Various Types. Diagnosis and Surgical Treatment in 161 Cases. S. W. Harrington. Rochester, Minn.—p. 3
- Differential Diagnosis of Low Back Pain. A. Steindler. Iowa City.—p. 7
- X Rays in the Diagnosis of Early Pulmonary Tuberculosis. R. E. Porter. Fort Stanton, N. M.—p. 9
- Early Diagnosis and Radical Treatment of Gastric Carcinoma. E. P. Palmer. Phoenix, Ariz.—p. 10
- Syphilitic Endocarditis of the Mitral Valve. Case Report. W. W. Waite. El Paso, Texas.—p. 13
- \*Diabetic Manifestations in Ophthalmology. W. J. Smith, Phoenix, Ariz.—p. 14
- Regional (Terminal) Ileitis. C. N. Ploussard and M. G. Kelly. Phoenix, Ariz.—p. 18

**Diabetic Manifestations in Ophthalmology.**—Smith discusses some of the ocular manifestations of diabetes. One of the more rare manifestations is that of lipemia retinalis. Moore of London states that he has not seen such a case since the introduction of insulin. Retrobulbar neuritis is usually found in older persons, is characterized by a small central scotoma and usually responds to treatment. If the condition is allowed to progress there may be some resulting atrophy. Iritis demonstrates the lack of resistance to infection which diabetic patients show. There are more often changes in the pigment cells on the posterior surface of the iris. They become swollen, thus throwing the iris into more prominent folds. The cells often become detached and may be found on the anterior surface of the lens. The majority of so-called diabetic cataracts are nothing more than ordinary senile cataracts developing in patients with diabetes. The true diabetic cataract is found in young persons, is bilateral and develops rapidly. It is characterized by flaky lesions which develop faster in the posterior layers of the cortex. Senile cataracts tend to develop earlier in diabetic than in nondiabetic persons. Likewise retinitis is somewhat similar in that in the vast majority of cases in which it develops there is usually associated a raised blood pressure, vascular disease and albumin in the urine. Often it is difficult to state from ophthalmoscopic appearances whether a given case of retinitis is due to diabetes, nephritis or arteriosclerosis. Wolfe states that there are certain characteristics of a true diabetic retinitis: 1. It rarely occurs in a young subject. 2. The patches of retinal exudate tend to have sharply defined edges, are distributed in an irregular manner and sometimes form an irregular ring around the macular region. 3. Small dark round retinal hemorrhages are suggestive of diabetes. As such they lie in the deeper layers of the retina. With regard to prognosis, Nettleship found that of forty-eight patients with diabetic retinitis 60 per cent lived for more than two years. Thus it is an indication of some gravity but is not as serious a sign as retinitis in renal disease. Hemorrhage is more apt to follow surgery of the eye in a diabetic than in a nondiabetic person. Changes in refraction are common. The exact mechanism for this is not known, but it may be due to an alteration of the osmotic pressure in the aqueous humor. This in turn causes an altered index of refraction of the lens cortex. It may cause myopia in some cases while in others hyperopia may develop. It may appear shortly after the beginning of insulin therapy. The author cites such a case.

### Yale Journal of Biology and Medicine, New Haven

11 165 276 (Jan.) 1939

- Effect of Estrogenic Hormone and Ovariectomy on the Normal Antibody Content of the Serum of Mature Rabbits. L. Weinstein. New Haven, Conn.—p. 169
- The Practical Application of Modern Pelvimetric Methods. H. Thoms and H. M. Wilson. New Haven, Conn.—p. 179
- Note on the Lack of Carcinogenic Action of Some Cardiac Glucosides and Saponins. P. A. Smith and W. U. Gardner. New Haven, Conn.—p. 187
- Notes on the Materia Medica of Nathan Smith. B. A. Smith. New Haven, Conn.—p. 189
- Synergistic Effect of Heptyl Aldehyde and Methyl Salicylate on Spontaneous Tumors of the Mammary Gland in Mice. L. C. Strong. New Haven, Conn.—p. 207
- History of the Terrible Epidemic Vulgarly Called the Throat Distemper as It Occurred in His Majesty's New England Colonies Between 1733 and 1740. E. Caulfield. New Haven, Conn.—p. 219

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Australian J Exper Biol and M Science, Adelaide

10: 2/5 370 (Dec) 1919 Partial Index

- Salt Optima in Agglutination A I Platt—p 275  
Case of Relapse in Experimental Poliomyelitis W G Hershup—p 285  
Vitamin C Nutrition and Susceptibility to Diphtheria as Possible Factors in Epidemiology of Poliomyelitis W G Hershup—p 287  
Variations in Behavior of Paretic Cerebrospinal Fluids with Different Types of Gold Sol S W Pennycuik C I Woolcock and R J Cowan—p 315  
Synthesis of Acetylcholine by Brain Tissue I R Trethewie—p 143

**Vitamin C and Poliomyelitis**—Hershup states that toward the end of 1937 an epidemic of poliomyelitis began in South Australia. A number of the earlier cases occurred in an area of a city in which immunization against diphtheria had been carried out previous to the epidemic, and Dwyer observed that the majority of the cases of poliomyelitis occurred in children non-immunized to diphtheria. Immunization had been carried out without previous Schick testing. In 1937 Jungblut reported that vitamin C had a therapeutic effect when injected subcutaneously into monkeys inoculated with the virus of poliomyelitis. A review of the literature on susceptibility to diphtheria and to poliomyelitis showed in each case a correlation with the results of certain experimental work with vitamin C. In 1917 Zingher reported that a positive reaction to the Schick test was given in a disproportionately large percentage of cases of poliomyelitis. Comparing the patients with poliomyelitis who were not immunized to diphtheria with the controls, the author finds that the age group of 12 years and over gives substantially the same percentage of positive Schick reactions as the control group. This is possibly the most extraordinary result obtained, as this age group contains 42 per cent of the patients and their ages range up to 60 years, 30 per cent of them are 21 years or more of age. Admitting that some of these are rural dwellers, the figure is still high in a state in which diphtheria is moderately prevalent. The same may be said of the whole group especially when it is considered that fewer than a third of the patients are less than 6 years of age. Of the 238 patients tested twenty-one had been artificially immunized and nine had had diphtheria. Eight of these thirty gave a positive reaction to the Schick test. In a control group of 359 persons, of whom four had had diphtheria and 355 had been artificially immunized, only two gave a positive Schick reaction. One of these had received only 0.5 cc. of anatoxin and the other only 1 cc. The author is tempted to suggest that the latter result is due to the fact that those who remained Schick positive after immunization contracted poliomyelitis. These figures support the idea of a constitutional defect underlying susceptibility to the two diseases, and it is not surprising to learn that several of the patients with poliomyelitis here, within a few months, contracted diphtheria despite immunization. Dwyer has reported that few of these immunized patients contracted poliomyelitis. This contrasts sharply with the report of Henry and Johnson that 51 per cent of their patients with poliomyelitis had been previously immunized. The explanation is probably that Dwyer's group was immunized without previous Schick testing, that is to say, many of them did not require it, whereas it is justifiable to assume that all of the latter group were Schick positive prior to immunization. From these results, supported as they are by Zingher's observations on a much larger group, it is evident to the author that there is a greater susceptibility to poliomyelitis in persons giving a positive Schick reaction than in those who give a negative reaction. Conversely there is a larger percentage susceptible to diphtheria among those who contract poliomyelitis than in the normal population. The urinary excretion of vitamin C from various groups of infected and noninfected persons has been estimated and the conclusion is drawn that, while the usual sequence of events is a decreased excretion of vitamin C following infection, it is probable that a low level of vitamin C nutrition predisposes to infection and severity of attack. It is probable that there is a relationship between nutrition and the age incidence in this disease.

## Journal Obst &amp; Gynaec of Brit Empire, Manchester

45 893 1066 (Dec) 1938

- William Blair Bell Memorial Lecture Uterine Inertia T N A Jeffcoate—p 893  
\*Production of Uterine Hemorrhage in the Normal Cycle and in Amenorrhea Through Progesterone B Zondek and S Rozin—p 918  
Study of Abortion Sequences P Malpas—p 932  
Interpretation of Radiologic Pelvimetry C Nicholson—p 950  
\*Puerperal Cervicitis Observations Based on a Series of Eighty Two Cases Treated at Queen Charlotte's Hospital H Arthure—p 985  
Study of Placental Site and Intra Uterine Relation by Original Method of Amniotic Sac Distention Report of 144 Cases R Torpin—p 993  
Some Aspects of the Pathology of Uterine Fibromyomas During Pregnancy C P Charlewood—p 999  
Surgical Treatment of Carcinoma Cervicis Uteri by the Radical Vaginal Method S Mitra—p 1003  
Subacute Puerperal Inversion Treated by Aveling's Repositor Case R J Keller—p 1013  
Simple Breast Reliever Pad H Willcox—p 1017

**Production of Uterine Hemorrhage by Progesterone**—Zondek and Rozin learned that if progesterone is administered to normally menstruating women for five days during the post-menstrual stage (seventh to twelfth day of the cycle) bleeding of several days' duration occurs after an interval of sixty hours on the fourteenth day of the cycle. Since the uterine mucosa in this stage does not show any of the secretory stage or only the beginning of it, this hemorrhage can be looked on as pseudo-menstruation. The normal ovarian cycle need not be disturbed by this event. If progesterone is administered at the time of the follicular rupture, at a moment when the patient has her own corpus luteum, bleeding either does not occur at all or there is a hemorrhage from a mucous membrane already developed into the premenstrual stage. In this case precocious menstrual bleeding can be induced. The authors also observed that treatment with progesterone for five days can produce hemorrhage in secondary amenorrhea without preliminary treatment with estrogenic substance. In primary amenorrhea, however, such treatment fails. Since it had become evident that progesterone could induce hemorrhage in the normal as well as in the disturbed ovarian cycle, the authors tried to initiate hemorrhage during pregnancy in order to bring about therapeutic abortion in this way. They used doses of from 50 to 150 mg of progesterone. Bleeding, however, did not occur and pregnancy continued.

**Puerperal Cervicitis**—Arthure states that it is of great importance to treat cases of cervicitis early, before the lesion has become chronic and deep seated. The infection is due to a nonhemolytic streptococcus but the essential cause of the lesion is trauma and the histologic aspect of puerperal cervicitis is identical with that of ectropion. The most frequent single factor responsible for this trauma is early rupture of the membranes, which is therefore inadvisable as a method of inducing labor. Treatment by cauterization can be carried out as an outpatient method without special preparation or after treatment. The author obtained satisfactory results in fifty-six of sixty cases of cervicitis treated by cautery. Partial failure may be due to inadequate treatment of the endocervicitis, which is probably present in all cases. Cauterization is far more efficacious in recent cervicitis than in cases of long standing, in which the infection is no longer superficial.

## Journal of Physiology, London

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- Studies on the Chemical Processes Which Occur in Muscle Before During and After Contraction M Duboussin—p 461  
Experimental Investigations of Reservoir Blood of Cat Spleen with Special Reference to Hemolysis and Sedimentation Reaction J Mellgren—p 483  
Reflex Acceleration of Respiration Arising from Excitation of the Vagus or Its Terminations in Lungs M Hammouda and W H Wilson—p 497  
Oxygen and Carbon Dioxide Content of Blood of Normal and Pregnant Decerebrate Cats A G Steele and W F Windle—p 525  
Some Correlations Between Respiratory Movements and Blood Gases in Cat Fetuses A G Steele and W F Windle—p 531  
Blood Volume in Lambs T Gotsev—p 539  
Note on Manometric Estimation of Oxygen in Small Samples of Blood M F Mason—p 550  
Properties of Secretin G Agren—p 553  
Relation Between Conduction Velocity and the Electrical Resistance Outside a Nerve Fiber A L Hodgkin—p 560  
Oxygen in Carotid Blood at Birth J Barcroft K Kramer and G A Millikan—p 571

## Lancet, London

1 168 (Jan 7) 1939

- Recurrent Peptic Ulceration Causes of and Design for the Second Operation on the Stomach R E Kelly—p 1
- \*Estrogenic Properties of 'Stilbestrol' (Diethylstilbestrol) Clinical and Experimental Investigation P M F Bishop Muriel Boycott and S Zuckerman—p 5
- Treatment of Pyloric Stenosis with Eumydrin R H Dobbs—p 12
- Medial Approach to the Midpalmar Space and Ulnar Bursa A K Henry—p 16
- Estimation of Sulfanilamide in Biologic Fluids A E A Werner—p 18
- Interference Dissociation C W C Bain—p 20
- \*Gout Following Salyrgan Diuresis N L Price—p 22

**Properties of a Synthetic Estrogen**—Bishop and his co-workers administered a synthetic estrogen (stilbestrol) to eighteen patients with amenorrhea of variable duration "Estrogenic withdrawal bleeding" was provoked in eight, and rhythmic uterine hemorrhage occurred during the period of administration in two. Of the patients who did not respond by uterine bleeding, one had previously failed to respond to the administration of natural estrogens and one had received no previous estrogenic therapy. The amenorrhea in this patient was of eight years' duration, the onset having accompanied that of anorexia nervosa. Six patients failed to respond to the synthetic estrogen though previous courses of theolol (estradiol benzoate) had resulted in withdrawal bleeding. Of the ten treated successfully, three had received no estrogen previously but responded to such low doses as 14 mg or less given by mouth. In fifteen patients with the menopausal syndrome and in ten with atrophic conditions of the vagina symptomatic relief (especially with regard to the daily frequency of hot flushes), vaginal smear pictures and improvement of the local condition (of the vagina) were taken as the main criteria of response. Of these twenty-five patients, eight failed to respond to the administration of the synthetic substance. Five of these received relatively small doses, totaling 28 mg or less, though three of these had reacted satisfactorily to lower doses of ethinyl estradiol (a partially synthetic compound of natural estrogen). Of the remaining three, two were suffering from atrophic vaginitis, neither had received previous estrogenic therapy and with both there was doubt as to whether the local condition was due to ovarian deficiency. The third patient failed to react to small doses of ethinyl estradiol. Of the successfully treated patients, one reacted to 0.1 mg given by mouth daily for a fortnight both symptomatically and with the production of an estrous smear (though the improvement was not maintained after a further course). Another patient failed to respond to doses of 0.1 mg but reacted satisfactorily to 1 mg doses both as to the fortnightly hot flushes and the vaginal smear. In all the other subjects doses of 1 mg or more produced satisfactory responses. Symptomatic improvement was almost always associated with a transformation of the vaginal smear to the estrous type. Two patients with dysmenorrhea were completely relieved by the daily administration of 1 mg tablets of the synthetic substance during the first half of the cycle. They had experienced similar relief from four injections of 5 mg of estradiol benzoate. Nausea or vomiting occurred in three cases. The authors do not believe that these symptoms depend on the dose given.

**Gout Following Salyrgan Diuresis**—Although mentioned by Hench (1936), the occurrence of gout after the use of salyrgan for the relief of edema in congestive cardiac failure does not appear to be widely recognized. Price reports five such cases and believes that the fact that they were observed within a period of little more than a year suggests that the association of salyrgan and gout cannot be uncommon. In all five cases salyrgan was given intramuscularly in doses of 1 cc on alternate days and supplemented by 13 Gm of ammonium chloride given three times a day by mouth. All the patients were kept strictly at rest and on a reduced intake of fluid. The onset of gout following the use of salyrgan in cases of cardiac failure is of grave prognostic significance. It seems to be usual for patients to succumb within a few weeks of the attack. It may be that gout develops only after forced diuresis in patients in the terminal stages of cardiac failure, or gout may have some deleterious effect on the cardiac condition. This raises the question of the desirability of using mercurial diuretics like salyrgan when there is a history of previous gout, since it seems possible that too successful a diuresis may be dangerous.

## Archives des Maladies du Cœur, Paris

31 1175 1270 (Dec) 1938

- Contribution to Study of Rhythm Coupled by Sinusal Bigeminy A Clerc R Levy and A Calo—p 1175
- \*Alcoholic Beriberi A Van Bogaert—p 1195
- Disturbances of Rhythm Provoked by Atropine J Enescu and N Vacrescu—p 1223
- Anomalies of Electrocardiogram in Course of Acetonemic Vomiting During Childhood C D Avierino—p 1237
- Sedimentation Speed of Erythrocytes in Chronic Valvular Cardiopathies Pathogenic and Therapeutic Considerations D Simici D Zamfir and V Munteanu—p 1241
- Influence of Nitric Esters in Gaseous State on Hypertension A. Aperia—p 1252

**Alcoholic Beriberi**—Following remarks about the effects of an insufficiency of vitamin B<sub>1</sub> in beriberi, Van Bogaert calls attention to the relationship between alcoholic polyneuritis and deficiency in vitamin B<sub>1</sub>. He gives a detailed report of the clinical history of a man aged 28 who entered the hospital with the diagnosis of myocardial insufficiency. The circulatory disorder was characterized by dyspnea, stasis in the jugular veins, hepatomegaly, generalized edema and pleural effusion. The heart was greatly enlarged and presented severe electrocardiographic changes. Moreover, the patient had a polyneuritis localized in the inferior members. The anamnesis revealed that, two years before, the patient had undergone a partial gastrectomy on account of a pyloric ulcer. For the last six years he had consumed daily large quantities of alcohol. He received neither diuretic nor cardiotonic medication but in addition to an ample diet was given daily an intramuscular injection of 10 mg of crystallized vitamin B<sub>1</sub> (5,000 international units). Under the influence of this treatment the diuresis increased, edema disappeared within six days and the pulse became slower. From the tenth day of the treatment the x-ray image of the heart was practically normal. In the course of the following week the dyspnea disappeared entirely and the liver was no longer palpable. At the end of this week the muscular pains in the legs had entirely disappeared and the patient was able to get up, walk around and even mount stairs without signs of dyspnea. The patellar reflexes were now normal but the achilles tendon reflexes were still abolished. After the patient had been in the hospital for three weeks the dose of vitamin B<sub>1</sub> was doubled, that is, two injections of 10 mg were given daily. This was done in the hope of restoring the electrocardiogram to normal outlines. However, when this supersaturation with vitamin B<sub>1</sub> had only a slight effect and a nervous factor in the abnormal electrocardiogram could be excluded, other tests were made and it was found that the basal metabolism was below normal. When this was discovered, treatment with thyroid was instituted and was continued even after the patient had been discharged from the hospital as apparently cured. In commenting on this case the author first estimates the mode of development of the B<sub>1</sub> avitaminosis and shows that it was not primary, as is the case in Asiatic beriberi, but rather secondary, that is, it was caused by defective assimilation. In this connection he estimates the possible importance of gastrectomy, hepatic lesions and alcoholism. After discussing the divergences which exist between the neurocirculatory syndrome of Asiatic beriberi and that of the secondary avitaminoses, he estimates whether the thyroid was involved in the electrocardiographic modifications of the reported case. He points out that the thyroid stimulates the general cellular exchange, even that of the myocardium, and that the electrocardiographic disturbances in B<sub>1</sub> avitaminosis seem to be the manifestation of a slackening of the intramyocardial cellular exchanges.

## Archives de Medecine des Enfants, Paris

42 172 (Jan) 1939

- \*Hypertrophy of Thymus in Course of Acute Leukemia of Children R Pierret, L. Christaens and Popoff—p 5
- Prophylactic and Therapeutic Value of Placental Globulin Extract in Measles Scarlet Fever and Mumps Mathilde de Biehler—p 29
- Relapsing Infectious Encephalitis L. Nove Josserand G Bertrand and Mlle. M. Flotard—p 34

**Hypertrophy of Thymus in Acute Leukemia**—Pierret and his associates say that in a comparatively short time they observed three children in whom acute leukemia was accompanied by hypertrophy of the thymus. They report the clinical histories of these three children, who varied in ages between

6 and 10 years. Then, following a review of the literature, they discuss the problem of concurrence of thymic hypertrophy and leukemia and reach the following conclusions: 1. There exists a clinical form of leukemia, which affects mainly children and which is characterized by the presence of a hypertrophy of the thymus. The hypertrophy of the thymus is not accompanied by clinical signs that are usually ascribed to this anatomic manifestation. In one of the described cases in which the necropsy revealed a thymus weighing 200 Gm. there were no inspiratory effort, no roaring sound and no dyspnea. The authors find it difficult to subscribe to the opinion of certain investigators who make thymic hypertrophy the "primum movens" of the disease, that is, who suggest that the cells issue from the thymic tumor and then pass into the circulation. They, on the contrary, think that the invasion of the thymus is secondary to the leukemia. The clinical factors that are of especial importance in this particular form of leukemia are (1) its extreme gravity and the superacute character of its evolution and (2) its extraordinary sensitivity to roentgen rays, which demands the greatest prudence in the utilization of roentgen therapy. From the diagnostic point of view, two points deserve to be stressed: (1) If roentgenoscopy indicates the existence of a tumor of the thymus, it is necessary to make a systematic examination of the blood and (2) it is advisable to make a careful roentgenologic examination in all cases of acute leukemia before roentgen therapy is instituted. It is not sufficient to relate observed shadows to mediastinal adenopathies, but it must be ascertained whether certain characteristics do not permit to connect these shadows to the thymus. In an addendum to this report the authors say that they observed a fourth case of enormous thymic hypertrophy in a child aged 4 who had leukemia. This child was hospitalized in a moribund condition. The necropsy favored the diagnosis of lymphoid leukemia, for it revealed a remarkable lymphoid infiltration of all organs. The thymus was of enormous size and it was entirely infiltrated with lymphocytes; Hassall's corpuscles were absent. The authors think that thymic infiltration is perhaps more frequent than was thought in the course of acute lymphoid leukemia of childhood, constituting a particularly severe form of the disease.

### Encephale, Paris

2 239 294 (Dec.) 1938

\*Choreas of the Aged. R. Pauly.—p. 239

Temporoparietal Disorientation and Preponderance of Right Hemisphere in Proprioceptive Agnosia-Alexias. M. Dide.—p. 276

**Choreas of the Aged**—In this report on the choreas of the aged, Pauly first gives a historical review of the literature and then presents anatomoclinical studies on the different forms of chorea that appear in aged persons. In persons over 60 it is possible to observe generalized and localized choreas, chronic, acute and subacute choreas, and primary and secondary choreas. The chronic generalized choreas of the aged are rarer than the choreas of Huntington, that is to say, the choreas due to a heredodegeneration. Much more frequent are the nonhereditary choreas. These choreas may be accompanied by mental disorders of the dementia type. Regarding the etiology the author says that in exceptional cases they are of syphilitic origin, sometimes they are arteriosclerotic, but usually they present anatomopathologic aspects much like those of Huntington's chorea. The chronic hemichoreas fit into the framework already established for the choreas of adults. They may be localized in the putamen-caudate region, in the nucleus of Luys or in the pedunculo-cerebellar region. Softened and hemorrhagic foci are the usual cause. Truly acute chorea may also develop after the age of 60. When this form has the antecedents of Sydenham's chorea or of acute articular rheumatism, some authors regard it as a relapse, that is to say, as a reactivation of the causal organism. Nevertheless, acute chorea can also be primary. It is more often generalized than localized, it is rarely accompanied by cardiac lesions and it has a tendency to relapses and to chronicity. Discussing the etiology of the latter form the author does not hesitate to concede the existence of a chorea of Sydenham in spite of its classic predilection for young persons. However, an anatomoclinical observation and experimental studies by Harvier and Decourt prove the existence of choreas provoked by a neurotropic virus comparable to that of epidemic encephalitis if not identical with it. Besides these acute choreas of the Sydenham

type there develop also subacute choreas with relapses, choreas which Lhermitte designates as intermittent. The author reports a case illustrating this type. Certain arguments militate in favor of a formal distinction between this intermittent form and the chorea of Sydenham. Discussing the anatomic aspects of the choreas of the aged, the author says that they are complex and diverse: there may be cortical and striatal lesions, lesions of the body of Luys and subthalamic ones, and lesions of the superior cerebellar peduncle. In each of these regions the eliciting causes are found to be multiple. However, whereas in the superior cerebellar peduncle the disintegration is usually of vascular origin and whereas in the body of Luys and in the subthalamic region softening is predominant, in the cortex and the central gray, on the other hand, there may be vascular or infectious lesions and cellular degeneration.

### Presse Medicale, Paris

47 81 96 (Jan. 18) 1939

Nonsurgical Treatment of Coxitis. Present Status of Question. F. Coste and G. Aubert.—p. 81

\*Grave Postoperative Attack of Paroxysmal Tachycardia Treated Successfully by Procainization of Left Stellate Ganglion. R. Leibovici, L. Dinkin and Wester.—p. 83

**Injection of Stellate Ganglion for Paroxysmal Tachycardia**—Leibovici and his associates report the clinical history of a man aged 29 who developed a severe form of paroxysmal tachycardia after an appendectomy. Since energetic medication was without effect on the tachycardia, it was decided to arrest the tachycardia by injecting procaine hydrochloride into the left stellate ganglion. About 20 cc. of a 1:200 solution of procaine hydrochloride was injected slowly. The effect was immediate. The pulse fell suddenly from 180 to 72 and the patient felt greatly relieved. In the minutes which followed the injection, Bernard-Horner's syndrome developed and persisted for several hours. This confirmed that stellate blockage had been accomplished. The pulse remained normal (always around 76 to 80). The further course was uneventful and the patient was discharged on the eighth day. Four weeks after the intervention an examination of the heart revealed nothing abnormal. The patient never had another attack of tachycardia. The authors cite factors which indicate that this was a case of paroxysmal rather than of sinus tachycardia and then point out that it is no longer disputed that the sympathetic plays a part in sinus tachycardia and that surgical interventions on the sympathetic have been employed with good success in a number of cases of sinus tachycardia. In a table they list a number of cases of sinus tachycardia and the surgical interventions that were employed (sympathectomy on the left side, section of the efferent branches of the stellate ganglion, stellectomy on the left, right or both sides, hemithyroidectomy and so on). In a second table they list cases of paroxysmal tachycardia and the various surgical treatments employed in them (stellectomy on the left or right side and injection of procaine hydrochloride into the stellate ganglion). Further they show that interventions on the right stellate ganglion are effective in sinus tachycardia and interventions on the left stellate ganglion in paroxysmal tachycardia. Their own observation as well as that of Mandl indicates that merely infiltration of the stellate ganglion, without stellectomy, may produce favorable results not only immediately but also permanently.

### Schweizerische medizinische Wochenschrift, Basel

69 69 88 (Jan. 28) 1939 Partial Index

Prognosis of Mental Diseases. B. Dukor.—p. 69

\*Familial Occurrence of Leukemia. R. Laub.—p. 71

Acute Porphyrinuria in Puerperium. Case. W. Kurt.—p. 73

How Long Does Test Serum Retain Agglutination Capacity? R. Meyer Wildisen.—p. 74

\*Further Cases of Spontaneous Poliomyelitis in Domestic Animals (Hogs). E. Frauchiger and W. Messerli.—p. 74

**Familial Leukemia**—Laub cites authors who have published reports about the familial occurrence of leukemia and describes the clinical history of a woman aged 26 who was under his observation and who died of myeloid leukemia. Investigating the etiology of this case he gave special attention to the family history and found that, fifteen years before, the patient's mother had died (aged 32) of the same comparatively rare blood disease, myeloid leukemia. Discussing this familial occurrence, he points

out that other investigators have raised the question whether the familial concurrence is merely accidental or whether hereditary factors play a part. Naegeli and Petri regard an accidental concurrence as most likely. Petri, for instance, finds no proof either in the literature or in his own observations that the appearance of leukemia in related persons is connected with hereditary factors. In contradistinction to Petri, Curschmann believes that the familial concurrence of leukemia is not merely accidental and that, although the question is not definitely solved, further investigations on the families of patients with leukemia might reveal signs of hereditary changes and susceptibilities of the blood forming organs. He, like Morawitz, rejects the theory of the infectious origin. The author thinks that his observation seems to support the opinion of the latter authors, namely that the familial occurrence of leukemia is not accidental but due to hereditary factors.

**Spontaneous Poliomyelitis in Hogs**—Frauchiger and Messerli say that since acute anterior poliomyelitis has been observed in cattle they have given special attention to paralytic symptoms in domestic animals. In this report they describe observations on two hogs which presented symptoms that greatly resembled those of acute anterior poliomyelitis. On the basis of these symptoms the disorder was diagnosed as probable poliomyelitis. Both animals were killed and the microscopic examination of the spinal cord revealed in both of them histologic aspects resembling those of acute anterior poliomyelitis in human subjects. Material from the spinal cords of these animals was introduced into two other hogs and into one steer. Because of an inadequate technic, nothing could be learned from the inoculation test on the hogs, but the steer, in which a formerly devised technic was employed for the inoculation, developed fever, the curve of which showed the dromedary type. Other symptoms included signs of fatigue, stiffness of the neck, and an atactic walk. From the seventh day after the inoculation the symptoms commenced to subside and a few days later the animal seemed normal again. The animal was killed fourteen days after the inoculation. The histologic aspects of the central nervous system were those of lymphocytic meningo-encephalomyelitis rather than those characteristic for poliomyelitis, but it must be remembered that the animal was not killed during the acute stage, when signs more typical for poliomyelitis might have been detected. However, since Spielmeyer's investigations demonstrated that similar histologic aspects do not necessarily indicate the same disease, etiology or causal agent, the authors do not definitely conclude that the described paralytic symptoms in hogs are identical with human poliomyelitis, but they do believe that this could be the case. They think that the detection of further cases of poliomyelitis in animals, the transmission from animal to animal and from man to animal, will provide more certainty.

### Gazzetta degli Ospedali e delle Cliniche, Milan

59 1255 1276 (Dec 18) 1938

\*Roentgen Irradiation of Hemopoietic Tissues in Normal Persons and in Those with Blood Diseases. A. Bertola, M. Ravetta and C. Zelaschi.—p 1255

Identification of Chronic Peritonitis Incapsulans with Hernia of Peritoneal Fossa. R. Babini.—p 1261

**Bone Marrow and Roentgen Irradiations**—Bertola and his collaborators studied the modifications of bone marrow from roentgen irradiations on the spleen, the sternum or other bones, or on the enlarged lymph nodes. The observations were made on four normal persons, eight patients with myeloid or lymphatic leukemia and two patients with malignant lymphogranuloma. They were applied every other day in small doses (from 210 to 630 roentgens in normal persons and from 60 to 150 roentgens for each treatment). The total number of treatments is not specified by the authors. In all cases bone marrow for microscopic study was taken by sternal puncture, before and after administration of the treatment. The irradiations caused no change in the erythroblastic tissues in normal persons or in the patients. They had a slight effect on the granuloblastic tissues of normal persons and a favorable action on the granuloblastic tissues of the patients. The proliferation of erythroblasts (ratio leukoblasts erythroblasts) and the curves of maturation and karyokinesis did not change in normal persons. In leukemia and malignant granuloma the production of erythroblasts did

not change. In leukemia the ratio leukoblasts erythroblasts improved or became normal from retarded production of granuloblasts. The curves of cellular maturation and karyokinesis improved (diminished mitosis, diminished prophase and increased telophases). The irradiations induced slight variations on the curves of cellular maturation in malignant lymphogranuloma. The number of lymphocytes in the bone marrow in cases of lymphatic leukemia diminished after the treatment. As a rule the myelogram in leukemia shows predominance of immature leukoblastic cells (myeloblasts or promyelocytes) before roentgen treatment and predominance of mature cells (myelocytes or myelometamorphocytes) or else a normal aspect after the treatment. The favorable modifications of the myelogram are induced by irradiations either of the bones or of the spleen. In one case of myeloid leukemia and a case of lymphatic leukemia, favorable changes of the bone marrow were induced from irradiations only of the spleen. The authors' attention was called to the pathogenic role of the spleen in leukemia and on the therapeutic value of roentgen irradiations on the structure. According to the authors the roentgen treatment is of value in these blood diseases, especially in leukemia, in which it controls the dysfunction of the hemopoietic organs which causes the disease. The article is a preliminary report.

### Bol de la Soc Cubana de Pediatria, Havana

11 154 (Jan) 1939 Partial Index

\*Evolution of Primary Tuberculous Infection in Infants. J. Rodriguez Betancourt.—p 11

Rupture of Kidney in Child. Case. J. Garcia Romeu.—p 25

**Primary Tuberculous Infection in Infants**—Rodriguez Betancourt followed the behavior of primary tuberculous infection by means of x-ray studies of the thorax in a group of 250 infants. The infection developed in the following forms. In seventy-two cases there was tracheobronchial tuberculous adenopathy, in 131 there was pulmonary parenchymal infiltration, in thirty-six there was unilateral or bilateral bronchopneumonia and in eight there was caseous pneumonia. The lesion regressed in 182 infants, forty are still being treated and twenty-eight died. Tuberculous meningitis is the most frequent complication of the grave forms. As a rule the lesions of primary infection heal and the patient remains allergic. The evolution of acute or chronic forms depends on how long the patients are permitted to remain in tuberculous environments. An early diagnosis is important. It must be followed by (1) their separation from the tuberculous contact, (2) establishment in good hygienic quarters with proper diet and (3) early administration of treatment. It is advisable to follow the evolution of the tuberculous lesion by means of repeated x-ray examinations of the thorax. Artificial pneumothorax is indicated in acute and subacute forms.

### Klinische Wochenschrift, Berlin

18 140 (Jan 7) 1939 Partial Index

Hereditary and Climatic Factors in Rheumatic Diseases. S. Dietrich.—p 1

Immunobiologic Evaluation of Active Prophylactic Vaccination Against Diphtheria by Means of Alum Diphtheria Toxoid in Children. G. Paschla.—p 7

\*Adrenal Cortex and Obesity. C. Bomskov and E. Schneider.—p 12

Active Factor That Increases Leukocytes. E. Baumann.—p 14

Action of Ascorbic Acid on Lipase Content of Blood. W. Kruger.—p 19

Electrical Method for Multiple Registration of Ocular Movements and Nystagmus. R. Jung.—p 21

Parasympathetic Fibers in Trigeminal Nerve and Trophic Innervation of Same. S. Moteki.—p 25

**Adrenal Cortex and Obesity**—Bomskov and Schneider point out that investigations by Verzar revealed that the bilateral extirpation of the adrenal cortex results in the complete cessation of fat resorption, that the administration of adrenal cortex extract will restore the fat resorption but will not increase it above the normal values, and that yeast can be substituted for adrenal cortex extract. In their own studies on the role of the adrenals in fat metabolism the authors observed that the length of survival of rats or mice following bilateral extirpation of the adrenals is dependent on the age of the animals, infantile rats and mice all die within a few days after the extirpation, whereas adult animals show two different types of reactions. One group dies with the signs of cachexia, while the other group survives indefinitely. The authors describe studies on these two groups.

of animals. Summarizing their observations, they say that about half of the animals develop cachexia, which results in death after from thirty to thirty-five days. The fat reserves of these animals decrease greatly. Microscopic studies disclose no remnants of cortical tissue and the thyroid is unusually active. The symptomatology is probably the result of the abolishment of the cortical function and secondarily of the activation of the thyroid. In the other animals, which survive indefinitely, an increase in weight can be observed which is the result of great fat deposits. The rats become grunts, weighing 350 Gm and more (normal weight from 200 to 250 Gm). The necropsy disclosed in all of these grunt animals accessory adrenals consisting entirely of cortical tissue. These accessory adrenals greatly exceed the removed organ in mass and it is concluded that the cause of the obesity of these animals is a hyperfunction of the adrenal cortex. Microscopic examination of the thyroids of the grunt animals disclosed a state of complete quiescence.

### Munchener medizinische Wochenschrift, Munich

SG 140 (Jan 6) 1939 Partial Index

- Osteomyelitis G Magnus—p 1  
 Spasmophilia and Convulsions During Childhood K H Struder—p 4  
 \*Capacity for Sports of Patients with Heart Disease H G Hoffmann—p 7  
 Increasing Tension of Articular Capsule and of Tendinous Tissues by Injection of Mixture of Patient's Own Blood and Clauden (Hemostatic) F Heiss—p 9  
 Possibilities of Practical Measurement of Conjugata Vera by Means of Digital Palpation with Aid of Special Instrument (Palpating Thumbel) R Knebel—p 10  
 Optimal Digitalis Therapy of Patients with Heart Disease R Aschenbrenner—p 13  
 Slow Fractures of Ascending Ramus of Pubis K Daubenspeck—p 17

**Exercise in Heart Disease**—Hoffmann says that the lack of a reliable method for testing the cardiac function should not lead the physician to forbid all exercises in the presence of doubtful signs. It is his aim to demonstrate that after clinical cure has been obtained in heart disease it is not only permissible but advisable to institute gradually increasing exercises. Among 132 patients with cardiac defects he found only ten in whom it was necessary to forbid all sports. All others (122), who no longer had a decompensation and who no longer required treatment, could be permitted to take up some sport under medical supervision. Those whose reaction to exercise was at first unknown were encouraged to swim under the supervision of a physician. In many instances it was acknowledged that swimming is the most favorable physical exercise. This is probably chiefly due to the horizontal position in the water, which facilitates the backflow of the blood from the periphery. Moreover, a suitable respiratory technic probably plays a part. It is important that the patient become accustomed to the water, especially at the onset of the swimming exercises he must be guarded against excessive shock and dyspnea. The clinical histories of three patients are described, two were young persons with mitral defects and one was a man aged 51 with an aortic insufficiency of long standing and with myocardial impairment. It is demonstrated what can be accomplished in sports, in spite of cardiac defects. In order to retain the increased capacity, the exercise must be continued.

### Maandschrift voor Kindergeneeskunde, Leyden

S 89 134 (Dec) 1938

- Etiology of Tower Head A J de Leeuw Aalbers—p 89  
 Spontaneous Generalized Osteoporosis in Small Girl J C Schippers—p 108  
 \*Sternal Puncture in Children Normal Sternal Punctate in Children G M H Veeneklaas—p 118

**Sternal Puncture in Children**—Veeneklaas, in exploring the possibilities offered by sternal punctures in children for the examination of the bone marrow, studied the sternal punctates of fifty children. He found that the manubrium, having the largest medullary nucleus, is the best site for the puncture. An exact estimation of the percentages of the different cells is possible only on the basis of statistical formulas. Megaloblasts, the nucleated and youngest red element, with a diameter of from 16 to 18 microns, which are found in large numbers in the bone marrow of patients with pernicious anemia, are found regularly, although in small percentages, in the sternal punctate of children

and must be regarded as normal elements. Micromyeloblasts and paramyeloblasts, which heretofore have generally been regarded as leukemic cells, were likewise regularly observed in small numbers in the medullary specimens of children. Thus they too must be regarded as normal manifestations in children. With increasing age there appears in the bone marrow a change in the ratio of granulocytes to lymphocytes, just as in the case in the blood. Megaloblasts, myeloblasts and lymphoblasts are more numerous in children less than 3 years of age than in older children. In cases of lobar pneumonia a pathologic augmentation of myelocytes and of plasma cells can be observed in the bone marrow. In severe cases of celiac disease the bone marrow is characterized by the occurrence of megakaryocytes that are staff leukocytes and segmented leukocytes with a diameter of from 16 to 18 microns. In severe cases of leukemia the blood picture may be agranulocytic, whereas the bone marrow contains numerous cells of a leukemic nature. Thus, even if the blood picture is normal and there are no noticeable symptoms, puncture of the sternum will permit the diagnosis of leukemia.

### Acta Medica Scandinavica, Stockholm

98 1139 (Dec 21) 1938

- Hyperthyroidism and Treatment with Compound Solution of Iodine J Tillgren and N Sundgren—p 1  
 Carcinomatous Metastases of Brain with Syndrome of Charot-Adams Stokes and Oculogyric Crises H Marcus E Sahlgren and H Björklöv—p 58  
 \*Physicochemical Condition of Bilirubin in Blood Serum and Urine I Snapper and W M Bendien—p 77  
 Diagnostic Significance of Thoracic Leads J Freundlich—p 83  
 Connection Between Takata-Jezler Reaction and Its Variant the Mancke-Sommer Reaction and Globulin Fractions of the Blood A de Vries—p 95  
 \*Studies on Effect of Nicotinic Acid on Experimental Gastroprival Pellagra Preliminary Report S Petri F Nørsgaard and E Bandier—p 117  
 Experimental Basis of Transfusion of Leukocytes J Hanausek—p 128  
 New Case of Myxedema Accompanied by a Reflex of Myotonic Type of Achilles Tendon S Eckerström—p 136

**Bilirubin in Blood Serum and Urine**—According to Snapper and Bendien, many investigations have been made on the physicochemical condition in which bilirubin appears in the body fluids. They cite studies carried out by others and by themselves. Their own method was that of ultrafiltration, whereas others employed cataphoresis and ultracentrifugation. They show that the investigations with the different physicochemical methods make it appear highly probable that the serum bilirubin is bound exclusively and quantitatively to the serum albumin. This is the case with any serum, no matter whether the reaction is direct or indirect. In urine from patients with jaundice and in watery solution bilirubin is present in the crystalloid state. The particles, however, are still coarsely molecular, so that on ultrafiltering these fluids the concentration of the bilirubin in the ultrafiltrate depends on the concentration of the colloidum solutions from which the membranes are prepared.

### Nicotinic Acid in Experimental Gastroprival Pellagra

—Petri and his associates state that previous experimental studies have demonstrated that surgical removal of the stomach in young dogs and pigs gives rise to a severe chronic and fatal pellagra. Moreover, on the basis of various therapeutic experiments on dogs with gastroprival pellagra and on patients with endogenous pellagra the existence of a hitherto not demonstrated antipellagrous function associated with the stomach seems highly probable. Large additions of yeast to the diet given to the dogs made no change in the development or character of the disease, whereas administration of human gastric juice or dried hog stomach brought about a rapid and conspicuous improvement in these animals and also in the pellagrous patients. At present experiments are carried out on gastrectomized pigs in order to determine the influence of parenteral administration of vitamin A, vitamin B<sub>1</sub>, riboflavin and nicotinic acid in the course of the experimental gastroprival pellagra and the associated morphologic changes. A preliminary account of the results obtained by administration of nicotinic acid is given in this report. The experiments, which were carried out on pigs, demonstrated the failure of nicotinic acid to exert an effect on experimental gastroprival pellagra. This is contrary to the effect of nicotinic acid in the pellagrous condition produced in



pigs by feeding experiments. It appears that this effect of nicotinic acid is dependent on the presence of a particular ("anti-pellagrous") function of the stomach. This view seems further to be confirmed by experimental observations obtained by a special technique. Thus the view advanced by Petri and his collaborators as to the gastrogenous character of pellagra has been substantiated further.

### Acta Radiologica, Stockholm

19 505 600 (Dec 31) 1938

- \*Roentgen Diagnosis of Primary Tumors of the Lung N Westermarck —p 505
- \*Roentgen Therapy in Rheumatic Diseases G Kahlmeter —p 529
- Total Roentgen Irradiation of Chronic Leukemia T Dale —p 539
- Treatment of Lymph Node Metastases from Carcinomas of Lips and of Oral Cavity R B Engelstid —p 546
- Insufficiency Fractures of Femur and Tibia C J Hansson —p 554
- Roentgenologic Demonstration of Perforation of Colonic Diverticulum Two Cases B Stenstrom —p 560
- Treatment with Hertzian Waves W A G van Eerdeningen —p 565
- Arthrographic Appearance of Ligaments of Knee Joint K Lindblom —p 582

**Roentgen Diagnosis of Primary Tumors of Lung**—In this paper on the roentgen diagnosis of pulmonary tumors, Westermarck confines himself to the primary growths of the lung. In so doing he pays especial attention to their early diagnosis. He deals with benign tumors as well as with primary sarcoma of the lung. Considered from the pathologic-anatomic point of view, the benign bronchial tumors can be classified as polyp, fibroma, lipoma, and adenoma. These tumors give rise to bronchostenosis, which condition dominates the roentgenologic aspects. The diagnosis requires bronchography. The author says that many benign pulmonary tumors are congenital. They spread toward the periphery of the lung. The chondromas are the most common. These appear as rounded or somewhat irregular shadows in the lung and they frequently contain calcifications. Besides chondromas, however, other mesenchymal tumors are found in the lung. The literature contains reports about fibromas, myomas and angiomas of the lung. In order to differentiate these tumors from extrapulmonary growths, bronchography should be carried out and diagnostic pneumothorax should be induced. Bronchial cancer in most cases gives rise to bronchostenosis. On the roentgenogram, this stenosis is usually in evidence earlier than is the shadow of the tumor. In order to facilitate an early diagnosis, the changes caused by bronchostenosis should be watched for and bronchography should be carried out. During the early stages the cancer is usually localized in the finer bronchial ramifications and from here it progresses in a central as well as in a peripheral direction. In the final stage either extensive infiltration of an entire pulmonary lobe or metastases in the hilus dominate the picture. Pulmonary sarcomas are comparatively rare. They are characterized by an expansive mode of growth and form large or small rounded homogeneous shadows, which are located in the center of a pulmonary lobe or occupy an entire lobe or most of the lung.

**Roentgen Therapy in Rheumatic Diseases**—This report by Kahlmeter is based on a material of approximately 5,000 cases of different forms of rheumatic disease which were observed during the years 1925 to 1937. Before discussing the results, the author describes the technique which he employed. The tension was 173 kilovolts, the intensity 5 milliamperes, the filter consisted of 0.5 mm of copper and 1 mm of aluminum and the focus-skin distance was 30 cm, except in case of the fields which measured 15 by 20 cm, here it was 40 cm. In most cases the dimensions of the fields were 10 by 15 cm, though fields measuring 8 by 10 cm were also frequently irradiated. At each session from 150 to 200 roentgens was applied and these doses were repeated two or three times at intervals of two or three days. After an interruption of from four to six weeks a second series was applied in the same manner if it proved necessary, perhaps to be followed by a third series after from six to eight weeks. To be sure, the aforementioned doses were not used in all disorders. In conditions like acute bursitis and peritendinitis stronger doses (200 roentgens) were given once or twice, however, in acute gonococcal arthritis from 75 to 100 roentgens was applied three or four times. Summarizing the results obtained with roentgen therapy, the author says that the effects are best in gonorrheal arthritis, gout, acute

infectious arthritis of the septic type and acute cases of bursitis and tendinitis. Although in a lesser degree, results are generally favorable in all forms and stages of tendinitis, in localized myalgia and neuralgia and, on the whole, in all periartritic symptomatic conditions. Thus, in case of hip disease, for instance, it is important to irradiate not only the joint itself but also the attachments of the trochanteric and adductor musculature. Moreover, the beneficial effect obtained in cases of osteo-arthritis of the knee joint is mainly due to the effect on the tendinitis and tendovaginitis which is always present in the surroundings of the knee joint, particularly on the inner side. It is no easy task, however, to analyze the benefit that may be derived from roentgen treatment in chronic polyarthritis ("rheumatoid arthritis"). In general it may be said that the effect is better the more recent the articular symptoms and so far as they are of clearly inflammatory nature or are periarticular and so far as the restricted mobility is due to the painfulness of the periarticular soft tissues and not to cicatrization or exudate or destruction of cartilage.

### Nordisk Medicinsk Tidskrift, Stockholm

16 1973 2012 (Dec 17) 1938

- \*Clinical Aspects of So Called Spontaneous Subarachnoid Hemorrhage E Lyngar —p 1974
- Thrombo-Angitis Obliterans (Buerger's Disease) K K Nygaard —p 1982
- Ten Years Experience with BCG Vaccination in Norrbotten C Nreslund —p 1990
- \*Ovalocytosis N Soderstrom —p 1996

**Spontaneous Subarachnoid Hemorrhage**—Lyngar says that clinically hemorrhage in the subarachnoid space constitutes a relatively well defined picture, since the symptoms depend on the hemorrhage as such without regard to its cause. The word "spontaneous" indicates that the hemorrhage is not due to trauma. Diagnosis is based on the presence of bloody spinal fluid, the blood corpuscles sink without coagulation, and the fluid over the corpuscles is yellowish. The source of the bleeding cannot be definitely determined in life. A bleeding may reach the subarachnoid space secondary to a hemorrhage in the epidural or subdural space or secondary to a superficial intracranial hemorrhage which makes its way either through pia or into the ventricle system, or the bleeding may originate in the blood vessels in the subarachnoid space. The author reports fourteen cases observed during a three year period. Seven patients were under 35, the youngest was 9 months old. Nine recovered. The disorder was characterized by sudden onset and symptoms of gradually increasing intracranial pressure and meningeal irritation. Only two cases were afebrile. Ophthalmoscopic examination, done in thirteen cases, revealed in seven changes in the fundus probably due to the intracranial hemorrhage, namely changes in the optic papilla, retinal hemorrhage, and in one case atrophy of the optic nerve. The etiology was often uncertain. The possibility of angiospastic disorders as an underlying cause is considered. In one case there was epilepsy, in one hypertension with headache, in three there had been headache for a longer time. Treatment consisted of spinal punctures, with removal of never more than from 5 to 8 cc of the cerebrospinal fluid in one session.

**Ovalocytosis**—Ovalocytosis, Soderstrom states, is a morphologic blood anomaly characterized by the more or less marked elliptic form of most of the red blood corpuscles. Reports of more than 100 cases have been published. There was hypochromic anemia in some of the cases, in some a hemolytic jaundice was present. In some of the cases with anemia definite ovalocytosis persisted after disappearance of the anemia, while in others the ovalocytosis was definite only in the anemic stage. Familial occurrence of the ovalocytosis was frequent. The ovalocytes are rather small and deficient in hemoglobin and should not be confused with the elliptic megalocytes of pernicious anemia. In the three personal cases reported the first examination revealed a moderate hypochromic anemia. In one of the cases treatment with iron resulted in parallel regression of both the anemia and the ovalocytosis, in another, which was familial, the treatment was followed by improvement of the anemia but the ovalocytosis remained unchanged. Hematocrit examination, according to Enghoff, showed a low volume index in two cases.



# THE STUDENT SECTION

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*Devoted to the Educational Interests and Welfare of Medical Students, Interns and Residents in Hospitals*

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## A Fourth Year Medical Student Is Introduced to Lobar Pneumonia

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In the year 1867, while discussing medical education, Oliver Wendell Holmes stated

The most essential part of a student's instruction is obtained, as I believe, not in the lecture room but at the bedside, nothing seen there is lost, the rhythms of disease are learned by frequent repetition, its unforeseen occurrences stamp themselves indelibly on the memory. Before the student is aware of what he has acquired he has learned the aspects and causes and probable issue of the disease he has seen with his teacher, and the proper mode of dealing with them, so far as his master knows

The basic truth of this remark has been more and more accepted by teachers of medicine, and now as a result the average present day student in a good medical school is fortunate in the almost unlimited opportunities he is offered to pursue the study of medicine at the bedside in large teaching hospitals. In such hospitals clinical material of all forms is abundant, and newer forms of therapy are constantly being employed, the student is in a position to observe, at first hand, their efficacy or failure

This is particularly true with reference to an important and common disease such as lobar pneumonia. Through didactic teaching, with his attention focused on the textbooks and with only occasional observation clinics, the student is apt to form the idea that lobar pneumonia is, for the most part, a very typical disease, with constant and impressive physical signs. It is only when the occasion for a clinical clerkship is presented and actual cases are placed in his hands for examination and diagnosis that he becomes aware of the frequent and almost diabolic nonconformity of this disease.

In the Fifth Medical Service at the Boston City Hospital, as soon as a patient with lobar pneumonia is admitted he is seen by one of the house officers, who immediately takes a blood culture and sends a sample of the patient's sputum to the Pneumonia Laboratory for typing. The Pneumonia Service, under the leadership of Dr. Maxwell Finland, is notified that a patient with pneumonia has been admitted, and some member or members of this service

review the case and offer therapeutic and prognostic suggestions. In the meantime the patient is placed as soon as possible in the hands of one of the clinical clerks, who are fourth year students. The clerk is made responsible, the condition of the patient permitting, for the following items:

- 1 A complete history, including family, marital, social and past history as well as of the present illness

- 2 A thorough physical examination (Both history and physical examination may be limited in extent if the patient is critically ill but will be completed during convalescence)

- 3 Examination of the blood to include red blood cell count, white blood cell count, hemoglobin determination (Sahli), differential count with a description of the smear, hematocrit study, mean corpuscular volume, mean corpuscular hemoglobin and mean corpuscular hemoglobin determination

- 4 Examination of the urine to determine color, reaction and specific gravity, tests to determine the presence of sugar, albumin, acetone and bile, and a microscopic examination of the centrifuged sediment

- 5 Microscopic examination of the sputum after Ziehl-Neelsen (acid fast), Gram and Löffler's methylene blue staining

- 6 Examination of the specimen of stool for the presence of occult blood

- 7 Withdrawal of blood for Hinton's test and, when the patient is over the age of 50 or when it is otherwise indicated, withdrawal of blood for nonprotein nitrogen or sugar determination

- 8 Any further examination, such as lumbar puncture or gastric analysis, at the discretion of the house officers or visiting staff

On the morning following admission the history, physical examination and results of the laboratory studies are discussed by the clinical clerk with one of the resident staff, and later in the morning the case is presented to a visiting physician, who questions the student concerning his diagnosis and suggested therapy.

During the hospital stay the patient's clinical course is followed by the clerk under the surveillance of the house officers or visiting staff, and the clerk is responsible for the daily laboratory work that is indicated and for progress notes.

Every opportunity is extended to observe the effect of whatever therapy is given, and the clerk also is expected to know the results of any x-ray examination or electrocardiographic or other tests performed.

Should death occur and permission for a post-mortem examination be obtained, the clinical clerk is informed of the time of the necropsy and is given an opportunity to correlate the clinical and the postmortem appearance in the case that he has had under observation in the manner outlined.

For the three months period from September through November 1938, to give an example of the opportunities now offered students in an active teaching service, the clinical clerks in the Fifth Medical Service of the Boston City Hospital had occasion to observe in this manner twenty-three cases of lobar pneumonia. These cases represented an unusually fine cross section of lobar pneumonia. The age of the patients varied from 15 to 76 years, the duration of the symptoms before the patients entered the hospital varied from two to fourteen days, and the physical signs presented by the patients varied from an almost negative examination and history to an overwhelming, prostrating infection.

All these patients had sputums which were typed and found positive for some specific type of pneumococcus, abnormalities of the chest were in all cases confirmed by x-ray examination.

Among the twenty-three cases thus observed there were six deaths, or a mortality rate of 26 per cent. Of these six patients, two were examined post mortem at the Mallory Institute, two were regarded as medicolegal cases because of a history of alcoholism, and permission for postmortem examination on the remaining two was refused. While so many fatal cases in a group so small seems unusually high, these fatalities are partially explained by the fact that in one case (6) not only was there a delay in entering the hospital, the patient having been ill six days before admission, but also there was a long history of chronic alcoholism, in another case (7) there was delay before hospitalization and the clinical picture was complicated by hypertension, obesity and alcoholism. In the other four fatal cases, death appeared to occur as the result of overwhelming infection.

It is noteworthy that of the patients encountered with pneumococcus type II infection, which usually is not considered to be most likely to prove fatal, four died. All received serum. Inquiry shows that approximately the same high mortality rate in the other services of the Boston City Hospital existed for pneumococcus type II infection during the time interval under discussion and that deaths from this type

of pneumonia have been more frequent so far this year throughout the entire state. At first this was thought due, perhaps, to a lowered efficacy of the serum, but after adequate investigation it now appears that in this locale at the present time there is a pneumococcus type II of greatly increased virulence.

An opportunity was afforded to observe closely the typical response in pneumonia to specific serum therapy and to learn the technic of administration. A patient receiving type I serum showed prompt recovery. It is truly impressive to any one to see the marked improvement in the general condition of a patient—disappearance of delirium, drop in temperature, pulse and respiratory rate and decrease in cyanosis—following serum therapy. Such improvement was noted in several cases within a few hours after serum treatment was commenced.

The students are taught the factors that influence the dosage of the type specific serum, namely the age of the patient, the amount of involvement, the presence of a positive blood culture, the duration of the disease, and pregnancy or any other complications.

They are also impressed with the necessity for inquiring about and testing for sensitivity and to be prepared to cope with any of its manifestations during serum treatment. They are shown the results of intracutaneous and conjunctival tests and are instructed to watch for the immediate and the thermal reactions, as well as the symptoms of serum sickness.

One case was encountered (case 12) in which the type specific serum seemed to have no effect on the temperature, pulse or respiratory rate. Another typing was done which disclosed the presence of a second type of infection, and injection of serum specific for the second type of pneumococcus brought about an immediate fall in the temperature, pulse and respiratory rate, and uneventful convalescence proceeded. This case emphasized the vital importance in the treatment of pneumonia of accurate sputum typing.

The utility of sulfanilamide in the treatment of lobar pneumonia, particularly that caused by pneumococcus type III, was witnessed, as well as the use of the newer types of this drug, specifically sulfapyridine.

In view of the statistical inadequacy of this report and with a consciousness of my inexperience, I wish it understood that this article is in no sense an endeavor to discuss the diagnosis or treatment of pneumonia. It is written in a grateful effort to describe the opportunities offered to an ordinary medical student as part of his fourth year work in medicine to become introduced to so important and so common an infectious disease as pneumonia.

# Syphilis as a Problem in American Colleges

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Interest in syphilis as a public health problem has been growing in virtually every quarter during the past few years. Our institutions of higher learning, primarily through groups such as the American Student Health Association and more recently through students, have acknowledged the problem. With a few very noteworthy exceptions, however, the attitude in general has been that, while the college might be interested in the general educational aspects of syphilis as a public health problem, syphilis as a medical problem among students is of negligible importance.

This attitude is not surprising, for relatively little has been known about the extent of the venereal diseases among college students, and until recently such things could hardly be spoken of in public. Fortunately during the past few years this state of affairs has greatly changed, especially in the point of view regarding discussion. Far-sighted physicians at the second National Conference on College Hygiene, of which the American Student Health Association was one of the sponsoring members, pointed out that "every approved means should be utilized in identifying and controlling venereal diseases."

But without facts to demonstrate that diagnosis and control of syphilis among the college population is a sound program from budgetary, medical and educational points of view, opinions persisted that the college student was a "selected" person not to be included in groups with a high prevalence of venereal disease.

## THE RECENT PUBLIC HEALTH SERVICE SURVEY

Some few attempts have been made to determine the extent of syphilis among college students, notably the work of Diehl of the University of Minnesota, but all such work has been limited to single institutions. In order intelligently to consider the problem—if there is one—of syphilis among college students, it was evident that facts should be gathered regarding the extent, nature and results of tests carried on among all American colleges.

This the United States Public Health Service attempted during the past year. A recently published article<sup>1</sup> has brought out a number of illuminating facts that should be of value in determining policies of college health administrators with regard to the venereal diseases. The study is by no means the final word on the

subject of syphilis in colleges but it provides as broad and comprehensive a sampling as has yet been described.

Questionnaires were sent to some 750 representative colleges early last spring. Replies were received from 515 institutions, which represents a rather adequate return of those colleges at least nominally concerned with student health problems. Records of 83,399 blood tests are included in the study. Of these, 5,011 tests were made on students either in colleges for white students only or in colleges with a very small percentage of Negro students.

Of the 78,388 tests given white students, 156 proved to be positive, a prevalence rate of 19.9 to 10,000 students. This verifies previous observations over the past decade.<sup>2</sup> These data have been compared by some investigators to the usual adult prevalence rate of 1 per cent, with the conclusion that syphilis is relatively unimportant in the colleges.

However, the comparison of the college rate with the corresponding age group of the entire population indicates that syphilis is probably as common among college students as among any other large group of comparable age. Since blood tests are usually given to entering students, mostly freshmen, the great majority of individuals studied in this survey fall within the 15 to 19 year age group, with a smaller proportion in higher age groups. A recent estimate<sup>3</sup> of the rate for the general population age 15-19 years is 18 to 10,000. The slightly higher rate for college students when compared to the 15-19 year age group may result from the fact that students in older age groups, such as juniors and seniors, are included.

Consideration of 2,312 tests given in all-Negro institutions showed positive reactions in sixty-two cases, or 268 cases to 10,000 students. This compares with the general Negro rate of about 300 to 10,000<sup>4</sup> in the same age group.

Breakdowns of the data by sex, region and size of school enrolment were made. There is an indicated difference of about 15 per cent less syphilis among college women than among college men. Such a difference is in line with nationwide prevalence rates by sexes. Regional division into East, South, Central and West

2 Diehl H S Wassermann Reactions in College Students Am J Pub Health 21 1131-1135 (Oct) 1931 Venereal Disease Among College Students, Journal Lancet 56 295-299 (June) 1936 Boynton Ruth E and Davies B P The Routine Wassermann Test in College Students Ibid 58 134 (March) 1938 Cole L R Survey of Syphilis Among Students at the University of Wisconsin, Arch Dermat & Syph 38 70 (July) 1938

3 Vonderlehr R A and Usilton Lida J Chance of Acquiring Syphilis and the Frequency of Its Disastrous Outcome Ven Dis Inform 19 396 (Nov) 1938

4 Study by the Division of Venereal Diseases, United States Public Health Service (unpublished data)

Read before the American Student Health Association New York Dec 30, 1938  
1 Tumbleson R C, and Ennes, H W Jr A Study of Syphilis in American Colleges J Social Hyg, January 1939

showed slight variations, but on the basis of the number of students tested there is no indication that any region has a higher rate than another. There is no significant difference, for example, between the rates for comparable groups in New England and the Deep South. Similarly, slight variations between rates for schools with small enrollments as compared with rates for schools with large student bodies are without significance. These facts seem to add evidence to the statement that syphilis recognizes no geographic or social class bounds.

A factor shown by this study to be a measure of adequateness of a college syphilis control program is the testing method used, that is, whether it is routine or selective.

The term "routine" as used in this study is considered as designating tests performed without exception on all students of a given group, usually freshmen and other entering students. Tests given on suspicious clinical signs at the request of the college physician or of the student were arbitrarily grouped together under the term "selective."

#### ROUTINE TESTS

Routine tests were given 42,074 students, of whom eighty-four gave positive reactions—a prevalence rate of twenty cases of syphilis to 10,000 students. Of the 36,314 tests made at the request of the physician or student, seventy-two showed positive reactions—a rate of 19.8 cases to 10,000 students. Consideration of the fact that the rates are practically identical regardless of the method of testing and that the variable factor is the total number of tests given leads to the conclusion that the number of cases found in a given student population is in direct proportion to the total number of students tested.

Thus, testing solely on a selective basis would not be considered an optimal application of the serologic diagnet from an epidemiologic standpoint. This follows from the fact that students selectively tested in all schools, large and small, represented not more than 15 per cent of the total student enrollment of the school, while routine tests were made on virtually 100 per cent of the group under consideration. For example, among 20,000 students, routine testing would be expected to reveal about forty cases of syphilis. Under the selective system 15 per cent, or 3,000 students, would be tested. At the rate of twenty cases in 10,000, only six cases would be expected, while forty actually would exist in the total student population.

Failure to detect the hidden manifestations of syphilis is frequent. Many infected persons do not know that they have syphilis and therefore do not request examination. The consequence is that testing by selective methods frequently results in failure to detect syphilis among college students. Even one case of

syphilis undetected may take on the aspects of a serious control problem. If that one patient spreads the disease to others, it finally becomes the focal point of a small epidemic. Early diagnosis and treatment is therefore the answer not only for protection to the individual but for the entire student body and college community.

Public health authorities agree that control efforts, to be effective, must be focused on individuals in the age groups of most frequent exposure. College students form a potential section of this important group. Control measures applied here offer real hope that the general rate can be materially reduced.

Perhaps the most noteworthy fact of the survey is the indication that college administrative officers are fast approaching this point of view. In large measure they realize that there is necessity for fighting syphilis on every front, including the college campus. More than 40 per cent of the 515 institutions that cooperated in this study already have in operation facilities for testing students. Most of these, of course, are only on a selective basis, but twenty-three schools give tests as a routine to all entering students. In particular in the Negro schools, college administrators have recognized the problem and are taking vigorous steps toward its solution. Of the eleven Negro colleges reporting, nine give tests, of these, six test by the routine method—a very practical example of facing a problem squarely. Throughout the nation a trend toward more attention to this problem is evident. In many cases, programs have been called for by students themselves and their call has been heeded by many college authorities. These are healthy signs.

The facts seem to substantiate the belief that there is a syphilis problem in the colleges. Two questions yet remain. First, is syphilis in colleges predominately a medical or an educational problem? Second, what policies may be followed?

Comments on some questionnaires returned in this study held that even if as many as twenty cases in 10,000 could be shown to exist among the college population, the time and cost of testing the entire student body as a routine would not be worth while.

It must be remembered, however, that syphilis is a dangerous communicable disease, one which, if untreated, results frequently in cardiovascular disease, neurosyphilis and untimely death but which, if found and treated early, has more than an 80 per cent chance of satisfactory outcome.<sup>5</sup> And syphilis is a special problem of youth, with more than half of all cases being acquired before the age of 25 years.

Every state except Wyoming has a public health laboratory which should make serologic

5 In discussing this paper, Dr. Ruth E. Boynton of the University of Minnesota reported that four of the sixteen cases detected by routine serologic tests and under treatment at the Students Health Service showed central nervous system symptoms.

tests available to colleges. By utilizing this source the cost to the college of taking routine tests will be far overbalanced by the social value of discovering and bringing infectious cases under treatment. The survey cites as a typical example of this point of view the statement of one doctor that "the finding of a case of syphilis should be as worth while as the finding of a case of pulmonary tuberculosis." The inclusion of a blood test for syphilis in every routine physical examination, including examinations at matriculation, would be a substantial contribution to the good health of the student population.

#### COLLEGES SHOULD SET THE EXAMPLE

There exists a direct connection between the medical problem in the schools and colleges and in other youth groups. The connecting link is the educational and demonstrative value of college programs.

The actions and thoughts of college administrators and faculty command respect. Thus health programs in our institutions of higher learning which frankly and openly recognize syphilis as a communicable disease problem cannot help but have a salutary effect on public opinion. Colleges and college students "set the style," so to speak, in a number of respects. The college student is a member of an important social group. His actions are watched with keen interest by a large part of the populace. Widespread knowledge that college students are being systematically tested for syphilis as a routine part of their health examinations and that both faculty and student consider it as any other communicable disease will present a practical example of what should be done, in addition to delivering more blows at the old prudish state of mind.

The effect on college students of having this problem pointed out to them, of being given an opportunity to discuss it and its related problems and of seeing practical, diagnostic and control measures actually applied cannot be overemphasized. The college student is the leading citizen of tomorrow. Today most of the important posts are held by college men and women. So it is that the degree of understanding of health problems which the college student acquires will condition to a substantial extent his thinking on problems of community and public health in the future.

It is significant that the American Youth Commission of the American Council on Education in a study<sup>6</sup> about to be published says of the college student "As a member of a special group in which society has invested heavily, he should become a leader of thought in those concepts by which family and community health may be preserved."

It has been pointed out more than once after detailed and exhaustive investigations that our schools and colleges are not properly preparing students to live a healthy life. Only recently the magnitude of the problem was recognized by a large group of health and educational organizations which met to consider means of action. No one will claim that matters of sex education, of the venereal diseases and of preparation for marriage and parenthood have been more than touched on. In too many of these subjects there exists a yawning chasm in curriculums.

For at least one of these subjects the reasons militating against a frontal attack have been largely removed. Syphilis is now known to be a problem in the colleges. We know we can control it by applying modern public health principles. We know that, if we do, public opinion will support that action. And we must realize that colleges have a responsibility to take the lead in the field of health education. Certainly until colleges recognize subjects such as syphilis and other venereal diseases to be valid topics of instruction, little advance can be hoped for in secondary schools.

Instruction in the venereal diseases should be included in the usual course on the control of the communicable diseases. It should also have a proper place in any course dealing with sex education, hygiene and public health. Syphilis may well be used to illustrate a modern community health program with emphasis on health education.

Another phase of the educational program is coordination directly with student activities. Syphilis has dramatic interest which has not failed to arouse the imagination of many college students. During the past year and a half a number of effective and highly worth while campaigns have been undertaken by college students. As heads of school health services, college physicians have an opportunity to take advantage of such interest through the medium of student organizations and newspapers to a degree which is rarely possible in other young groups.

Frankly, during the past few months I have been much encouraged by the active interest in problems of health which has been demonstrated by young people. It gives me hope that the people on whom we must lean in the future are awake to problems of correct living. Students are beginning to realize that good health means essentially keeping well, not getting well. If we fail to encourage this concept, with its related implications, we have failed in a major responsibility.

#### THE PLAN FOR ACTION

Since there is a problem of syphilis control in the colleges, what can be done about it? I shall briefly review the alternatives.

<sup>6</sup> Diehl, H. S. and Shepard, C. E. The Health of College Students. Preliminary Report to the American Youth Commission of the American Council on Education, Washington, D. C. May 1938.

As physicians we are aware of the efficacy of modern methods for the diagnosis and treatment of syphilis. Inclusion of a reliable system of finding syphilis quickly, easily and cheaply among a large student population is one of our major concerns. Fortunately the serologic dragnet answers that question. Its application requires little or no addition to the personnel required for the conduct of complete physical examinations on entering students. Cooperation with state or municipal laboratories in most instances will reduce laboratory costs to a negligible figure.

There are three points that should be stressed in handling positive cases. Obviously it is of extreme importance to be sure that the positive report is indicative of syphilis. Competent laboratories usually run several tests on blood specimens, but even their positive reports should be verified by physical examination and a second positive blood test in patients with latent syphilis.

Second, it is very important that the college physician see to it that treatment is begun and carried through. By whom the treatment is to be given is a matter for individual decision. In many cases it may be possible for the student to take treatments from his own physician and pay for them himself. If he cannot, however, the school must see that treatment from some source is forthcoming.

Closely linked to this problem of treatment is a third point. Positive reactions must not be allowed to be the basis of expulsion or other disciplinary action unless the patient refuses to carry through adequate treatment or persists in activity conducive to the spread of the disease. This was emphasized by the second National Conference on College Hygiene.

Syphilis in the college student is a challenge directed particularly to health administrators and educational leaders. Our nation will always face crises as great as or greater than any we have known in the past. It cannot afford to be burdened with men and women unfit to be leaders because of preventable disease.

#### CONCLUSIONS

1 Based on a sample of 78,388 tests, the prevalence of syphilis among white college students is 199 in 10,000. This figure compares closely with that of the corresponding age group in the general population.

2 In colleges for Negro students only the rate was 268 in 10,000 students. This rate likewise is comparable to that for the general Negro population of a corresponding age group.

3 The slightly lower rate among college women is also in line with the national figures.

4 Application of serologic tests on a selective basis results in failure to detect a large proportion of the infected student population. Routine testing of all students is definitely indicated.

5 The cooperation of state and municipal health departments should be sought in performing serologic tests without charge on specimens from college students. This arrangement will lower the cost of routine tests.

6 Routine serologic testing in colleges gives each student a definite lesson in syphilis control and serves to impress the importance of this phase of public health work on him in later life.

7 The action of college authorities in requiring routine serologic tests for syphilis among all students not only would be a substantial contribution to the health of the student population but would set an example which less fortunate young people might be more apt to follow.

## Comments and Reviews

### CLINICAL INVESTIGATION

*Abridgment of an address by Dr. George R. Minot, professor of medicine, Harvard University Medical School, Boston, presented at the dedication exercises of the Squibb Institute for Medical Research, New Brunswick, N. J., Oct. 11, 1938, and published in Science, Nov. 4, 1938.*

Every patient who consults a doctor presents a problem for investigation before the best advice can be offered. Nowhere does a patient stand so good a chance as in a clinic where his disease is arousing scientific curiosity. Every practitioner, at the bedside, must constantly sharpen his powers of observation and judgment, and recognize that his education must be continued by his own strenuous mental effort. His curiosity to learn must never wane. Since medicine deals so essentially with human prob-

lems, the physician must constantly strive to broaden his outlook on life. This may be done by cultivating interests that often would be considered far removed from the practice of medicine.

There is no sharp line of demarcation between the practicing physician and the physician who makes it one of his duties to conduct clinical investigation. Indeed, the clinical investigator must be an able clinician, one who understands human beings and can act wisely for all aspects of a given individual. His training in investigative principles must be sound and he should have an ardent desire to seek for knowledge by scientific methods.

Clinical investigation may be undertaken wherever the physician has his headquarters if he trains himself to keep in mind the study of

problems, however, the establishment of appropriate space and opportunities for clinical investigation in large hospitals where the study of patients under controlled conditions can be undertaken seems especially wise. This permits investigators to be surrounded with a wealth of clinical material for study from which ideas can originate and allows the hospital to be a progressive modern institution and the patients to receive the very best treatment. It is of great advantage if the clinical investigator is in close contact with men working in a wide variety of scientific fields and especially in those disciplines closely related to clinical medicine, such as pharmacology, bacteriology, chemistry and biology. Mingling of such men offers opportunity for the free exchange of thought, indeed, this arrangement allows the ideas originating from the needs of the patient to be readily carried for elucidation to some laboratory of fundamental science, and knowledge obtained there to be applied in the clinic. For the cure and prevention of disease and the relief of pain the final test is on man himself, so that a clinical investigative unit needs to be a part of an institute for medical research or associated with one.

#### GREAT LABORATORIES UNNECESSARY

Clinical investigation does not necessarily require great laboratory set-ups. The patient is the center of the picture, wards are the salient feature of the clinical investigative unit. The technical apparatus required for intelligent observation and for the proper care of the patient is but a means to an end and is a relatively insignificant, though often to the casual observer the most impressive, feature of a clinical investigative unit. The most important possession, besides the sick people, is the recorded data collected with a view to obtaining a definite pattern and frequently ascertained by simple procedures, often entirely by the use of the intellect. From the trustworthy records of natural phenomena and of the actions of organisms under controlled experimental conditions, concepts concerning disease are formulated leading to the alleviation of man's ailments. The plodding worker often obtains a long record and masses of data which are sometimes thought to indicate good work. That is often far from the case, because his data may have been obtained without critical understanding. Quantity does not supplant quality. The individual with an aggressive mind can often by skilfully planned questions and observations in relatively small quantity elicit more significant information than is found in some voluminous records. The foundation of research work lies in the quality of the minds of the investigators and the freedom and tranquillity permitted for the use of their abilities. Free choice of problems and free choice to follow

leads disclosed must be the privilege of the experienced investigator.

Although any physician may conduct clinical investigation and share his knowledge with his colleagues, the term clinical investigator is usually applied to a man who devotes a considerable amount of time to the study of clinical problems in organized clinical laboratories. Many men, who essentially never observe a patient, study numerous problems pertaining to the clinic, but such individuals are not clinical investigators.

A trained clinical investigator may approach problems in two different ways. In the first instance a clinician seeks tools through which to solve problems that originate in his mind at the bedside, such a man appreciates, for example, that, to supply the deficiency of the blood-clotting mechanism in hemophilia, chemical procedures should be utilized to discover something that might permanently alleviate the disease if given by injection each day. The second method of approach also is for a man with clinical training, but one who has acquired the use of tools, which he takes to the bedside to apply to problems suggested by the tools, for example, a man trained in the chemico-physical aspects of the clotting of blood, who seeks a patient to elucidate the mechanism of blood coagulation. The former is more truly the clinical investigator, and it is by the intellectual rather than by the technical method that he approaches problems. This does not imply that it is unwise for investigations of fundamental importance to proceed from morphologic, chemical or physiologic motivations without reference to the immediate needs of the clinic, for it is by the study of fundamental problems that most significant advances are made. Both types of clinical investigators have their place in the development of useful knowledge, but if aggregations of individuals, chosen only because they are acquainted with special technics, form the personnel of a clinical investigative unit the practical needs of clinical medicine are apt to be forgotten.

It is certainly an incorrect conception of research that it makes a man heartless or indifferent to human suffering. Many clinicians who have spent much time in investigation are unusually keen in their ability to appreciate and to treat the emotional disturbances of patients. In fact the clinical investigator is apt to be successful somewhat in proportion to his appreciation of the sick man as an individual. He must have the power to see straight, which is a rare gift. To see no more and no less than is actually before one, to see with one's reason as well as with one's perceptions—that is to be an observer and to read the book of nature aright. To note the resemblances of things one



to another may be an essential point in acquiring information. Factors often need study one at a time, yet it must not be forgotten that synthesis is essential in the formulation of final knowledge. The investigator must ponder on topics where emotions blend with cold reason and where the answer is dictated by the emotions, though it is largely formed by reason. Emotion is the driving force that arouses inquisitiveness, sustains interest and keeps the investigator at work through drudgery. Reason is the critical control that guides and checks progress. It is developed by long training in the scientific method. Emotion and reason are always mixed, one can only do one's best to use each for its serviceable purpose and avoid the usual mistake of allowing emotions to dominate one's judgment.

Whether a man is to undertake clinical investigative work does not depend on his precise occupation but lies in the man himself. Whoever undertakes clinical investigation must learn to recognize clinical facts, realize that intuition often guides, and that the patient's health must never be jeopardized. He must establish a detailed diagnosis without pothering over unessential details and proceed to action for every aspect of the patient and his case. This type of work has great educational value. Every physician must be trained to look at problems from more than one angle and be unwilling to confine himself to standardized procedures. By making frequent contacts with those especially studying medical problems, he will constantly imbibe knowledge. An understanding of the principles of scientific investigation aids him to judge critically, to appreciate the nature and significance of proper controls, and to evaluate the significance of the many communications published on medical topics.

Before a problem is intensively studied it is essential to become acquainted with previously acquired knowledge on the subject. Although subservience to the past makes stagnation, development of it is true progress. Science may render that which went before obsolete, but it builds on the past, constantly advancing new knowledge from the standpoint of the already known. Thus the investigator must consult authorities in large part by going to the library. Consulting colleagues is extremely helpful but does not alone take the place of reading what has been written on a subject. Conversation alone as the only basis for obtaining information can lead to confusion between "authority and the oracle," which is perilous to scientific work. A library is not merely a hall of books but a hall of records of human experience and thought, where one may learn the path along which man has toiled and may discover guiding and liberating influences for the future.

In clinical investigation the studies are often of a collective nature, as in the evaluation of clinical data or of new procedures, or in the correlations of chemical and pathologic information. Proper statistical methods must be employed and standard deviations and probable errors calculated. The descriptive discipline of nosography—the painting of accurate pictures of disease—is a useful guide to keep experimental procedures from going astray. This type of work may depend on the good fortune of observing several cases and not on planned investigation. There is need for more accurate work of this sort especially concerning initial symptoms and the natural history of long-lasting chronic conditions. Controlled observations of human pathologic physiology is the nature of many of the studies of the clinical investigator. The question of the origin or cause of disease is of unusual importance to study. Therapeutics, which is linked with pharmacology, is essentially experimental and will always have experimentation on man for its chief basis. The action of drugs always needs evaluation. The object, however, is to study the human body and not drugs per se.

#### CONTROL OF CONDITIONS

The control of experimental conditions in human beings is crude as compared with the utmost rigidity in the control of the worker in pure science, so that data of observations may be only qualitative or but crudely quantitative. One of the many variable factors depends on the fact that the human being has a soul and a highly organized nervous system. His emotional reactions, worries, jealousies and the like and his reactions to one or more persons not only can lead to illness but can affect the functions of organs. The medical-social, psychology, economic and allied aspects of individuals can be investigated with profit. The field is a difficult one for reliable scientific study because it involves all the complexities of human life. Even so, a considerable fraction of the successful care and treatment of patients and the prevention of much illness is to be identified with the proper consideration of their medical-social problems. It is significant to realize that a prepared mind, well planned scientific observations and the taking of infinite pains will lead to success. Important original contributions often are made which require only simple technic and clinical wisdom.

The clinical investigator is not to be thought of as a lone worker or as a man sharply separated from other types of doctors. A close relationship with practitioners, specialists and laboratory investigators of many types is mutually beneficial. There are no sharp lines of demarcation between one medical interest and another or between medicine and a variety of disciplines. Cross fertilization at the border-

lines of knowledge can serve to develop new information. The advancement of learning cannot be made in water-tight compartments.

More fundamental than the actual discoveries being made today is the preservation of the right to engage in research. Security and happiness

have profound beneficial effects on the character of intellectual work. As time passes by we must always be alert to adapt ourselves to changes and realize that to understand the present we must look both toward the past and toward the future.

## Medical College News

*Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items to be considered for publication in the Student Section*

### Positions in California for Student Intern and Senior Intern

The Personnel Board of the State of California desires to obtain the best qualified persons for student intern and senior intern to fill anticipated vacancies at the state institutions. Written examinations will not be required of applicants, rating being based on education, experience and fitness based on investigation and appraisal of scholastic records. The entrance requirements for the senior intern position is successful completion of the academic course of an approved medical school, including or supplemented by a one year internship, and for the student intern, successful completion of a four year academic course in an approved medical school or registration and attendance in the final year of such course. The senior will assist, under the supervision of a staff physician, with the medical work in a state institution for the mentally diseased or deficient. The entrance salary is \$50 a month and maintenance for self and family, while those maintaining an efficiency rating of at least 80 per cent may receive annual salary increases of \$10 until a maximum of \$90 a month is reached. The entrance salary for the student intern position is \$25 a month and maintenance, while those maintaining an efficiency rating of at least 80 per cent may receive annual salary increases of \$5 until a maximum of \$45 is reached. Applications may be filed at any time during 1939. If a candidate is found acceptable his name will be placed on the list eligible for employment, in accordance with his rating. Applications must be made on official application blanks, which may be obtained from the State Personnel Board at 1025 P Street, Sacramento, 108 State Building, San Francisco, 401 State Building, Los Angeles, or at the Civil Service Commission, Library Annex, Ninth and E streets, San Diego. All applicants must be citizens of the United States.

### Denver Student Wins Harvard Prize

The Henry A. Christian Prize at Harvard University Medical School, Boston, has been awarded to Henry Swann II of Denver, a fourth year medical student. Mr. Swann graduated from Williams College in 1935. The prize, named in honor of Dr. Henry A. Christian, Hersey Professor of Theory and Practice of Physics, is awarded to "the student in the four year class who has displayed diligence and notable scholarship and offers promise for the future."

### Interns and Residents Eligible for Prize

The American Association of Obstetricians, Gynecologists and Abdominal Surgeons has announced that the annual Foundation Prize for this year will be \$100. Those eligible include (1) interns, residents or graduate students in obstetrics, gynecology and abdominal surgery and (2) physicians (M.D. degree) who are actually practicing or teaching obstetrics,

gynecology or abdominal surgery. Competing manuscripts must (1) be presented in triplicate under a nom-de-plume to the secretary of the association before June 1, (2) be limited to 5,000 words and such illustrations as are necessary for a clear exposition of the thesis, and (3) be typewritten (double spaced) on one side of the sheet, with ample margins. The successful thesis must be presented at the next annual (September) meeting of the association, without expense to the association and in conformity with its regulations. For details address Dr. James R. Bloss, secretary, 418 Eleventh Street, Huntington, W. Va.

### Annual Lecture in Honor of Dr. Irons

The Kappa Chapter of the Nu Sigma Nu fraternity at Rush Medical College and at the University of Chicago have established an annual lectureship in honor of Dr. Ernest E. Irons. The first lecture was given March 8 at Billings Hospital by Dr. Evarts A. Graham of Barnes Hospital, St. Louis, on "Bronchogenic Carcinoma." Dr. Irons is clinical professor of medicine at Rush Medical College, from which school he graduated in 1903. He was the dean of Rush for many years.

### Special Lectures at Duke University

A symposium on pneumonia was held at Duke Hospital, Durham, N. C., to which members of the medical profession and technicians were invited. Dr. Frederic M. Hanes, professor of medicine, Duke University School of Medicine, lectured on "Pneumonia in Adults" and Dr. Angus M. McBryde, assistant professor of pediatrics, on "Pneumonia in Infants and Children." Dr. Joseph Stokes Jr., associate professor of pediatrics, University of Pennsylvania School of Medicine, Philadelphia, lectured to the staff and students on "Viruses" February 8, and Dr. Arthur Bruce Gill, professor of orthopedic surgery, University of Pennsylvania School of Medicine, on "Open Reduction of Congenital Hip" February 14.

### Outstanding Graduates of Temple University

The General Alumni Association of Temple University, Philadelphia, announced February 12 the names of ten outstanding graduates selected for conspicuous service to the university and its alumni association. Several different departments of the university are represented in this list, and Dr. James Marsh Alesbury, class of 1922, was the only selection this year representing the school of medicine. These certificates of award were presented at a founder's day dinner at the Bellevue Stratford Hotel, February 15. Leon A. Halpern, D.D.S., president of the General Alumni Association, making the presentations. The speakers were U. S. Senator James J. Davis, Federal Judge George A. Welsh and Dr. William T. Ellis, traveler and author.

## Castellani Lectures at Yale

Sir Aldo Castellani, visiting professor of preventive medicine and public health in the Louisiana State University Medical Center, New Orleans, lectured at Yale University School of Medicine, New Haven, Conn., February 28, on "Medical Organization in Tropical Expeditions" and "Mycetes and Mycoses."

## Intern Alumni Association Winter Clinic

The annual intern alumni association winter clinic at Providence Hospital, Detroit, was held Dec. 28-30, 1938. The guest lecturer was Dr. Walter Schiller, director of laboratories, Cook County Hospital, Chicago, and formerly of the University of Vienna. Among the subjects discussed were gynecology, physiology, pathology and endocrinology.

## Indiana to Publish New Bulletin

The Indiana University School of Medicine, Indianapolis, published the first issue of its new *Quarterly Bulletin* under the editorship of Dr. Jacob K. Berman, assistant professor of surgery. It will publish proceedings of the medical center's weekly conferences, of the monthly meetings of the various departments, of the Medical Advisory Council, papers on medical pedagogy, reports of research and items of general interest. In addition to Dr. Berman and Dean Willis D. Gatch, the editorial board consists of the following: Drs. Ernest Rupel, Robert L. Glass, Edgar F. Kiser, Harold M. Trusler and Frederic W. Taylor, and James F. Glore, medical artist.

## Central Teaching Clinic

The Intern Committee of the Des Moines Academy of Medicine and Polk County Medical Society has established a central teaching clinic which meets at Broadlawn Hospital, Des Moines, Friday mornings as a special feature in the interests of interns and practitioners. The February 3 instructor was Dr. Walter L. Bierring, and his subject, "Relation of Modern Public Health Service to Medical Practice"; February 10, Bernard C. Barnes, "Appendicitis"; February 17, Harry C. Willett, "Treatment of Syphilis"; and February 24, Verl A. Ruth, "Dislocations of the Lower Spine."

## National Board Questions in Medicine

Following are the questions used by the National Board of Medical Examiners in medicine in part two of the examination held Sept. 12-14, 1938.

Answer questions 1 and 2 and three of the remaining four.  
1. What involvement of the nervous system is most commonly associated with pernicious anemia? What are the signs, symptoms and differential diagnostic features? 2. Contrast the physical signs of pneumothorax with those of massive collapse of the lung. 3. What are the signs and symptoms of acute morphine poisoning? Outline the treatment. 4. Discuss the etiology and describe the course of agranulocytopenia. 5. Discuss the etiology and diagnosis of abscess of the liver. 6. What is the significance of albuminuria?

## Michigan Personals

Dr. George Adelbert Richardson has been appointed a fellow in otolaryngology at the University Hospital, Ann Arbor. Dr. Richardson graduated from Northwestern University Medical School, Chicago, in 1938. He has just completed his internship in the Evanston Hospital, Evanston, Ill.—Dr. Fred V. Rockwell, resident in neurology at the University Hospital, left January 1 to be assistant resident in psychiatry at the Payne Whitney Psychiatric Clinic, New York Hospital, New York. Dr. Wilford A. Risteen has been promoted to the position of resident, the assistant

resident in neurology for the first six months of 1939 will be Dr. Leon Ferber, a graduate of the University of Tennessee College of Medicine, Memphis, in 1937. Dr. Ferber just completed an internship in the John Gaston Hospital of Memphis.—Dr. Robert Roy Rabalais, assistant resident in surgery at the University Hospital, has accepted a post as resident at the American Hospital at Neuilly, Paris, France.—Following a year at the University of Oxford on a Guggenheim fellowship, Dr. Lawrence Olin Brockway has been appointed assistant professor of chemistry at the University of Michigan.

## Prize to First Year Medical Student

Beta Tau Mu, honorary premedical fraternity at Louisiana State University in Baton Rouge, offers a prize to the first year student in the school of medicine who took his premedical work at Baton Rouge and who made the highest grades in the first semester. The award is given in memory of Emile Jacob, who would have been a member of the 1942 class of medicine but who died last summer. This prize was awarded at a meeting February 28 to Dionisus V. Cacioppo.

## New York Personals

Dr. Georg Strassmann, formerly professor extra ordinarius for forensic and social medicine at the University of Breslau, Germany, has been appointed to the department of forensic medicine at the New York University College of Medicine, New York City.—Leonard J. Piccoli, Ph.D., professor of materia medica and physiology at Fordham College of Pharmacy, has been elected the first president of the American Association for the Advancement of Professional Pharmacy.—The following promotions have been announced at the New York Medical College and Flower Hospital: Dr. Loudon Corsan Reid has been promoted to the position of assistant professor of pathology, in charge of surgical pathology. Dr. David McCullagh Mayer has been promoted to the position of assistant professor of oral and plastic surgery, and chief of that service.

## California's Seventy-First Anniversary

During the celebration of the seventy-first charter anniversary of the University of California, the medical school held alumni day clinics, March 22, including operative clinics by Dr. Howard C. Naffziger and the surgical staff, and by Dr. Frank W. Lynch and members of his staff in the department of obstetrics and gynecology. In the afternoon, senior students acted as guides to visitors on a tour of the medical center. There were demonstrations under the direction of Dr. William J. Kerr, professor of medicine, and Dr. Francis S. Smyth, professor of pediatrics.

## New Courses in Orientation to Practice

The University of Minnesota School of Medicine, Minneapolis, is offering this spring to senior medical students for the first time a course known as orientation to practice. The series of lectures, beginning April 7 and closing June 16, include the ethics of the practice of medicine, opportunities in and preparation for practice, management of public and private patients, starting the practice of medicine, malpractice, the physician in court, medical care of the indigent and low income groups, medical organization, and quackery, fads, cults and "patent medicines." The lecturers are H. S. Diehl, A. W. Adson, S. M. White, O. J. Hagen, W. A. O'Brien, Ray Scallen, R. E. Scammon, C. B. Wright and Judge Paul Carroll.

### Ludvig Hektoen Lecture

Dr Eleonors T Bell, professor of pathology, University of Minnesota Medical School, Minneapolis, presented the fifteenth Ludvig Hektoen Lecture of the Frank Billings Foundation at the Palmer House, Chicago, February 24, on "The Pathogenesis of Glomerulonephritis Including Lipoid Nephrosis"

### New Teachers at South Carolina

Among the new members of the faculty of the Medical College of the State of South Carolina, Charleston, 1938-1939, are the following

Dr Seaton Saller, department of pathology  
Dr Marcus Edward Cox, department of pathology  
Dr James Marshall McFadden Jr, department of pathology  
Dr Solomon Carl Werch, department of pharmacology and materia medica

### Course on Medical Writing and Use of the Library

The dean of the School of Medicine of Louisiana State University, New Orleans, has announced for the first time a series of lectures on medical writing and the use of the library for first year students. The course begins with an analysis of study habits. A later lecture deals with the principles of medical nomenclature, with special reference to etymology and correct usage. The opening lecture of the second group concerns the historical development of medical libraries. Other lectures deal with the use of indexes, the selection of references and the most important periodic literature. Practical instruction is given in the library, where the students, in small groups, are shown the location of indexes, journals, textbooks and systems

### Massachusetts Personals

The faculty of medicine of Madrid University recently granted the degree of Doctor Honoris Causa to Dr Walter B Cannon of Harvard University Medical School, Boston, and president-elect of the American Association for the Advancement of Science. Dr Cannon is co-chairman of the Medical Bureau and North American Committee to Aid Spanish Democracy. —Dr John C Whitehorn, director of laboratories at McLean Hospital, Belmont, has been appointed professor of psychiatry in the Washington University School of Medicine, St Louis. —Benjamin Kropp, Ph D, has resigned as instructor in anatomy and research fellow in obstetrics at the Harvard Medical School to become lecturer in embryology at Queens University Medical School, Kingston, Ont. —Dr Elliott C Cutler, Moseley professor of surgery at Harvard University and chief surgeon at the Peter Bent Brigham Hospital, Boston, was awarded an honorary doctorate by the University of Strasbourg, France, Nov 22, 1938

### Dormitory Named in Honor of Victor C Vaughan

At the University of Michigan Medical School, Ann Arbor, a new dormitory for medical students is being erected and will be designated the Victor C Vaughan House, in honor of the late Dr Vaughan, who was dean of the medical school from 1891 to 1921

### Assistant Dean Appointed

Dr Franklin E Walton was appointed assistant dean of the Washington University School of Medicine, St Louis, January 28. Dr Walton was graduated from Washington University School of Medicine in 1927, served on the resident surgical staff of Barnes Hospital for three years and was resident surgeon for

two years. He was appointed an assistant in surgery on the staff of the medical school in 1928 and was made an instructor in 1937. Dr Walton will work with undergraduate medical students and act as adviser to students seeking internships after graduation

### Canada Personals

Prof Guy F Marrian, D Sc, of the University of Toronto, has been appointed to the chair of chemistry in relation to medicine at the University of Glasgow, to succeed Professor George Barger, who now holds the chair of chemistry. —Dr William Boyd, professor of pathology and bacteriology in the University of Toronto Faculty of Medicine, gave a Mayo Foundation lecture Dec 1, 1938, at Rochester, Minn., on "Some Reasons for the Recent Increase in Bronchial Carcinoma"

### Pennsylvania State Board Questions

The following list of questions in medicine and surgery were submitted by the Pennsylvania State Board of Medical Education and Licensure at the examination in Harrisburg, January 4

#### DIAGNOSIS, SYMPTOMATOLOGY, MEDICAL JURISPRUDENCE AND TOXICOLOGY

- 1 What symptoms would lead you to suspect the presence of Addison's disease
- 2 Describe the symptoms and outline the diagnosis of acute lobar pneumonia
- 3 Discuss the diagnostic significance of vomiting and name some of the diseases outside the gastrointestinal tract in which this symptom is observed
- 4 What are the criteria for the diagnosis of progressive pernicious anemia? Give the laboratory findings
- 5 What are the symptoms of diabetic acidosis?
- 6 What are the symptoms of vitamin B deficiency?
- 7 In the case of a patient suffering from typhoid fever what are the symptoms of perforation of an intestinal ulcer?
- 8 Describe the signs and symptoms and outline the diagnosis of acute leukemia
- 9 In the event that a therapeutic abortion is indicated what precautions must you take to keep within the law and protect yourself from prosecution in performing the same?
- 10 What are the symptoms of phosphorus poisoning?

### Professor Appointed

Dr Donald Ewen Cameron, recently senior research psychiatrist at Worcester State Hospital, Worcester, Mass., has been appointed professor of neurology and psychiatry at Albany Medical College, Albany, N Y

### Pennsylvania Provost Retires

Announcement of the retirement of Josiah H Penniman, L H D, provost and John Welsh centennial professor of history and English of the University of Pennsylvania, Philadelphia, was made by Thomas S Gates, LL D, president of the university. Beginning June 30, Dr Penniman will hold the title of provost emeritus and will be succeeded as provost by George William McClelland, Ph D, vice president of the university in charge of undergraduate schools and professor of English

### New Nursing Courses at Temple

The School of Nursing of Temple University, Philadelphia, has announced a three year course leading to a diploma in nursing, a combined university and professional training covering five years leading to bachelor of science in nursing and a program for graduate nurses who desire to prepare for supervisory, teaching and administrative positions in nursing schools. The dean of the School of Nursing is Miss Beatrice E Ritter

### Appointments at Harvard

Harvard University has announced the following appointments to the teaching and research staff of Harvard Medical School for the current academic year

Lucie Adelsberger of Berlin, Germany, instructor in bacteriology M D Friedrich-Alexanders-University, Erlangen 1923

Georg Schlomer of Berlin, Germany, instructor in psychiatry, M D Munich 1910

Charles R Atwell, Boston, instructor in psychology, A M Harvard 1931

George M Wyatt, Wilmore, Ky instructor in roentgenology, M D Western Reserve, 1923

Rupert A Chittick, Belmont, Mass, assistant in psychiatry, M D Harvard 1929

Thomas Colver, London research fellow in medicine, M R C P London, 1935

Kenneth M A Perry London, research fellow in medicine, M R C P London, 1937

Rulon W Rawson, Chicago research fellow in medicine and assistant physician to the Collis P Huntington Memorial Hospital, M D Northwestern 1938

#### From Oct 1, 1938, to July 1, 1939

Francis R Dieumalde, of Peiping Union Medical College China research associate in biologic chemistry M D Johns Hopkins 1920

#### From Nov 1, 1938, to Sept 1, 1939

Thomas R C Fraser as research fellow in medicine, D P M London '37

Alfredo Lanari, Buenos Aires as research fellow in physiology, M D Buenos Aires '34

Eric K Cruickshank Aberdeen Scotland as research fellow in surgery, M B, Ch B Aberdeen University '37

Maximilian G Verlot, Ghent, Belgium as research fellow in surgery M D Ghent '35

#### From Jan 1 to Sept 1, 1939

Adolph Melzer, Boston, as assistant in surgery M D Cornell '34

Maurice H Greenhill, Worcester Mass, as research fellow in psychiatry, M D University of Chicago '36

School of Public Health, From Nov 1, 1938 to Sept 1, 1939

Nathan Gorin, Boston as assistant in child hygiene M D Boston University '17

### Memorial Scholarships at North Carolina

A fund of \$20,400 has been established at the University of North Carolina by an unannounced donor to provide four scholarships in memory of the late Dr Mark R Braswell, Rocky Mount Dr Braswell graduated from the University of Maryland in 1886 and practiced medicine in Rocky Mount until 1911, when he retired to devote his time to farming and other interests He died in 1937

### Tennessee Personal

Dr Fred L Moore, Bristol, health officer of Sullivan County for the past ten years, has been appointed associate professor of preventive medicine at Long Island College of Medicine, Brooklyn Dr Moore is a graduate of Dalhousie University Faculty of Medicine, Halifax, N S, class of 1924 Dr J W Erwin, Nashville, health officer of Washington County, has been appointed to succeed Dr Moore

### Eastman Memorial Lecture at Rochester

Dr George L Streeter, director, department of embryology, Carnegie Institution of Washington, Baltimore, delivered the Eastman Memorial Lecture at the University of Rochester (N Y) School of Medicine, February 10 His subject was "The Rise of the Three-Germ-Layer Theory in Embryology and Some of Its Limitations"

### Founder's Day at Woman's College

A three day program of discussion on "Current Medical Problems Confronting the General Practitioner" marked the observance of the eighty-ninth anniversary of the founding of the Woman's Medical College of Pennsylvania March 9-11 Subjects listed on the program were "Sulfanilamide and Its Clinical Value," "Barbiturates and Sedatives," "Responsibility

of the General Practitioner in Cancer of the Cervix, Rectum and Breast," "Current Views on the Management of Diabetes" and "Every day Problems in Allergy," discussed by members of the faculty and staff At a founder's day luncheon March 11, alumnae were the guests of the college

### Oklahoma Personal

Donald B McMullen, D Sc, formerly of Monmouth College, Monmouth, Ill, was recently appointed assistant professor of bacteriology at the University of Oklahoma School of Medicine, Oklahoma City, instead of professor of bacteriology, as stated in THE JOURNAL Oct 29, 1938, page 1716

### Alabama Personal

Dr James S McLester, Birmingham, was the guest speaker at the annual convolve of Pre-Medics at the University of Alabama chapter of Alpha Epsilon Delta, February 3 His topic was "Personal Observation of the Practice of Medicine in Europe and Russia"

### Tuberculin, Wassermann and Malaria Tests Offered to Students

Alpha Epsilon Delta, honorary premedical fraternity, recently sponsored a program offering tuberculin tests to the entire student body and Wassermann and malaria tests to new students at Millsaps College Dr John W Dugger, Jackson, Miss, director of industrial hygiene for Mississippi, gave a talk on "Tuberculosis, Its Causes, Importance and Methods of Controlling It" Dr Dolph V Galloway, Meridian, supervisor of syphilis control for Mississippi, gave a talk of corresponding nature with regard to syphilis

### Ohio State Board Questions in Chemistry

The following questions were used by the State Medical Board of Ohio in the examinations for licensure Dec 7-9, 1938, at Columbus

- 1 Discuss the chemistry of bone What factors influence its calcification?
- 2 State the general properties and mention the compound elements of protein
- 3 Give detail of testing suspected stains for blood Explain the chemistry of any reaction used
- 4 (a) What is normal  $pH$  in urine compatible with health?  
(b) How can the  $pH$  value of urine be determined?
- 5 Give chemical antidote for poisoning from the following  
morphine                      corrosive sublimate  
carbonic acid                  arsenic

### Maryland Personal

Dr Norman Cameron, associate in psychiatry, Johns Hopkins University School of Medicine, Baltimore, has resigned to take charge of the laboratory for experimental psychology and psychopathology at the Payne Whitney Clinic of the New York Hospital, New York City

### Fund to Aid Worthy Students

The University of Cincinnati recently received a bequest of \$10,000 from the estate of Mrs Ida B Rulison to establish a fund bearing her name to aid "needy and worthy medical students in such manner as the board of trustees of said university shall in their discretion deem most advisable for scholarships"

### Missouri Personal

Dr Charles H Neilson, associate dean of the St Louis University School of Medicine, has been appointed to the state board of health by Governor Stark for a term ending Dec 12, 1942

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Autopsy revealed a firm sausage-like enlargement of the distal 10 cm of the left ureter, from 3 to 4 cm in diameter firmly fixed to the surrounding tissues. The lumen of the distal 7 cm was distended to from 1.5 to 2 cm by a soft papillary, partially necrotic tumor, and a diffuse gray tumor was seen throughout the thickened wall. A continuation of this growth extended into the left lobe of the prostate and into the bladder wall, pushing up the mucosa. The regional and periaortic lymph nodes were not involved, but there were multiple metastases in the pleura of both lungs and scattered nodules in the lung parenchyma and liver. None were found in the bones. No other source of primary tumor was found.

Microscopic examination of the ureter (fig 2) showed the ureteral tumor to arise from and replace the mucosa. The tumor cells showed both papillary stalk formation and solid nests of squamous cells, sometimes with keratinization which extensively invaded the wall. The bladder and prostate showed extension of squamous cell carcinoma from without.

The final diagnosis was partially papillary and partially solid squamous cell carcinoma (grade 3) of the distal end of the left ureter, with extension to the bladder and left lobe of the prostate and metastases in the lungs and liver.

**CASE 3**—E. L., a white man aged 65 who entered the Los Angeles General Hospital Dec. 12, 1936, had first noticed painless hematuria one year before. Three months before the bladder had filled with clots, but for six weeks there had been no bleeding. He complained of pain in the perineum running down both legs and swelling of the left leg. There were marked loss of weight and weakness. The patient was well developed, and a general examination gave negative results. The kidneys were not palpable. The external genitalia were normal. With rectal palpation the prostate seemed small, the right lobe was soft and the left firm. To the upper part of the left lobe was attached a stony-hard fixed mass which extended up beyond the palpating finger.

Roentgenograms of the kidneys, ureters and bladder were normal. An intravenous urogram showed a normal right kidney but no dye on the left in thirty minutes. A cystogram

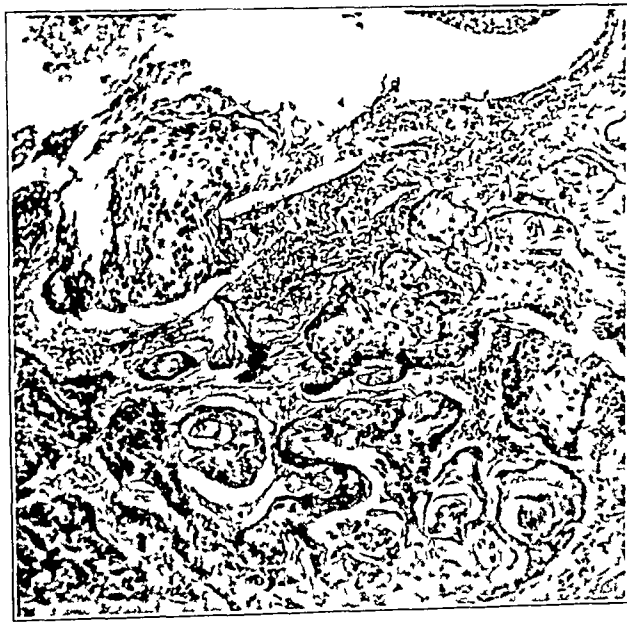


Fig 3 (case 3)—Wall of ureter showing portion invaded by nests of fairly well differentiated squamous cells.

was reported as showing encroachment on the bladder by a mass from underneath. There was a small amount of residual urine, which showed many red and occasional pus cells. The value for nonprotein nitrogen was 30 mg.

Cystoscopic examination showed a bar type prostatic obstruction. The interureteric ridge was hypertrophied, but the meatuses appeared normal. Back of the trigon near the left meatus a tumor mass invaded from below. Indigo carmine

came intensely from the right but not from the left. Catheters met an impassible obstruction just above the left meatus but caused no bleeding. No ureterogram could be obtained for the left side. Biopsy of the mass showed squamous cell cancer. A clinical diagnosis of cancer of the bladder was made. The mass was fulgurated heavily, and the patient was referred to the California Institute of Technology for high voltage roentgen therapy. A total of 6900 roentgens was given in four weeks.



Fig 4 (case 4)—Lateral wall showing widespread invasion by squamous cells.

through four portals. The disease progressed, loss of weight and strength was rapid. The liver enlarged, the left leg became markedly swollen and death occurred one month after the last roentgen treatment.

At autopsy the distal extravascular 8 cm of the left ureter was seen to be profoundly thickened by a hard tumor growth so that it was from 2 to 4 cm across, and it was firmly bound to the pelvic tissues, especially at the pelvic brim, where tumor had extended into and occluded the common iliac vein. The midportion was from 1 to 2 cm thick. Above the tumor there was marked dilatation of the proximal 10 cm of the ureter and of the pelvis, by thick pus. Marked fibrosis of the renal parenchyma was present. The mucosa of the bladder was intact and no evidence of tumor of the bladder was seen. Massive metastases were found in the liver, and several biliary lymph nodes contained tumor. Soft tumor nodules were found in the fourth lumbar and upper sacral vertebrae. No tumor was found in other parts of the body.

Microscopic examination through various levels of the ureter showed a solid squamous cell tumor growth (grade 2) arising from and replacing the mucosa and in many places growing throughout the entire wall in irregular nests (fig 3). Some of the cells showed keratinization, but most of them were fairly small and poorly differentiated. The metastases showed similar tumor.

The postmortem diagnosis was solid nonpapillary, poorly differentiated squamous cell carcinoma (grade 2) of the lower and middle portion of the left ureter, with stenosis and pyonephrosis, fibrosis of the renal parenchyma, metastases to the liver, biliary lymph nodes and spine, and tumor thrombosis of the left common iliac veins.

The tumor which pushed up the bladder mucosa and was destroyed by fulguration by the clinician was an extension from the ureter. The only bladder growth present at autopsy in multiple sections was found in the mucosa of the mural portion of the ureter. The extent of the tumor-bearing portion of the ureter from the bladder to 10 cm from the pelvic junction was unique.



CASE 4—F W, a white woman aged 22, the mother of three children, a patient of Dr R G Tucker, entered the Alhambra Hospital Aug 8, 1933, complaining of constant severe pain in the left part of the pelvis and the left thigh of three months' duration. This pain had increased until opiates were required. There was loss of weight and moderate fever with night sweats. There was no dysuria or gross hematuria. The young woman was pale, in pain and evidently ill. An extremely tender mass 5 cm in diameter was found just above the pelvic brim on the left side. A mass was palpated high in the side of the pelvis and considered to be tubal. Pelvic examination otherwise showed only a lacerated cervix without tumor. The head, chest and extremities were normal. The urine did not contain blood or pus. A blood count showed 4,100,000 red blood cells, 17,500 leukocytes, hemoglobin content 60 per cent, neutrophils 75 per cent, lymphocytes 21 per cent, monocytes 3 per cent and basophils 1 per cent. No urologic study was made.

The clinical diagnosis was tubo ovarian abscess. Through a lower midline incision the pelvic organs were found to be normal and the mass was found to be retroperitoneal over the psoas muscle. Fluctuation was present and the mass was drained. Much necrotic tissue and pus was evacuated. Biopsy of the wall of the mass showed squamous cell carcinoma (grade 3), origin undetermined. Profuse drainage continued for four weeks, with the temperature up to 102 F. Severe pain persisted, the mass enlarged and edema of the left leg developed. Death occurred September 12.

At autopsy the left ureter showed a roughly sausage-shaped tumor, in places from 5 to 6 cm thick, involving a segment 12 cm long, beginning 8 cm from the kidney. It had invaded widely the retroperitoneal tissues, especially the pelvic brim and psoas muscle. Large areas of suppurative (*Staphylococcus aureus*) necrosis were found throughout the mass. The distal 4 cm of the ureter was not involved by tumor. The ureter above the growth was distended to 3 cm in circumference and was filled with thick purulent urine, as were the markedly dilated pelvis and calices. Many small abscesses were present in the kidney, which measured 12 by 6 by 4.5 cm. Metastases were present in the left iliac and periaortic nodes. Numerous septic infarcts were found in both lungs. No extra-ureteral primary tumor was found.

Microscopic examination showed a solid squamous cell growth arising from and replacing the mucosa and invading the markedly thickened wall and the periureteral tissue. Some portions showed keratinization, and other portions showed less differentiated small polyhedral squamous cells (fig 4).

The final diagnosis was solid, nonpapillary squamous cell carcinoma (grade 3) of the middle and lower portion of the left ureter, with pyemia due to *Staphylococcus aureus* and infarcts in both lungs.

CASE 5—H W, a white woman aged 72 was seen at home in the terminal stages of her illness by Dr R C Olmsted, and no urologic examination was possible. She died with symptoms of obstructive vomiting and a tentative diagnosis of carcinoma of the pylorus was made.

At autopsy the distal third of the right ureter was seen to be thickened to 3 cm in diameter by a tumor-bearing portion involving a segment 3 cm long the lower border 2.5 cm above the bladder. The lumen was completely obliterated. Extension into the broad ligament had occurred and there was widespread metastasis to the abdominal lymph nodes, with many implants in the peritoneum. Marked hydro ureter and hydronephrosis were present. The duodenum showed an indurated benign ulcer 8 cm broad and 8 mm deep with marked fibrosis and stenosis of the pylorus. There was no primary malignant growth in any organ except the right ureter.

Microscopic examination showed the tumor of the ureter (fig 5) to arise in the mucosa and to grow through the entire wall and into the periureteral tissue in the form of irregular nests of squamous cells. An occasional pearl was seen but most of the cells were less differentiated and nonkeratinized. The metastases were similar.

The diagnosis was primary squamous cell carcinoma (grade 3) of the right ureter with marked hydro ureter and hydronephrosis, metastases to the abdominal nodes and peritoneum, and indurated benign ulcer of the duodenum with pyloric stenosis.

CASE 6—J M, a white man aged 69, who entered the Los Angeles General Hospital Nov 18, 1935, had been in excellent health until one year previously, when sciatic pain developed on the right side. After two months this disappeared, but then he began to have pain in the right side of the pelvis which later moved to the upper part of the abdomen. During the year he had lost 50 pounds (23 Kg), and in the last three months he had become jaundiced. Twice in the last two months he had had terminal hematuria. He was nauseated and acutely ill on admission.

Examination showed emaciation and moderate jaundice. The liver was nodular and extended almost to the umbilicus. A tender mass 6 cm in diameter was present in the right upper posterior quadrant of the abdomen and moved with respiration. The lungs were normal. The blood pressure was 160/90. The prostate was reported normal. The patient went to the general medical ward because of the jaundice and was not studied urologically. A tentative diagnosis was made of cancer of the right kidney or cancer of the stomach. He died five days after admission.

At autopsy, performed by Dr Newton Evans and Dr C B Coggin, the right ureter showed a solid tumor growth 2 cm long at a level 5 cm above the bladder, thickening it to 2 cm across and producing complete obstruction. Marked distention of the ureter and pelvis by thick purulent exudate was present above the tumor and there were numerous abscesses in the renal parenchyma. Metastases were found in the common iliac and lower periaortic lymph nodes and in one left supraclavicular node, and massive metastases were present in the liver, which weighed 3,900 Gm. No primary tumor was found in any organ other than the ureter.

Microscopic examination of the ureter (fig 6) showed replacement of the mucosa by an irregular growth of poorly differentiated nonkeratinized squamous cells, varying considerably in size and shape and showing moderate hyperchromatism of the nuclei. The wall of the organ was infiltrated and markedly thickened by a similar growth. The metastases in the liver were of similar structure.

The diagnosis was solid, nonpapillary, poorly differentiated squamous cell carcinoma (grade 3) of the lower end of the right ureter, infected hydro ureter and hydronephrosis, multiple renal abscesses, metastases in the iliac, periaortic and supraclavicular lymph nodes, and massive metastases to the liver with moderate jaundice.

#### COMMENT

Of particular interest is the widespread extension of tumor in all the cases except case 5. The sausage-like growth in cases 2, 3 and 4 was quite striking. Metastases were found in all our cases.

#### SUMMARY

1 In our six cases of proved as well as in 133 cases compiled from the literature, the tumors were most commonly found in the end of the ureter, and in about 30 per cent they protruded into the bladder. They varied from minute papillary growths to widely invading massive squamous growths. Their histologic picture was similar to that of carcinoma of the bladder.

2 Hematuria, pain and palpable abdominal mass (usually a hydronephrotic kidney) were the chief clinical features.

3 Diagnosis is based on bleeding from one ureter, together with obstruction or a filling defect as shown by urogram, or by observation of a tumor protruding into the bladder.

4 The treatment of choice is nephro-ureterectomy. A two stage operation is much the safest. Late diagnosis often limits treatment to lesser surgical intervention and palliation.

5 The prognosis is bad. However, three eight year cures have been reported.

NOTE—Since this paper was written five additional cases have been described by Charles C Higgins (Primary Carcinoma of the Ureter *Ann Surg* 108 271 [Aug] 1938).

HEMATOGENOUS TUBERCULOSIS  
AND SILICOSISTHE ROENTGEN DIAGNOSIS OF  
TUBERCULOSILICOSIS

JACOB GERSHON-COHEN, M D

AND

LOUIS COHEN M D

PHILADELPHIA

## HEMATOGENOUS TUBERCULOSIS

Tuberculosis is an infectious disease which it is conceded may invade the blood stream. The acute forms of miliary tuberculosis seen in the young and often as a terminal phase of chronic ulcerative pulmonary tuberculosis are the forms of blood stream infection familiar to the clinician. More occult and less well recognized are the subforms of miliary tuberculosis which heal. These are more often recognized by the roentgenologist than by the pathologist or clinician. There is plenty of laboratory evidence to prove the occurrence of tuberculous bacteremia without lethal consequences, but it is not our purpose to enter into this somewhat controversial aspect of the problem. We believe not only that the tubercle bacillus does gain access to the blood stream more frequently than usually admitted but also that certain definite histologic reactions follow which are demonstrable in roentgenograms of the lungs, that is, of course, if the lesser circulation becomes involved. These reactions confirm Ranke's<sup>1</sup> ideas about the allergic histologic changes seen at this time. The reaction is a marked lymphocytic invasion of the perifocal tissues about the tubercle with a marked exudative response. This may be followed by rapid central necrosis and cavity formation or by slow resolution with or without scar tissue formation. The various manifestations of this phase of the disease have been completely analyzed and classified on a clinical basis by Neumann.<sup>2</sup> The remarkable thing about this classification is that, though done on a clinical basis without much aid from roentgen studies, it is admirably suited for roentgenologic use. His divisions are (1) typho-tuberculosis of Landouzy, (2) proliferative primary complex, (3) polyserositis and pleurisy in its various forms, (4) tuberculosis fibrosa diffusa, (5) tuberculosis fibrosa densa, (6) fibro-ulcerative tuberculosis following fibrosa diffusa or densa and (7) "phthisis cavitaria ulcerosa."

These terms are very descriptive and examples of each of the forms, once seen, are easily remembered. We are here concerned only with diffuse fibrous and discrete miliary or acinonodular forms because of their close resemblance to silicosis, but their appearances vary according to such readily recognized factors as bacterial virulence, resistance of the host, morphologic and functional changes of the parts involved and frequency and intensity of seeding of the organism. Characteristic of all forms is a tendency to resolution or fibrosis of the lesions with only a mild systemic reaction of the host (fig 1). This results in the exhibition of few symptoms, among which fatigue is most prominent

Probably more than half of the cases end in healing, often without recognition of the cause by the family physician. Only when trigger symptoms appear, like hemoptysis, cough and expectoration or pleurisy does the physician suspect a tuberculous basis. In serial roentgenograms the lesions are characterized by a pre-dominance of fibrous tissue formation, which frequently leads to calcification (fig 2). (It is precisely these changes that often mimic silicosis but which present, none the less, differences in pathogenic characteristics.) Patients who recover after having passed through this stage of tuberculous infection, though they may have advanced through the progressive ulcerative forms with widespread intracanalicular extensions, often live to old age, with permanent scars demonstrable in serial roentgenograms. It seems true that lung reinfection is more frequently encountered in these tuberculous patients than in subjects who have escaped tuberculosis. Barring such supervening accidental infections, however, these subjects may live to old age, only to succumb to heart failure because of the heavy load the right side of the heart sustains as a result of the increased resistance in the lesser circulation.<sup>3</sup>

## SILICOSIS

Changes develop in the lungs in silicosis very similar to the later changes of Ranke's allergy.<sup>3</sup> These changes are essentially the stage of endothelial phagocytosis and the stage of fibrous tissue proliferation. The fibrosis may be predominantly linear or miliary and nodular, often it is mixed. It is said to be progressive even after inhalation of the dust particles ceases, but the burden of proof rests with the proponents of this concept,<sup>4</sup> whose records show an extremely high incidence of supervening infections,

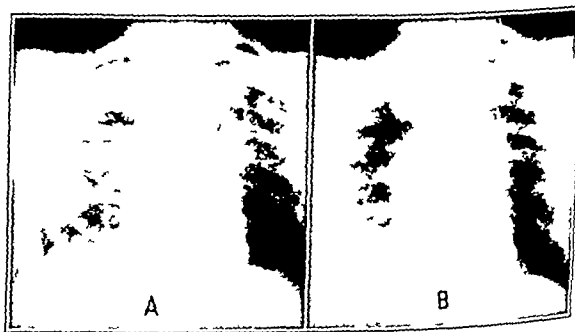


Fig 1—1 disseminated acinonodular tuberculosis in a patient 44 years old, Feb 23 1934. Tuberculosis was first diagnosed nine years before. When this roentgenogram was taken the patient was losing ground rapidly with cough and hemoptysis prominent symptoms. After two months of conservative treatment in a sanatorium a phrenicectomy was done on the right side because a cavity developed in the upper lobe and a pneumothorax could not be done. The cavity blocked shortly after phrenicectomy. Most of the widespread infiltrations in both lungs resolved or organized. B the patient was clinically well when this roentgenogram was taken March 26 1938.

particularly tuberculosis, so that death can hardly be ascribed to progressive silicosis. In the absence of further exposure to dust, simple silicosis may progress to a point characterized chiefly by a slight increase in the size of the nodular islands of fibrosis, with only slight aggravation of the resultant emphysema. Healing nodular tuberculosis, on the other hand, regresses, the nodules become smaller, sharper and often calcify

From Eagleville Sanatorium Eagleville Pa and Millville Hospital Millville N J.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Eighty Ninth Annual Session of the American Medical Association San Francisco June 16 1938.

<sup>1</sup> Ranke Karl Ernst Primäraffekt sekundäre und tertiäre Stadien der Lungen tuberkulose Deutsches Arch f klin Med 129 224 (June) 1919.

<sup>2</sup> Neumann Wilhelm Die Klinik der Tuberkulose Erwachsener ed 2 Berlin Julius Springer 1930.

<sup>3</sup> Loeschke H Die hamatogenen Tuberkulosen Beitr z klin d Tuberk 61 171 183 1932.

<sup>4</sup> Britton J A and Head J R Pneumoconiosis The Delayed Development of Symptoms J A M A 96 1938 (June 6) 1931. Law son G B Jackson W P and Gardner J E Pneumoconiosis in Iron Miners, J A M A 96 1129 (April 4) 1931. Watkins Pichford W Silicosis in South African Gold Mines J Indust Hyg 9 109 139 (April) 1927.

fied if not completely resorbed. Aggravation of the emphysema is theoretically the same as in silicosis. The ultimate degree of nodular fibrosis reached in silicosis is determined by the amount of retained silicious material. When this limit is reached there is a substantial degree of arrest if tuberculosis does not complicate the picture. Simson and Strachan<sup>5</sup> concluded that "a very considerable proportion escape this complication throughout." While our serial studies do

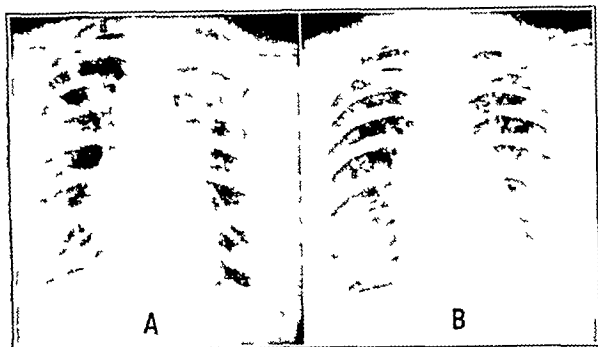


Fig 2—A moderate fibro-ulcerative cavernous tuberculosis in the upper lobes of both lungs April 2 1930. In the greater circulation only the kidneys were suspected of involvement because of a persistent faint trace of albumin for many months. With conservative treatment the processes in both lungs healed in about eight months with fibrosis and calcification of the linear and nodular infiltrates. B taken April 13 1938 shows the irregularity in the size and distribution of the lesions.

not extend over so long a period, our observations strongly support this view.<sup>6</sup>

The South African investigators have long recognized a form of tuberculous complication which is like hematogenous tuberculosis in that there is a marked tendency to arrest of the disease. This tendency is particularly striking in cases of the fibrous and acino-nodular forms, which so closely simulate silicosis itself in the roentgenogram. The condition in this large group of cases is designated by them "tuberculosilicosis" to distinguish it from the older, better understood "silicotuberculosis." While the lesions of the "infective," or "tuberculosilicotic," type may occur in nodular form, the nodules are characteristically irregular in size and outline. Sometimes large dense areas of massive fibrosis develop, but they hardly possess the appearance of classic unmodified silicosis or tuberculosis (fig 3). These infective lesions can be recognized roentgenographically. Simson and Strachan<sup>5</sup> have shown that the inoculation of preparations from infective silicotic lesions which showed no positive evidence of tuberculosis to the naked eye or microscopically gave a majority of positive results for tuberculosis. This has led their bureau to classify under the term "silicosis of the infective type" those cases in which lesions of the character described are present but in which nevertheless the accepted local or general indications of active tuberculosis are not present. Such cases comprise a large distinctive, clinical and radiographic group.

#### TUBERCULOSILICOSIS

We have had ample opportunity to see the evolutionary hematogenous tuberculous changes in long serial studies at Eagleville Sanatorium, Eagleville Pa. In the Millville Hospital, Millville, N. J., a large number of

routine serial studies of men who work in the sand-pulverizing industries are in progress. Comparisons with the cases observed at the tuberculosis sanatorium were thus possible. These studies yield concepts of the pathogenesis and pathology of both diseases not readily reconstructed by the pathologist from postmortem studies. Chief reliance falls on the roentgenologist, not the pathologist, for establishing the diagnosis in symptomless cases of infective silicosis, or tuberculosilicosis. In the roentgenograms the number of scars, their type, their distribution and the secondary changes they produce can be studied. The most important factor in these changes is the length of the infective period.

The chief diagnostic stumbling blocks in building the picture of tuberculosilicosis have been the absence of evidence of tuberculous infection in postmortem examinations, the paucity or absence of clinical symptoms of tuberculosis during life and, most important (or at least the factor most stressed), the absence of tubercle bacilli in the sputum. Another difficulty is the fact that the course of the disease is chronic without the patient or the physician realizing the true cause of the mild symptom complex in the early stages. Only when erosion of a lesion into a vessel produces hemoptysis or development of a cavity results in cough and expectoration with toxic symptoms, in part probably ascribable to secondary infection, does the suspicion of tuberculosis develop. Even when the condition is diagnosed at this stage there is often apparent arrest of the disease, especially if the provoking agent is no longer effectively operative. The residual scars of this phase of the disease do not resemble the later manifestations of simple silicosis or of the discrete miliary or nodular forms of hematogenous tuberculosis. The roentgen diagnosis is thus less difficult because the early linear scarring of initial silicosis is "added" to the previous scarring of tuberculosis. This may not be evident at first because the tuberculous fibrosis is so well organized and masked by the compensatory emphysema that its presence is not suspected, but there develops nevertheless a concentration of fibrosis in patchy areas, usually in the upper lobes. This

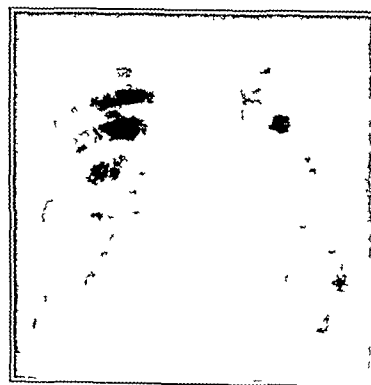


Fig 3—Tuberculosilicosis. A man aged 46 had tuberculosis when he was 19 years old at which time he was sick nine months. He recovered completely and never had a recurrence. For several years he worked at an emery wheel and shortly before roentgen examination he had hemoptysis. The slight cough and dyspnea he had had for two years were regarded by him as annoying but not otherwise significant. To change his occupation immediately and to treat him for tuberculosis was the course chosen by his physician.

ends in an asymmetrical distribution which is the telltale point of differentiation between simple silicosis and tuberculosis. The roentgenologist, then and not the pathologist, can make a positive diagnosis, and he need not be deterred by the clinician who disagrees because typical physical signs are lacking or because the sputum is free of the tubercle bacillus. Auerbach's<sup>7</sup> disagreement with Beattie, Ichert and Gardner about the fibrotic nature of tuberculosis in

<sup>5</sup> Simson F. W. and Strachan A. S. Silicosis and Tuberculosis publication 36 (vol. 6) South African Institute of Medical Research Johannesburg Union of South Africa 1935 p. 567. Report of Miners' Health Medical Bureau for Three Years Ended 31st July 1935. Pretoria Union of South Africa Government Printer 1936 pp. 9-19.

<sup>6</sup> Routine serial studies are made of employees in the sand-pulverizing industries of southern New Jersey under the direction of Dr. H. S. Braun of Millville, N. J.

<sup>7</sup> Auerbach Oscar. The Pathology of Pneumoconiosis. Quart. Bull. Soc. Am. Ho. p. 2: 327 (Oct.) 1936.

silicosis in their postmortem studies might have been resolved if the pathologic changes noted in serial roentgen studies had been included in their observations. It is not always easy for the pathologist to construct his archeologic histologic picture at necropsy if he has not had roentgen data of the disease when the pathogenic tide ebbed toward healing with resolution, fibrosis and calcification. The clinician, in his field, may be led astray in his diagnosis because of the absence of toxic symptoms or deterioration in general health. He may not be able under these conditions to demonstrate the clinical counterparts of the pathologic changes, even areas of large consolidations in the upper lobes, and pleural thickening or other indications of latent or arrested infection are easily missed.

Simple silicosis, if progressive or intense enough may lead eventually to chronic bronchitis and emphysema with heart failure on the right side. Since clinical hematogenous tuberculosis too may progress to a similar lethal ending it is not at all surprising that when the two conditions cross an augmented tendency to interstitial fibrosis ensues, no matter which is the more predominant or which came first. If silicosis predominates, a more rapidly developing bronchitis and emphysema



Fig 4—Tuberculosilicosis. A, Sept. 11, 1936 and B, April 23, 1938. The roentgen diagnosis was based on the irregularity of distribution and size of the acinonodular infiltrations and the diffuse hazy infiltration in the upper lobe of the right lung. A man aged 51 who worked for seven years as a screener in a sand pulverizing plant had pneumonia at 18 and influenza at 40. He had cough and expectoration occasionally with hemoptysis for eight months after the influenza. The roentgenograms suggest a possible tuberculous basis for these manifestations. While there have been only slight changes in the appearance of the lungs during two years of serial observations withdrawal from further exposure to silica before the pathologic changes advance to the silicotuberculous form of the disease is highly recommended.

results, if tuberculosis predominates the symptom complex of tertiary bronchopulmonary tuberculosis with intracanalicular extension results. Since tuberculosis is predominant and not sufficiently altered by the silicosis it is called silicotuberculosis. On the other hand, just as hematogenous tuberculosis may become arrested, so with limited exposure to silica the silicosis in a subject with hematogenous tuberculosis also may become limited. Then the interstitial fibrosis may appear to remain stationary although more extensive in the areas where the lesions of the two diseases exist together (fig 4). In 89 per cent of 150 cases in this category, Simson and Strachan found no postmortem evidence of active tuberculosis. Even infective silicotic lesions of the massive type tend to be only slowly progressive though they lead ultimately to a condition of active tuberculosis.

Asymmetrical distributions of linear and nodular fibrosis in persons with silicosis would therefore seem sufficient in themselves to establish the diagnosis of infective silicosis, with tuberculosis in the vast majority

of cases, labeled the etiologic infection. The term tuberculosilicosis is better reserved for this condition to distinguish it from silicotuberculosis, which might be used to designate the type in which tuberculosis is so predominant as to be diagnosed easily. This is so true that Watkins-Pitchford<sup>4</sup> believes that the pathologic process in almost all the cases of "simple silicosis" on the Rand is fundamentally the same as that of tuberculosis with silicosis. "The development of what appears to be a condition of simple silicosis, in these days, is probably a pathologically unique result of a tuberculous infection in a latently silicotic individual." The diagnosis of latent tuberculosis with silicosis is much more difficult, and the roentgenologist has done most to set forth the criteria. Our views are an extension of those commonly held on this subject and are in essential agreement with the points made by Pancoast and Pendergrass.<sup>8</sup> Their criteria for diagnosing tuberculosis in the presence of silicosis are (1) deviation of the trachea, (2) fibrosis at the periphery of the lungs, especially apical, and (3) marked thickening of the pleura. These are the changes that follow in the wake of organized tuberculous processes, especially those designated manifestations of "hematogenous tuberculosis." Our conclusions simply add further support, as well as a broader concept, to the diagnosis of this form of the disease. We recommend that this type of simultaneous infection be classified under a separate heading. This is in line with the recommendations of Pancoast and Pendergrass, who suggest dividing silicosis into types rather than into stages, as if silicosis were always of the same type. To designate this form tuberculosilicosis in accordance with the practice of the South African workers seems logical. Then the term silicotuberculosis might be reserved for the frankly tuberculous process associated with silicosis when the bacteriologic diagnosis of tuberculosis is positive. The practical significance of emphasis on these points of diagnosis is that the morbidity and mortality rates for silicosis might be materially improved if proper changes were made in the occupation of the silicotic person at this stage of his tuberculous infection. The well known aggravating influence progressive silicosis has on tuberculosis could thus be avoided. This would result in fewer cases of tuberculosilicosis becoming silicotuberculosis—the terminal form of the disease—and thus improve the management of employee compensation, an increasing problem in this field.

#### ABSTRACT OF DISCUSSION

DR. PHILIP J. HODES, Philadelphia: The most difficult problem of physicians interested in silicosis today is that of the pulmonary infections which complicate this disease and tuberculosis is by far the most important. For years two types of tuberculosis, adult tuberculosis and childhood tuberculosis, have been recognized. Men familiar with silicosis have recognized a third type, silicotuberculosis, which has different characteristics. In discussing a fourth type, hematogenous tuberculosis, the authors have entered a controversial field. In carrying the problem of hematogenous tuberculosis into the field of silicosis, they are opening a new field, in which many physicians are

<sup>8</sup> Pancoast, H. K. and Pendergrass, E. P. *Pneumoconiosis*. New York: Paul B. Hoeber, Inc. 1926. The Roentgenological Aspects of Pneumoconiosis and Its Medical Importance. *J. Indust. Hyg.* 15: 117-135 (May) 1933. A Review of Pneumoconiosis. *Am. J. Roentgenol.* 26: 556-610 (Oct.) 1931. Roentgenological Aspects of Simple Silicosis and Silicotuberculosis. *Am. Rev. Tuberc.* 20: 43-60 (Jan.) 1934. Roentgen Classification of Pneumoconiosis Based upon Roentgen Appearances With and Without Coexisting Tuberculous Process and Differential Diagnosis. *J. Indust. Hyg.* 16: 327-345 (Nov.) 1934. Roentgenological Aspect of Pneumoconiosis and Its Differential Diagnosis. *J. A. M. A.* 101: 587-591 (Aug. 19) 1933.

lost at present, but because of the importance of the problem it behooves us to investigate it along the lines suggested by them. At present it is difficult to reconcile ourselves to the thought that a disease as variable as tuberculosis can combine with a disease as variable as silicosis and still retain its identity well enough to be of prognostic value. I believe that repeated examinations are of paramount importance in determining the prognosis for patients with silicosis plus infection. The authors referred to cardiac disease due to silicosis. I have never seen cardiac damage which could be attributed directly to silicosis. The patients who died cardiac deaths invariably presented complications which were superimposed on their silicosis. I should like to ask what effect this type of tuberculosis has on the sedimentation rate in silicosis. Are the roentgen manifestations of hematogenous tuberculosis the same in industries with a silica hazard other than the sand-pulverizing industries? I should like to know whether syphilis influences the roentgen manifestations of this disease. In treating patients with silicotuberculosis, one might be tempted to induce artificial pulmonary collapse. Experience has taught that silicosis with infection does poorly after pneumothorax therapy. Silicosis, especially silicosis with infection, has been looked on as a progressively fatal disease. I agree with the authors as to the more optimistic outlook one may assume for silicosis with infection. The series of patients presented bears testimony to the good which can be done patients with this disease if they are properly handled.

DR. FREDERICK SLYFIELD, Seattle. In the first film that was shown, I should like to ask the authors whether they made a diagnosis of hematogenous tuberculosis—I mean before subsequent film added light on the subject—and, if so, how.

DR. PHILIP H. PIERSON, San Francisco. I have been interested in the diffuse miliary nodules seen in persons with tuberculosis, oftentimes not associated with clinical manifestations. I have thought that I could correlate them with sun bathing which was carried perhaps to the point of acquiring a heavy coat of pigmentation. I should like to know whether the authors feel that this may be a factor in this wide dissemination. I think from the minute distribution of these nodules that a bronchial artery spread, rather than a pulmonary artery spread, may be taken into consideration as a factor in these small nodules.

Dr. Marc Jaquerod of Leysin has published a book on the difference in appearance in bronchial artery spread and pulmonary artery spread, expressing the belief that there is a distinction between the two. Another explanation for these fine, discrete nodulations may be a reaction in the lymphoid tissue present in the branching of all bronchioles. This reaction might be similar in the roentgenogram to a hematogenous spread. I wondered whether the authors made a diagnosis of silicosis in that prenodular stage and whether one is safe in committing oneself to the view that the man has silicosis when the disease is only in this stage of increased linear marking.

DR. JACOB GERSHON-COHEN, Philadelphia. The roentgenologist may diagnose hematogenous pulmonary tuberculosis and silicosis by careful study of the distribution of fibrosis and calcification. If the fibrosis is more concentrated in isolated areas, especially in the upper lobes this is sufficient evidence to justify suspecting a tuberculous infection complicating silicosis. In many forms of hematogenous tuberculosis the only roentgen change may be localization of linear or nodular fibrosis in the upper lobes unassociated with toxic symptoms or tubercle bacilli in the sputum, and the same holds true if this kind of infection coexists with silicosis.

DR. LOUIS COHEN, Philadelphia. Hematogenous tuberculosis is being overlooked as a clinical chronic pulmonary entity in this country and not being overlooked in other countries in spite of the fact that Dr. Hodes says the point is controversial. In Vienna one will see wards full of patients with what physicians call hematogenous tuberculosis; they prove the diagnosis at autopsy and treat the disease with old tuberculin because they feel it is in the blood stream and the problem consists in picking up the immunity of the patient. I don't think that any of the patients had syphilis because all the patients at the sanatorium have routine Wassermann and

Eagle tests. The sedimentation rates are up in all of them. I am glad Dr. Hodes brought up the question of failure of the right side of the heart because we are not convinced that tuberculosis or tuberculosis plus silicosis causes it. A great deal of work is being done along that line, and a great deal of argument has been raised pro and con. I believe the prognosis of silicosis is much less dangerous than one is given to believe. I believe the silicotic patient is dyspneic and emphysematous, and even with tuberculosis—if he has the benign hematogenous form and is picked up early and taken out of his industry—he can go along and do as well as any other man of his age. He may be dyspneic on climbing a hill or walking up steps. We diagnose all these hematogenous conditions first by the x-rays and second by the clinical symptoms. The patients are not all sick, they appear to be in a benign condition and may or may not cough or expectorate and have what looks like extensive symmetrical evenly distributed advanced tuberculosis. I have now under my care four people for whom a diagnosis of hematogenous tuberculosis was made years ago and they now have renal tuberculosis—four people with positive sputum and tubercle bacilli in the urine. I don't know anything about the effect of the sun's rays except that the group of physicians I work with are much against the use of ultraviolet therapy in active tuberculosis. I believe these hematogenous lesions are in the interstitial tissue of the lung and the lesser circulation.

## THE MANAGEMENT OF TUBERCULOSIS OF THE CERVIX UTERI

A REPORT BASED ON 191 CASES SIX CASES BEING REPORTED FOR THE FIRST TIME

DONALD C. COLLINS, M.D.

LOS ANGELES

Tuberculosis of the cervix uteri merits the serious consideration of the entire medical profession. It is significant that its gross appearance often closely resembles that of carcinoma. Tachezy<sup>1</sup> and Tommaselli<sup>2</sup> have both drawn attention to instances of tuberculosis and carcinoma existing in the same uterus. Only sixty-two articles on this subject were listed in the Index-Catalogue of the Library of the Surgeon General's Office, United States Army, up to the year 1914. In few recorded cases in the past has the condition been correctly diagnosed before the cervical lesion was studied under the microscope. Undoubtedly in many instances it has been lightly dismissed as representing far advanced cervical carcinoma with a consequent hopeless prognosis. This is unfortunate because many patients could have been restored to a full and useful life had proper treatment been instituted.

Counsellor and I<sup>3</sup> presented a study on this subject in 1934. We added one new case and listed 108 other cases collected from the literature. This presentation is a continuation of that work. The eighty-two new examples mentioned here were not included in our previous report. This study is therefore based on a consideration of 191 instances of this disease. Forty-one new cases have been described since 1933 in the available literature at my command. Thirty-five additional cases have been found recorded prior to the

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Read before the Section on Obstetrics and Gynecology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 16, 1938.

<sup>1</sup> Tachezy, Rudolf. Tuberculosis of Uterine Cervix. *Casopis lékařů českých*, 1931, 153:1536 (Nov. 25), 1932.

<sup>2</sup> Tommaselli, A. Tuberculosis del collo e adenocarcinoma del corpo dell'utero associati. (Contributo clinico e anatomico-topologico). *Riv. chir.* 1933, 241 (May), 1935.

<sup>3</sup> Counsellor, Virgil S., and Collins, Donald C. Tuberculosis of the Cervix Uteri. *Am. J. Obst. & Gynec.* 30:830-840 (Dec.) 1935.

year 1934 Parrain,<sup>4</sup> in his graduation thesis on this subject at Paris in 1935, estimated that up to then 216 examples of secondarily contracted tuberculosis of the uterine cervix had been described together with



Fig. 1 (case 1)—Biopsy specimen from the cervix showing typical Langhans giant cells and tubercle formation. Reduced from a photomicrograph with a magnification of 240 diameters.

forty-four instances of true primary infection. Since Parrain's<sup>4</sup> study, reports of thirty-four new cases have been found.

Lisfranc<sup>5</sup> is said to have been the first to identify tuberculosis of the cervix. In 1851 Geil<sup>6</sup> described this disease so well that little has been added in the ensuing eighty-seven years. Cohnheim<sup>7</sup> during 1879 showed that coitus with a tuberculous man could cause this condition. In 1883, one year after Koch's epochal discovery of the tubercle bacillus, Victor Babes<sup>8</sup> isolated the same organism from the vaginal secretions of a patient who was suffering from tuberculosis of the cervix uteri.

In America J. Whitridge Williams<sup>9</sup> in 1892 and John B. Murphy<sup>10</sup> in 1904 reviewed this entire subject and stabilized its treatment. Time and space do not permit the mention of many notable articles that have since appeared dealing with this condition. The recent contributions of Counseller and Collins,<sup>3</sup> Morillo-Una,<sup>11</sup>

Finlaison,<sup>12</sup> Lester<sup>13</sup> and Danforth<sup>14</sup> are valuable additions to our knowledge of this disease.

Among 33,580 reported instances of female genital tuberculosis there were 133 (0.3961 per cent) of tuberculosis of the cervix uteri. Of these 133 cases thirteen (9.776 per cent) were undoubtedly instances of primary tuberculosis. In approximately 42 per cent of these cases there was associated active pulmonary tuberculosis. Williams<sup>9</sup> said that, in 0.16 per cent of women suffering from pulmonary tuberculosis, tuberculosis of the uterine cervix subsequently developed. In the histologic examination of 44,484 operative specimens reported in the literature there were only eleven (0.024728 per cent) proved instances of this disease.

Tuberculosis of the cervix uteri is, in approximately 85 per cent of cases, secondary to a tuberculous focus elsewhere in the body. Such primary foci may be found in the lungs or in either the gastrointestinal or the genito-urinary tract. Of the 185 cases which I have studied from the literature, in 156 (84.318 per cent) there was demonstrable tuberculosis elsewhere. In 102 cases (55.131 per cent) genito-urinary tuberculosis was present in either an active or a quiescent stage. Marriage and pregnancy are two common contributing etiologic factors. Tuberculosis of the female generative tract occurs most frequently in the fallopian tubes and progressively diminishes in fre-

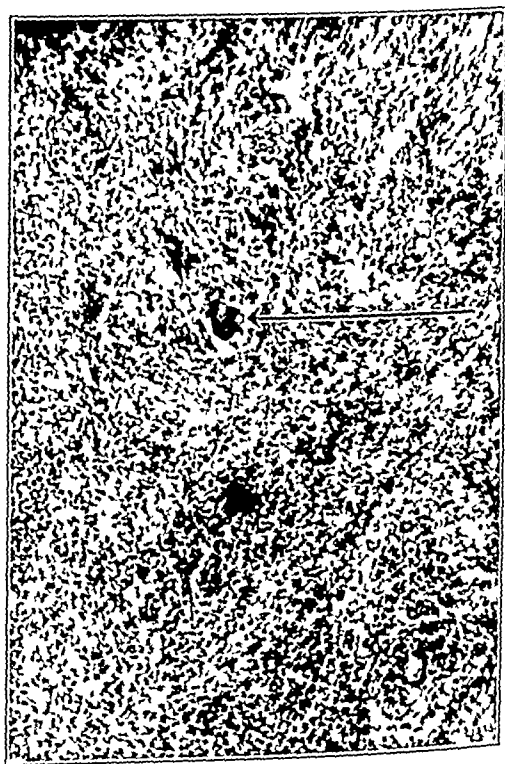


Fig. 2 (case 2)—Biopsy specimen from the uterine cervix showing typical Langhans giant cells and tubercle formation. Reduced from a photomicrograph with a magnification of 180 diameters.

quency as it approaches the uterine cervix. It is believed that this disease usually results from a descending infection spread by contiguity from foci situated higher

4 Parrain E. Contribution to the Study of Primary Tuberculosis of the Cervix. Thesis Paris 1935.

5 Lisfranc Jacques quoted by Bonnet Louis and Bulliard Henri. La tuberculose du col de l'uterus. Gynec et obst 24 97 125 (Aug) 1931.

6 Geil quoted by Williams<sup>9</sup>.

7 Cohnheim Julius. Tuberculose vom Standpunkte der Infektionslehre. Leipzig 1879 also quoted by Williams<sup>9</sup>.

8 Babes. Bacilles de la tuberculose dans une ulceration perineale dans la tuberculose du vagin et dans une ulceration de la levre inferieure. Bull Soc anat de Paris 58 341 344 (July) 1883.

9 Williams J. Whitridge. Tuberculosis of the Female Generative Organs. Johns Hopkins Hosp Rep 3 85 152 1892.

10 Murphy John B. Tuberculosis of the Female Genitalia and Peritoneum. Sections III and IV. Tuberculosis of the Portio Vaginalis and Cervical Canal. Am J Obst 49 6 35 (Jan) 1904.

11 Morillo-Una L. Tuberculose des Gebarmutterhalses. Ztschr f Geburtsh u Gynak 110 166 209 1935.

12 Finlaison F. H. Tuberculosis of the Cervix Uteri with a Description of an Original Case. J Obst & Gynaec Brit Emp 42 473 486 (June) 1936.

13 Lester Charles W. Tuberculosis of Uterine Cervix. Am J Surg 33 574 580 (Sept) 1936.

14 Danforth William C. Tuberculosis of the Cervix. Ann Surg 107 407 412 (Sept) 1937.



in the pelvis or by hematogenous and lymphogenous routes from distant foci

Primary tuberculosis of the uterine cervix is rare. In this series of 185 cases studied from the literature

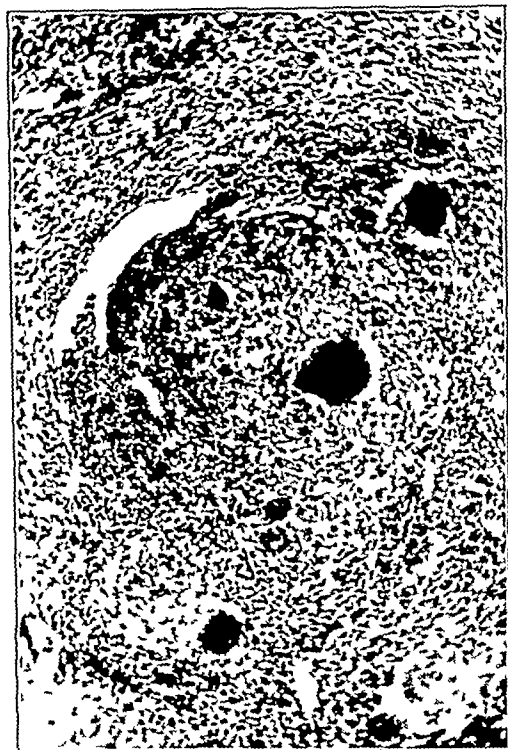


Fig 3 (case 3)—Biopsy specimen from the cervix, showing numerous Langhans giant cells and tubercle formation. Reduced from a photomicrograph with a magnification of 240 diameters

TABLE 1—Reported Incidence of Tuberculosis of the Cervix Uteri

Author	Number of Cases	Source of the Material	Tuberculosis of Cervix Cases	Percentage of Total Material
Berkeler (1903)	795	Postmortem examination	3	0.35
Schlimpert (1911)	3,114	Postmortem examination	3	0.085
Greenberg (1920-1941)	807	Cases of pelvic tuberculosis	37	4.125
Davis (1932)	1,200	Surgically removed cervixes	1	0.083
Norris (1933)	1,130	Specimens from obstetric and gynecologic laboratory of the University of Pennsylvania	4	0.326
Diethelm and Ramsey (1933)	3,647	Gynecologic specimens from St. Vincent's Hospital Toledo Ohio (1921-1933)	1	0.027
Ferroni (1933)	4,000	Cases of tuberculosis of the pelvis	12	2.664
Counsellor and Collins (1933)	400,000	Surgical pathologic specimens (Mayo Clinic material)	1 (3-7)	0.0002-0.0010
Collins (1933)	84,000	Patients admitted to the Hollywood Hospital and the Presbyterian Olmsted Memorial Hospital Los Angeles up to May 1, 1935	1	0.00119
Collins (1933)	72,000 610,000	Los Angeles County Hospital general surgical pathologic specimens patients admitted up to May 1, 1935	5	0.00695 0.00082
Total cases			cs	

there were sixteen proved instances of this type of primary infection. A true example of primary tuberculosis of the uterine cervix must fulfil the criterion of being the only focus of tuberculosis in that patient. Murphy<sup>10</sup> demonstrated that such a primary infection

must usually be an ascending one derived from the outside and introduced into the vagina. Many authors have denied the possibility of this type of tuberculous disease. Wives of tuberculous husbands rarely have primary tuberculosis of the cervix. Cases are recorded in which the husband's disease caused either tuberculous salpingitis or endometritis with a normal intervening cervix.

Tuberculosis of the cervix uteri is classified into four types: the ulcerative, the papillary, the milinary, and the rare bacillary catarrhal. Thus the gross appearance of the cervical lesion may vary widely. The typical lesion is usually ulcerated. The edges are either well defined or undermined and are surrounded by either tubercles or normal-appearing tissue. The adjacent portions of the vagina may be involved, and tubercles may be seen. Bishop<sup>15</sup> expressed the belief that a papular-polypoid lesion was the earliest discernible evidence in many of these cases. Such a lesion may later degenerate into a huge ulcer with ragged undermined edges. Sometimes the specific infection may be deeply situated in the endocervix and reveal little or no external sign of disease. Occasionally one sees a stenotic fibrosing lesion.

Secondary infections are commonly superimposed on these lesions. Varying degrees of bleeding or even severe hemorrhages with accompanying foul leukorrhea are frequently encountered. Microscopically, typical tubercle formation is not commonly seen. Often atypical tubercles composed of only epithelioid and



Fig 4 (case 4)—Biopsy specimen from the cervix showing a Langhans giant cell and incomplete tubercle formation. Reduced from a photomicrograph with a magnification of 180 diameters

lymphocytic cells may be the only evidence on which a presumptive diagnosis of tuberculosis can be made. Acid-fast stains for the presence of the tubercle bacillus in either the microscopic section or the tissue smear may be apparently negative. Inoculation of guinea pigs may prove to be the only reliable method by which a

<sup>15</sup> Bishop Everett L. Tuberculosis of Cervix with Report of a Case. *Am J Obst & Gynec* 19: 822-825 (June) 1930



TABLE 2—Source of 187 Reported Cases of Tuberculosis of the Cervix Uteri

Year	Author	Reference	Cases
1922	Thaler H	Zentralbl f Gynak 16 134	1
	Herrmann	Zentralbl f Gynak 46 1862	1
	Hless V	Zentralbl f Gynak 16 186	1
1923	Latzko W	Zentralbl f Gynak 46 1864	4
1924	Vogel W	Zentralbl f Gynak 48 883	1
1925	Blanchi G	Morgagni 66 678	1
1926	Lilherbrock A	Zentralbl f Gynak 49 159	1
1926	Weibel W	Zentralbl f Gynak 50 2571	1
1927	Bassanoff	Zentralbl f Gynak 54 235	1
1928	Katz A	Zentralbl f Gynak 51 220	1
1928	Halter G	Zentralbl f Gynak 52 2813	1
1929	Gundolfo Herrera R	Rev med latino am 11 1468	1
1929	Gundolfo Herrera R and Ahumada	Bol Soc de obstet y ginec B A S 16	2 (1)
1930	Schiller W	Zentralbl f Gynak 53 2747	1
1931	Ennio B	Ann di obstet e ginec 5- 1120	1 (*)
	Missett, I V	Ann Obst & Gynec 21 431	1 (1)
	Ferry G	Bull Soc d obst et gynec 20 642	1
	Dworzak H	Zentralbl f Gynak 55 2070	1
	Ahumada J C	Bol Soc de obstet y ginec 10 23	1
	Petridis P A	Bull Soc d obst et gynec 20 700	1
1932	Fischetti L	Rassegna d obst e ginec 41 20	1 (1)
	Iachery R	Casop lek cesk 71 1631	2
1933	Riche V and Gulbal A	Bull Soc d obst et gynec 22 393	1
	Rinesi R and Ferrazini P	Rev med d Rosario 3 586	1
	Moulouquet P	Gynec et obst 25 147	1
	Schmidt and Weibel W	Quoted by Moulouquet P	2
	Dupeux B	Gynecol 1- 100	1
1934	Favreau and Battour	J Obst & Gynec Brit Imp 10 1270	1 (1)
	Russolillo M	Arch di obstet e ginec 41 14	1
	Nizza M	Boll Soc piemontese d obstet e ginec 66	1
	Hauch C D	Am J Obst & Gynec 25 216	1
1935	Veyrasat, J	Presse med 4- 1442	1 (1)
	Morillo Una J	Ztschr f Geburtsh u Gynak 110 166	1
	Curranza I	Neoplasmes 14 185	1
	Platareanu and Protogheopol	Rev franc de gynec et d obst 30 115	1
	Diethelm M W, and Ramcsy T I	Am J Obst & Gynec 30 420	1 (1)
	Tommaseoli A	Riv di chir 1 233	1 (1)
	Calegari I	Boll d Soc med-chir Pavla 49 1271	1
	d Erchia F	Clin obstet 15 114	1
	Bortolozzi M	Pathologica 27 113	1
	Counsellor V S, and Collins D	Am J Obst & Gynec 10 530	109 (11 1)
1936	Krishnaswamy K C et al	Indian M J 71 254	5 (3)
	Finlaison F H	J Obst & Gynec Brit Emp 41 47	1
	Szenwic W	Ginekologia polska pp 1116	1 (1)
	Lin S	China M J 50 1023	1
	Lester O W	Am J Surg 17 574	1 (1)
1937	Masciottra R L, and de Hoz M	Rev med quir patol 4 104	1
	Okinczye J	Mem Acad de chir 61 716	1
	Mitra S	Calcutta M J 1- 12	1
	Figueron casac P and Balzan	Semana med 1- 11	1 (*)
	Danforth W C	Ann Surg 107 40	1
Totals			187 (*16 14)

\* True primary infections      † Questionable primary infections

TABLE 3—Data on Six New Cases Reported in this Study

Case	Age	Important Positive Findings	Tuberculous Foci Elsewhere	Type of Lesion	Treatment	Final End-Result
1	4/9/29 to 5/12/29 O P D 4/10/30	30 Mrs J R Mexican housewife secundipara Wassermann negative sick 1½ years exploratory laparotomy 4/17/29 (patient of Dr Wilburn Smith)	Tuberculous peritonitis and asclites left tubal mass	Ulcer large involving entire cervix	Medical surgery refused	Unknown de ported back to Mexico
2	3/18/30 to 3/27/30	24 Mrs O B S white American housewife secundipara Wassermann 4 plus sick 4 years (patient of Dr H C Seaver)	None	Small polyp posterior lip of cervix	Surgery refused	Unknown left hospital again t our advice disappeared
3	5/23/31 to 6/6/31 10/29/31 to 11/6/31	22 Mrs F A M, Mexican housewife nullipara Wassermann negative sick 1 year 5/28/31 amputation of cervix Sturmdorf method 11/2/31 dilation and curettement for stenosis of the cervical canal returned in March 1938 (patient of Dr L G McNellis)	Tuberculous salpingitis roentgenogram of chest negative now tuberculous of bladder and kidneys	Ulcer anterior lip edges are friable small bled easily	Surgical amputation of cervix 3 months later dilation and curettement was done for a stenosis of the cervical canal	Well until March 1938 now suspected tuberculous of the kidneys and bladder
4	8/21/36 to 9/8/36 reentered October 1937	31 Mrs H T Mexican widow septipara Wassermann negative sick 4 years reentered in October 1937 very ill from progression of tuberculosis (patient of Dr C R Howson)	Advanced bilateral tuberculous of kidneys and lungs with cavitation and of larynx	Ulcer small anterior lip	Medical only no surgery because of advanced general tuberculosis	Left against our advice reentered in Oct 1937 and died 10/4/37 postmortem was refused
5	O P D 5/9/38	37 Mrs L A Mexican housewife nonipara Wassermann doubtful sick 6 months treatment not started as all tests have not been completed (patient of Dr Pence)	Suspected tuberculous of bladder and tubes	Polypoid around external os bled easily	None as yet study not finished as yet	Still under treatment now
6	9/17/37 to 9/24/37	30 Mrs M D Greek widow for 9 years nullipara sick 4 months (patient of Dr T H McLaughlin)	None now pleurisy in 1904	Polypoid anterior lip small bled easily	Radium to lesion 1.5 mg hours in 8 days	Well so far lesion has entirely healed

Additional follow up notes to Jan 17 1939  
Case 3 4/22/38 Removal of proved tuberculous left submandibular lymph node which had acid fast bacilli on bacteriologic study Last seen 7/15/38 when examination of cervix showed it to be well healed and negative  
Case 5, 5/11/38 Roentgenograms of the chest showed moderately advanced pulmonary tuberculosis of the abdomen old tuberculosis of lumbar vertebrae and of mesenteric lymph nodes 5/18/38 Pelvic examination (by malignancy board) Cervix hard nodular but movable with distal third ulcerated bleeding and painful Prosalpinx filled the culdesac 6/7/38 Menstruating asked to return one week later for con ligation of a possible panhysterectomy Patient disappeared left no forwarding address and her present whereabouts were unknown on 1/17/39  
Case 6 Radiation therapy was applied to this patient against my advice The cervical lesion recurred during September 1938 Since then it has steadily enlarged in size until now the entire cervix and vault of the vagina are deeply ulcerated Urinary urgency frequency and dysuria together with rectal tenesmus are quite marked She has refused any surgical treatment (Christian Scientist) despite our warning as to the probable unfavorable final result

correct diagnosis can be established. Biopsy is a quick method of establishing a probable correct diagnosis. A competent pathologist should examine the biopsy specimen, which should be of sufficient size to include all the constituent cellular elements of the cervix in order to permit the making of a correct diagnosis. Removal of such a specimen will not injure the patient, while the issues at stake are of such gravity as to make

other factors are favorable, because usually extensive tuberculous disease of the upper pelvic part of the generative tract is present and must be eradicated if cure is to result. For that reason and because of the rarity of a primary tuberculous infection of the cervix, local treatment of the cervical lesion is not advisable. For similar considerations roentgen and radium therapy will often prove to be disappointing in their end results. The contraindications to the employment of surgery are advanced local tuberculous lesions with extensive involvement of the neighboring bladder or rectum, extensive tuberculous salpingitis, marked secondary infection, the presence of active tuberculous foci elsewhere, cardiovascular disease and senility. The ultimate prognosis in this disease entity is dependent on the type of treatment employed and on whether active tuberculosis is present elsewhere in the body.

For brevity, tables have been used to condense and summarize the data of this study. Table 1 lists the recorded incidence of this disease according to various groupings of material.<sup>16</sup> Table 2 shows the source of tuberculosis of the cervix in 185 cases mentioned in

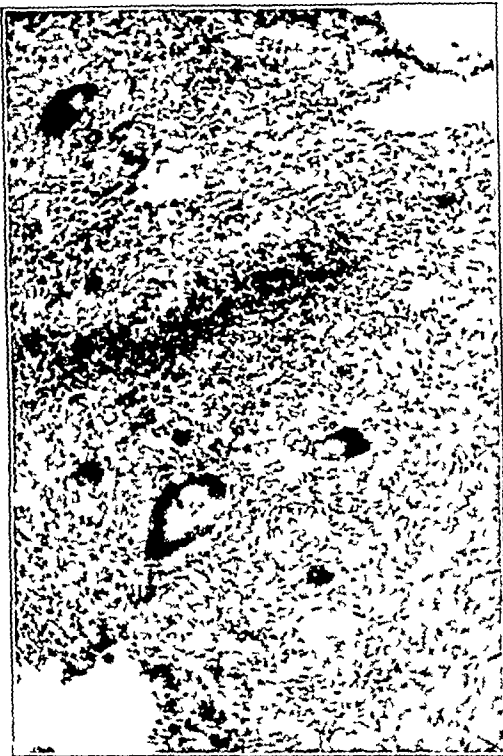


Fig. 5 (case 5)—Biopsy specimen from the uterine cervix revealing typical Langhans giant cells and partial tubercle formation. Reduced from a photomicrograph with a magnification of 240 diameters.

a correct diagnosis imperative. Syphilis may closely simulate this disease. Earlier medical literature on this subject is replete with reports in which biopsy was not done. Radical operations were performed for the eradication of a supposed carcinoma of the cervix, with a resultant increased operative mortality and morbidity—not to minimize the anxiety that such a false diagnosis caused the patient and her relatives.

Tuberculosis of the uterine cervix is important chiefly in cases in which little or no evidence of tuberculosis is discernible elsewhere in the body. The lesion is often accidentally discovered by the physician in examining the cervix. In a hundred ulcerated lesions of the cervix which grossly resemble a neoplasm the physician could correctly diagnose the lesion as being caused by a carcinoma in ninety-eight. The disease must be differentiated from lesions resulting from hypertrophy of the cervix accompanied by eversion and erosion, myomatous or polypoid changes, gonorrhea, syphilis, actinomycosis, sarcoma and principally carcinoma. Adequate biopsy of the lesion should be of great value in the differential diagnosis if it is considered in conjunction with the history, the physical examination and the laboratory observations.

The treatment of tuberculosis of the uterine cervix should preferably be of a radical surgical character such as abdominal hysterectomy with the possible preservation of one ovary if the patient's condition and

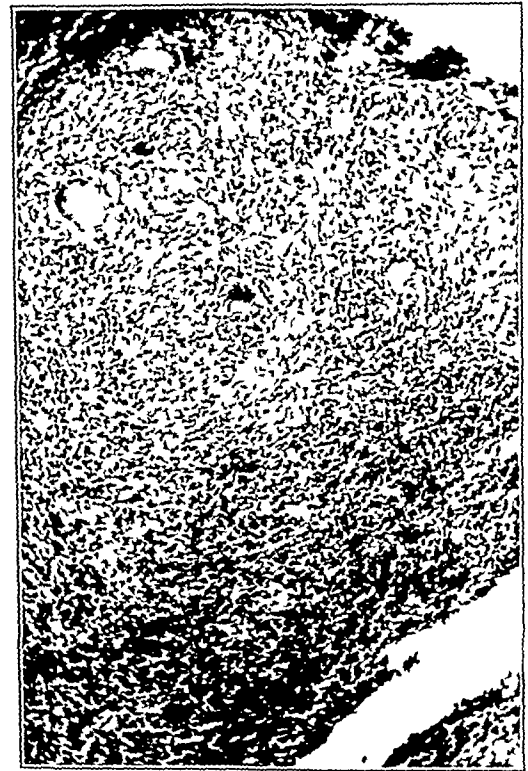


Fig. 6 (case 6)—Biopsy specimen from the uterine cervix showing typical Langhans giant cells and tubercle formation. Reduced from a photomicrograph with a magnification of 240 diameters.

this report, classified as primary and secondary types. Table 3 depicts the important features in six new cases of this disease that are being reported in this paper.

16 The data given in table 1 were obtained from the following sources:  
Berkeley Comyns: Genital Tuberculosis in the Female. *J. Obst. & Gynec. Brit. Emp.* 3: 31-45 (Jan.) 1903.  
Calegari L.: Su di un caso di tubercolosi del collo dell'utero. *Boll. d. Soc. med.-chir. Pavia* 49: 1271-1284, 1935.  
Davis James E.: A Study of 1200 Cervixes Including 589 Case Histories, 3500 Microscopic Sections and the Gross Specimens of 1200 Biopsies. *Am. J. Surg.* 17: 32-38 (July) 1932.  
Diethelm Martin W. and Ramsey Thomas J.: Tuberculous Endometritis. *Am. J. Obst. & Gynec.* 30: 420-424 (Sept.) 1935.  
Ferroni quoted by Calegari.  
Greenberg J. P.: Tuberculous Salpingitis. A Clinical Study of 200 Cases. *Johns Hopkins Hosp. Rep.* 21: 97-156, 1920-1924.  
Norris Charles C.: Obstetrics and Gynecology. Philadelphia and London: W. B. Saunders Company 2: 568-572, 1933.  
Schlimpert Hans: Die Tuberkulose der Portio. *Arch. f. Gynäk.* 94: 463-925 (No. 3) 1911.

for the first time I believe that case 6 is possibly an example of primary tuberculosis of the cervix. Figure 7 depicts the gross appearance of the lesions in these six new cases.

1930 Wilshire Boulevard

#### ABSTRACT OF DISCUSSION

DR L. A. EMGE, San Francisco. When tuberculosis of the cervix is encountered six times within seven years at one institution, as reported by Dr. Collins, it is in order to call attention to it, however, only a few practitioners will ever encounter it in private practice. In the clinic at Stanford University School of Medicine my associates and I have observed only one case of proved primary tuberculosis of the cervix among about 700 cervixes microscopically examined between 1912 and 1922. Since then we have examined microscopically 3,000 more cervical specimens without seeing another such example. Regardless of

of all unusual lesions or lesions that do not readily respond to treatment. This still is the best means of arriving at a prompt and accurate diagnosis. Surgical destruction still offers the greatest promise for cure, but whenever the disease is part of a more generalized abdominal or systemic tuberculosis, surgical destruction may do more harm than good. Whether cervical tuberculosis is primary or secondary is of purely academic interest and does not change the clinical management.

DR HENRY SCHMITZ, Chicago. Among 1,170 cervixes which were examined microscopically at the tumor clinic at the Cook County Hospital tuberculosis of the cervix was observed in three cases. The impression in each was of a descending infection, as there was a primary infection somewhere in the body. I wonder whether the radical surgical treatment of tuberculosis under these conditions is really safe, in view of the common knowledge of how easy it is to reactivate the primary tuberculous lesion. One patient was in poor condition and died from general tuberculosis. The other two were carefully and slowly treated with radium, and their cervixes healed and never caused them any further difficulty. By this conservative attitude it was felt that in one of the cases, particularly, reactivation of the primary infection was avoided.

DR DONALD C. COLLINS, Los Angeles. I shall follow the time-honored plan of using my five minutes to show slides of these tuberculous lesions, for which I did not have time earlier.

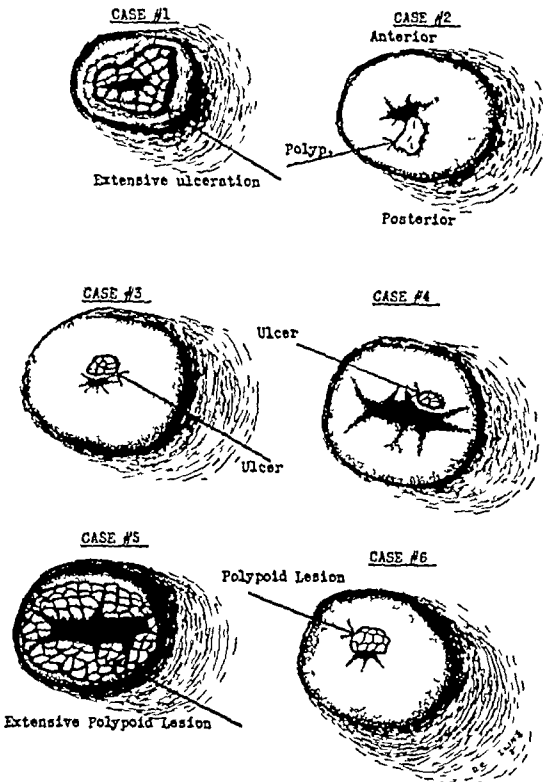


Fig 7—Gross appearance of the cervical lesions in this study.

the variations reported in its incidence, tuberculosis of the cervix is rare and I doubt that 0.16 per cent of all women suffering from pulmonary tuberculosis experience its development in the cervix, as quoted from Williams by Dr. Collins. Progress of the disease is slow and is not accompanied with rapidly progressive invasion typical of cancer. This in itself should attract attention. Furthermore, the evident resistance to conservative treatment certainly should create suspicion. Therefore I cannot share Dr. Collins's pessimism regarding the forgotten or mismanaged case. My acquaintance with a single case left the impression that the local discomfort is so constant and annoying that only a thoughtless practitioner would fail to provide means for an accurate diagnosis. Four patients in Dr. Collins's series were Mexicans. This raises the question of susceptibility of the different races to tuberculosis of the cervix. It is generally assumed that the cervix is resistant to this disease. Of thirty-eight cases of genital tuberculosis studied in our department, in eight there was involvement of the endometrium without extension to the cervix, and in only one, cervical involvement without extension to the fundus or other pelvic organs. Unfortunately there are no criteria to facilitate the clinical diagnosis of this disease except chronicity, and the physician must fall back on the time-honored principle of microscopic investigation

#### X-RAY DIFFRACTION ANALYSIS AS APPLIED IN PNEUMOCONIOSIS

HENRY C. SWEANY, M.D.  
AND  
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CHICAGO

When attention became centered on silicon dioxide as the cause of fibrosis in silicosis, it was expected that a chemical analysis for the substance would establish the presence or absence of pathologic levels in tissues and body fluids. Work in this direction was carried out by King and his associates,<sup>1</sup> Fowweather,<sup>2</sup> Riddell,<sup>3</sup> Boehme<sup>4</sup> and McNally.<sup>5</sup> As with many similar situations in science, the results obtained by these workers did not measure up to expectations, for a positive correlation between the quantity of silica and the extent of pathologic changes was found not to exist in many instances. A chemical analysis gives only total silica, which may occur in the tissue as free silica or in the combined form of some silicate. If silicates are present to any great extent, a high value for silica will be obtained. If at the same time the amount of free silica is small, there may be little or no fibrosis, for silicates are apparently inert substances, asbestos being a notable exception. It is thus evident that a new approach to the problem was necessary in order to differentiate the harmful from the relatively harmless forms of silica.

The method of Clark and Reynolds,<sup>6</sup> which made use of x-ray diffraction analysis in the identification of quartz in mine dusts, seemed to offer possibilities of application in the field of tissue analysis. The method had been attempted by various workers, but not with

From the Research Laboratories of the Municipal Tuberculosis Sanatorium.

Read before the Section on Pathology and Physiology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 17, 1938.

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2. Fowweather, F. S. *Refractories J* 10: 173, 1934.

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untreated dry tissue Hicks McElroy and Warg<sup>7</sup> studied the residue after trypsin digestion of the tissue, Sundius, Bygden and Bruce<sup>8</sup> after hydrogen peroxide digestion and Kahane and Antoine<sup>9</sup> after nitric, sulfuric and perchloric acid digestion

When Dr G L Clark offered the facilities of the x-ray laboratory at the University of Illinois, together

Jephcott, Gray and Irwin<sup>13</sup> were applying x-ray diffraction analysis to the ash of thirty-five specimens of lung They identified quartz, feldspar and mica as the principal constituents In the continuation of our work, a large number of samples of powdered lung tissue were subjected to analysis The results obtained have been a confirmation of those given in the preliminary reports

#### METHODS

Previous to the chemical analysis, the results of which have already been published,<sup>10</sup> the lung tissue had been hardened in a dilute solution of formaldehyde, dried in vacuo at 70 C, ground to pass a forty mesh sieve and dried further to constant weight at 105 to 110 C For the x-ray study, thin samples were prepared by packing the powdered tissue into disks from 0.2 to 0.3 mm in thickness The x-ray beam, collimated by two 0.01 inch (0.025 cm) pinholes, was supplied by a Philips Metalix tube with a copper target, operating at 20 milliamperes and 27 kilovolt peak The film was

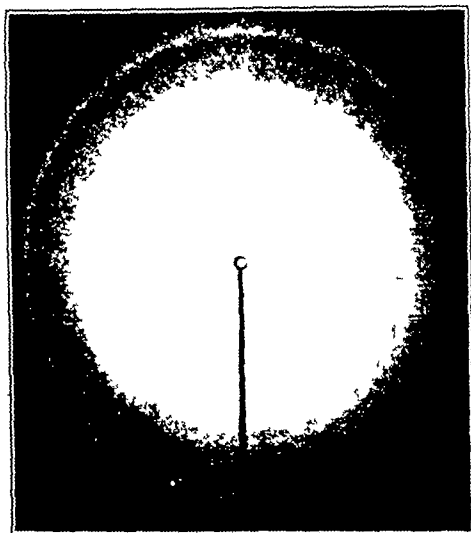


Fig 1 (case 5)—Lung tissue of farmer with multiple calcifications silica 0.63 per cent No quartz

with his cooperation and highly specialized technical assistance, a few representative samples of dried and powdered lungs which had already been analyzed for silica by a standard chemical method<sup>10</sup> were selected

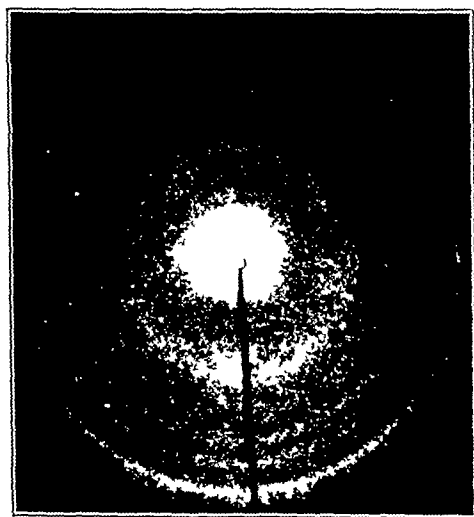


Fig 2—Typical tuberculous calcification

for study The results appeared so promising that a preliminary report<sup>11</sup> was made in 1937 followed by a more complete report in 1938<sup>12</sup> At the same time

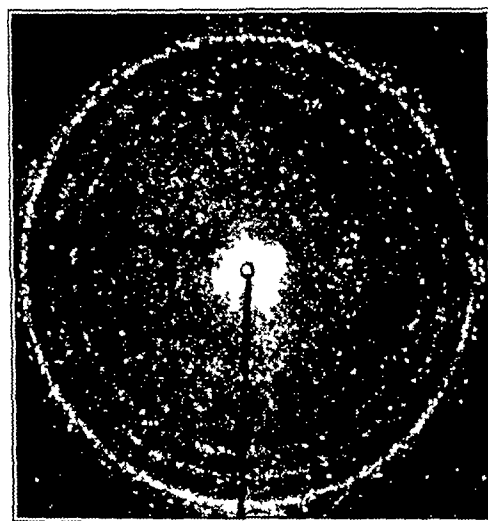


Fig 3—Apatite

held in a flat holder at a distance of 5.0 cm from the sample The exposure time was usually seven hours This length of time was made necessary by the use of very thin samples, but with this type of sample the pattern of the inorganic constituents was not masked by the effects of the large amount of organic material present

#### RESULTS

The results of the x-ray diffraction studies are summarized in the table The subjects have been divided into three groups, (A) those showing no pathologic evidence of silicosis, (B) those having silicosis and (C) those with borderline conditions, many of whom had some other form of pneumoconiosis

The normal group included two infants, one having 0.09 per cent silica and the other 0.16 per cent The x-ray pattern showed a broad halo about 3.6 cm in diameter, with more or less scattering about the central spot No sharp lines were present The third patient was a 56 year old nurse (silica, 0.11 per cent) There were no quartz lines, but other crystalline substances were indicated The fourth patient was a housewife who had died of tuberculosis The silica content was 0.05 per cent, the pattern resembled that of the infants' lungs The fifth patient was a 72 year old man who

<sup>7</sup> Hicks Victor McElroy Olive and Warg M E J *Indust Hyg & Toxicol* 19 177 (April) 1937

<sup>8</sup> Sundius N Bygden A and Bruce T Tr *Ceramic Soc* 35 167 (April) 1936

<sup>9</sup> Kahane Ernest and Antoine Georges *Bull Soc chim Biol* 18 1769 (Dec) 1936

<sup>10</sup> Sweany H C Porsche J D and Douglass J R *Chemical and Pathologic Study of Pneumoconiosis with Special Emphasis on Silicosis and Silicotuberculosis Arch Path* 22 593 (Nov) 1936

<sup>11</sup> Klase Rosalind Sweany H C Mrgudich J N and Clark G L *Science* 86 544 (Dec 10) 1937

<sup>12</sup> Sweany H C Klase Rosalind and Clark G L *Radiology* 31 299 (Sept) 1938

<sup>13</sup> Jephcott C M Gray W M and Irwin D A *Canad M A J* 38 269 (March) 1938

had farmed all his life. There was a surprisingly high content of silica, 0.63 per cent, although no silicosis was present. There were multiple disseminated calcified and ossified nodular tubercles throughout the lungs—several hundred in all. X-ray diffraction analysis showed no quartz lines. Instead the pattern obtained (fig 1) was similar to that of a typical tuberculous calcification (fig 2) and to the pattern of

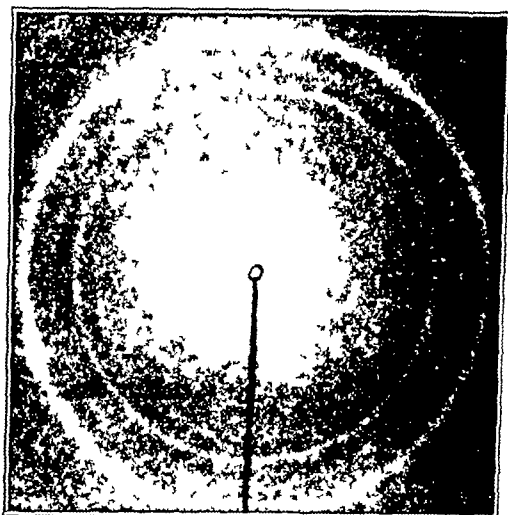


Fig. 4—Powdered bone.

apatite (fig 3). The similarity to the pattern of powdered bone (fig 4) could also be noted.

All the specimens for group B, comprising patients with silicosis, showed the 3.34 angstrom unit spacing of quartz. The pattern of quartz (fig 6) is included for comparison. As the concentration of quartz increases, the 4.25 angstrom unit spacing becomes visible. Both lines were strong in the pattern for patient 19 (fig 7), a sand blaster exposed to dust for eight years. Chemical analysis showed 20 per cent silica and pathologic examination revealed solid masses of fibrotic whorls without tuberculosis. Patient 11 is worthy of special mention.

A man aged 29 reported that he had worked in a cement factory at Ottawa, Ill., for six months. Silicosis was not suspected because cement dust is inert and because roentgenograms of his chest always showed a characteristic fibroid tuberculosis. At postmortem examination massive silicotic lymph nodes were found at the hilus of the lung together with many small nodules throughout the bases. Both upper lobes contained fibroid cavities. It was obvious that this man had been exposed to large quantities of silica in work that had not been mentioned in the history. Subsequently Dr. Roswell Pettit of Ottawa, Ill., consented to review this man's work record. After a diligent search he found that the patient had been a cement worker for eight months and that he had spent four months grinding silica for abrasives. This short and apparently heavy exposure was sufficient to give him silicosis, but the silica content of the dried lung tissue was only 0.26 per cent, a value only slightly higher than normal. The X-ray diffraction pattern showed a faint but definite quartz line (fig 8). This case demonstrates clearly that an amount of quartz sufficient to produce fibrosis may be detected by X-ray diffraction analysis.

There were thirteen patients in group C, representing borderline conditions. Patient 20 was a machinist for seven years, but at death the pathologic picture was chiefly that of tuberculosis with a questionable silicotic taint. The chemical analysis revealed only 0.13 per cent silicon dioxide, a value well within normal limits. The X-ray diffraction pattern showed a distinct quartz

line (the exposure time was fourteen hours, twice the usual time) together with the pattern of a tuberculous calcification. A boiler maker, a janitor, a molder and an engineering draftsman had no pathologic or chemical evidences of silicosis. None of them showed the presence of quartz in the diffraction pattern. Patient 24 was a soft coal miner for twenty years. The pathologic picture was that of typical anthracosis, although the silica content was 0.43 per cent. However, no quartz lines were present in the X-ray pattern, instead, the complex pattern of some silicate mineral was obtained (fig 5). Patient 26 was a blacksmith and tool maker for thirty years. There were definite silicotic and anthracotic aspects to the extensive fibrocaceous tuberculosis. Microscopically these properties were all clearly demonstrated. The silica content was 0.22 per cent and there was a definite quartz line in the X-ray pattern. Patient 27 was a hoister in a lead and zinc mine, who died of tuberculosis without any demonstrable silicosis (silica, 0.24 per cent). The presence of quartz was faintly indicated in the X-ray pattern. The silicon dioxide content was just above the pathologic level but as yet no silicosis had developed. Patient 32 was a lead and zinc miner who had worked for eight years in a mine where safety devices were used. There was gross tuberculosis with only a slight suggestion of microscopic silicosis. There was a faint quartz line in the diffraction pattern. The other patients all showed some questionable aspect either in the history or in the pathologic picture, yet the chemical analysis revealed rather large amounts of silica. Except in patient 29 the diffraction patterns all showed the presence of quartz although the exact amount remains to be determined.

#### COMMENT AND CONCLUSIONS

X-ray diffraction analysis is characterized first of all by its great specificity. Nearly all crystalline compounds give patterns distinctly different from all others.

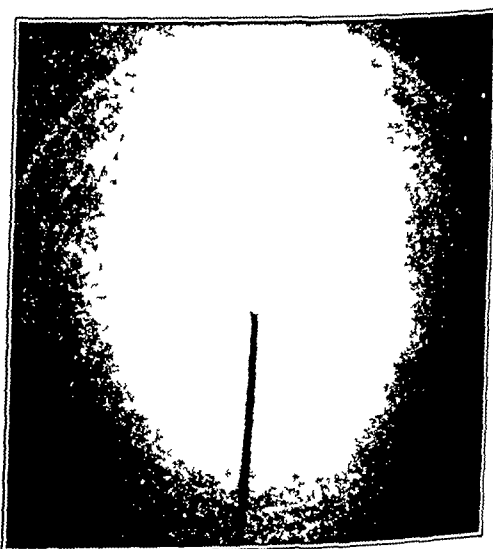


Fig. 5 (case 24)—Lung tissue of coal miner with anthracosis; silica 0.43 per cent; quartz absent.

Hence in a field where chemical methods are not available for identification of the type of silica present and where microscopic methods are inadequate for the study of mineral particles of the size encountered in tissue, the X-ray method gives definite information as to the identity of the crystalline substances present.

Furthermore, a comparison of the patterns with regard to the nature of the lines, i. e. whether they are smooth or dotted, indicates that there is a variation in size of particles from case to case. We conclude that in general the particles are 1 micron or less in diameter. Further work remains to be done on this aspect of the problem.

Another advantage of the x-ray method with the technic described is that the tissue can be used for the analysis unmodified by chemical treatment. Whenever the tissue is digested with some reagent one must

make the questionable assumption that no changes take place in the mineral deposits. In our work such an assumption has been unnecessary.

A further significant feature is the great sensitivity of the method. With our present technic we are able to detect quartz in a concentration as low as 0.2 per cent. This concentration has been found in previous work to constitute the threshold of the pathologic level. Hence, the finding of a faint line on the x-ray film corresponding to the 3.34 angstrom unit spacing of quartz appears to be a good indication of the presence



Fig. 6—Quartz

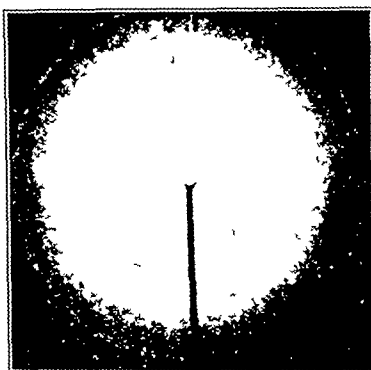


Fig. 7 (case 19)—Lung tissue of sand blaster with silicosis

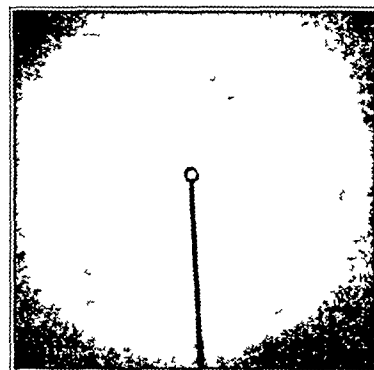


Fig. 8 (case 11)—Lung tissue of cement worker and abrasive grinder with silicotuberculosis silica 0.26 per cent quartz present

*Clinical and Pathologic Data and the Results of Chemical and X-Ray Diffraction Analysis on Dried Lung Tissue*

Patient	Age Years	Occupation	Period of Expo- sure Years	Period After Expo- sure Years	Gross Pathologic Condition	Microscopic Pathologic Condition	Silica in Dry Tissue %	Result of X-Ray Analysis
<b>Group A Controls</b>								
1	1—				Normal lung		0.09	Quartz absent
2	1—				Normal lung		0.16	Quartz absent
3	56	Nurse			Normal lung		0.11	Quartz absent another crystalline substance present
4	46	Hou. wife			Fibrous silicosis		0.03	Quartz absent
5	72	Farmer			Multiple calcifications		0.03	Quartz absent pattern that of typical tuberculous calcification
<b>Group B Patients with Silicosis</b>								
6	3	Millstone sharpener	8	7	Silicosis	Silicosis	0.61	Quartz present
7	78	Miner	Many	1	Anthraco-silicosis	Anthraco-silicosis	0.94	Quartz present
8	9	Stone quarry worker	9	1	Silicotuberculosis	Silicotuberculosis	0.26	Quartz indicated
9	40	Rock miner	18	8	Silicotuberculosis	Silicotuberculosis	1.03	Quartz present also other substances
10	41	Stone cutter	3	1	Silicotuberculosis	Silicotuberculosis	1.22	Quartz present also other substances
11	29	Abrasive grinder	0.3	10	Silicotuberculosis	Silicotuberculosis	0.26	Quartz present
12	48	Stone cutter	10	4	Silicotuberculosis	Silicotuberculosis	2.46	Quartz present also other substances
13	62	Lead and zinc miner	17	7	Silicotuberculosis	Silicotuberculosis	0.64	Quartz present
14	6	Lead and zinc miner	40	4	Silicotuberculosis	Silicotuberculosis	0.90	Quartz present
15	50	Lead and zinc miner	3	2	Silicotuberculosis	Silicotuberculosis	1.13	Quartz present
16	48	Lead and zinc miner	?		Silicotuberculosis	Silicotuberculosis	1.57	Quartz present
17	38	Lead and zinc miner	10	20	Anthraco-silico tuberculosis	Anthraco-silico tuberculosis	0.52	Quartz present
18	40	Coal and zinc miner	19	Several	Anthraco-silico tuberculosis	Anthraco-silico tuberculosis	1.12	Quartz present also other substances
19	59	Sand blaster	8	0.5	Silicosis	Silicosis	2.00	Quartz present in large amount
<b>Group C Patients with Borderline Disease</b>								
20	27	Machinist	7	Many	Silicotuberculosis	Tuberculosis	0.13	Quartz present pattern of tuberculous calcification indicated
21	60	Boiler maker in lead and zinc mine	?	Many	Anthraco-silico carcinoma	Carcinoma	0.10	Quartz absent
22	64	Tailor	4	3	Bronchiectasis	Anthraco-silico	0.17	Quartz absent
23	41	Molder	Many	3	Empyema	Empyema	0.18	Quartz absent
24	40	Coal miner	23	5	Anthraco-silico	Anthraco-silico	0.43	Quartz absent strong pattern probably of a silicate mineral
25	36	Engineering draft man	?	1	Silicotuberculosis	Tuberculosis	0.14	Quartz absent
26	36	Blacksmith tool maker	0	1	Silicotuberculosis	Silicotuberculosis	0.22	Quartz present
27	36	Hou. ter in lead and zinc mine	16	15	Tuberculosis	Silicotuberculosis	0.74	Quartz indicated
28	41	Chef and copper miner	?	?	Fibrous silicosis and fibrous tuberculosis	Silicotuberculosis	0.34	Quartz indicated
29	42	Molder in brass foundry	6	1	Tuberculosis	Silicotuberculosis	0.41	Quartz probably absent other substances present
30	40	Molder	3	13	Tuberculosis	Silicotuberculosis	0.4	Quartz present
31	40	Foundry worker coal miner	2	1	Tuberculosis	Silicotuberculosis	0.6	Quartz present
32	37	Lead and zinc miner	3	1	Tuberculosis	Silicotuberculosis	0.20	Quartz present also other substances

of sufficient quartz to have already caused, or to be in the process of causing, specific fibrosis in the tissue. The method thus should be of value in medicolegal work whenever difficulty is experienced in determining the presence or absence of silicosis or a silicotic complication.

Finally the method seems to offer possibilities for further development. Clark and Reynolds<sup>6</sup> have made quantitative studies of the amounts of quartz in mine dust. Using a technic similar to theirs, we hope to be able to determine quantitatively, or at least semiquantitatively, the concentration of quartz in tissues. Work in this direction is now in progress. The application of the method to the detection of quartz in sputum is also being studied, with the expectation that a method of diagnostic significance may be developed.

## OPERATIVE INJURY TO THE ANAL SPHINCTER

PAUL C. BLAISDELL, M.D.

PASADENA, CALIF.

Considerable confusion exists concerning the applied surgical anatomy of the sphincter mechanism of the anus as concerned with operative injury to it, with reference here particularly to that surgical trauma necessary to the cure of anal fistulas. What and where is it safe to cut? There are expressed such divergences of opinion and conception, so much patent misconception and so much lack of any conception as to warrant a review, together with a presentation of any additional information.

It is surprising to me how little attention has been called even to the fact of this confusion in proctologic literature, let alone to any attempts at elucidation. Probably the situation is in large measure explained by failure to recognize the full importance of the subject and its implications.

### IMPORTANCE OF THE TOPIC

Cases of total postoperative incontinence are an obvious concern, and yet there is lack of appreciation of three important facts in connection with these common unforgivable tragedies, viz that they are common, they are unforgivable and they are tragedies. The impressions obtained from descriptions that remedial plastic operations are easily accomplished is not true, for often it is difficult to secure a successful outcome.

More common are the cases of relative incontinence involving limited control, particularly regarding seepage of fluid or passage of gas. Social and business life may be thereby considerably restricted and the condition a daily burden, or at best a constant inconvenience. Not a little hesitation is encountered concerning rectal operations because of such cases among friends of prospective patients. The victims one meets—and they are by no means rare—have been rather firmly convinced by their surgeons that such sequelae are necessary and to be expected.

While it is true that in many cases relative and total incontinence are due to the vicious practice of postoperative packing, from my study they have been due

in the majority of instances to injudicious surgical practice based on ignorance of the surgical anatomy of the region.

Even more important from the standpoint of actual numbers of patients involved, the same factor is responsible for a large part of the inordinately high rate of recurrence following operations for fistulas. That is, righteous fear of injury to the sphincter mechanism and unfamiliarity with the applied surgical anatomy in relation to fistulectomy too often occasion a choice between unguided radical surgical measures with resulting degrees of incontinence, on the one hand, and timid measures with avoidable recurrences, on the other. In ignorance of what and where it is safe to cut, one avoids incontinence only to stumble far too frequently into the pitfall of a high recurrence rate.

Much of the fault for these far too common and unwarranted errors must be laid at the door of the proctologist, for while each proctologist has learned by exceptional experience the practical surgical anatomy adequate for his own use, his written formulations, on which others must depend for guidance, have in many respects proved inadequate and conflicting.

### REVIEW OF THE LITERATURE

As evidence of the confusion mentioned one can find expressed or implied the belief that usually none or but little of the external sphincter is involved in fistulectomy and, on the other hand, that the whole muscle or variable parts of it are concerned. Some authors have stated that fistulas may course "deep" to the internal sphincter, while others have not mentioned this possibility. Some have said that if the external sphincter is to be cut even partially the operation should be done in two stages and others that the entire muscle may be safely cut at one time or even a whole segment removed and still others have expressed opinions between these two extremes. One can find the belief expressed or implied that it is equally safe (or dangerous) to cut the external sphincter anywhere in its circumference, that it is safe to cut posteriorly, but not elsewhere, or both

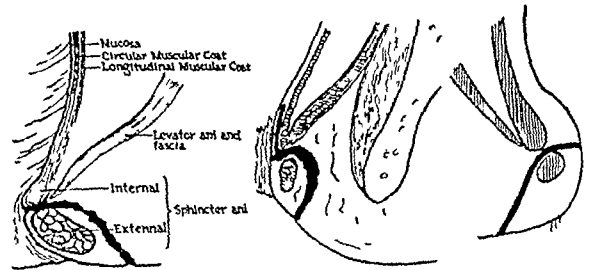


Fig. 1—Schematic representations from the literature of anal anatomy and the relations of fistulas. They are common misconceptions and from them may arise erroneous implications as to (1) the simplicity of the clinical recognition of the external sphincter and (2) the common relation of fistulas to this whole muscle. Compare with figure 3.

posteriorly and anteriorly but not laterally, that cutting is only relatively safer posteriorly or that, owing to anomalies, posterior severance may on occasion be as disastrous as that undertaken elsewhere. One who believes that continence is chiefly dependent on the external sphincter can find support for his view in the literature, as can one who has the different impression that it is chiefly dependent on the internal sphincter, while recently the concept of the anorectal ring, a composite structure of parts of several muscles, as the guardian of continence has been developed. One



proctologist states that he has split the anal canal, including both sphincters and fibers of the levator, 600 times, while another counters that fistulas which necessitate such treatment are rarely seen even in a large experience, and that if the whole sphincter mechanism were cut even in stages, function would be definitely

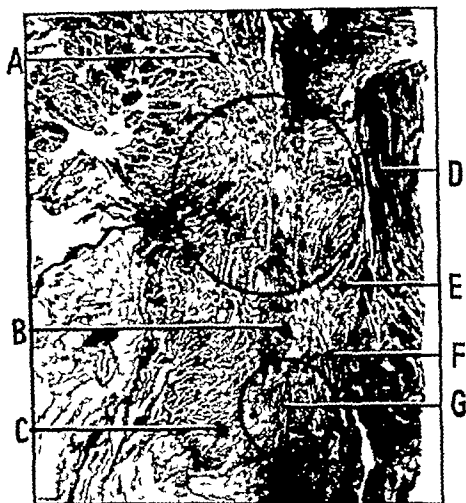


Fig 2—Paraffin section of the wall of the anal canal. A levator ani muscle. B longitudinal muscular coat of bowel. C superficial and deep portions of the external sphincter. D mucosa. E internal sphincter. F anal intermuscular septum. G (small circle) subcutaneous portion of the external sphincter. The large circle represents the anorectal ring including portions of the internal sphincter, the longitudinal muscular coat, the levator ani and the deep portion of the external sphincter. Notice (1) that only the subcutaneous portion of the external sphincter is below and in the same longitudinal plane with the internal sphincter, the other two portions surrounding the latter. (2) the prolongations of the longitudinal coat of the bowel coursing through and thus dividing the external sphincter and (3) the continuity of structure between the levator ani and the deep portion of the external sphincter.

impaired. Postoperative packing rather than injudicious section is regarded by some as the essential element in the genesis of incontinence.

Possibly I have conferred undue importance on these differences, but from a critical analysis of fistula surgery in general it is obvious that something is lacking either in the facts available or in their adequate appreciation.

#### COMMENT

In almost none of the references, with the notable exception of the contribution of Milligan and Morgan<sup>1</sup> and an allusion by Hiller,<sup>2</sup> is there any discussion whatever or even a mention of the clinical recognition of the various component muscles mentioned. That is, amidst all these conflicting statements practically the only point on which there is apparently almost universal tacit agreement is the fundamental premise that the separate muscles can be easily, accurately and uniformly recognized at operation.

I am of the opinion that far from being so simple as to merit almost alone its undebated position this fundamental problem of clinical identification of muscles is responsible more than anything else for such divergent expressions. There exists gross error in this basic premise so universally taken for granted, in at least partial explanation for which I particularly point out here the inaccurate foundation of descriptive

anatomy commonly illustrated, but not described, in textbooks (compare figure 1 with figures 2, 3 and 4). Such simple relations depicted between the muscles and the simple and constant relation between fistulas and muscles do not exist, and the resultant clinical misinterpretations and erroneous assumptions are obvious as sources of confusion.

For clear analysis in accordance with conditions as they actually exist I point out that there are only two possible means of differentiating and recognizing these muscles clinically, viz by palpation and by sight (dissection).

Almost exclusive dependence must more often than not be placed on palpation, because operation involves commonly the limited exposure obtained with but a linear section, or little more, of the tissues. Thus this phase of the problem is of major importance.

I am in agreement with the recent observations of Milligan and Morgan as to what entities of the anal musculature can be recognized by palpation. For my purpose here these may be reduced to (1) the subcutaneous portion (only) of the external sphincter and (2) the anorectal ring (fig 2), a composite structure composed of portions of the internal sphincter, the longitudinal muscle fibers of the wall of the bowel, the levator ani and the deep portion of the external sphincter. In other words, it is impossible to distinguish by palpation the external and internal sphincters as complete distinct entities, it is useless therefore to say, as far as palpation is concerned, what can or cannot be done surgically with safety in terms of these muscles individually.

What further help is afforded by the sense of sight in recognizing the different structures discussed, and is it sufficient to compel alteration of this concept?

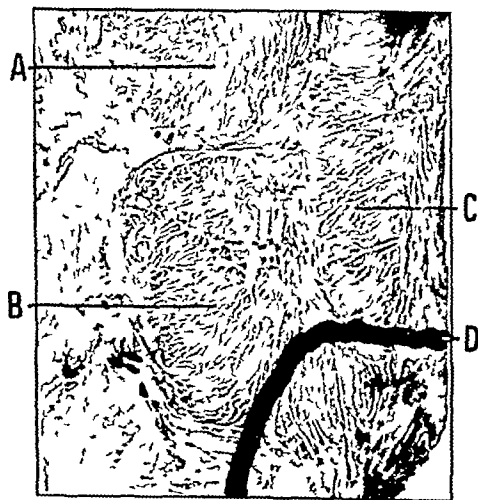


Fig 3—Paraffin section of the wall of the anal canal. A levator ani muscle. B external sphincter. C internal sphincter. D course of the fistula plotted as explained in the text, extending outward from the anal intermuscular septum and following one of the terminal prolongations of the longitudinal muscular coat through the external sphincter. The fistula involves here the subcutaneous portion of the external sphincter, the commonest arrangement. Occasional sections show as here and in contrast to figure 2, sharp demarcation between the levator ani and the external sphincter.

#### LABORATORY INVESTIGATION

Preliminary to answering this question I made numerous dissections in the autopsy room and studied gross and paraffin sections made in the laboratory. I

1 Milligan E T C and Morgan C N. Surgical Anatomy of the Anal Canal with Special Reference to Anorectal Fistulae. *Lancet* 2: 1130 (Nov. 24) and 1213 (Dec. 1) 1934.  
2 Hiller Robert I. The Anal Sphincter and the Pathogenesis of Anal Abscess and Fistula. *Surg. Gynec. & Obst.* 52: 921 (May) 1931.

shall not pause here for details of these different approaches but report compositely only the following salient points

It is impossible to define the internal sphincter as a clearcut anatomic entity because no upper border exists, the so-called internal sphincter being but the thickened lower border of the inner circular coat of the bowel. It would be comparable to determine where the handle of a baseball bat ends.



Fig. 4—Model of anal anatomy reconstructed in accordance with paraffin sections and including conceptions of Milligan and Morgan. A deep portion of the external sphincter. B superficial portion of the external sphincter. C subcutaneous portion of the external sphincter. D lower border of the internal sphincter. E region of anal intermuscular septum. F attachment of superficial portion of the external sphincter to the coccyx. Just lateral to D a piece of the subcutaneous portion of the external sphincter has been clipped off to show how the superficial portion of the external sphincter surrounds the internal only the subcutaneous portion being below and in the same longitudinal plane with the internal.

I have already referred to the complex relations of the external sphincter, as shown in the illustrations, and again call attention to their significance.

The external sphincter uniformly blends imperceptibly with the levator ani and tearing of the muscle is usually necessary to separation (except of course anteriorly, where the latter does not surround the anus).

From the several approaches I gained the distinct impression that pus extension could readily separate the external sphincter from the (encircled) internal sphincter to the upper border of the former but that, instead of breaking through here between the external sphincter and levator and thus completely separating the external sphincter, extension would more easily follow the strands of the longitudinal muscular coat of the bowel which course through the external sphincter (figs 2 and 3).

These facts from the laboratory not only corroborate the difficulties of palpation mentioned but also suggest difficulties in the accurate delineation of the muscles clinically even with the aid of dissection and sight, particularly, I repeat, with the little more than linear section warranted in most cases and with the interference of tissue planes due to inflammatory reaction and scar tissue. From them too one could with propriety question both the accuracy and the importance of discussions concerning operative trauma to the whole external sphincter because of the theoretically more ready involvement of but a variable part of that muscle.

I have not demonstrated to my satisfaction the separation between the superficial and deep portions of the external sphincter, as described by Milligan and Morgan, but this minor difference does not affect the usefulness of my concepts.

With this laboratory work as a background let me answer the question as to what of these structures I have been able to recognize clinically—and accurately.

#### CLINICAL OBSERVATIONS

In all my work with fistulas I have never found it necessary to identify the internal sphincter, nor am I certain that I could do so if I would, in the living human being, particularly in the presence of fistula scar tissue. As far as fistula surgery is concerned, reference to the internal sphincter as a clinical entity should be discontinued.

With cases involving wide dissection, such as those requiring plastic repair and a minority of fistulas more extensive or deeper than usual, I have delimited the external sphincter to my satisfaction. There are difficulties, however, such as accurately delineating it from the levator, as found in the autopsy room, but for the practical purposes of these operations I may say that the muscle can usually be defined. I emphasize, nevertheless, that considerable familiarity with the region may be necessary. Incidentally, my clinical experience bears out my theoretical deduction that involvement of the whole muscle is comparatively uncommon.

On the other hand, viewing as a whole the field of fistula surgery and considering the limitations of the dissection necessitated in the great majority of fistula operations and the difficulties imposed by erasure of tissue planes and the presence of scar tissue—all added

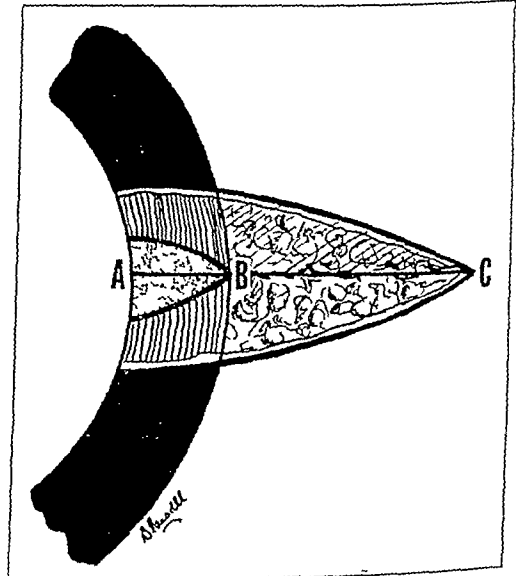


Fig. 5—The comparative effects of removal of short and of more extended fistulas on retraction of the ends of the sphincter. If the fistula extended but through the muscle A to B or a little more retraction would be limited as shown by the stippled area; if dissection included on the other hand such a distance as from B to C retraction with its bearing on subsequent incontinence would be more wide as indicated by the line shaded area.

to the anatomic complexities reviewed—one finds that the amount of muscular involvement in terms commonly used has been largely a matter of only approximate knowledge even to the expert. Considering further that the specialist still observes probably but

a small percentage of these cases, taken the country over, I suspect that, were the truth known, operation is done in a large proportion with no knowledge at all as to what muscle tissue is severed

I therefore reiterate the suggestion that the accepted concept of the surgical anatomy be rearranged to terms of (a) the subcutaneous portion of the external sphincter and (b) the anorectal ring, I believe this would obviate many of the difficulties outlined, from the standpoint both of the specialist and of the occasional operator. Recognition of these structures is simple of acquirement, its use is adequate for the purpose and particularly effective because by correct anal palpation (with the forefinger inside the anal canal opposed firmly to the thumb on the outside) one can both continuously follow tracts by their scar tissue and be constantly informed of their relations to the anatomic structures

Let me consider the question from a different point of view, by plotting the known directions pursued by fistulous tracts in relation to the planes of the anal canal and outside skin. This approach is a common one and becomes possible and valuable because for all practical purposes the internal opening of fistulas may be regarded as occurring at a fixed and constant point at or near the anal intermuscular septum. From here the most common course through the musculature is at right angles to the anal canal and thence in a gentle curve to the skin. Plotting this recognized course on the common misconception of anal anatomy shown in figure 1, an almost universal representation in the literature, gave theoretical basis to the assumption that the whole external sphincter was usually involved in fistulectomy, an assumption too easily accepted because of the unrecognized difficulties of adequate clinical recognition of the muscle herewith detailed. Plotting the same course on the correct anatomic conception, shown in figure 3, would involve in fistulectomy only a part of the external sphincter, which corresponds with the theoretical deductions mentioned earlier. Thus portions of the external sphincter, particularly the subcutaneous portion, have probably been often mistaken for the whole muscle, and in its clinical assumptions and applications proctologists have not all been talking about the same thing. The implications are obvious and support my previous conclusions

#### SUGGESTED RULES

Any formulation as to what is safe to cut should either make more accurate distinction as to severance in the different quadrants or, if in more general terms, provide adequate margin of safety to include all. It is not sufficient to say "Be a little more careful laterally than posteriorly." This too is the case in comparing short fistulas and those of wider extent, where more extensive dissection permits wider gaping of the severed ends of muscle (fig 5)

Recognition of the devastating effects of postoperative packing is a *sine qua non*, and all dictums regarding operations for fistulas must assume an understanding of this principle

Operative injury to the supportive framework of the anus outside the sphincters, injury to the nerve supply and atrophy of disuse are little discussed topics germane to my thesis which must forego consideration at this time

While the main object of my paper has been to point out and analyze the basic elements of confusion in the literature, for the sake of completeness I suggest, without time for discussion, the following rules in conformity with the anatomic concepts developed

1 It is always safe to cut once the subcutaneous portion of the external sphincter, in my opinion the portion most frequently involved

2 It is never safe (and exceedingly rarely necessary) to cut entirely through the anorectal ring

3 Amounts of muscle between that of the subcutaneous external sphincter and the anorectal ring can and should be cut by the two stage operation<sup>3</sup> (fig 6)

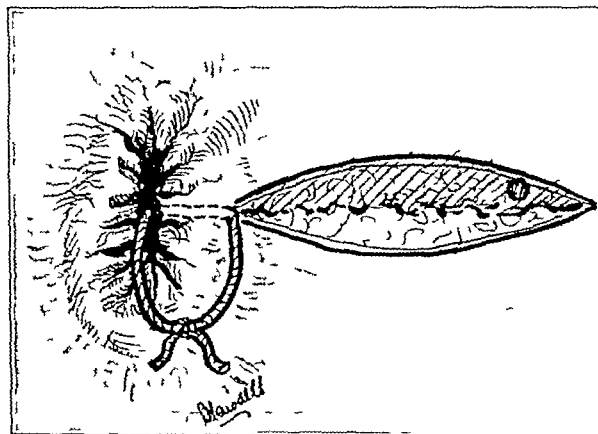


Fig 6—The principle of the two stage operation for rectal fistula. Dissection has been carried up to the sphincter musculature. Linen kordo is tied through the remaining portion around the muscle tissue involved. After the lateral wound has healed the remaining portion is severed usually in the office during local anesthesia. Wide retraction of the ends of muscle is thus obviated not only in accordance with the principles shown in figure 5 but because of the anchoring of the ends of muscle in scar tissue.

4 The attachment of the anus to the coccyx should not be severed at the primary operation

There will be dissenting voices, but I hope at least to have provided herein a more accurate basis for future discerning discussion. I do not maintain that even considerable variance is not possible, but any deviation must be determined by the individual operator according to and commensurate with his increasing familiarity and experience

#### ABSTRACT OF DISCUSSION

DR MALCOLM R. HILL, Los Angeles. I had occasion to observe this study and see it from a laboratory angle. I did not realize how incomplete an understanding of applied surgical anatomy I have been carrying in my armamentarium. The work of Hiller in this field has definitely explained that posterior proctotomy is not safe in 100 per cent of cases because of anomalies or muscle defects. Milligan and Morgan's work referred to by Dr Blaisdell, is fundamental. This conception of muscle relations has been upheld by such anatomic works as those by Cunningham and Spalteholz, but it falls to the lot of a modern anatomist-surgeon and more recently to that of a practicing proctologist to uncover these hidden facts in applied surgical anatomy of the anal sphincter mechanism. Previous application in part by Dr Blaisdell has given us a plausible explanation as to the cause of anal fissure. I refer to the published paper "Pathogenesis of Anal Fissure and Implications as to Treatment." Dr Tom E. Smith mentions this work in his article on "Anal and Perianal Fissures and Ulcers," maintaining that that obstructing portion of the subcutaneous external sphincter be

3 Allen J. Hill and Haisdell, Benjamin. A Two Stage Operation for Fistula in Ano. Surg. Gynec. & Obst. 38: 621 (March) 1934

called "Blaisdell's bar" I had the privilege of assisting in the operative amphitheater with the application of this conception of the surgical anatomy in cases of plastic repair following previous injury. It is valuable to proctology and surgery that Dr. Blaisdell should come to our rescue in thus scrapping the multiplicity of misinformed ideas and laying down certain fundamentals. We may thus be guided in dealing with complicated problems and be able to avoid injury to the anal sphincter mechanism.

## MEDICAL ASPECT OF CANCER OF THE STOMACH

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Clinical research in malignant disease of the stomach, even though productive of no new or striking conclusions, is justifiable if it intensifies the impressiveness of certain facts which cannot be sufficiently emphasized if the disease is to be combated. This study of 251 cases, in 187 of which the lesion was considered operable, was undertaken in this spirit and particularly with the purpose of arriving at certain conclusions concerning the role of the gastro-enterologist, the general internist and the general practitioner in the treatment of gastric cancer. The surgeon's function is well defined and involves, in addition to surgical technique in a difficult operation, the decision as to operability and

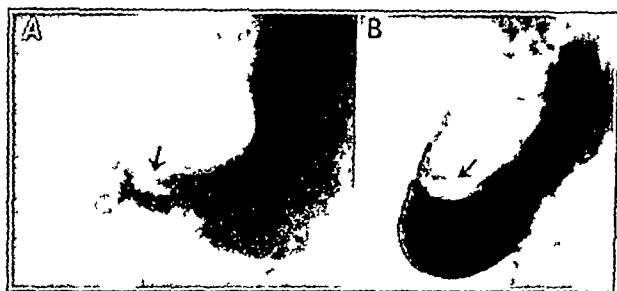


Fig. 1—Prepyloric deformities suggestive of malignant disease but due to benign lesions. A, duodenal ulcer and prepyloric spasm. B, prepyloric ulcer and duodenal ulcer proved benign by gastroscopic examination and clinical course.

extent of operability when the lesion is actually visualized and palpated at the operating table. In some cases the surgeon has the first opportunity to detect early cancer of the stomach when operating for another lesion or to suspect it in his clinical contacts with a patient. Most frequently, however, the early diagnosis falls within the scope of the gastro-enterologist and the general practitioner and constitutes their chief duty in the treatment of this disease, a duty of more vital importance than their second one, that of postoperative care. The facts that cancer of the digestive tract occurs most frequently in the stomach and that its onset there is most insidious, together with the frequent perplexities of early detection and the value of early operation, make the first possible diagnosis of this disease a challenge to the acumen and vigilance of the general practitioner and the gastro-enterologist.

The history of gastric carcinoma is often definite. The stomach can be clearly visualized by x-ray examination, the chemical data are diagnostically suggestive

and the examining eye can now look at the lumen and mucosal lining with the gastroscope. There would therefore appear to be little justification for late diagnosis and the unhappy discovery of an inoperable lesion, but not infrequently, against the ideal of early diagnosis and early operation, certain conditions exist, chief among which are the apparent innocuousness of certain symptoms and an obscurity in the objective signs, particularly those of x-ray examination.

The first agenda of this study was to point out, not for the first time but in emphatic repetition, certain guiding signs which if followed might result in early diagnosis of gastric cancer. The questions asked and answered in part by these data concerned the role of the internist, for example:

- 1 In what type of patients does malignant disease of the stomach occur?
- 2 What are the earliest suggestive symptoms?
- 3 Are the diagnostic measures available today adequate for its early detection?
- 4 What good can be expected of early diagnosis and surgical intervention?

It is a usual medical mental procedure to suspect the ailing middle aged of cancer. The statistics of this series show that it should apply to gastric cancer, the largest number of patients, 68 per cent, being between 50 and 69 and almost equally divided between the 50's and the 60's. However, 19 per cent were in their 40's, 5 per cent were between 31 and 38 and 8 per cent were over 70. Sixty-three per cent were men and 37 per cent women in the group whose lesions were considered operable while in the group whose lesions were considered immediately inoperable 77 per cent were men and 23 per cent women. This variation in the two groups suggested the possibility that women seek aid somewhat earlier than men.

Translated into an answer to the question as to what type of persons may be suspected of gastric carcinoma, these statistics contribute the conclusion that all persons over 30, men twice as frequently as women, should be suspected of cancer of the stomach when certain symptoms are found.

The next question, what are the earliest suggestive symptoms? was studied through the statistics of this series. In most histories of cancer of the stomach, two stages are described, one preceding the other by weeks or months. The second may involve a change in the character of the primary symptoms, such as an intensification or a change in the time of occurrence of pain, or there may be a completely new group of symptoms. These two stages have been called primary and secondary in this study.

The same symptoms are found in different incidences in the two stages. Pain or distress, usually epigastric but in some cases described as general abdominal and in a few cases entirely atypical, for example in the right upper or left upper quadrant or in the shoulders occurred as the most frequent primary and secondary symptom. Loss of appetite and weight were the next most frequent primary symptoms and the third and fourth most common secondary symptoms. Nausea with vomiting was the second most frequent secondary symptom, and vomiting occurred as the fourth most frequent primary symptom. With lesions of the cardia hiccups and dysphagia occurred in a few cases as the primary symptom, and in a few cases constipation

or diarrhea alone was the primary symptom. Constipation was the fifth most frequent secondary symptom. The classic syndrome of loss of weight, appetite and strength thus maintains its importance as a strongly suggestive symptom of carcinoma of the stomach, but it is worthy of note that pain or distress, and in the secondary stage nausea and vomiting, were the commonest early symptoms. Since these are not insidious symptoms it should follow that, if they were properly evaluated by the patient and differentiated by the physician earlier malignant gastric lesions would be discovered. Possibly a useful rule for patient and physician might be that in a patient over 35 abdominal discomfort of over a few days' duration should be checked and if persistent rechecked with careful study, both roentgenographic and chemical. In not a few of the cases in which pain was the predominant symptom, it was attributed without x-ray or other study to ulcer and was treated as such, sometimes with temporary relief of symptoms and therefore delay in the final diagnosis. This study also brought out the fact that the earliest symptoms, especially when they were fatigue or loss of weight and strength, were too often treated as due to anemia or nervous exhaustion. Liver or iron therapy, long vacations and trips around the

TABLE 1—Symptoms Suggestive of Gastric Cancer

Primary Symptoms	No of Cases	Secondary Symptoms	No of Cases
Pain or distress	106	Pain or distress	54
Loss of appetite	21	Nausea and vomiting	53
Loss of weight	22	Loss of appetite	43
Vomiting	17	Loss of weight	35
Loss of strength	10	Constipation	21
Belching and hiccups	8	Loss of strength	19
Dysphagia	7	Hemorrhage	1
Pallor	6	Pallor	10
Nausea (no vomiting)	4	Regurgitation	1
Diarrhea	3	Belching and hiccups	1
Constipation	2	Palpable mass	8
		Diarrhea	7
		Dysphagia	7

world have sometimes been used as treatment when careful study should have been applied and reapplied. One of the lessons emphasized by this study was the value of rechecking, a procedure to which the public should be educated if cancer is to be diagnosed early.

To review, the two most frequent early symptoms of the disease are actually pain and nausea with vomiting, both of which are by no means insidious and are not diagnostic without differentiation. Loss of weight and appetite stood high in the list, the second most frequent primary and the third most frequent secondary symptom, and, though commonly recognized as the most important symptoms of cancer, were accepted by the patient and sometimes by the physician first consulted without adequate apprehension. A previous acute infection of the respiratory tract, a chronic prostatic or renal condition, and fatigue and worry were too often accepted as sufficient explanation. Two patients recently seen in the Laker Clinic had previously been sent for a winter in Florida and a world cruise, respectively, because of symptoms of fatigue and loss of weight, when they actually had an early carcinoma of the stomach, the growth being diagnosed months later and too late for surgical removal. Another patient's loss of weight and failing strength had been explained by himself and his physician by his inability to chew his food because of a new artificial denture until he

himself noticed an abdominal mass. Although neglect of symptoms as completely misleading as constipation, diarrhea or gaseous eructations is more to be condoned, this study emphasizes the importance of an examination of the entire digestive tract of the patient over 30 when any digestive symptom occurs.

The duration of symptoms before diagnosis was of considerable interest (table 2). In much the largest

TABLE 2—Duration of Symptoms Before Diagnosis

Under 1 month	9	9-10 months	4
1-2 months	8	10-11 months	1
2-3 months	15	11-12 months	2
3-4 months	23	1 year	22
4-5 months	14	1-2 years	9
5-6 months	17	2-3 years	8
6-7 months	22	3-4 years	12
7-8 months	10	4-5 years	2
8-9 months	8		

group, the patient came to the clinic either directly or very soon after his first consultation with his family physician, his symptoms having been tolerated by him without fear and without advice or because of that peculiar quirk of human mentality which causes man to fear to know that which is all the more fearful to know when he finally acknowledges it. The largest number of patients gave either six months or a year as the duration. Fifteen had had a long history of indigestion merging into the present symptoms, but it was a rather striking fact that in most cases the previous medical history was an unusually good one, the present illness being the first with many patients in their 50's or 60's.

The common finding of achlorhydria in the first examination is not devaluated by the fact that normal or high acidity occurred in thirty-two cases. There was achlorhydria in ninety cases, hypochlorhydria in twenty-nine cases, normal acidity in twenty-six cases and hyperchlorhydria in six cases. The presence of hydrochloric acid should make one no less suspicious, but its absence should increase suspicion. This is the only safe deduction from these statistics. Another important deduction made from a study of a few of these cases is that with a patient known to have chronic achlorhydria periodic check-ups of the stomach are indicated and certainly any new symptom requires

TABLE 3—Amount of Weight Lost

No loss	10 cases
1-10 pounds	17 cases
10-20 pounds	48 cases
20-30 pounds	49 cases
30-40 pounds	20 cases
40-50 pounds	12 cases
50-60 pounds	5 cases
60-70 pounds	1 case
Over 70 pounds (1 in 2 yr 1 in 7 mo)	2 cases

study. Furthermore, a change from normal or high acidity to achlorhydria in a patient under treatment for gastric ulcer or with a history of a healed lesion, or even without previous gastric disease, should arouse suspicion.

The amount of weight lost is indicated in table 3. One patient gained weight with ulcer treatment. The majority of patients had lost between 10 and 30 pounds before the diagnosis was made.

A palpable mass was noted in fifty-six cases. Resection was performed in twenty-nine of these (total in

three, exploratory laparotomy in seventeen, gastro-enterostomy in nine and gastrostomy in one. Of the twenty-nine patients who had resections, five lived from one to two years (three had metastases at operation), one, who had a total resection, lived three and one-half years (metastases were present at operation), one lived eight years (no metastases were present at opera-

careful fluoroscopic examination before and after relaxation management will usually distinguish adequately between phantom and actual lesions. In the occasional case exploratory operation must be done, and if a lesion is found at the pylorus it should be regarded as malignant and subtotal gastrectomy performed. In two cases of this series exploration was

done because an annular constriction persisted in the prepyloric area in spite of trial management, no organic lesion or adhesions were found to explain the constriction and, postoperatively over a period of years, occasional check-up examinations revealed the same type of deformity, which without the historical background would have again caused suspicion of malignancy. Spasm and adhesions in the media from a healing or healed ulcer of the posterior wall may also cause unwarranted suspicion, especially if no observation was made at the time of visualization of the ulcer or its healing progress. The appearance of the lesser curvature niche has aroused considerable interest among

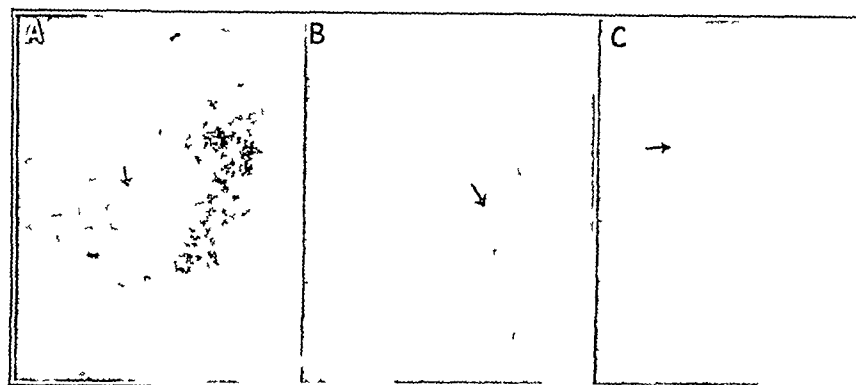


FIG. 2—Benign lesions of the lesser curvature which might have been considered suggestive of malignant disease in *A* because of the meniscus surrounding the lesion and recurrence after subtotal gastrectomy; histologic examination indicating benign ulcer in *B* because of the irregular shape of the crater; disappearance of the crater during healing indicating a benign lesion; and in *C* because of the size and irregularity of the crater; histologic examination after subtotal gastrectomy done for recurrence indicating a benign lesion.

tion), and one has lived ten years (metastases were found at operation). These data add emphasis to the facts that a palpable mass is not a contraindication for surgical intervention and that small metastases are not a contraindication for resection.

X-ray examination has two purposes, diagnosis and location of the lesion and determination of operability. The modern technique of x-ray examination, particularly the recognition of the normal and abnormal mucosal pattern, determined by observing results with pressure palpation under the fluoroscope, and fixation of the picture with spot films, has been of great value in differentiating real from phantom lesions of the stomach and benign from the malignant lesions. The commonest phantom lesions simulating carcinoma are those caused by spasm, adhesions or loops of jejunum in close anatomic relationship to the pylorus. In spite of the medicinal and natural antispasmodics (such drugs as atropine and such natural measures as complete rest in bed and general relaxation), spasm of the two muscular apertures of the stomach, the cardia and pylorus, often persists to such a degree that visualization of the mucosal pattern in those areas and of the muscular activity and flexibility of the walls is impossible. This spasm has sometimes been found to be caused by disease elsewhere in the digestive tract or elsewhere in the body, as in a recent case in which autopsy showed that it was due to cardiac disease. Errors in diagnosis are then possible in either direction, ascribing the defect to spasm and not operating or ascribing it to cancer and operating uselessly.

Figures 1 to 4 are from cases in which differentiation between phantom or benign lesions and carcinoma had to be made, and figure 5 is from a case in which there was a ten year survival.

Endoscopic examination (esophagoscopy for the cardia and gastroscopy for the pylorus) is helpful and will be of more and more help in distinguishing spasm or other phantom lesions from organic lesions, except when the lesion is entirely submucosal. Then, however,

gastro-enterologists, and the statement has often been made and usually confirmed that irregularity of outline, broad base, lack of smooth contour and the presence of a meniscus around the base indicate a malignant process. Exceptions to this observation occurred in this study as figure 2 shows. Two patients of this series had had gastric ulcers which had been followed to healing several years previously. With one, opportunity was afforded by resection to find in the resected portion a carcinoma adjacent to the scar of the healed ulcer.

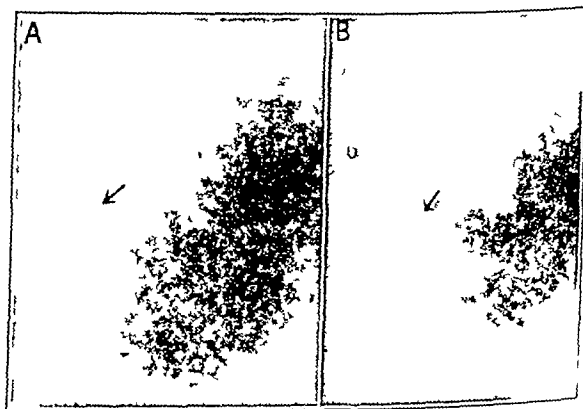


FIG. 3—Prepyloric deformities with histories suggesting malignant disease that shown in *A* was malignant while with that shown in *B* there was no organic lesion. The patient represented by *A* was a man aged 63 who complained of vomiting pain in the back (for seven months) and a loss of 9 pounds (4 kg.) in weight. The operative diagnosis was a small annular adenocarcinoma at the pylorus. The patient represented by *B* was a man aged 40 with nausea and vomiting of eight months duration and a loss of 30 pounds (13.6 kg.) in weight. The diagnosis was pylorospasm and nicotine poisoning.

The location of gastric lesions has long been regarded as of paramount importance in distinguishing the malignant from the benign. Malignant lesions occurred in this series in the cardia and fundus in thirty-one cases, in the media in fifty-two cases and in the antrum and pylorus in ninety-eight cases. Benign ulcers likewise occur in all these parts of the stomach. The only loca-

tion in which an ulcerating lesion is always malignant is the greater curvature, at any level, when exclusively involved. The prepyloric area has in recent years had more careful examination both at operation and at autopsy, and constantly increasing evidence accumulates to demonstrate the healed ulcer at this site, thus freeing this area from the gloomy verdict of inevitable malignancy.

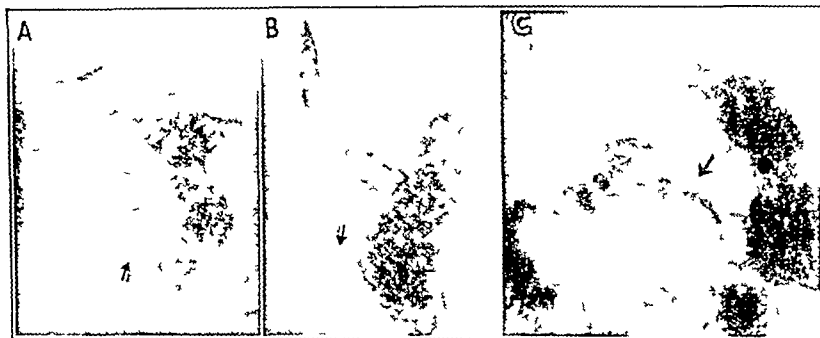


Fig 4—A and B deformities of the antrum simulating neoplasm but produced by spasm following gastro-enterostomy. The patient represented by B had lost weight and strength for six months with an increased suspicion of malignant disease but the final diagnosis made by gastroscopic examination and the clinical course was gastritis and spasm produced by avitaminosis. C a malignant process in the antrum in a gastro-enterostomized stomach.

nancy. The fact remains, however, that in this series in 35 per cent of the cases in which resection was performed the malignant lesion was in the prepyloric antrum. Furthermore, progress in healing of an ulcer is not as easily or distinctly followed at this area as when the niche protrudes from the lesser curvature, and whenever, after a short period of trial management, doubt persists as to the flexible integrity of the stomach wall at this point, whether or not occult blood continues to appear in the stools and symptoms continue to be evident, subtotal gastrectomy is to be chosen as an alternative to the harbouring of an unhealed ulcer or a carcinoma. Benign ulcers at the cardia are rare, and most malignant lesions there are definitely irregular and rigid, their appearance leaving no doubt as to their malignancy. Furthermore the rare benign ulcer in this area can be observed to heal or not to heal especially with careful observation of the rugae the conformation of which around the lesion helps to make the diagnosis. If the lesion is malignant pressure, with a small amount of thick barium sulfate in the stomach, will reveal an irregularly distorted appearance of the rugae, which seem to disappear completely around the lesion, whereas with an ulcer the radiation of the rugae is more regular and intensified around the lesion.

The lesion of the media, if annular and constricting, may be a benign hourglass deformity of a healed ulcer or a malignant lesion infiltrating and constricting the stomach wall. Most of the latter type are clearcut rigid defects but the very early ones simulate the innocent hourglass defects of ulcer healing and can be distinguished only by their lack of flexibility, as observed by careful fluoroscopic examination.

The niche of the lesser curvature, usually in the media which whether large or small is so often the visualization of an ulcer represents occasionally a malignant lesion. In the most confusing cases, the healing or nonhealing can be observed by the disappearance of the niche or its persistence and if it persists resection is indicated because of actual or potential malignancy. The discrete smoothly outlined tumor of the stomach which from the x-ray examination might

be considered a benign leiomyoma, should in my opinion never be allowed to remain thus diagnosed, since except by histologic examination it is impossible to distinguish it from a malignant lesion, notably leiomyosarcoma.

Gastroscopic examination is of considerable help and, with further knowledge of the various types of gastritis, promises to be of still greater help in revealing early carcinoma, especially the ulcerating type, the typical ulcer being clear-cut and having sharp edges and a grayish exudate at the base and the typical ulcerating carcinoma having ill defined edges and a distorting of the mucosal pattern for some distance around the ulcer. Although the posterior wall and the pylorus frequently cannot be seen in cases in which this visualization is most needed to rule out the presence of a malignant lesion, observation of asymmetrical peristalsis, confirming the results of the fluoroscopic observation, is valuable as an adjuvant diagnostic sign.

The answer to the question Are present day diagnostic criteria of sufficient aid in making the diagnosis of cancer of the stomach adequate? is Yes, if they are used with precision and are applied and reapplied with constant vigilance.

The final question, What good can be expected of early diagnosis and surgical intervention? must now be confronted in the light of the data from this series.

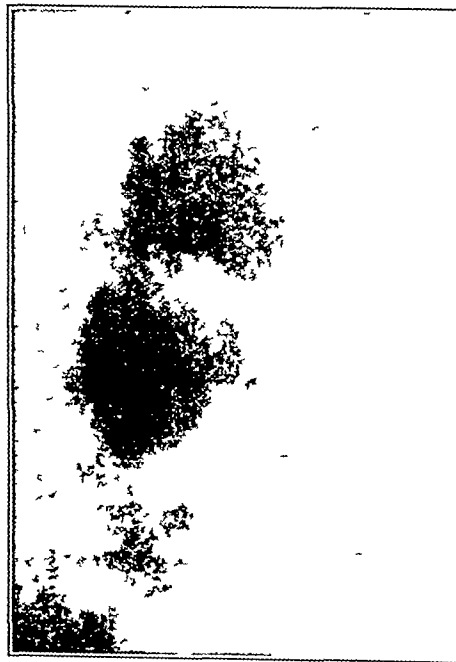


Fig 5—The stomach of a man aged 63 who had survived for ten years cancer of the stomach with metastases to lymph nodes. In 1928 he had a six month history of epigastric distress and loss of weight (20 pounds 9 kg.). Subtotal gastrectomy was performed and the diagnosis was carcinoma of the pyloric end of the stomach with metastases to lymph nodes. In 1938 he was well and working though he required treatment for primary anemia.

(tables 4 and 5). If consideration of this matter is initiated with a reflection that gastric cancer is a grim disease and that survival of even a small group of patients for a year or more beyond the natural course of



the disease is a relatively successful result, detection and removal of the lesion is worth while. If the first recognition of trouble on the part of the patient could be synchronized to the actual beginning of the neoplasm, detection and removal would be decidedly more worth while. At present, detection appears to depend on the natural sensitivity of the patient to internal disturbance, the rapidity of growth of the lesion, the patient's mental attitude toward summoning help and the acumen and thoroughness of his medical consultant. The location of the lesion and its nature, whether ulcerating or

TABLE 4—Type of Operation

Location of Lesion	Total Lesions	Resection		Exploratory Laparotomy	Gastro-Enterotomy	Gastrotomy
		Subtotal	Total			
Cardia and fundus	188	103	7	40	17	11
Media	52	28	2	10	1	11
			(media and fundus)			
Antrum	56	38		8	10	
Prepyloric antrum	20	28		5	6	
Most of stomach involved	10	6	3	1		

infiltrating, probably have considerable influence on the time relationship of the first symptom, but in this series no definite relationship could be established between location of the lesion and its early recognition. If obstruction at the cardia or pylorus occurs or an ulceration in the part of the stomach most involved in motility, the patient has an earlier consciousness of something wrong than if a part of the stomach less vitally concerned with its mechanics is involved, such as the posterior or anterior wall.

The statistics studied here show, unfortunately, no definite relationship of duration of symptoms and diagnosis of lesion to successful outcome, some of the patients who reported their symptoms earliest having died postoperatively after exploration only or removal of very advanced lesions. This fact would seem to frustrate the purpose of this study, which was intended to emphasize the importance of early diagnosis, but to offset the obvious inconsistency, it must be remembered that many potentially good results were thwarted by the necessity of submitting a patient in poor condition to a radical surgical procedure, whereas if the same patients could have had resection when they were in better condition, a large number would undoubtedly have survived. Furthermore, in the case of gastric cancer, with its natural 100 per cent mortality, even one patient in 187 who shows a ten year survival, with complete capacity for work, and several patients with a survival of from one to three years make worth while all efforts toward early detection and treatment.

The second part played by the internist in the treatment of gastric cancer is the management of the patient after resection. The late postoperative care of the subtotally or totally gastrectomized patient consists of encouragement during a long convalescence, practical aid in diet, maintenance of good colonic function, upkeep of nutrition and prevention of anemia. Convalescence is usually more protracted than after most surgical procedures, and this fact, together with the suspicion or knowledge by the patient that his lesion was malignant, usually makes psychotherapy, at least of the casual type, a real necessity. The diet is best

arranged in five small meals in order to avoid overdistention of the jejunum. The anastomosed loop of jejunum is found by fluoroscopic examination to distend moderately without discomfort to the patient and in the totally gastrectomized patient sometimes takes on the appearance of a small stomach. Overdistention, however, produces discomfort and sitophobia. The five meals should consist of the most easily digestible foods and be equal in size and of correct variety to supply all bodily needs. It is important to establish and maintain colonic tranquillity. The commonest form of colonic dysfunction after subtotal or total gastrectomy is diarrhea, and this is often controlled by the use of hydrochloric acid. Constipation is best treated by diet and the use of small rectal injections of oil or saline solution rather than by oral medication, as irritation of the colon may result in symptoms difficult to control and to explain to the apprehensive patient. Nutrition of the partially or totally gastrectomized patient is often maintained only with great difficulty, a fact which usually has no relationship to the nature of the disease, for it is equally true, according to my experience, after gastrectomy for ulcer. A woman in this series who had had total gastrectomy for carcinoma of the fundus had subsequent vomiting and substernal pain due to spasm at the anastomosis of the esophagus and jejunum, which was relieved by dilation of the esophagus, with resultant improvement in nutrition. Secondary anemia is a common sequela of the original disease and the operation and in most cases must be constantly combated. Anemia of the primary type requiring liver therapy occurred in a few cases of this series.

## SUMMARY

1 One should suspect cancer of the stomach in any patient over 30 complaining of any digestive symptom, but especially abdominal distress or loss of appetite and weight.

2 One should not send a tired middle-aged patient away for a rest or long holiday, even though his fatigue is adequately explained by circumstances, without

TABLE 5—Results of Resection (103 Cases\*)

Patient died immediately after operation	31
Patient lived after operation, now dead	41 cases
(2 mo, 2 4 mo, 1 5 mo, 3 6 mo, 1 8 mo, 2 1 yr, 1 12 yr, 13 23 yr, 8 34 yr, 2 45 yr, 3 67 yr, 2 78 yr, 2 10 yr, 1)	
Patient lived after operation, may be living now	18 cases
(3 mo, 1 4 mo, 2 7 mo, 1 8 mo, 1 9 mo, 2 12 yr, 3 23 yr, 3 34 yr, 3 56 yr, 1 78 yr, 1)	
Patient lived after operation, now living	9 cases
(3 mo, 1 6 mo, 1 8 mo, 2 12 yr, 1 23 yr, 1 45 yr, 2 10 yr, 1)	

\* No postoperative report in 4 cases

† Died of coronary disease

examining and reexamining him for cancer of the stomach, and one should not treat the "run down" middle-aged patient for anemia without a thorough study of his digestive tract.

3 One should follow the known achlorhydric patient and the patient with a known healed gastric ulcer with regular check-up examinations to be certain that no gastric malignant growth has occurred.

4 One should educate the patient to the idea of early and repeated examinations if unexplained symptoms persist.

5 In spite of well grounded pessimism regarding the average results in the present day treatment of gastric malignancy, one should regard each patient as an individual for whom the earliest possible diagnosis may result in the longest possible survival

#### ABSTRACT OF DISCUSSION

DR FELIX CUNHA, San Francisco With what Dr Jordan has presented here I am entirely in accord. The emphasizing of the early diagnosis of carcinoma of the stomach is, of course, continuous and insistent and incessant, and that is as it should be. Recently at the University of California there was a one week intensive seminar in gastrointestinal disease and forty-five physicians from the Pacific Coast showed enough interest to attend. Each day attention to early diagnosis of carcinoma was stressed in one way or another. I haven't any doubt that a patient falling into the hands of any of those men would stand a good chance so far as diagnosis of early carcinoma of the stomach is concerned. Gastro-enterologists must find a way to take a message to the physician who either lacks physical equipment to make diagnoses or practices medicine by trial and error. We have to take it to the man who is either temperamentally and intellectually unfit—I mean by that, either lazy or ignorant. He is the man who neglects the time element in arriving at a diagnosis. He diagnoses "indigestion," gives an alkaline powder and tells the patient to come back. The patient comes back unrelieved, and he gives him a different alkaline powder, and it is that interval of delay which seals the patient's fate so far as early diagnosis is concerned.

DR GEORGE M. UNDERWOOD, Dallas, Texas As I read only a few months ago some reports from Guy's Hospital which came out more than a year ago, it occurred to me that it might be interesting to this section to quote from them briefly at present in connection with this paper. In 1929 Dr A. F. Hurst suggested that chronic atrophic gastritis might predispose to carcinoma of the stomach. In America I think not a great many physicians thought much of the idea. I shall go back to the reports, which came out in 1936. The research commission from Guy's Hospital investigated a group of patients in the same economic class for oral sepsis, rapid eating, the eating of highly spiced food, the eating of very hot food and excessive smoking. Now, bearing in mind that the incidence of carcinoma of the stomach in the Netherlands is practically three times that in England, whereas the incidence of carcinoma in general is the same in the two countries, these things were found. Oral sepsis is one and a half times as frequent among the Netherlands, the eating of spiced food and the taking of very hot food, 60 C or hotter, is two and a half times as frequent among the Netherlands and the custom of eating exceedingly rapidly and the habit of smoking to marked excess are five times as great among the Netherlands. I think this emphasizes the conclusions that Dr Jordan made. It emphasizes that the medical man should be a source of education in his community. His influence should be toward studying the small lesion, the small benign ulcer, the small polyp and gastritis. Everything clinically possible should be done to prevent the development of these lesions, as they may later predispose to more serious lesions.

DR SARA M. JORDAN, Boston I thank Drs Cunha and Underwood for their discussions. There are two things more I should like to say about the study. 1 I felt it necessary, after studying the data, to follow the known achlorhydric patients by frequent x-ray examination because several patients with cancer of the stomach were known in previous years to have had achlorhydria. 2 I tried to make some correlation between the duration of symptoms and the operability of the lesion and, unfortunately, was not able to do so. This vitates, in a way, my theme which is a plea for early diagnosis, except that in each case it, of course, would have been an advantage to the individual subject to have an earlier diagnosis. Therefore if I may be a little facetious, the whole plea for early diagnosis is one for rugged individualism in the treatment of cancer of the stomach with a disregard for the average discouraging prognosis of the disease.

## FRACTURES OF THE LOWER END OF THE HUMERUS

GEORGE J. GARCEAU, M.D.

INDIANAPOLIS

It appears that physicians in general fear fractures of the lower end of the humerus. Many practitioners must treat these fractures in their communities. Often they ask the question "In what type of fractures about the elbow should I assume the full responsibility?" A knowledge of the prognosis would help them to select the fractures which are attended with the least danger. The treatment of supracondylar fractures is different from that of fractures of the lateral or medial condyle. This fact should also be of some help.

This paper, based on an analysis of 133 fractures involving the condylar region of the elbow, is an attempt to answer this question.

One hundred and seven or 80.5 per cent, of the 133 fractures were of the supracondylar and epiphyseal

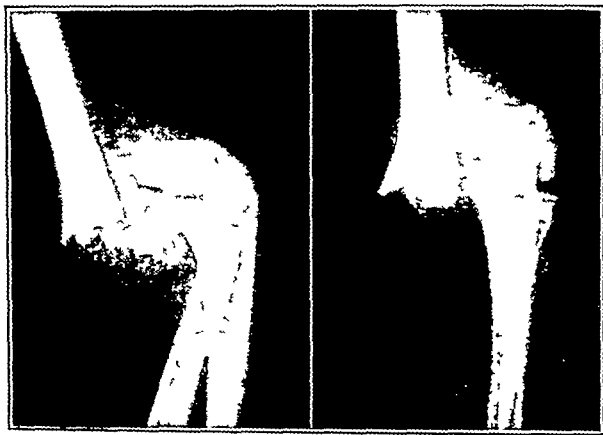


Fig. 1 (case 1)—Supracondylar fracture of the left humerus

separation type. Fifteen, or 11.2 per cent, involved only the lateral condyle. Eleven, or 8.2 per cent, were fractures of the medial condyle.

#### SUPRACONDYLAR FRACTURE

The average age of patients with supracondylar fracture was 8.1 years. The youngest patient was 2 years old and the oldest 17. Eighty-four, or 78.5 per cent, were between the ages of 4 and 11 years. Ten were older than 13 years.

It is generally understood, and I thought correctly so, that if supracondylar fractures are fairly well reduced a satisfactory result will be obtained. I have compared the degree of reduction with the final result.

For comparison I have classified the reductions as shown by roentgenogram as excellent, good and fair. An anatomic restoration was called excellent. One with complete correction of the lateral or medial displacement of the lower fragment but with incomplete reduction as seen in the lateral plane was called good. Incomplete reduction in all angles was classified as fair.

In the supracondylar group, fifty-four reductions (50.5 per cent) were excellent. Of these, in 94.4 per cent there were excellent end results, and no unsatis-

From the Indiana University School of Medicine.  
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factory results occurred. In contrast, there were only 48.4 per cent excellent results in the group classified as good reductions. In the fair reductions there were only 9 per cent excellent results. This comparison would make one reflect on the statement that a fairly well reduced supracondylar fracture will give a satisfactory elbow. It is true that many elbows so treated

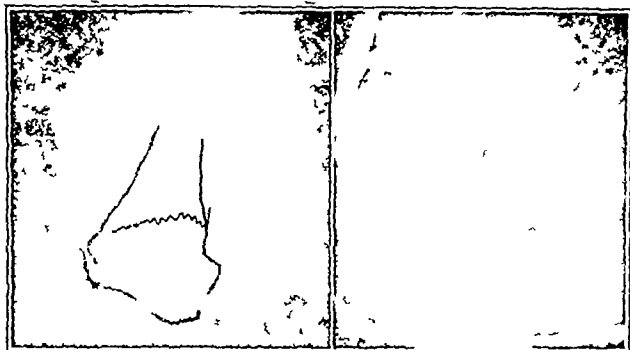


Fig. 2 (case 1)—Supracondylar fracture of the left humerus reduced by manipulation.

have excellent function but if deformity is present the result cannot be classified as excellent. Twenty-five of the 107 elbows had normal range of motion but had slight to very noticeable valgus or varus deformity after two years. These results have been classified as good or fair.

In the group of 107 cases the results were as follows: sixty-eight (63.5 per cent) excellent, twenty-four (22.4 per cent) good, twelve (11.2 per cent) fair and three (2.8 per cent) poor. Of the patients with poor results, one underwent amputation of the arm for gas gangrene with recovery, one had Volkmann's ischemic contracture and one has poor function with disability. Of the



Fig. 3 (case 1)—Excellent result. The line of fracture can be seen growing away from the elbow. There is a disturbance of the trochlear epiphysis.

twenty-five elbows with deformity, fourteen have visible angulation, eleven have valgus and three have varus deformity.

Seven of the twelve patients with fair results have limitation of motion and all have either valgus or varus deformity. Limitation of flexion will disappear with growth in cases in which the limitation is due to an anterior bone block at the lower end of the upper fragment.

Eight of the 107 patients required open operation owing to delayed reduction. Late open reduction is followed by slow restoration of function. The prognosis in supracondylar fracture of the humerus is good if early and accurate reduction is obtained.

The complications encountered were few. One patient had palsy of the radial nerve and recovered after neurolysis. One with palsy of the median nerve recovered spontaneously in about three months. Two elbows showed signs of ischemia. One was opened and the bicipital fascia was sectioned, resulting in excellent recovery. In the one which was treated without operation typical Volkmann's ischemic contracture developed. Myositis ossificans was not noted.

My plan of treatment is early reduction. Even when great swelling is present, reduction is attempted. Delay of three or four days makes reduction difficult, owing to induration of soft tissues and contracture of the triceps muscle and tendon.

The displacement of the lower fragment was backward, upward and often medial or lateral. In no instance in this series was the lower fragment displaced anteriorly.

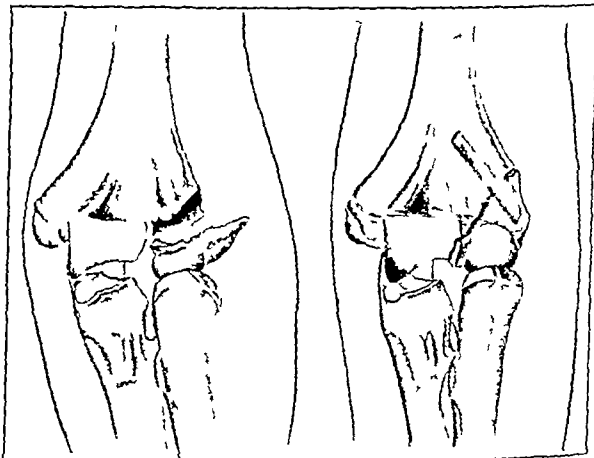


Fig. 4 (case 2)—Fracture of the lateral condyle in a girl aged 11 years.

Under general anesthesia the laterally or medially displaced lower fragment is brought directly behind the shaft of the humerus. The elbow is extended and traction applied to the forearm. The elbow is then slowly flexed while both thumbs push downward and forward against the condyles, thus correcting the upward and backward displacement. The tendency is to correct incompletely the lateral displacement of the lower fragment. The arm is immobilized in a slightly padded posterior molded plaster splint, the elbow flexed from 45 to 70 degrees, and the forearm semipronated. The pronation relaxes the bicipital fascia. If the swelling is great, flexion of the elbow must be less. A roentgenogram is immediately taken, and if the reduction is not satisfactory the manipulation is repeated. Lateral or medial displacement of the lower fragment will result in valgus or varus deformity. Complete immobilization is maintained for at least three weeks. At the end of five weeks, support is discontinued. Heat massage and active motion are used but forceful passive motion is not employed. Physical therapy is not used extensively.

Volkmann's ischemic contracture is the most dreaded complication. A palpable radial pulse does not indicate

that ischemia is not impending. The contracture is due to the fibrosis of muscle tissue from anoxia. The venous obstruction may result from impingement of the lower end of the upper fragment onto the cubital veins, injury to the cubital veins, swelling or pressure from a hematoma under the antibrachial fascia. The venous return is blocked, resulting in the bursting of capil-



Fig. 5 (case 2)—Fracture of the lateral condyle treated by open reduction pinned with a beef bone peg.

laries in the muscle tissue. Pain, dusky blue discoloration, swelling, coldness of the hand, diminished tactile sense and diminished voluntary motion of the fingers are the danger signs. When these are present, flexion of the elbow should be decreased and, if improvement is not rapid, section of the bicipital fascia is indicated. Delay results in irreparable damage. Splintage may be a contributory cause but is seldom the primary cause of Volkmann's contracture. Early reduction, elevation of the arm or, if necessary, section of the bicipital fascia will lower the incidence of ischemic contracture.

#### FRACTURES OF THE MEDIAL CONDYLE

There were eleven fractures of the medial condyle, 82 per cent of the series. The ages ranged from 2 to 15 years and averaged 8.2 years. The displacement was mild in five cases and considerable in six. The results were excellent in 45.5 per cent, good in 45.5 per cent and poor in 9 per cent (one case). There were four open reductions with internal fixation, with end results classified as good. The patient with a poor result should have had internal fixation. One patient had palsy of the ulnar nerve at the first examination but recovered spontaneously in about six months. Medial condylar fractures with displacement should be opened and internal fixation of the fragment used.

#### FRACTURES OF THE LATERAL CONDYLE

Fractures of the lateral condyle offer a more formidable problem. Many excellent contributions have appeared on this subject, especially those of Speed and Macey<sup>1</sup> and Wilson.<sup>2</sup> Lateral condylar fracture with displacement is considered to indicate open reduction and internal fixation with a nail, bone or ivory peg.

There were fifteen (11.2 per cent) lateral condylar fractures in this group. The average age was 8.5 years. Six patients (40 per cent) with considerable displacement were treated by open reduction. Of these, two have excellent and four have good results. For nine with little displacement of fragments reduction by closed manipulation was used. Of these, two have excellent, three good, two fair and two poor results. The two patients with poor results have anterior displacement of the condyle with union. One patient with a functionally fair result has nonunion. The prognosis in fractures of a single condyle, even with open reduction and pinning, is not so favorable as in the supracondylar type. This type of fracture, as seen in the roentgenogram, does not appear as serious as the supracondylar fracture. No neural lesions were observed in this group.

Analysis of cases for epiphyseal disturbance revealed fourteen instances. The epiphyseal architecture at the lower end of the humerus is complicated. There are at least four important centers of ossification: the two epicondyles, that of the trochlea and the epiphysis of the capitellum. It is not surprising that the epiphyses are often involved in the so-called supracondylar and always in the single condylar fractures. The fourteen patients with cubitus valgus and varus had disturbance of growth. The deformity could not be entirely accounted for by displacement laterally or medially. The anteroposterior views demonstrated excellent reposition of the lower fragment. The deformity increased in two years. I believe this was due to arrested or delayed growth at the epiphysis.

#### SUMMARY

1. Supracondylar fractures of the elbow must be differentiated from single condylar fractures.



Fig. 6 (case 2)—Result excellent, no deformity being present after fifteen months.

2. Supracondylar fractures should be reduced accurately and early. Lateral or medial displacement of the lower fragment must be avoided to prevent deformity, especially when the epiphysis is involved.

3. Single condylar fractures with displacement are best treated by early open reduction and internal fixation.

4. Volkmann's ischemic contracture is due to obstruction to venous circulation in the forearm. Early reduction is the best prophylaxis.

<sup>1</sup> Speed, I. S. and Macey, H. B. Fractures of the Humeral Condyles in Children. *J. Bone & Joint Surg.* 15: 905 (Oct.) 1933.

<sup>2</sup> Wilson, P. D. Fractures and Dislocations in the Region of the Elbow. *Surg., Gynec. & Obst.* 56: 335 (Feb.) 1933.

5 Epiphysial disturbance may be expected in a small percentage of cases

6 The physician can utilize the prognosis as a guide in assuming full responsibility for treatment

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#### ABSTRACT OF DISCUSSION

DR J. H. DORMAN, Dallas, Texas I believe that the reason better treatment for fractures is not had is that fractures as a subject are entitled to a place of their own and should be taught better. The student should be made to realize the importance of proper treatment in the first service rendered, as this is the all important service and must be rendered by the man on the ground. Such service can be rendered by the specialist only in a comparatively few instances.

DR H. W. SPIERS, Los Angeles Dr Garceau has presented an excellent review of his rather large series of fractures of the lower end of the humerus of children. His effort to answer the question of the general practitioner "In what type of fractures of the elbow joint should I assume full responsibility?" is a praiseworthy one. There are so many pitfalls to avoid in the successful care of fractures of the elbow in youth that one hesitates to be at all dogmatic. One thing seems certain. Excellent early reduction and maintenance of reduction will secure a good anatomic and functional end result. It might be well said "Call for help when reduction is difficult and not satisfactorily maintained." My experience coincides with that of Dr Garceau in that single condylar fractures with displacement require early open reduction and fixation. This is not always an easy procedure. With the capitellum it is sometimes almost impossible. Here in California the medicolegal problem in connection with fractures in children is a serious one. The statute of limitation for minors does not hold until the person has passed his twenty-second birthday. I should have liked to hear Dr Garceau say something about the difficulties of x-ray diagnosis of fractures about the elbow in childhood. Many of the problems of malunion that have been encountered are based on this diagnostic difficulty. It has been my routine to roentgenograph the opposite elbow for comparison when the condition is doubtful. The epiphyses about the elbow are numerous. Consolidation of these makes an ever changing picture. Fractures through the epiphyses and cartilage often are not readily apparent. The angle of the capitellum and the shaft changes as growth takes place. The foundation of Dr Garceau's entire summary is predicated on accurate x-ray diagnosis. To me this item seems tremendously important in assuming responsibility. The author has given the unvarnished end results of his experience. I am in agreement with them, however, I would suggest to the average general practitioner that he be fully awake to the load he must carry if he treats complicated fractures of the elbow of children.

DR J. ALBERT KEY, St. Louis I do not know why Dr Garceau did not include fractures of the epicondyle of the humerus with the fragment displaced into the elbow joint. In cases I have observed it has been necessary to open the joint, get that fragment out and fix it back in place. Dr Garceau made the statement that Volkmann's ischemic contracture is due to venous obstruction, and that has been the general opinion since Barney Brooks reported his experimental work in which he tied off the veins to the gastrocnemius muscle in the dog. A month ago I opened the forearm of a boy 10 years old who had had a supracondylar fracture previously and who had a perfect anatomic reduction with immobilization in acute flexion. When I saw him three weeks later he had complete paralysis of his median and ulnar nerves and typical Volkmann's ischemic contracture. I performed neurolysis of these nerves from the wrist to a point above the elbow, and the muscles looked like the white meat of a chicken. The amazing thing to me was the relatively slight bleeding. I was delayed considerably in my operation by attempting to preserve the radial and ulnar arteries. I started from the bottom because it seemed to me that that was the easiest place

to find these nerves. By the time I got up to the elbow I began looking for the brachial artery and I could not find it. It was not until that dissection was carried 3 inches above the elbow that I was able to get a pulsating brachial artery. In other words, this Volkmann's paralysis occurred in the presence of total occlusion of the artery and not of the veins. It was stated that the hand had not been noticeably swollen at any time.

DR HUGH T. JONES, Los Angeles Another word about Volkmann's ischemic contracture. Not long ago I was called to see a child who on a Sunday night had sustained a fracture of the elbow. The general practitioner in charge had watched the arm until Wednesday night. There had been a radial pulse. Wednesday night. Thursday morning, very early, it was absent. I saw the patient about 5 a. m. I reduced the fracture, using Kirschner wires. There were signs of paralysis of the median nerve. Neurolysis was done. I also tried to expose the brachial artery. I had trouble too in finding it, but cut the fascia of the biceps and was sure that I had relieved all pressure about this artery. Still there was no return of the radial pulse. It worried me a great deal. I closed the wound. In the course of the morning a positive and negative pressure apparatus was used without help. In the afternoon the child still did not have a radial pulse. The stitches were taken out of the skin of the wound, and immediately the radial pulse came back. It happened that the skin had stretched to its elastic limits and was acting as a tourniquet about that arm, because the second that I took those stitches out of the skin the radial pulse returned. So I am sure along with Dr Key, that I had encountered a case in which the brachial artery was at fault instead of the vein.

DR STEIFF F. STEWART, Los Angeles I want to stress again the points concerning Volkmann's ischemic contracture. First, I feel that in case of a rapidly swelling forearm fascial decompression should be done at the earliest possible moment, second I agree with Dr Key as to the importance of the brachial artery and wish to record one case in which Volkmann's ischemic contracture followed a compound fracture and division of the brachial artery in the midarm.

DR GEORGE J. GARCEAU, Indianapolis Difficulty is often encountered in obtaining satisfactory anteroposterior roentgenograms, which are necessary in order to estimate the degree of reduction. I often take roentgenograms of the opposite elbow for comparison. Drs. Key, Jones and Stewart believe that injury to the artery may cause Volkmann's contracture. I agree with that opinion. It is my belief that the contracture is the result of anoxia and, of course, arterial occlusion will cause anoxia. The artery may be injured by the lower end of the upper fragment. It may be torn. I have opened such forearms and found the muscles full of bloody exudate. In one such case the artery was patent. I doubt very much that splintage is a primary cause of Volkmann's contracture. I believe that the original injury is the cause and not the method of treatment.

**Prevention of Malaria in Italian Troops**—In the recent war in Ethiopia malaria did not give very serious concern, although on the northern front a number of zones were badly malarial and on the southern front all the zones were terribly malarial, the disease being absolutely general among the indigenous Somali population. With a white army approximating half a million men there were 1,241 cases of primary malaria admitted to hospital and 1,093 admissions for relapses, with twenty-three deaths from pernicious forms, including black water fever, which was extremely rare. What were the prophylactic measures taken? With the troops continuously on the move and the area of operations being enormously extended mosquito nets and antilarval measures were often impossible. From the beginning we insisted on quinine prophylaxis every soldier received three tablets a day of quinine sulfate or bichlorohydrate, each tablet containing 0.2 Gm (3 grains). The men also knew that we could find out whether they had taken quinine or not. They were frequently paraded and one in every ten or twenty men was made to pass urine. This was tested with Tanret's reagent on adding a few drops of this reagent, if quinine has been taken, the urine becomes turbid, if quinine has not been taken the urine remains clear—Castellani, Sir Aldo. *J. Roy. Nat. Med. Serv.* 24:304 (Oct) 1938.

## Clinical Notes, Suggestions and New Instruments

### LOSS OF SUBCUTANEOUS FAT OF THE LOWER EXTREMITIES (LIPODYSTROPHY)

JOHN A. BIGLER, M.D., CHICAGO

Lipodystrophy is a disorder in which there is a loss of subcutaneous fat. The loss is absolute in that in the affected areas there is a complete absence of the subcutaneous tissue fat. None of the other tissues seem to be involved. The face is affected most commonly and more markedly than other parts of the body. The absence of fat is not congenital, because in affected persons the fat has previously been present in the regions from which it disappears. In some reported cases there has been an apparent increase in the fat of the lower part of the body. The condition is undoubtedly a disease entity rather than a symptom complex because of the absence of any other clinical, physical or pathologic manifestations. In association with other diseases there may be a marked decrease in the amount of subcutaneous fat but the fat loss is never absolute. The disorder is not familial, and there is no impairment of the health. The onset usually occurs from the fourth to the eighth year of age. The case here reported is unique in that, while there is the typical loss of subcutaneous fat, only the lower legs are affected, the face and upper parts of the body being normal. I have been unable to find any record in the literature of a similar case.

N. M., an Italian girl born Sept. 23, 1923, was first seen in the Children's Memorial Hospital outpatient department Sept. 13, 1935. The only complaint was of underweight. There had apparently been normal development and nutrition until the age of 8 years. Since then there had been a progressing thinness, this being most marked in the lower extremities. The mother said that because the family was very poor the child did not get enough to eat. There was no loss of appetite. The birth was normal. There was a history of chickenpox at the age of 2 years, mumps at the age of 3 years and measles at the age of 5 years. There had been no illness near the time the loss of weight was first noticed. Three sisters and two brothers all older than the patient were apparently normal. The mother and father were living and well.

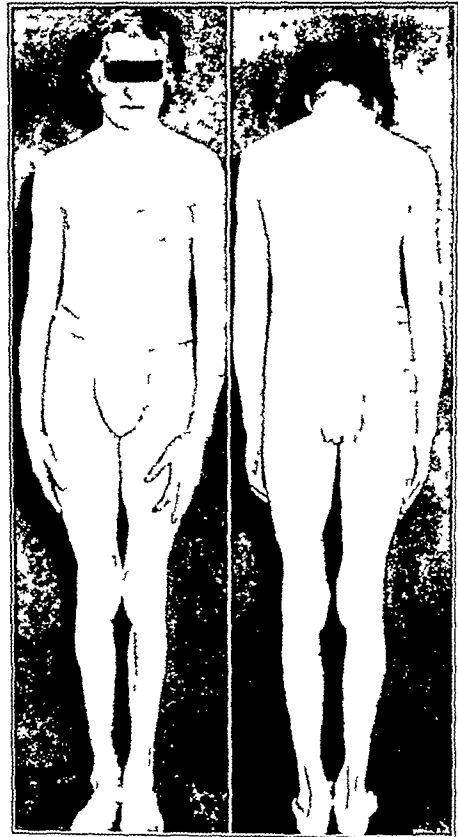
Physical examination revealed that the child was very thin, she was 56 inches (142 cm) tall and weighed only 59 pounds (27 Kg). The lower extremities appeared emaciated in contrast to the degree of malnutrition of the rest of the body. The skin was of normal color and was soft and elastic everywhere. Over the lower part of the legs it was extremely thin as compared with that of the rest of the body, although marked malnutrition was present. The reflexes were normal, as was the muscular power. Cutaneous sensation was normal. The veins and muscles were easily visible through the thin skin of the lower part of the legs. The examination was otherwise normal. The child was active and not physically handicapped.

The basal metabolism rate was plus 11. The intelligence quotient was rated as 77 per cent. The red blood cells numbered 5,440,000 and the white blood cells 7,600 per cubic millimeter. The differential count showed 50 per cent polymorphonuclears, 27 per cent lymphocytes, 16 per cent monocytes, 6 per cent eosinophils and 1 per cent basophils. The Wassermann and Kahn reactions of the blood were negative. The Pirquet, Schick and Dick reactions were negative.

A section of skin taken down to the muscle fascia from the calf of the left leg appeared normal except for a complete absence of fat. A section taken from the area above the left knee where the skin shows an abrupt change in its thickness was normal grossly and the fat was of the usual yellow color. The fat varied from 1.5 to 0.5 cm in thickness. On microscopic examination the section of skin from the calf revealed a complete absence of fat in the skin and subcutaneous tissue. The hair follicles contained a small amount of fat staining material. Where the subcutaneous fat should have been there were a few layers of a loose fibrous network. In every other respect the

sections were normal. In the sections taken from the thigh the skin appeared normal, as did the fat layer. The fat stained normally, and the fat cells were of the usual size. No changes could be seen to account for the decrease in the subcutaneous fat, although these sections were taken from an area which had partially undergone loss of fat. The microscopic diagnosis was complete loss of subcutaneous fat.

After more food was furnished to the family the child's weight increased to 67½ pounds (30.5 Kg) and the height to 57 inches (145 cm) in five months. The contrast between the nutrition of the lower legs and that of the rest of the body was more marked than previously. After the child had spent one year at a farm school, the weight increased to 90 pounds (41 Kg) and the height to 61.2 inches (155 cm). At this time the child was well nourished, even plump, down to the lower third of the thighs. From there down the lower legs still appeared emaciated, as did the feet.



Patient weighing 90 pounds (41 kg) and 61 inches (155 cm) in height. Note the extreme thinness of the lower legs as compared with the rest of body.

The gradation from the normally thick to the thin skin takes place rather sharply above the knees. Curiously, there is a small area anteriorly below the knees on both legs where the skin is of nearly normal thickness. The affected skin feels normal except for the loss of fat. Because of the thinness of the skin the veins are prominent and the muscles stand out. Menstruation has not begun but the breasts are moderately developed and the other prepubertal changes are present. There is no muscular weakness, and except for the loss of subcutaneous fat the child is healthy and normal. The illustration shows her as she appears now with the well marked contrast between the lower legs and the rest of the body.

Lipodystrophy is not an uncommon disease. Approximately 100 cases have been reported and undoubtedly many more have been observed. The skin of the face, neck, and thorax is most commonly affected but there may be extension to involve the scalp and arms and the trunk down to the iliac crests. Twelve cases in which there was involvement of the skin of the face, neck, and even the thorax have been observed at the Children's Memorial Hospital.

It seems that only rarely does the loss of subcutaneous fat extend from above to include the thighs because only three such cases have been reported. Watson and his associates<sup>1</sup> had a 38 year old patient with involvement of the face, neck and trunk and the thighs down to the tibial tuberosities. There was thought to be extra fat below the knees. In Christiansen's<sup>2</sup> 40 year old patient the loss of fat involved the face, upper part of the arms, trunk and thighs. Microscopic sections of the skin of the arm and thigh revealed a complete absence of fat. A boy 14 years old with involvement of the whole trunk and the upper part of the thighs was observed by Leipoldt.<sup>3</sup> In a case reported by Gilchrist<sup>4</sup> there was a loss of subcutaneous fat in various-sized localized areas of the legs. This case was not typical of lipodystrophy in that there was evidence of some peculiar type of infectious process.

The etiology of the loss of subcutaneous fat is unknown. Postmortem studies and tests of the body chemistry, including both fat and carbohydrate metabolism have all given negative results in such cases. The following theories have been advanced to explain the loss of fat: 1 There is a local disturbance in the subcutaneous tissue interfering with the normal disposition of fat but in these cases fat is actually absorbed. 2 There is a dysfunction of one or more of the endocrine glands. When glandular dysfunctions are present there is usually an increased deposit of fat rather than complete loss of fat. Also if the loss is on an endocrine basis there is no reason why it should always be localized and never general in distribution. 3 There is a disturbance of the trophic nerve mechanism having to do with fat distribution and metabolism. It has been suggested that there may be a center in the midbrain in the region of the floor of the third ventricle for the control of fat metabolism and distribution. If such a center exists it is peculiar that in all the cases of lipodystrophy so far reported the loss of fat extended from the upper portion of the body downward and that in no case was it generalized. One may reasonably ask why involvement of the lower extremities alone is so rare.

Lipodystrophy is easily differentiated from cachexia in that the latter condition is of general distribution and although there is a decrease in subcutaneous fat the fat is never completely absent. No form of therapy is known which is of benefit in the case of lipodystrophy.

707 Fullerton Avenue

## RUPTURED TUBAL PREGNANCY

A HELPFUL DIAGNOSTIC SIGN

LEO BRADY, M.D. BALTIMORE

Almost twenty years ago T. S. Cullen<sup>1</sup> drew attention to bluish discoloration of the umbilicus as a sign of ruptured extra-uterine pregnancy and even though this sign is shown by only a small percentage of the patients with tubal gestation nevertheless quite a large number of cases showing bluish discoloration of the umbilicus have been now observed and reported. Hence I would hesitate to increase the already large number of reports of such cases were it not that a patient whom I recently had under my care showed a Cullen sign which differed from the majority of the cases already reported in that the discoloration of the skin and subcutaneous tissue did not appear at or around the umbilicus or in a postoperative hernia but in a thin spot in the abdominal wall which had developed as the result of an operation for a ruptured appendix. A careful study of the literature revealed that only two such cases have been previously reported, one in 1932 by Schmitz<sup>2</sup> and the second in 1935 by Smith and Wright.<sup>3</sup>

<sup>1</sup> Watson W. N. B. and Ritchie W. T. *Progressive Lipodystrophy* Quart. J. Med. 18: 224 (Jan.) 1925.

<sup>2</sup> Christiansen V. *Rev. neurol.* 38: 1169 (Sept.) 1922.

<sup>3</sup> Leipoldt C. L. *Notes on a Case of Lipodystrophia Progressiva* South African M. J. 15: 161 (Feb.) 1920.

<sup>4</sup> Gilchrist I. C. and Ketron L. W. *A Unique Case of Atrophy of the Skin Preceded by the Ingestion of the Fat by Large Phagocytic Cells—Macrophages* Bull. Johns Hopkins Hosp. 26: 291 (Oct.) 1916.

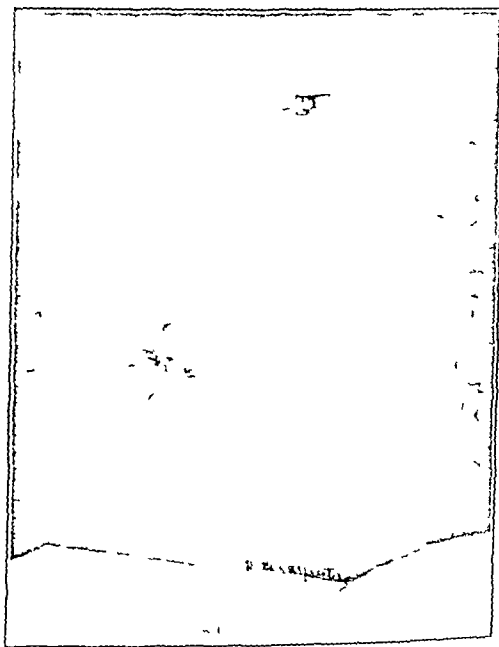
<sup>1</sup> Cullen T. S. *Bluish Discoloration of the Umbilicus as a Diagnostic Sign where Ruptured Extra Uterine Pregnancy Exists* Contributions to Medical and Biological Research Dedicated to Sir William Osler on his Seventieth Birthday. New York: Paul B. Hoeber 1919.

<sup>2</sup> Schmitz Elisabeth. *Zur Diagnostik der rupturierten Extrauterine graviditat* Med. Klin. 28: 736 (May 27) 1932.

<sup>3</sup> Smith Irwin and Wright F. J. *Cullen's Sign in Ruptured Ectopic Gestation* Lancet. 1: 930 (April 20) 1935.

A summary of my case is as follows: Mrs. A. S., aged 35, was admitted to the Johns Hopkins Hospital April 17, 1938, complaining of pain in the lower abdomen and irregular uterine bleeding. She had been operated on for a ruptured appendix in 1923. The rest of her past history was unimportant. Up until the time of the present illness the menstrual periods had come regularly and had lasted four days, and there had been no bleeding between the periods. The patient had never suffered from dysmenorrhea. The March menstrual period, which was due on the thirteenth, did not start until the twenty-fourth but when the patient did commence to bleed she continued to do so until she was admitted to the hospital three weeks later. During these three weeks she had recurring attacks of sharp pain in the lower part of the abdomen. There had been pain on defecation but no dysuria. There was no history of weakness or fainting spells.

The patient volunteered the information that one week before she entered the hospital that is about two weeks after the onset of the irregular bleeding she had noticed that the old operative scar had turned bluish black. She added that the bluish black in the scar had been gradually getting less between the time she first noticed it and the time she entered the hospital.



Cullen sign appearing in a postoperative scar in a case of ruptured tubal pregnancy. The color is most intense in the center of the scar and fades out in the tissues around the scar. The umbilicus is normal.

On admission to the ward the patient did not appear to be in shock. Her temperature was 98.6 F and her pulse rate 80 to the minute. The hemoglobin was 84 per cent and the leukocyte count 9000. The breasts showed colostrum. The abdomen was not distended and the respiratory movements were free. The right lower quadrant of the abdomen presented a remarkable appearance. The center of the postoperative scar was bluish black, while the surrounding area showed different hues of color, such as are seen in a fading bruise. The umbilicus itself was normal in appearance. There was no hernia in the postoperative scar but the abdominal wall was thin in this region. There was definite tenderness on palpation over the lower part of the abdomen.

On vaginal examination the cervix was soft. The body of the uterus was forward and slightly enlarged. There was marked tenderness on pelvic examination and in the left fornix a soft sausage shaped mass could be felt. A diagnosis of a ruptured left tubal pregnancy was made.

The drawing shows the appearance of the abdomen before operation. The bluish black discoloration of the scar made me feel confident that my diagnosis of ruptured tubal pregnancy was correct, even though I was aware that occasionally other conditions, such as bleeding from an ovary, may cause intra abdominal hemorrhage and thus may produce a Cullen sign.



At operation about 200 cc of old blood was found in the pelvis. The omentum was adherent along the old operative scar. The left tube was the site of an ectopic pregnancy. The rupture had occurred in the tube near its distal end. The left fallopian tube was removed. The patient's convalescence was uncomplicated and she was discharged on the sixteenth day after operation. While the patient was in the hospital the bluish black discoloration in the old scar gradually lessened, but it was still apparent when she was discharged and did not disappear until the patient had been home about two weeks.

#### SUMMARY

In a case in which the typical bluish black discoloration of the skin and subcutaneous tissue first described by Cullen as indicating intraperitoneal hemorrhage was seen the discoloration occurred in a weak spot in a right rectus scar and not at the umbilicus. There was no postoperative hernia. It would seem therefore, that in cases in which intra-abdominal hemorrhage is suspected the Cullen sign should be looked for not only at the umbilicus but also in any weak spots in the abdominal wall such as sometimes result from abdominal operations even when there is no hernia present.

Medical Arts Building

## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS  
HOWARD A. CARTER, Secretary

### ALLERGIA PILLOWS AND MATTRESSES ACCEPTABLE

Manufacturer: Allergia Products Company, 99 Chapel Street, Newton, Mass.

Allergia Pillows and Mattresses are recommended to give relief from allergic disturbances which are caused or aggravated by the irritation of dust generated by normally used bedding fillers. It is claimed that Allergia Products Company employs a pure silk fiber which has the inherent property of not breaking down into dust so readily as do commonly employed filler materials. The filler is encased within a diastaford woven tick, the latter having been processed to render it normally free of sizing dust and starch which are generally considered to be allergic irritants.

An Allergia mattress is made in much the same way as any other mattress but differs in the respect that any materials which may offer an allergic disturbance have been omitted and materials which are known to be relatively free from irritating dust are used in their place. These mattresses are made with an inner spring unit which is covered with deep layers of filling material both top and bottom.

The firm claims, further, that its products provide relief in approximately 98 per cent of the cases in which the individual is sensitive to house dust. In this connection the firm states that it is mindful of the fact that of all allergic persons who are sensitive to house dust there are approximately 2 per cent who are allergic to silk. The firm believes that those who are sensitive to silk are sensitive to it in some other form than that used in Allergia filling material. For example, those who might be sensitive to a cutaneous contact with silk would not be apt to be sensitive to it within a pillow ticking.

To support the claim that the pure silk fiber used in Allergia products has the inherent property of not breaking down into dust so readily as do the other commonly used filling materials the firm submitted a box of Allergia filling material which had been in use in a mattress for over two years. This was referred along with the pillow and mattress to a qualified investigator appointed by the Council. The following report on the product was submitted:

Saline extracts were made from the new material and from that which had been in use in a pillow for two years in accordance with the usual technique employed in making house dust

extracts. This consists of placing a handful of the material in a pint jar and wetting it thoroughly with physiologic solution of sodium chloride containing 0.4 per cent phenol. Sufficient additional fluid is added so that the jar will be filled about one-eighth inch above the soaked material. The surface is covered with toluene, the jar is covered and the extraction is allowed to proceed for twenty-four hours. The saline extract is then squeezed out and is filtered through a Seitz filter. In this way a solution of the active material, as nearly saturated as possible, is obtained. This material is used intradermally, undiluted.

Five extremely house dust sensitive allergic persons were tested with extracts from both of the materials referred to and it was found that, whereas there were no reactions to the new material, relatively large and significant reactions were obtained to the extract of the material which had been used for two years with four of the allergic persons.

Since it was desirable to eliminate any error due to some irritating material which might be present in the used sample, both extracts were then dialyzed against distilled water for forty-eight hours. The salt content was then brought up to 0.85 per cent and further tests were made on the same five patients with the same result. Good reactions were not obtained with other patients given very small or indifferent tests to house dust and, while some of the active material which is called house dust is formed in the Allergia material, it is present in much less concentration than in a cotton mattress or pillow in use for the same length of time.

It is worth while to state that there is no such thing as a nonallergic substance. There can be only substances which are less likely to be the cause of sensitivity than others. The Allergia pillows and mattresses seem to belong to the latter category.

As a practical measure any bed may be rendered efficient and satisfactory for the house dust sensitive patient by completely encasing the mattress and pillows in any impervious material.

In view of the foregoing report, the Council on Physical Therapy voted to accept the Allergia Pillows and Mattresses for inclusion in its list of accepted devices.

### MEDICOPASTE BANDAGE ACCEPTABLE

Manufacturer: Medicosane Laboratories, 1472 Broadway, New York

Medicopaste Bandage is an adhesive gauze bandage impregnated with zinc oxide paste (Unna's boot). The bandage proper is wrapped in four layers of wax paper and placed in an airtight can. It is a 4 inch bandage available in 7 or 10 yard lengths. The active ingredients include zinc oxide, glycerin and 0.1 per cent each of phenol (carbolic acid) and formaldehyde as preservatives. The melting point of the medicinal paste is lowered so that it stays liquid at usual room temperatures and needs no heating. Thus the wet bandage may be applied in the form of an Unna boot without heating or painting. It is white.

The company recommends it as a means of applying a firm yet resilient compression dressing or mechanical support which will not yield to the expansion pressure of swelling. It aids the circulation by applying an even continuous pressure. In addition, it is claimed that the paste stimulates healing and is nonirritating to the skin.

Principal indications for its use, according to the firm, are vascular inflamed varicose veins, thrombophlebitis, ulcers, swellings, postfractures, foot ailments and eczemas. Other possibilities of use include sprains, prophylactic dressings in threatened thrombophlebitis, dressings on other parts of the body and in unpadded plaster of Paris casts as an intermediate layer between the skin and the cast. This product was examined and tried in clinical practice and found useful for the treatment of thrombophlebitis and ulcers and apparently fulfils the requirements of a firm elastic resilient support.

In view of the foregoing report the Council on Physical Therapy voted to include the Medicopaste Gauze Bandage in its list of accepted devices.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, FEBRUARY 18, 1939

## THE AMERICAN MEDICAL ASSOCIATION STUDY OF MEDICAL CARE

Reports received on the American Medical Association Study of Need and Supply of Medical Care already cover a far larger sample of the population than has been covered by any previous survey. This is the first survey that has asked and obtained information from all groups in the population definitely interested in medical care. Many who should know better still repeat the falsehood that this survey requests information from physicians only and insinuate that doctors know nothing about those who do not come to the physician's office.

Only one of the nine forms used in this survey is directed to physicians and dentists. The others are sent to hospitals, nurses, health departments, welfare and relief agencies, schools both public and parochial, colleges and universities, fraternal and similar organizations, and pharmacists. All these are asked for information concerning persons unable to obtain needed and desired medical care. Not one significant source of first hand, reliable information as to medical conditions has been omitted.

The returns from the eight forms sent to others than physicians are uniformly much more complete than those from the physicians and dentists. It is not at all uncommon for a county medical society to receive 100 per cent replies from these institutions and individuals, while no such percentage of returns has ever been obtained from physicians and dentists.

However much generalized discussion and disagreement there may have been between representatives of some of these institutions and the medical profession as to the extent of medical care, individual managers of hospitals, welfare organizations and similar bodies when asked to report definitely and specifically regarding the conditions with which they are personally familiar agree to a remarkable extent with physicians. In no report so far received has there been any sharp disagreement as to need for additional medical services where such exists and as to the absence of such need in localities where adequate provision of medical care now exists.

The most general lack of medical care that is reported is with regard to insufficient appropriations for poor relief or governmental institutions. The impression is gained from a reading of the reports—which have not as yet been tabulated to make such a conclusion absolutely certain—that the most important obstacles in the way of those who need medical care are the red tape and official regulations which restrict the giving of medical care.

Another striking observation is the large number of counties in which all sources of information agree that no one in the locality who desires and seeks medical care is denied it. The road to such care may be obstructed by the red tape and regulations already mentioned, and there is need to clear away these obstacles but there is no locality in which any organization even suggests that "one third of the population" is unable to obtain medical service.

## BRONCHIECTASIS

The essential abnormality in bronchiectasis according to Kline,<sup>1</sup> is the absence, atrophy, damage or destruction of elastic and muscular tissues of the bronchial wall. Usually severe inflammation of the various coats occurs first with damage or destruction of the elastic and muscular tissues. Finally there is complete destruction of a portion or all of the bronchial wall, associated with inflammatory and chronic changes of the regional pulmonary parenchyma. In children staphylococci, in adults the Miller-Vincent micro-organisms are frequently the causative agents responsible for the necrotizing changes. Cylindric, fusiform or saccular bronchiectasis develops, depending on the location, extent and severity of the process.

Bloch and Francis<sup>2</sup> differentiate primary or predisposing factors in the etiology and secondary or immediate agents. The primary factors consist largely of acute infectious diseases involving the upper respiratory tract. Among the secondary causes involvement of the nasal sinuses, chiefly the maxillary, is increasingly recognized as having a dominant part in the origin of bronchiectasis. Bronchiectasis, these writers say, is essentially a disease of the lower lobes of the lung which are most easily accessible to drainage from above. One or both lower lobes were involved in fifty-four of sixty patients. Of single lobes, the left lower one is the most frequently affected.

Since the use of iodized oil for bronchography according to Singer,<sup>3</sup> the positive diagnosis of bronchiectasis can be made even to its character. Following the instillation of the oil, the film would be expected to show the tubes widened, beaded, cylindric or cystic when an atelectatic bronchiectatic area is present. The compensatory lung fields are seen with bronchi wide

1 Kline B S Pathology of Chronic Nontuberculous Inflammations of the Lung Am Rev Tuberc 38 663 (Dec) 1938  
2 Bloch R G and Francis B F Chronic Nontuberculous Infections of the Lung Am Rev Tuberc 38 651 (Dec) 1938  
3 Singer J J The Roentgenological Aspects of Nontuberculous Pulmonary Disease Am Rev Tuberc 38 680 (Dec) 1938

apart and not dilated. A case of bronchiectasis should not be considered as completely examined roentgenologically until both lungs have been injected. This is particularly important since the medical treatment in most cases is at best only palliative. Bronchoscopy, according to Samson,<sup>4</sup> is also important as a procedure for the diagnosis and treatment of certain pulmonary infections. In bronchiectasis, bronchoscopy usually reveals diffuse dull red mucosal inflammation. There is moderate granulation and ease of bleeding, both observations increasing in intensity as the pathologic lobe is approached. Samson states further that bronchoscopy, while not curative of bronchiectasis, may produce an amelioration of symptoms, in fact, cough and sputum may disappear for years following a series of bronchoscopic aspirations.

Most therapy with the exception of lobectomy in selected cases has proved disappointing. Lobectomy, however, carries definite risks and requires as indication, in the opinion of Bloch and Francis, a unilateral or practically unilateral involvement. One stage lobectomy for bronchiectasis is approved also by Brunn and Goldman<sup>5</sup> based on extensive experience.

The prevention of bronchiectasis has been sadly neglected up to now. There is much parental negligence of chronic upper respiratory infection and chronic bronchitis in children. Bloch and Francis emphasize the danger of slow and continuous flow of infected material into the bronchial passages in the production of bronchitis. They believe that as the growing recognition of the role assumed by chronic sinusitis in this disease increases the occurrence of bronchiectasis should decrease. From a climatic point of view they believe that bronchitis of minor degree is favorably influenced by that atmospheric dryness which is beneficial for sinusitis. However, it seems to them that a permanent change of domicile in most instances alone can yield lasting results.

#### TRAUMATIC FAT NECROSIS OF THE BREAST

Traumatized or ischemic fat in any part of the body can undergo sterile autolysis or heterolysis resulting in saponification by histiocytes and giant cells. Shattock in 1896 gave an accurate description of the changes found in his case of 'saponifying necrosis in a lipoma of the thigh'. Fat necrosis has occurred in the subcutaneous tissues of young infants (Farr) in a hernial sac the thigh, the buttock or the abdominal fat. These lesions are harmless and of little clinical importance. When fat necrosis occurs in the cellulose-adipose tissues over the breast or in the breast, however, the lesion assumes a special clinical significance principally because it mimics so closely the clinical signs of mammary cancer. The knowledge of this lesion dates from a report in

1920 of two cases by Lee and Adair.<sup>1</sup> In one of these cases a radical amputation of the breast, muscles and axillary contents was performed because the surgeon believed that the tumor was malignant. In the other, the possibility of a benign lesion was considered and the breast alone was removed.

Hadfield<sup>2</sup> in 1930 collected records of forty-two cases of fat necrosis of the breast, to which he added records of three cases. Dunphy<sup>3</sup> has recently reported sixteen cases of fat necrosis observed in the Peter Bent Brigham Hospital between 1923 and 1937. Two of these occurred in the breast and two in the postoperative mastectomy scar.

Trauma and infection are mentioned as etiologic factors in the production of fat necrosis. The frequency of trauma and infection to which the subcutaneous tissues and fat are exposed on the one hand, and the rarity of the lesion on the other, suggest that there must be still another, possibly endogenous, factor. It has been suggested but not proved that pancreatic cells may be transported to such areas, remain latent and be activated by trauma. Neal<sup>4</sup> believes trauma alone may be sufficient, since all cells contain lipase.

According to Hadfield the lesion in the majority of cases is a small mass of traumatized cutaneous fat undergoing quiet and painless sterile autolysis or heterolysis and that its bulk is increased by the accumulation in it of phagocytes engaged in the absorption of fatty acids and fibroblasts initiating repairs. Eventually the lesion cicatrizes and any unabsorbed fat and saponified products become enclosed in mature fibrous tissue. A thick-walled cyst containing dark fluid results and calcification is frequent in the late stages. The central feature of the process is slow, aseptic saponification of neutral fat by blood and tissue lipase, analogous to pancreatic fat necrosis but much milder in degree and independent of any direct action of pancreatic lipase.

In about 40 per cent of the cases there was a history of rather severe trauma to the breast and in most of them the tumor developed where the injury was inflicted. There was no association with lactation and no discharge from the nipple. The history of duration of the tumor varied from two years to ten days. The tumor appears as a firm painless nodule which gradually and at times rapidly increases in size. In more than 50 per cent there were adhesions to the skin and occasionally the typical 'peau d'orange' appearance so characteristic of mammary cancer. In 10 per cent retraction of the nipple was noted. The symptoms which strongly suggest malignancy according to Lee and Adair, are the rapid increase in size, adhesions to the skin, hard consistency, lack of pain and adhesions to

<sup>4</sup> Samson, P. C. Bronchoscopy in Chronic Nontuberculous Infections of the Lung. *Am Rev Tuberc* 38: 688 (Dec) 1938.

<sup>5</sup> Brunn, Harold and Goldman, Alfred. Surgical Treatment of Nontuberculous Pulmonary Suppuration. *Am Rev Tuberc* 38: 703 (Dec) 1938.

<sup>1</sup> Lee, Burton J. and Adair, Frank. Traumatic Fat Necrosis of the Female Breast and Its Differentiation from Carcinoma. *Ann Surg* 72: 188 (Aug) 1920.

<sup>2</sup> Hadfield, Geoffrey. Fat Necrosis of the Breast. *Brit J Surg* 17: 673 (April) 1930.

<sup>3</sup> Dunphy, J. F. Surgical Importance of Mammary and Subcutaneous Fat Necrosis. *Arch Surg* 38: 1 (Jan) 1939.

<sup>4</sup> Neal, M. Pin on and Ellis, Max M. Etiological Factor of Fat Necrosis. *South M J* 23: 313 (April) 1930.

the deeper structures. They conclude that the diagnosis of traumatic fat necrosis of the breast is possible on gross examination and that in the presence of a distinct history of trauma to the breast and a well circumscribed mass, showing rapid increase in size unassociated with pain and without axillary nodes that are firm, an accurate preoperative diagnosis is possible. However, if occasional unnecessary radical mastectomy or irradiation is to be avoided, reliance should be placed on a biopsy.

### OPPORTUNITIES FOR INTENSIVE GRADUATE TRAINING IN OBSTETRICS

The importance of providing medical students and interns with sufficient opportunity for observation and participation in obstetric procedures cannot be overestimated. While many medical schools and teaching hospitals have attempted to organize obstetric instruction so that supervised training of students and interns may provide a maximum utilization of the teaching material available, there are still many patients and considerable free time outside the conventional academic year that may be utilized for undergraduate and graduate study.

A commendable development of the past two years provides practicing physicians in several regions with the opportunity to spend from one to four weeks in hospitals with active ward services in obstetrics. In each the effort is cooperative. The hospital or medical school opens its teaching facilities to the profession, the respective state medical society's committee on maternal health arranges the graduate program and announces the course, and the respective state department of health lends financial aid, usually with funds provided under the Social Security Act. Such courses were successfully conducted at the University of Illinois College of Medicine, Chicago, during the summers of 1937 and 1938 and at the University of Nebraska College of Medicine, Omaha, in July 1938 and were begun at the Indiana University School of Medicine, Indianapolis, in November 1938.<sup>1</sup> Recently through its committee on maternal welfare the Medical Society of New Jersey announced that any practicing physician of New Jersey may attend organized refresher courses given at the Margaret Hague Maternity Hospital in Jersey City.<sup>2</sup>

Each of these intensive intramural courses is designed in essentially the same way. Each is operated on a full one week or two weeks daily schedule with special classes for a limited number of physicians who are given ample opportunity to observe obstetrics as it is practiced under desirable hospital conditions. Lectures in obstetrics and sometimes in pediatrics, conferences, seminars, bedside instruction, antepartum and postpartum clinics,

manikin demonstrations, laboratory exercises and home delivery services all have been included to some extent. Either regular members of the teaching staff or special instructors are assigned, in one hospital twenty six instructors composed the faculty for a class of ten physicians. Fees vary from nothing to \$10 a week for one or two weeks' instruction.

Intensive intramural courses in obstetrics have been given on a somewhat different basis at Tulane University of Louisiana School of Medicine, Department of Graduate Studies, New Orleans, Harvard Medical School, Courses for Graduates and Tufts College Medical School, Boston, University of Michigan Medical School, Department of Postgraduate Medicine, Ann Arbor, University of Minnesota Center for Continuation Study, Minneapolis, Washington University School of Medicine, St. Louis, Mo., Medical Society of the County of Kings and Long Island College of Medicine, Brooklyn, Columbia University, New York City, the New York Polyclinic Medical School and Hospital, New York City, Vanderbilt University School of Medicine, Department of Postgraduate Instruction, Nashville, Tenn., and Duke University School of Medicine, Durham, N. C. Since instruction in these institutions is organized and administered in a different manner from the cooperative courses previously referred to, higher fees are sometimes necessary.

Thus practicing physicians have an opportunity to spend a short period of residence in any one of at least twelve medical centers to learn of the modern methods used in the practice of obstetrics.

### Current Comment

#### GEORGIA PHYSICIANS AND HEALTH OFFICIALS STUDY TOGETHER

Satisfactory progress in public health depends on close cooperation between practicing physicians and dentists and the official health departments, local and state, and through these the health agencies of the federal government. An interesting example of cooperation between health officers and physicians is a series of meetings in the state of Georgia<sup>1</sup> sponsored by the several county medical societies and the county boards of health, with the U. S. Public Health Service cooperating through the Georgia Department of Public Health. Ten cities were chosen for these meetings: Rome, Washington, Americus, Thomasville, Griffin, McRae, Waycross, Swainsboro, Lagrange and Gainesville. The meetings brought to the rural practitioner in all parts of the state the latest information on the four subjects syphilis, the infant, obstetrics and laboratory aids. Through such discussion of common interests in public health, understanding is furthered and progress is made. These are friendly meetings. "Family Gatherings" is the name which Georgia's Health gives them and at the head of the program is the friendly invitation "Come Let Us Reason Together."

<sup>1</sup> Postgraduate Committee Offers Intensive Courses in Obstetrics and Gynecology at Indiana University School of Medicine. J. Indiana M. A. 31: 576 (Oct.) 1938.

<sup>2</sup> Bingham, A. W. Refresher Courses in Obstetrics. Maternal Welfare Article Number Thirty Two. J. M. Soc. New Jersey 35: 738 (Dec.) 1938.

<sup>1</sup> Georgia's Health 19: 3 (Jan.) 1939.

# ORGANIZATION SECTION

## HEALTH INSURANCE WITH MEDICAL CARE: THE BRITISH EXPERIENCE

*A Letter from Sir Henry B Brackenbury With a Reply*

*To the Editor* —I have read the book by Dr D W Orr and Mrs Orr entitled "Health Insurance with Medical Care the British Experience" I have read also your review of that book in THE JOURNAL of December 10 last Any author submitting his work for review must be prepared to accept the consequences provided that criticisms are honest and well informed I have no brief for these authors I have never met them But as their book appears to me to be the truest "evaluation of the medical service given under health insurance" in Great Britain (to use your own description of what should be the aim of a work of this kind) that has been written for American readers, and as your review appears to me to be widely mistaken in its facts and not fair in its comments, perhaps you will allow me to make a few frank observations I do this as one who himself worked as a full insurance medical practitioner for the first sixteen years of the operation of the system, who has continued to be associated, both clinically and administratively, with the system till the present time, and as one who has never hesitated to call attention from time to time to certain deficiencies which are freely admitted and has perhaps had some part in the rectification of several of these I speak now of the system as it has been operating during recent years, and I am concerned only with the picture presented of its methods and effects in Great Britain and not at all with the question of its applicability to America

The main items of your indictment of the authors are (a) that they have sought the opinion of inappropriate and biased members of the profession only, (b) that they have accepted favorable opinions while ignoring what you regard as notorious facts which are unfavorable, (c) that they have had improper regard to the opinions of insured persons as to the way in which the system affects them, (d) that in the bibliography there is a "complete omission" of books, reports and pamphlets which tell against their conclusions This would be a damning indictment if true, but let us consider it

In the main the medical practitioners consulted by the authors were those who have had considerable experience as doctors in the insurance service or as administrators of that service Many of them have had both I should have regarded such experience as a valuable qualification for the expression of an opinion, not, as you regard it, as a criterion of unreliability I suppose you adopt the principle of the proverb "observers see most of the game" But this is very often not true and it is the opposite of the truth if the observers know little or nothing of the nature of the game or of the rules under which it is played There is unfortunately no consultant and specialist service under the British insurance scheme (except indirectly to a very limited extent), and in consequence many of

the most eminent members of the profession have no practical knowledge of its working at all Some consultants, however, have interested themselves in its administration from the medical side I have never heard from such a consultant an opinion adverse to the scheme as a whole Of course it is possible to find a few individuals among the doctors working the scheme who dislike it Dr and Mrs Orr found one among the relatively few whom they interviewed But why should you view with suspicion, and characterize as untrue, the general and collectively expressed opinion of some 20,000 doctors who know from their personal experience what they are talking about?

The charge that the authors have ignored the facts which are not in harmony with their conclusions is refuted to some extent in your own review In at least two instances you point out that, having quoted certain statements of their informants, they go on to give facts which are not in harmony therewith and to express their own opinion that these statements at least require serious modification Again, I should have thought that, in any impartial review, this would have been counted to them for righteousness, not thrown up against them as contradictory You proceed, however, to point to two matters in which you allege that your charge is true, one relates to excessive prescribing due to the whim or to the pressure of patients, the other to attendances at the outpatient departments of hospitals

As to the former, in spite of my long experience, I know nothing of the "continuous flood of letters sent out by regional medical officers" with regard thereto, nor of the "many complaints in official reports, including those of the Ministry of Health, of excessive prescribing to satisfy the demands of the patient" As to the latter I have never once heard it said that "the repeated appeals for financial aid for hospitals were largely due to the increased burden created by national health insurance," a statement which you allege is "continuously" made There is no restriction on the ordering of "proper and sufficient" medicines for an insured patient If there are some prescribers who, either through inexperience or through being unduly influenced by the advertisements of wholesale druggists, order expensive preparations when an official one from the British Pharmacopoeia the British Pharmaceutical Code or the National Formulary would be equally efficacious and less costly, and if the attention of such prescribers is drawn to this fact that is a merit, not a demerit of the system and even in such cases the practitioner is always given the opportunity of showing that in the particular instance the more expensive preparation was necessary or desirable After careful investigation it is quite clear that the "waiting lists" of a number of hospitals are due to causes almost entirely unrelated to national health insurance and so

far as it may be true that the system has led to the discovery of the need of many insured patients for a course of really specialist treatment or to a realization by their dependents of the desirability of early medical attention for which they are unable to pay their own doctor, this is surely an indirect effect of the system which is beneficial, not detrimental.

With regard to the authors having sought the opinions of insured persons themselves, your remarks appear to be either obscurantist or irrelevant, yet this you describe as your "sharpest criticism." Your parallel with the "thousands of testimonials to the efficiency of the panacea" produced by a "distributor of nostrums" does not hold. The gravamen of the charge against the insurance system is that it produces perfunctory medical attendance and that insured persons do not get a square deal as regards interest and attention from their doctors. Knowledge, skill and therapeutic results doubtless vary from doctor to doctor, for it must be remembered that all insurance practitioners are private doctors also. A novel and valuable feature of the investigation by Dr. and Mrs. Orr is the conclusion, from the mouths of insured persons themselves, that this charge (with doubtless a few individual exceptions) is untrue. It is well known to be so both by doctors and by the officials of Approved Societies in Great Britain.

Finally, what are these books and reports which have been deliberately omitted from the bibliography because they do not bear out the opinions of the authors? I do not mean publications written during the earlier years of the national insurance service nor those which merely criticize some detail of the service or point out some particular imperfection. I mean such as may be said to condemn the whole system in general or in principle or, in the words of your review, "contradict many of the conclusions of the book as to the character of the service given." I assert quite definitely that neither of the reports which you specifically mention does anything of the kind.

Let me not be misunderstood. There are still admitted imperfections in the detailed working of the system, but these, like others of more importance that have already disappeared, can be got rid of by negotiation. There are deficiencies its scope needs extending in several directions. There are some practitioners whose work is less efficient than might be desired; there are perhaps a few who have accepted more responsibilities than they can well undertake together with their noninsurance practice. Further, I agree that it is impossible to estimate even approximately, how far national health insurance has contributed to the manifest betterment of the public health that has taken place during the past twenty-five years, since so many other favorable factors have been at work, and any comparison in this connection between America without such a service and Great Britain with one, appears to be entirely irrelevant to the issue with which I have been concerned in this letter.

Yours faithfully,

HENRY B. BRACKENBURY  
30 West Heath Drive  
Hendon, N. W. 11  
England

This letter was referred to the Bureau of Economics of the American Medical Association, which makes further comments.

*To the Editor*—We take this up in the order in which it is written.

(a) "That they have sought the opinion of inappropriate and biased members of the profession only." There is no statement that these are inappropriate and biased but that only those who were in favor of the scheme were consulted. The book speaks for itself on this subject—in that the authors apparently found only one critic. Yet the files of the *British Medical Journal* for Sept. 12, 1936, for Oct. 17, 1936, and for July 24, 1937, and the *Birmingham Medical Review* for June 1935 are sufficient evidence that there are a number of physicians who denounce this system in stronger language than that used in the review or than has ever been used in the *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*. Quotations from physicians who have practiced under the panel system and later gone to other countries, and who give similar opinions, may be found in the *Canadian Medical Association Journal* for February 1938, pages 188-189, and the *South African Medical Journal* for Oct. 28, 1933, the *British Journal of Tuberculosis* for April 1934 is another illustration.

(b) "That they have accepted favorable opinions while ignoring what you regard as notorious facts which are unfavorable." While here, as with the other statements, it might be pleaded that the indictment does not represent the position of the review, it is true that there is no reference in the Orrs' book to excessive prescribing, to lack of preventive activities, to an increase in morbidity, to restrictions on prescribing (which will be mentioned later), to lack of postgraduate training, to the separation of medical service into two classes, and to the necessity of a young physician buying his opportunity to start a practice.

(c) "That they have had improper regard to the opinions of insured persons as to the way in which the system affects them." Will Sir Henry claim that the lay public is capable of judging the efficacy of a medical service when it has no opportunity for comparison with other services and no technical training? Just how does this sort of an opinion differ from the testimonials offered by quacks as proof of the satisfactory character of their services?

(d) "That in the bibliography there is a 'complete omission' of books, reports and pamphlets which tell against their conclusions." The review itself lists some of these documents, others are listed in this comment.

Sir Henry objects to the statement as to "excessive prescribing due to the whim or the pressure of patients." The *British Medical Journal* for March 1, 1930, page 405, in commenting on a statement in the Report of a National Advisory Committee to the effect that "the insured person would have the right of complaint against the insurance practitioner under article 32 of the Medical Benefit Regulations, 1928, for refusing to prescribe an alleged drug" says:

If (as the committee now appears to lay down) 'any question is to be regarded as including the right of a patient to have given to him, or prescribed to him the drug or preparation

which he thinks he ought to have, irrespective of whether the practitioner thinks it appropriate or not, the medical profession could not for a moment countenance the right of an insured person to raise any such question. The word "refusing" seems to imply a "demanding" on the part of the patient. It would be a topsy-turvy kind of medical practice in which the patient named the drug and the doctor obediently prescribed it, or, greatly daring, declined to do so.

As to the complaints against excessive prescribing, see the Report of the Chief Medical Officer for 1935 in the January 1937 issue of *Public Health* and the Eighteenth Annual Report of the Ministry of Health, 1936-1937, page 187.

As to the statement that there is no interference with prescribing, the Report of the Ministry of Health mentioned in the preceding paragraph (page 189) says: "Regional Medical Officers paid 891 visits in 1936, compared with 840 in 1935, to doctors whose prescribing appeared to call for explanation." (The statement in the review regarding the mass of letters written was based on statements made to the reviewer personally and files of letters shown to him by the Regional Medical Officer of Birmingham in 1931.)

The reviewer has investigated health insurance in Great Britain and has traveled from Glasgow to London by automobile, during which time he repeatedly saw the sign-boards of hospitals along the road asking for assistance and was repeatedly told by people in various parts of England that there was an increased burden on the hospitals because of the tendency of panel physicians working on a per capita payment plan to send many cases to the hospital, where, incidentally, the panel physician usually was not allowed to practice. A Canadian physician, who was a former panel practitioner, writing in the *Canadian Medical Association Journal* for February 1938, said: "The busy panel practice resolves itself into a 'clearing station'. The only major decision made is whether the patient is really ill or not. If he is really ill he is sent to the local hospital, and the expense and responsibility are shifted to that quarter. If he is not considered to be really ill some of the panel prescriptions will be prescribed." (See also the following statement from Report on the British Health Services, by P. E. P., page 162: "The panel doctor, at any rate in large towns, often has neither the facilities nor the equipment which, as precise diagnosis becomes daily more possible, are necessary to provide an adequate service. As a result he passes on his patients to the hospital and specialized clinics and often enough he tends to become little more than an agent for signing certificates.")

It is not universally agreed that "the system has led to the discovery of the need of many insured patients for a course of really specialist treatments." This statement is not borne out by many of the other criticisms, including the complaints of those concerned with the cure of tuberculosis that delay in discovering this disease exists to an extent fully equal to that about which a similar complaint is made in the United States.

There is no charge that the books omitted "condemn the whole system in general" but they do as stated contradict many of the conclusions of the Orrs' book as to the character of the service given.

Complaint of the lack of preventive measures is found in the Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1937: "On the

State of the Public Health," pages 53-55. Reference is made in the review to some of the reports that describe the steady increase in morbidity as recorded in days during which a benefit was received for incapacity to work and the over-medication previously mentioned. Sir Henry repeats the now familiar objection to any comparison of vital statistics as "entirely irrelevant to the issue." Perhaps he is not aware that the advocates of health insurance for years quoted often inaccurate and distorted vital statistics to bolster up their claim that health insurance had a favorable effect on morbidity and mortality statistics. Now that it has been definitely shown that the comparison of such statistics at almost every point fails to show any superiority of insurance countries, we are constantly assured that such comparisons are unjustifiable.

As appropriate to this discussion, attention might also be called to the strenuous opposition that is being raised by the branches of the British Medical Association in Australia and New Zealand to the introduction of health insurance in those countries and to the fact that they fail to have their opinions changed by the arguments offered by Sir Henry on his recent visits to those countries. It would seem that physicians in the British Commonwealth of the Nations would probably be sufficiently familiar with conditions in the home country to render them especially competent to draw accurate conclusions as to the desirability of the British system as compared with the system of private practice in Australia and New Zealand.

The charge of bias is based primarily on the continuously applied and sometimes directly stated claim that there are practically no criticisms by panel physicians—a statement that is disproved by the quotations in the medical journals to which reference is previously made. The question is not raised as to books that "condemn the whole system in general," because no one disputes the fact that the vested interests—financial, professional and political—created by the system of health insurance have made any attempt at abolition of the system hopeless. There is also full recognition of the fact that the British Medical Association is engaged in a splendid effort to make health insurance work, and certainly the reviewer would not criticize that effort. It is believed, however, that the attempt "to sell" the British system to America by one-sided presentation of its character is something against which the medical profession in the United States should protest. In other words, the reviewer takes the same stand which Sir Henry takes in his quotation and endorsement of the Memorandum of Evidence submitted on behalf of the British Medical Association to the Royal Commission on National Health Insurance, where he says:

The organization of a National Health Insurance scheme is not necessarily, or even probably, the best means of utilizing limited resources for the promotion of national health. It is more than likely that there are a number of other directions in which, severally or collectively, a corresponding expenditure would produce an even more satisfactory return.

The medical profession in America has simply maintained "that there are a number of other directions in which, severally or collectively, a corresponding expenditure would produce an even more satisfactory return", apparently the physicians of Australia and New Zealand agree.



# LEGISLATION OF INTEREST TO PHYSICIANS CONSIDERED BY STATE LEGISLATURES IN 1938

Prepared by T V McDavitt of the Bureau of Legal Medicine and Legislation

(Continued from page 556)

## IV LEGISLATION REGULATING THE DISTRIBUTION OR POSSESSION OF FOODS, DRUGS, COSMETICS AND BIOLOGICS

**NARCOTICS**—The uniform narcotic drug acts in force in Louisiana and New Jersey were so amended this year<sup>92</sup> as to make cannabis or marihuana a narcotic drug within the meaning of the act. The New York uniform narcotic drug act was so amended this year<sup>93</sup> as to define cannabis to include "the following substances under whatever names they may be designated (a) the plant, its leaves or tops of the plant *Cannabis sativa* L., from which the resin has not been extracted, (b) the resin extracted from such plant, and (c) every compound, manufacture, salt, derivative, mixture or preparation of such resin, or of such plant from which the resin has not been extracted."

An amendment<sup>94</sup> to the Massachusetts Narcotic Drug Act raises to ten years from five years the term of imprisonment that may be imposed on a person convicted of unlawfully selling, delivering, furnishing, giving or exchanging a narcotic drug or possessing a narcotic drug for such purpose.

A new Mississippi law<sup>95</sup> amends the law relating to marihuana with respect to the circumstances under which a warrant may issue to search premises on which violations of the law are suspected of being perpetrated.

A bill was killed in Indiana<sup>96</sup> to make it unlawful to sell or otherwise distribute any commodities intended for smoking in which there is any *Cannabis indica*. The bill also proposed to make it unlawful for any person to possess or smoke cigarets, cigars or tobacco or other commodities intended for smoking containing any of the drug mentioned.

An unsuccessful attempt was made in Mississippi<sup>97</sup> so to amend the uniform narcotic drug act as to prohibit the distribution of barbituric acid compounds except on the written prescription of a licensed physician, dentist or veterinarian.

Unsuccessful attempts were made in New Jersey<sup>98</sup> to create a state bureau of narcotic control to supervise the use of narcotic drugs in the state, to license persons to sell, distribute or dispense narcotic drugs at wholesale or retail and to enact such regulations as may be necessary to accomplish those purposes.

**BARBITURIC ACID DERIVATIVES**—Unsuccessful attempts were made in Mississippi<sup>99</sup> to prohibit the retail sale or distribution of barbituric acid compounds except on the written prescription of a licensed physician, dentist or veterinarian. The legislature of South Carolina reacted unfavorably to attempts<sup>100</sup> to repeal the law enacted in 1937 prohibiting the retail sale or distribution except by virtue of the prescription of a licensed physician, dentist or veterinarian, of the "synthetic drugs known as barbiturates and their compounds."

**SULTANILANIDE — DINITROPHENOL — DIETHYLENE GLICOL**—A resolution adopted in Massachusetts<sup>101</sup> creates a special commission to investigate the desirability of legislation to prohibit, except on the

prescription of a licensed physician, the sale of amino sulfamidobenzene, dinitrophenol or sulfanilamide. This commission was also charged with the duty of investigating the desirability of legislation prohibiting the sale of drugs containing as a solvent ethylene glycol, diethylene glycol or any derivative thereof, and legislation prohibiting the retail distribution of drugs, which if taken in whole or in part may cause death, unless the containers of such drugs have labeled thereon statements as to how much if taken at one dose would kill and the appropriate antidote.

**BIOLOGICS**—A bill was killed in Massachusetts<sup>102</sup> to prohibit the distribution of vaccine or other virus, toxin, anti-toxin or other serum, unless the container of such substance has affixed thereto a label stating the exact content of the virus or serum, the date when manufactured, the place of manufacture and the name of the manufacturer and a statement as to the specific disease against which it is claimed to immunize.

**LIMITATION ON MANUFACTURE OR SALE OF NEW DRUGS**—Bills were killed in Georgia<sup>103</sup> to prohibit the sale, dispensing or distribution in the state of any new drug until the drug should first have been tested chemically by the state chemist and its medical value approved by him and the director of the state department of health. A similar bill was likewise killed in Mississippi<sup>104</sup>.

**FOODS, DRUGS, COSMETICS AND THERAPEUTIC DEVICES**—Extensive amendments to the existing state pure food and drug act were adopted in Virginia<sup>105</sup>. Among other things, the new law provides that the term "drug" includes all substances and preparations recognized in the official United States Pharmacopoeia, official Homeopathic Pharmacopoeia of the United States, or official National Formulary, or any official supplement to any of them and all substances and preparations intended for use in the diagnosis, cure, mitigation, treatment or prevention of disease in man or other animals and all substances and preparations other than food and cosmetics, intended to affect the structure or any function of the body. The new law also brings "cosmetics," defined as "all substances and preparations intended for cleansing, or altering the appearance of, or promoting the attractiveness of, the person," within the purview of the act.

Bills to enact new laws prohibiting the manufacture, sale or distribution of adulterated or misbranded foods, drugs, cosmetics and therapeutic devices were considered and killed in Mississippi<sup>106</sup> and New York<sup>107</sup>.

## V BILLS AFFECTING HOSPITALS

### A Hospitals Generally

**CONTRACTS FOR HOSPITALIZATION, HOSPITALIZATION INSURANCE**—Legislation to authorize the formation of corporations to provide on a "nonprofit basis" "hospital care" to their members and subscribers has already been discussed in this survey immediately following the introduction

92 La. Acts 1938 Act No. 82 N. J. Laws 1938 c 156  
93 N. Y. Laws 1938 c 457  
94 Mass. Laws 1938 c 321  
95 Miss. Laws 1938 c 352  
96 Indiana first special session H 495  
97 Miss. H 1076  
98 N. J. S 140 A 132  
99 Miss. H 595 H 1076  
100 S. C. H 1439 H 1570  
101 Mass. Law 1938 c resolve 53

102 Mass. H 1407  
103 Georgia first special session H 347 S 74  
104 Miss. H 595  
105 Va. Laws 1938 c 375  
106 Miss. H 595  
107 N. Y. A 364 A 556

**PAYMENT BY STATE FOR CARE RENDERED INDIGENT PATIENTS**—The Mississippi law authorizing the payment by the state of bills of approved hospitals in the state for care rendered indigent sick persons was amended by two laws enacted this year. One new law<sup>108</sup> provides that if adequate hospital facilities are lacking in a county bordering on another state, an acceptable hospital in a contiguous county in the neighboring state treating an indigent resident of Mississippi may be recompensed by the state. The other law<sup>109</sup> states in detail the certificate that must be extended by a licensed physician and two other residents of the county in which the applicant for hospital care to be paid for by the state resides, which certificate must be procured on behalf of each indigent person cared for before the state will reimburse the hospital caring for him. The law also requires the state hospital commission, which administers the law, to report to the clerk of the chancery court monthly a list of persons in his county who have received hospital care under the act.

An unsuccessful attempt was made<sup>110</sup> so to amend the same law as to reduce the amount the state would reimburse hospitals for care rendered indigents to \$150 from \$250 a day for each indigent cared for.

Bills to provide a procedure whereby hospitals might be reimbursed by the state for treatment and care rendered indigent persons injured in motor vehicle accidents were rejected in New York.<sup>111</sup>

**INSURING PAYMENT OF HOSPITAL BILLS**—The Virginia lien law was so amended this year<sup>112</sup> as to provide that if a personal injury results in death the lien of a hospital caring for the decedent can be asserted either against (1) a judgment or compromise accruing because of the injury and death or (2) the general state of the decedent, but not against both. A new New Jersey law<sup>113</sup> creates a lien in favor of state and county institutions and charitable institutions maintained in whole or in part by state or county funds, to which persons have been committed or admitted by virtue of title 30 of the Revised Statutes against the property of persons confined there and receiving care and treatment. A new Louisiana law<sup>114</sup> requires any person who has received treatment in any of the charity hospitals of the state<sup>115</sup> for injuries which might entitle him to damages or compensation and who files suit for the recovery of such damages or compensation to cause a copy of the petition in any such suit to be served on the hospital from which he received treatment.

A bill was killed in Rhode Island<sup>116</sup> to grant hospitals rendering services to persons injured through the negligence of others liens on all rights of action recoveries judgments or settlements accruing to the injured persons by reason of their injuries.

An unsuccessful Virginia bill<sup>117</sup> proposed that the proceeds of a judgment based on a wrongful death should be paid to the personal representative of the decedent and after the payment of the cost of suit and reasonable attorney's fees there should be paid the charges of hospitals physicians and nurses incurred during the last illness of the decedent but not to exceed \$200 in the case of the hospital and \$50 to each such

physician and nurse. The New Jersey legislature failed to act on a bill<sup>118</sup> which proposed that in the distribution of the assets of an insolvent decedent hospital charges and expenses for the last illness should be on a par with judgments entered against the decedent in his lifetime, funeral charges and expenses, and physicians' and nurses' bills during the last illness and should have precedence over all other claims.

**LICENSING OF ALL PRIVATE HOSPITALS**—An unsuccessful Massachusetts bill<sup>119</sup> proposed to prohibit the operation of private hospitals except by virtue of a license issued by the department of public health, which was to be empowered to make rules and regulations for the operation of such institutions.

**HOSPITAL EMPLOYEES**—A resolution was adopted in Massachusetts<sup>120</sup> which requires the department of labor and institutions and the department of public health to conduct an investigation relative to the hours of labor of women and children in hospitals.

Bills to limit the hours of employment in hospitals of all employees, male or female, to not more than eight hours in any one day, nor more than forty-eight hours in any calendar week were killed in two states.<sup>121</sup>

**REQUIRED REPORTS**—A new Louisiana law<sup>122</sup> requires the person in charge of a hospital who has first knowledge of a death occurring suddenly, accidentally, by violence, under suspicious circumstances, or from abortion to notify the appropriate coroner and district attorney.

Bills to require hospitals to report to specified authorities in the instances noted were killed in Massachusetts and New Jersey. The bills in Massachusetts<sup>123</sup> would have required a report when caring for a case of induced abortion. The New Jersey bills<sup>124</sup> would have required a report when any person admitted was found infected with venereal disease, one bill<sup>125</sup> even going so far as to propose to require a hospital to subject every patient admitted to a Wassermann or other approved blood test for the detection of syphilis.

**ADMISSIBILITY OF HOSPITAL RECORDS IN EVIDENCE**—A new Louisiana law<sup>126</sup> provides that whenever a certified copy of the chart or record of either of the charity hospitals of the state is offered in evidence in court it is to be received as prima facie proof of its content.

**MISCELLANEOUS**—An unsuccessful attempt was made in Massachusetts<sup>127</sup> to require the state department of public health to furnish not less than two oxygen tents to each hospital in cities of 30,000 or more population, to be used without charge on patients whom the board of health in such city or town deems needy. Another unsuccessful Massachusetts bill<sup>128</sup> proposed to establish a hospital lottery commission which was to be authorized to permit any hospital in the state to conduct a lottery under such plan and subject to such rules and regulations as might be adopted by the commission. Bills were rejected in New York<sup>129</sup> to require hospitals to permit a patient's attorney to inspect all hospital records relative to the patient. An unsuccessful attempt was made in Massachusetts<sup>130</sup> to require any chartered hospital in the state to accept any patient when requested to do so by a licensed physician. An unsuccessful Mississippi bill<sup>131</sup> proposed to make it unlaw-

118 N. J. A. 387

119 Mass. H. 1298

120 Mass. Laws 1938 c. 45

121 N. J. A. 236, N. J. A. 351

122 La. Acts 1938 Act No. 366

123 Mass. H. 1106 H. 1528

124 N. J. A. 591 S. 168

125 N. J. S. 108

126 La. Acts 1938 Act No. 90

127 Mass. H. 1529

128 Mass. H. 161

129 N. J. A. 703 S. 880 (vetoed by governor)

130 Mass. H. 1194

131 Miss. H. 364

108 Miss. Laws 1938 c. 127

109 Miss. Laws 1938 c. 267

110 Miss. S. 375

111 N. Y. A. 492 A. 1666 S. 1511

112 Va. Laws 1938 c. 374

113 N. J. Laws 1938 c. 29

114 La. Act 1938 Act No. 289

115 It is not clear whether this refers merely to the so-called state charity hospitals or to any charitable hospital in the state.

116 R. I. S. 40

117 Va. H. 17

ful for any hospital to assign any nurse not a graduate or registered nurse to a special case unless the nurse receives the compensation paid for the nursing care rendered

### B Governmental Hospitals

**STATE HOSPITALS FOR THE TREATMENT OF TUBERCULOSIS**—A new Indiana law<sup>132</sup> authorizes the establishment of a state hospital for the treatment of tuberculosis, to be known as the Southern Indiana Tuberculosis Hospital. The law specifically provides that the governing board of the hospital staff members and other employees shall not be subject to any suit or claim for malpractice for care or treatment rendered therein.

An unsuccessful attempt was made in Virginia<sup>133</sup> to appropriate \$250,000 for the erection and equipping in Southside of a sanatorium for the treatment of tuberculosis.

**STATE CANCER HOSPITALS**—A law was adopted in Rhode Island<sup>134</sup> which authorizes the governor to appoint a commission of five, not less than three of whom must be medical practitioners, who, together with the director of public welfare and the director of public health, are to make a thorough study and investigation as to the advisability of establishing a cancer hospital at the state institution at Howard. This commission is to report to the general assembly not later than Feb. 1, 1939, the results of that study and make such recommendations as it may deem proper.

An unsuccessful attempt was made in New York<sup>135</sup> to authorize the establishment of three state hospitals for the care and treatment of persons afflicted or threatened with cancer or allied diseases.

**STATE HOSPITALS FOR THE TREATMENT OF INFANTILE PARALYSIS**—Unsuccessful attempts were made in Massachusetts<sup>136</sup> to provide additional facilities for the treatment of persons crippled by infantile paralysis or other crippling conditions. One bill sought the construction of a health center adjacent to Buzzards Bay while the other sought a 100 bed ward in the Lakeville State Sanatorium.

**STATE HOSPITAL FOR TREATMENT OF CRIPPLED CHILDREN**—A law was adopted in Louisiana<sup>137</sup> directing the state hospital board and the state board of health to establish and operate a "hospital bath houses and other necessary and/or incidental facilities at Hot Wells, Louisiana, for the care and treatment of crippled children and/or the care and treatment of the indigent and destitute."

**COUNTY GENERAL HOSPITALS**—Authority was given for the holding of an election in July 1938 in York County S. C., in which the electorate were to be given the chance to approve or disapprove the question of issuing a bond issue of \$175,000 for constructing and establishing a county general hospital. The staff of this hospital, if it is established, is to consist of all licensed physicians residing in the county.<sup>138</sup>

**COUNTY TUBERCULOSIS HOSPITALS**—A new Mississippi law<sup>139</sup> authorizes one or more counties, separately or jointly, to establish, maintain and operate a "tubercular" hospital. A South Carolina law<sup>140</sup> empowers the counties of Dillon, Horry and Marion, or one or

more of them to contract with the Florence-Darlington Tuberculosis Commission for the erection and operation of a hospital for the care and treatment of residents of the counties indicated afflicted with tuberculosis.

**COUNTY MATERNITY HOSPITALS**—A new New Jersey law<sup>141</sup> authorizes the board of chosen free holders of any county of the first class to establish and operate a maternity hospital.

**CLINICS FOR THE TREATMENT OF VENEREAL DISEASES**—A new South Carolina law<sup>142</sup> requires the county health department of Greenville County to operate a "venereal clinic" to render services free of charge to those unable to pay and to require those persons able to pay to pay a reasonable charge for the services.

An unsuccessful attempt was made in Massachusetts<sup>143</sup> to authorize the department of public health, either alone or with the cooperation of local boards of health, hospitals, dispensaries or other agencies, to establish clinics throughout the state to provide treatment for persons suffering from gonorrhea or syphilis.

## VI WORKMEN'S COMPENSATION LEGISLATION

So far as can be ascertained no workmen's compensation legislation of interest to the medical profession was enacted in 1938. The following are the more important legislative proposals which failed of enactment. A Massachusetts bill<sup>144</sup> to limit the right of a worker to select his own physician by requiring him to select a physician from a list established by the department of industrial accident, which, however, was to be required to list all physicians applying for such listing, a Rhode Island bill<sup>145</sup> to provide compensation for silicosis and asbestosis contracted in the course of an employment, a New Jersey bill<sup>146</sup> to make it less difficult for a workman to establish the fact that a hernia resulted from an industrial accident, bills in Rhode Island<sup>147</sup> and Virginia<sup>148</sup> to require the employer to furnish reasonable medical, dental and hospital services and medicines to an injured employee without limit as to amount or time, a Kentucky bill<sup>149</sup> to limit an employer's liability for medical and hospital services to the first six months after an industrial accident and to \$200 in amount, reserving in the compensation board, however, the right to order an extension of the period of treatment or of the limit of expense, a New York bill<sup>150</sup> to require an employer to provide an injured workman with such dental care as might be necessary to restore him from the effects of an industrial accident, and other New York Bills<sup>151</sup> proposing in general to limit the right of hospitals and employers to employ physicians on a salary basis to treat injured workmen.

## VII MISCELLANEOUS LEGISLATION

**COMPULSORY HEALTH INSURANCE, SOCIALIZED MEDICINE**—A new New York law<sup>152</sup> creates a state commission to study and recommend ways and means for minimizing risks of illness through the extension of public health services, for furnishing adequate medical care for persons of low income, the cost to be met from public funds, for making public funds available for the support of medical education and for studies, for raising the standards of medical practice, for medical care to the indigent, for using private institutions in allocating

132 Ind. Laws 1938 c. 2

133 Va. S. 45

134 R. I. Laws 1938 c. — approved Feb. 7 introduced as H. 629 approved March 17 introduced as S. 86

135 N. Y. A. 2261

136 Mass. S. 359 H. 1531

137 La. Acts 1938 Act No. 220

138 S. C. Acts 1938 Act No. 1268

139 Miss. Laws 1938 c. 299

140 S. C. Acts 1938 Acts No. 1162

141 N. J. Laws 1938 c. 425

142 S. C. Acts 1938 Act No. 1200

143 Mass. H. 1300

144 Mass. H. 1041

145 R. I. S. 239

146 N. J. A. 80

147 R. I. H. 748

148 Va. H. 130

149 Ky. H. 31

150 N. Y. A. 2329

151 N. Y. S. 1119 A. 1551

152 N. Y. Laws 1938 c. 682

public funds for the rendition of medical services to the public, for effecting adequate administration and supervision of the health functions of the state government and, if deemed advisable, for consolidating under a separate department all federal and state health and medical services and activities. This commission is to report to the legislature before Feb 15, 1939.

The legislature of New York failed to act on two other proposals which if adopted would have tended to socialize the practice of medicine. One bill<sup>153</sup> would have authorized the state department of social welfare to supply to all married persons having an income of less than \$1,200 annually and all single persons having an income of less than \$900 annually necessary medical, dental and hospital services free of charge. The bill proposed that the medical services be rendered by such licensed physicians, dentists, nurses and hospitals as would agree to render services in such manner as the medical assistance board, which the bill proposed to create, would designate. The other New York bill<sup>154</sup> proposed to authorize the state department of health to render free of charge to all inhabitants of the state "all medical surgical dental, nursing care and treatment and all other services and facilities known to science and designed or adapted for use in all cases of sickness, accidents and childbirth maintenance in hospitals, the furnishing and supplying without cost of medicines drugs," and all other necessary equipment and supplies. The bill proposed to increase the staff of the department so as to include all registered physicians, dentists, pharmacists, technicians, research and laboratory workers and all other persons practicing allied professions who elected to serve and to pay them salaries in accordance with the schedule fixed in the bill. The department was to be authorized to exercise exclusive control over all public hospitals and was to have complete supervisory powers over all private hospitals and the staff, officers and employees thereof.

Proposals to enact compulsory health insurance schemes were rejected in Massachusetts,<sup>155</sup> New York<sup>156</sup> and Rhode Island.<sup>157</sup> These bills proposed a system of compulsory and voluntary sickness insurance the benefits of which were to consist of cash and all forms of medical dental and hospital services.

**TREATMENT FOR INFANTILE PARALYSIS AND OPHTHALMIA NEONATORUM AT PUBLIC EXPENSE**—The governor of New York vetoed a bill<sup>158</sup> to require local boards of health and health officers to provide suitable surgical medical and hospital treatment and care to persons infected with or exposed to infantile paralysis. Two unsuccessful attempts were also made in New York<sup>159</sup> to require the district state health officer in whose jurisdiction a case of ophthalmia neonatorum occurred to provide hospital, medical and special nursing care.

**PNEUMONIA CONTROL PROGRAMS**—A new New Jersey law<sup>160</sup> appropriated \$25,000 to the state department of health for the fiscal year ending June 30 1938, to be expended in the purchase and distribution of type I and type II pneumonia serum, to be available free of cost to persons afflicted with pneumonia and financially unable to purchase the necessary serum. A supplement to this law appropriating an additional \$10,000 for the fiscal year ending June 30 1939, was also enacted.<sup>161</sup>

A bill failed of enactment in Virginia<sup>162</sup> which proposed to direct the state board of health to establish a statewide collapse therapy program to be made available to all tuberculosis patients in need of such treatment. Such program is to include facilities for pneumothorax and for surgical procedures including phrenic nerve operations pneumolyses and

thoracoplasties in all public hospitals or institutions. The state board of health is further directed to establish a statewide follow-up program for tuberculosis patients including the continuance of pneumothorax of all marginal and indigent patients without cost to them and to provide for the giving of such treatment by private physicians, who are to be paid by the state.

**MARRIAGE REQUIREMENTS**—Laws to require, as a condition precedent to the issuance of marriage licenses that both parties to the proposed marriages present certificates from physicians that they are free from stated venereal diseases, were enacted in Kentucky,<sup>163</sup> New Jersey,<sup>164</sup> New York<sup>165</sup> and Rhode Island.<sup>166</sup> The Kentucky and Rhode Island laws require freedom from all venereal diseases, while the New Jersey and New York laws require freedom only from syphilis. The Rhode Island law in addition requires freedom from tuberculosis in the infectious stages. The certificates of the physicians under all four laws must be based on standard laboratory tests and also in Kentucky and Rhode Island on physical examination. All the laws referred to, except the Kentucky law, are now in effect. The Kentucky law does not become effective until March 1, 1940.

Unsuccessful attempts were made in five states<sup>167</sup> to require as a physician's certificate as to freedom from stated venereal diseases with respect to both parties to a proposed marriage as a condition precedent to the issuance of marriage licenses.

A resolution adopted in Ohio<sup>168</sup> authorizes the establishment of a special commission to make a study of the prevention of congenital syphilis and of the prevention of the spread of venereal disease through marriage by requiring an antenatal physical examination to determine the presence of a venereal disease before a license to marry is granted by the probate court.

**VENEREAL DISEASES**—Unsuccessful attempts were made in Georgia<sup>169</sup> and Louisiana<sup>170</sup> to amend existing laws relating to venereal diseases so as to authorize appropriate local health authorities to examine persons infected with or reasonably suspected of being infected with venereal diseases, to quarantine such persons and to require such persons to submit to treatment until cured. A New Jersey bill,<sup>171</sup> which failed of enactment, proposed to require a person infected with a venereal disease to consult at once a licensed physician or any hospital or clinic maintained for the treatment of such diseases. The bill also proposed to require hospitals to subject every patient to a Wassermann or other approved blood test for the detection of syphilis. The Georgia and New Jersey bills referred to also proposed to require a physician treating a patient for venereal disease to notify stated health authorities. Other proposals with respect to venereal disease are considered in the section immediately following.

**PHYSICAL EXAMINATION OF FOOD HANDLERS OR DOMESTIC SERVANTS**—A law enacted in South Carolina<sup>172</sup> prohibits the employment on and after Jan 1, 1940 in Greenville County of a domestic servant unless the servant obtains a certificate from the county health department showing that he or she is either free from

163 Ky. Laws 1938 c 120 (similar bills also considered were H 224 H 44 H 104)  
164 N. J. Laws 1938 c 126  
165 N. Y. Laws 1938 c 640 (similar bills also considered were A 124 A 381 A 2067 S 784)  
166 R. I. Laws 1938 c — approved March 29 introduced by H 760 (similar bills considered were S 10 H 541 S 103)  
167 Ga. H 248 N. (first special session) La H 118 Miss H 5 H 69 S C S 1061 S 1201 V. S 8 H 9  
168 Ohio Laws 1938 c — adopted June 16 introduced by H R 178 N. in the third special session  
169 Ga. S 90 N. (first special session)  
170 La. H 440  
171 N. J. S 168  
172 S. C. Acts 1938 Act 1200

153 N. Y. A 2310  
154 N. Y. A 2143  
155 Mass. H 372  
156 N. Y. A 32 S 320  
157 R. I. H 668  
158 N. Y. A 287 (companion bill S 202 died in senate)  
159 N. Y. S 1718 A 2125  
160 N. J. Laws 1938 c 24  
161 N. J. Laws 1938 c 430  
162 Va. S 40

syphilis or under proper and adequate treatment for that disease. Servants must procure such a certificate annually thereafter.

A bill was killed in New York<sup>173</sup> to prohibit the employment as a domestic servant of any person with a communicable disease if such person in the course of his work would attend children or perform any work in connection with the handling of food. The bill proposed to require every domestic to submit within sixty days after the enactment of the bill to necessary medical examinations.

Bills were killed in four states<sup>174</sup> to require food handlers to be examined at least semiannually by licensed physicians and to prohibit a person from acting as a food handler unless possessed of a certificate from a physician that he or she is not infected with any venereal disease or other communicable disease.

**BLOOD TRANSFUSIONS**—The Massachusetts legislature referred to its next annual session a bill<sup>175</sup> proposing a regulatory act for the use of blood for transfusion purposes. The bill would have banned the use of the blood of any donor who had ever had syphilis or questionable sexual intercourse within three months of the transfusion. Prior to the use of any blood the donor was to be required to submit to a serologic test and to a physical examination.

**ASELUALIZATION**—The legislature of New Jersey<sup>176</sup> rejected a proposal to authorize the sexual sterilization of all persons "likely to procreate idiot, imbecile or feeble-minded progeny."

**BLOOD GROUPING TESTS**—A new New York law<sup>177</sup> supplements the code of criminal procedure by providing that whenever it shall be relevant in any criminal proceedings to determine the parentage of any child, or the identity of any person or corpse, the court, on the motion of the defendant, shall order any party to such action and the person involved in the controversy to submit to serologic blood tests and the results thereof shall be receivable in evidence but only where definite exclusion is established. Such tests are to be made by physicians appointed by the court from a list of physicians certified by the state medical society.

An unsuccessful attempt was made in New Jersey<sup>178</sup> to provide for compulsory blood grouping tests in illegitimacy actions the results of which would have been admissible in evidence or where definite exclusion was established.

**VACCINATION**—A new Virginia law<sup>179</sup> authorizes local boards of health, in addition to rights previously possessed at law, to require, whenever they deem it necessary to prevent an epidemic, the compulsory administering of toxoid.

Two bills were killed in Massachusetts<sup>180</sup> which proposed to provide that no person should be required to submit to any form of vaccination or inoculation as a condition precedent to admission to any public institution. One of these bills<sup>181</sup> also proposed to prohibit the display or distribution in the public schools of medical or surgical advertising or propaganda.

**EXAMINATION OF PUBLIC SCHOOL PUPILS**—A bill was defeated in New York<sup>182</sup> to require the semiannual examination of public school pupils by duly licensed psychiatrists and to authorize the commitment to a state institution of pupils found to be afflicted with a mental disability of such a type as would interfere materially with the instruction of other pupils. A bill was killed in New Jersey<sup>183</sup> to require medical inspectors, principals and teachers in charge of public schools to

make at least annual eye and ear tests of pupils with such scientific devices as may be approved by the commissioner of education. The board of education of each school district was to be authorized to appoint specialists to make the required examinations.

**MEMBERSHIP IN COUNTY MEDICAL SOCIETY CONDITION PRECEDENT TO RIGHT TO PRACTICE**—The Mississippi legislature again killed a bill<sup>184</sup> proposing to create in each county a county medical association and condition the right of a physician to practice on membership in the county medical association of the county of his residence. The association was to be in charge of all public health work in the county, and the rendering of care to the indigent sick was to be authorized to appoint from its membership a county health officer and was to be given full power to isolate and treat persons afflicted with infectious venereal disease for such times and under such restrictions as might be proper.

**MISCELLANEOUS**—The following miscellaneous bills all failed of enactment: a New York bill<sup>185</sup> to pay \$75 to the parents in every future case of legitimate childbirth, a Massachusetts bill<sup>186</sup> to require an applicant for a license to operate a motor vehicle to furnish a written certificate after an acceptable medical examination, showing physical and mental fitness with a favorable intelligence rating, a New York bill<sup>187</sup> to make it the duty of school authorities to purchase and distribute to all pupils of kindergarten and primary grades such quantities of cod liver oil or a concentrate thereof of equal vitamin content as the school or private physicians may prescribe, a Rhode Island bill<sup>188</sup> to provide for the examination by a psychiatrist, to be provided by the department of public welfare of every person indicted for an offense punishable by life imprisonment or who is indicted for any offense and had been previously indicted, and a New York bill<sup>189</sup> to create a state lunacy authority and subordinate local lunacy boards which were to make psychiatric, psychologic and psychometric examinations of all persons indicted for felonies and to report their observations to appropriate local courts. The state lunacy authority was to have power to review the findings of local lunacy boards and to examine inmates of a state institution for the insane or mentally defective prior to their release.

184 Miss S 351  
185 N Y A 648  
186 Mass S 249  
187 N Y A 976  
188 R I H 612  
189 N Y S 651

### SQUARE DEAL IN MEDICAL CARE

The National Dental Association and the National Nurses Association, in cooperation with Chicago organizations of Negroes engaged in the professions associated with medical care, have clearly stated their position concerning the medical program of the Interdepartmental Committee in a pamphlet entitled "A Plea for a Square Deal in the Administration of Medical Care in America." In its general outlines these organizations agree with the statement of the special session of the House of Delegates of the American Medical Association. However, they lay special emphasis on the fact that the program submitted by the Interdepartmental Committee tends to perpetuate some phases of racial discrimination. They ask that any action under recommendation II providing for the expansion of hospital facilities take note that the most significant shortage in hospital services is in the care for the Negro. Emphatic opposition is offered to "any system of compulsory health insurance."

The following comment under recommendation V—Compensation of loss of Wages During Sickness, is strikingly applicable to much of the discussion of the lack of medical care:

Widespread education of the public must be so strong as to make the people want and will to be healthy. Health cannot be bought; it cannot be given; it cannot be forced upon a people. It must be everlastingly worked for. The basis of health lies in proper habit of eating, sleeping, recreation, clothes and sanitation of home and work of shop. Disregard of any of these elemental fundamentals regardless of all the medical care in the world brings physical disability. Health is not a commodity; it is a condition achieved through individual education and effort maintained by social cooperation. To us it seems that if care depends on the highly trained technical medical profession cooperating with not dominated by society.

173 N Y A 884  
174 Ky H 113 Mass H 606 Miss H 165 S 445 Va H 173  
175 Mass S 40  
176 N J A 405  
177 N Y Laws 1938 c 372  
178 N J A 61  
179 Va Laws 1938 c 340  
180 Mass H 855 H 1301  
181 Mass H 1301  
182 N Y S 647  
183 N J A 235

## OFFICIAL NOTES

ANNUAL CONGRESS ON INDUSTRIAL  
HEALTH*First Annual Meeting Held in Chicago Jan 9 and 10 1939**(Continued from page 550)*

DR H H KESSLER, Newark, N J, in the Chair

TUESDAY JANUARY 10—MORNING

Health and Safety Activities of the Federal  
Bureau of Mines

MR DANIEL HARRINGTON Washington D C The organic act establishing the Bureau of Mines was approved May 16 1910 The act was amended in 1913 Both the original and amended acts indicated that health and safety of the mine workers constituted the chief function of the bureau Soon after the creation of the bureau an arrangement was made with the United States Public Health Service by which doctors of that organization could cooperate with engineers of the Bureau of Mines in investigations to improve the health of persons engaged in the mining and allied industries The bureau also employed doctors through the civil service, but about 1914 a fairly definite arrangement was made with the Public Health Service At first the health work of the bureau was largely making surveys The first study on a definite problem was in 1914 by Dr A J Lanza and Edwin Higgins on silicosis in the Joplin Missouri region, followed in 1916 by a similar study in the Butte, Montana region by Dr Lanza and Daniel Harrington In 1916 to 1920 field studies on dust and ventilation were conducted in coal and metal mines in mining localities in several states by engineers and doctors under the general direction of Mr Harrington In 1920 the position of chief surgeon was created and Dr R R Sayers of the United States Public Health Service was appointed after which the health work of the Bureau of Mines was devoted largely to the laboratory, though some field activities were continued The Health Division as such was created in 1926 as one of the divisions of the Health and Safety Branch with Dr R R Sayers in charge and laboratory work was done with gases and dusts The work of the Health Division was recessed in 1933 when the funds of the Bureau of Mines were seriously curtailed and was resumed in a limited way in 1935 with Dr H H Schrenk in charge as chief chemist The bureau has no legal authority to enter mines or other establishments or to enforce its recommendations as to health, safety or efficiency, the regulation of mining and other mineral industries being vested in the individual forty eight states rather than in the federal government

The Health and Safety Branch of the Bureau of Mines is essentially a service organization though considerable research is done The branch now has ninety nine persons in its two divisions eighty-two (twenty-nine safety instructors twenty-eight engineers eighteen clerks and seven others) in the Safety Division and seventeen in the Health Division Members of the personnel of the Safety Division are stationed in seventeen states and do field work in nearly every state in the Union The seventeen persons in the Health Division are stationed in Pittsburgh and in Washington D C In its educational activities the engineers and safety instructors of the Safety Division annually come in contact with about 300 000 persons in the mineral industries The first and training work constitutes in some ways the most effective method of putting health and safety data before the mining industry about 100 000 now taking the course annually It is estimated that through it at least 200 lives are saved annually and that probably at least 10 000 nonfatal accidents are prevented During the past fiscal year first aid training was given in 790 mining communities in thirty eight states 102 698 persons receiving certificates for having completed the course

In general the mine worker in reasonably well conducted mines has almost ideal conditions as to temperature and humidity The underground temperature at working places is usually around 60 F with relative humidity around 80 or 90 per cent In most mines the temperature of the working

places varies little throughout the hour, day, week or year, though there are exceptions Many deep mines have high temperatures, others have both high temperature and high humidity, and the workings of shallow mines are very likely to be affected by outside climate conditions, including also to some extent winds

Coal mines generally have far better ventilation systems than are found in other types of underground operations Most coal mines have fairly effective ventilating systems and the chemical quality of the air is usually excellent Ordinarily the oxygen content of the air of coal mine working places is over 20 per cent and carbon dioxide is less than 1 per cent Every year, however, the Bureau of Mines finds scores of instances in which air in working places of supposedly well ventilated coal mines has oxygen below 20 per cent and carbon dioxide above 1 per cent or even as high as 2 or 3 per cent Methane rarely is found in excess of 1 per cent in coal mine working places

The air in metal or nonmetallic mineral mine working places is more likely to be deficient or contaminated than in coal mines Neither the state laws nor considerations of protective expediency usually force them to install efficient ventilation systems

By far the greater number of underground workers have dry surroundings in which to labor The dry working places have both good and bad features The much more pleasant working conditions in dry places carry with them far more health and safety hazards to the underground worker than do the wet places The wet place may merely have water or mud on the floor, or water may fall through the air like rain, varying from a drizzle to a downpour In certain lead ores the water may carry lead compounds in solution and lead poisoning may affect the worker Under some conditions in copper mines copper salts are dissolved in the water and the worker has what are termed "copper sores," and unless his feet are well protected from the water they may become too sore for walking Where the water and air are cold, the worker is likely to be subject to respiratory trouble or he may have rheumatism In wet mines having high temperatures the worker is likely to be afflicted from time to time with boils or to become weakened from too profuse perspiration or from undue heart strain and in wet mines in climates with really cold winters, unless extraordinary precautionary measures are taken the workers are likely to suffer undue exposure in wet clothing on coming to the surface Thus while those in wet places in mines have some health hazards they are likely to escape the scourge to which nearly every underground worker in dry mines or even in dry places in wet mines is subject namely the dust hazard In wet coal mines the worker has relatively little fear of the widespread coal dust explosion nor does he need to fear that his lungs may become incapacitated through breathing finely divided dust particles in the air

After more than twenty years of study of the engineering phases of dust disease in mining, I am of the opinion that breathing large quantities of relatively finely divided dust over long periods ultimately will be harmful to health This includes not only silicious dust but also bituminous or anthracite coal dust or dust of iron ore limestone alumina or any other mine dust or any or all combinations of those dusts Moreover, the dust problem at least in and around mines both as regards health and safety in coal mining and as regards health in noncoal mines should be almost entirely an engineering and operating problem It now is used largely as a type of racket in which the victims of dust disease get little or no relief financial or otherwise yet the mine operators are harassed by lawsuits or foolish regulations Moreover well meaning but poorly informed law making bodies or investigation committees promulgate regulations or laws on dust disease, chiefly with reference to silicosis when no definite data are available as to numerous essential factors With decidedly limited knowledge of the actual underlying facts concerning the causation of dust disease the only safe method of handling the problem at present is to accept the ideas that the long, con-



tinued breathing of air containing large quantities of finely divided dust will almost certainly sooner or later have harmful physical effect and that the only known "cure" is the prevention or limitation of the occurrence of dust in mines. Dust disease is the greatest health menace to the miner, and many of our miners are obliged to breathe far too much fine dust. The outstanding remedy for this bad situation is education of mine workers in the necessity of taking such precautions as are available, of mine officials to recognize the seriousness of the situation and to provide equipment and methods to reduce or prevent the incidence of disease and, if necessary, to force their adoption on the miners, of the doctors to correctly diagnose dust disease, give publicity to its prevalence, its seriousness, and to preventive remedies, and in death certificates to assign miners' consumption of other dust disease as the cause when such is the case, and of the merchants, newspapers and other influences in the community in trying to prevent the disease rather than in hiding its existence.

The introduction of rock dust into coal mines to prevent or limit explosions is a long step in the right direction toward coal mine safety and, if done with judgment, need not introduce any additional health hazard into coal mines.

Sanitation in and around mines has been improved, but much remains to be done before the miner or his family can be said to work or live under up-to-date sanitary conditions. Sewerage conditions in general may be termed deplorable. In coal mines any attempt to remedy conditions as to sewerage would be ridiculed by the workers as childish, though metal miners are inclined to react with some favor to rules or devices looking to improvement of underground sewerage conditions. The mines, with some exceptions, have not had sufficient assurance of stability of operation to justify the expenditure for really good sanitary conditions in mining communities; this includes sewers, city water system, concrete roads, lawns, brick or concrete houses with baths and other conveniences. Many fairly progressive mines have failed to provide a good usable type of wash house, though some mining companies have wash houses or "drys" that resemble palaces. Very likely it would not only pay well in the various kinds of satisfaction they bring to those who work in mines but also in dollars and cents if the companies would do far more than they have done to provide workers and their families better welfare and sanitation facilities.

As specific remedial measures for metal mines I would suggest mechanical ventilation, with some definite person in charge, to force moving currents of air to every place where men work to remove dust, heat and gases. The use of water should be enforced in every place where dust may be found. Where possible, the blasting should all be done after a shift, where this cannot be done there should be enforcement of strict regulations as to the wetting of the region of blasting both before and after the shots are fired, removal of all explosive fumes by adequate air currents, and prevention of entrance into a blasted place until all dust and fumes have been removed. There should be strict physical examination of mine workers before employment and at periods of not greater than six months during employment, with prompt removal from dangerous underground work should unfavorable physical symptoms be found.

The coal mining public, instead of 'standing pat' and referring to out of date and often misleading foreign statistics that coal dust is harmless to health, should make an impartial, strict study of dust conditions in coal mines, paying particular attention to examination of the chest conditions. Coal camp doctors who have direct knowledge of the harmfulness of coal dust to underground workers should come forward with technical articles descriptive of the situation, and state and federal authorities and other interested agencies should cooperate in making studies and publishing results as to the health situation of workers in dusty places in coal mines.

A short paper cannot cover adequately the necessities in trying to evaluate the results and accomplishments of the Bureau of Mines in its health and safety efforts for the benefit of those engaged in the mineral industries. On the safety side some figures are available. During the five year period just previous to the creation of the Bureau of Mines 13,288 persons were killed in the coal mines of the United States,

an average of 2,658 a year, and the fatality rate for this five year period was 5.89 persons killed per million tons of coal produced. The number killed in our coal mines in 1932 was 1,207, and the fatality rate per million tons of coal produced was 3.36, in 1933 there were 1,064 killed, a rate of 2.78, in 1934 there were 1,222 deaths, a rate of 2.93, and in 1935 there were 1,242 deaths, a rate of 2.93, tentative figures for 1936 indicate that 1,330 fatalities occurred, a fatality rate of 2.72, the lowest coal mining fatality rate on record, and tentative figures for 1937 show that there were 1,467 fatalities, a rate of 2.98. During the twenty-seven years of the Bureau of Mines, the coal mine fatality rate has been reduced sufficiently to indicate an average annual saving of life of more than 1,000 persons. If the cost of a life to the operator is considered at a relatively low amount, such as \$5,000, irrespective of humanitarian considerations (and not considering nonfatal accidents) the annual saving of somewhat more than 1,000 lives may be considered as 'worth' more than \$5,000,000, or almost three times the amount being expended by the Bureau of Mines during the present fiscal year and nearly double the entire expenditure of the bureau for any year of its existence.

The financial losses that the workers have avoided through this increased safety of coal mine operation are colossal. The average age of the coal mine worker who is killed is about 35 years and, in general, he should have a future active working period of at least twenty years. In normal times he should earn at least \$1,000 annually, in his twenty years' active life expectancy he would receive approximately \$20,000 for his services. Hence the saving of the life of about 28,000 coal mine workers in the past twenty-seven years through a decreased death rate in coal mining has prevented a financial loss to them of at least \$560,000,000, and this does not take into consideration the financial losses saved to the worker through the elimination of large numbers of nonfatal accidents.

The foregoing detailed facts about coal mining are more or less similar to safety conditions in the other phases of mining and allied industries, including metal mines, nonmetallic mineral mines and the petroleum industry, all of which still have a relatively high rate of accident occurrence, though much progress has been made in the past six years.

The beneficial effects of the health work of the bureau can by no means be as readily shown statistically as can the effects of its safety work, but definite information can be given not only as to the effect on workers but also as to protective or preventive methods, devices and procedures. The work of the bureau with respiratory protective equipment is outstanding, its early work in dust constitutes the basis of information and teaching on these matters today in industrial work, numerous other accomplishments of a fundamental character could be mentioned. The subject of health in mining, however, has not been given nearly the attention it warrants. It is almost certain that far more underground workers are incapacitated or die annually from the breathing of excessive amounts of dust than are killed by mine explosions and fires. Air conditioning, now practically in its infancy in general industry, offers a possible fruitful means of safeguarding the health and to some extent the safety of the mine worker. A few mining companies are making air conditioning installations. When mine disasters with loss of life occur or when mine workers become incapacitated or die from ill health resulting from their occupation, much of the burden finally falls on the public, as cost is ultimately passed on to the user of coal or other mineral products. In addition, while the compensation received by the victims or their dependents help them temporarily, in general the families of crippled or killed miners or the sickly or crippled miners themselves, become largely dependent on the public for support, in one manner or another. Health and safety work in mining and allied industries offer large remuneration in salvage of life and limb as well as in dollars and cents for dividends as well as for capital investment. Questions in connection with occupational disease are harassing industry and mining is deeply affected, suits involving millions of dollars have been in court in connection with dust disease, and this is only the beginning. The prevention of dust disease in mining is readily susceptible of solution and its various ramifications should be attacked vigorously. The Bureau of Mines is the best agency to handle the research



Numerous other health and safety problems in the mining and allied industries also can and should be solved, and again the Bureau of Mines is the logical organization to do much of the work. The bureau, with its vast experience and with a definite record of accomplishment, is the spark plug to keep the work functioning effectively, but to enable the Bureau of Mines to do a good job, the funds allotted to it for health and safety work should be increased severalfold.

### The Public Health Interest in Industry —Federal, State and Local

DR WARREN F. DRAPER, Washington, D. C. The health of about 20 million people who are engaged in productive occupations and on whom the life and health of much of the population depend is of paramount concern to those entrusted with the welfare of the nation. It is well known that certain environmental factors such as poisons, dusts, excessive temperatures and humidities, defective lighting and noise have a decided influence on the health of workers. There is evidence indicating a greater average mortality rate in the industrial population than in the group of gainfully employed persons as a whole. A high mortality is especially notable among unskilled workers. Workers in large establishments are provided with health services to some extent, but the provision of health services in small establishments is a more difficult matter.

In considering health improvement we are confronted with several problems. First, the disability and loss of time due to occupational accidents still bulk large in the layman's view of industrial hygiene. According to the last preliminary report of the National Safety Council there were 19,000 deaths in 1937 due to industrial accidents. Second, certain occupations are associated with high morbidity and mortality. Thirdly, many workers in early adult and late life are found to lack the physical capacity and mental stamina to undertake certain types of work. Lastly, we have far too much absence from work due to sickness. While accidents, occupational diseases and high occupational death rates appear to be impressive, there is no doubt that the least dramatic side, the lost time and incapacity due to illness is important. Large industrial establishments have expanded their medical services to include such functions as preemployment and periodic physical examinations of workers, job placement and medical and engineering control of occupational diseases. At present forty-six states have laws providing benefits in the event of accidental injury and twenty-one of these have enacted legislation compensating workers for one or more occupational diseases. During the past year several states have had commissions studying their occupational disease problems for the purpose of guiding the legislatures in their consideration of occupational disease legislation.

The United States Public Health Service, through its Division of Industrial Hygiene, has been active for years in this field with reference to research, education and cooperative service. Today there are twenty-five state industrial hygiene units actively engaged in this work, while six other states are conducting studies for the purpose of determining their needs with reference to such a program. All but six of these units were established within the last two years. According to data supplied by the U. S. Department of Labor the direct and indirect costs of industrial injuries in this country are approximately 5 billion dollars annually. This estimate does not include the economic losses due to nonindustrial injuries and illnesses which we know are far in excess of specific occupational diseases and accidents. The twenty-five industrial hygiene units in the states and the federal government are spending approximately 1 million dollars. The wide difference between the economic loss and the amount spent for prevention indicates forcefully the need for greater effort for the protection and improvement of the health of the worker.

Experience has shown that in the practice of industrial hygiene the essential features of a program should include research and its application, and education. The machinery for carrying out such a nationwide program is already in existence. The Division of Industrial Hygiene has been conducting research both in the laboratory and in the field and the results have been disseminated throughout the nation to be

applied by the appropriate agencies. In addition, the Division of Industrial Hygiene has been active in the development of industrial hygiene services in state and local organizations, so that conditions affecting the health of our industrial workers may be properly appraised and steps taken for their improvement.

Under an enlarged program of the Public Health Service for industrial hygiene the work naturally divides itself into three categories. First, the administrative functions concerned with coordinating all activities undertaken by federal and state agencies and by unofficial organizations. Second, the expansion of industrial hygiene units in state and local health departments. Finally the studies and investigations carried on by the laboratory and field sections of the Division of Industrial Hygiene.

The work of the division is to be carried out cooperatively with state and local health departments, industry, physicians and unofficial organizations concerned. The chief functions of a division of industrial hygiene in a state department of health are to study factors adversely influencing the health of workers, to control unhealthful conditions and to integrate all the facilities within the department of health and the state which can produce an improvement in the health of workers.

The determination of the scope and nature of the industrial hygiene problem should be the first consideration, and this will indicate the kind, magnitude and direction of the work to be undertaken in this field. It would be possible to make this determination in any state where reliable statistics are available on industrial morbidity and mortality, and accurate information on occupational diseases and accidents. At present such data are lacking in nearly all the states; in some instances information on accidents exists, and less frequently on occupational diseases. The preliminary survey now in progress indicates that already sickness records are kept on nearly half of our working population. It is felt that, by intensive educational work among physicians and industrial officials, arrangements can be effected to secure reports of absenteeism due to occupational diseases and other illnesses. The Division of Industrial Hygiene has been receiving such data for many years from a group of thirty industrial sick benefit organizations which provide sickness benefits for approximately 170,000 industrial workers. The methods for expanding this plan on a nationwide basis are therefore available. The success of a nation's industrial health program is dependent on the standard and completeness of the health services that are provided for industrial workers. While the treatment of traumatic injuries and the performance of physical examinations on applicants for work are necessary, industrial medicine can no longer be considered to be limited to these activities alone. Modern practice requires the application of preventive measures as well. A plan for providing health services in industry should include:

#### A Under the direction of the plant physician

- 1 Regular appraisal of plant sanitation
- 2 Periodic inspection for occupational disease hazards
- 3 Adoption and maintenance of adequate control measures
- 4 Provision of first aid and emergency services
- 5 Prompt and early treatment for all illnesses resulting from occupational exposure
- 6 Reference to the family physician of individuals with conditions needing attention, cooperating with the patient and his physician in every practical way to remedy the condition
- 7 Uniform recording of absenteeism due to all types of disability
- 8 Impartial health appraisals of all workers
- 9 Provision of rehabilitation services within industry
- 10 The conduct of a beneficial health education program

#### B Under the state or local bureau of industrial hygiene

- 1 Consultation with plant management regarding needed corrections of environmental conditions
- 2 Advice to the management and medical supervision as to the relative toxicity of materials or process and advice concerning new materials prior to their introduction into the industry
- 3 Assistance in developing, maintaining and analyzing an effective record
- 4 Consultant service to medical supervision or private physicians, compensation authorities and other state agencies regarding illness affecting workers
- 5 Provision of necessary laboratory service of both a clinical and a physical nature
- 6 Integration of the activities of other public health bureaus in their programs for worker—for example, the control of cancer, syphilis and tuberculosis

To determine the best methods of controlling occupational disease and reducing illness caused by the industrial environment, laboratory and field investigations must be carried on constantly. There is a need for the determination of the toxicologic effects of inorganic and organic substances used in industry, especially new commercial compounds. For example, the development of organic solvents is increasing so rapidly that new solvents are being evolved for potential and industrial use almost every day. An evaluation of the toxic properties of such substances should be made before their commercial application in order to prevent harmful effects to the workers using them. The employment of new commercial compounds has increased the number of cases of industrial dermatitis. We must devote time to this problem, especially with regard to methods of determining the effects of materials on the skin, methods of treatment, and the development of preventive measures for control.

There is need for investigating radiation phenomena with particular reference to their effect on the spread of air borne infections, to industrial smoke pollution as a factor in health and to the determination of injury and physical changes arising from the industrial use of x-rays and radioactive materials. Studies have been requested in the field of vibration, noise and illumination. Industrial hygiene must be prepared to develop methods of measuring physical fitness under various industrial conditions such as high and low temperatures and humidities, rarefied and compressed air, and certain conditions in which repeated motion and strenuous activities are concerned. Finally, the determination of methods for controlling exposure and reducing occupational disease hazards through engineering methods is a problem which has received inadequate attention. Fundamental work on methods and equipment needed for the control of dust, fumes, vapors and gases so that concentrations may be reduced below the threshold limits is one of the most important functions of industrial hygiene. The Public Health Service has received requests for assistance in the way of money and of teaching personnel. Since in further promoting a satisfactory health program the needs for trained personnel will grow, it is important that institutions for clinical research and the teaching of industrial medicine be established as early as possible.

#### Industrial Health Activities by Labor Departments in the Government

DR ALICE HAMILTON, Washington, D. C. The subject given to me is the part played by the federal and state departments of labor in the protection of workers against accident and disease. The federal government for many years did not concern itself with industrial health and the Division of Labor Standards, the branch of the Department of Labor now concerned with it, is of very recent origin. While it is simply an advisory body, the function of the Division of Labor Standards is very important. Its duty is to formulate codes of safe procedure which the states may adopt and to frame model laws which the states may, if they choose, enact. This means a great deal of fact finding and of consultation with experts in many fields.

A labor department thinks first of the practical aspect of the problems of industrial health, or the way in which the actual worker in the actual factory or mine is to be protected against the dangers which experts have discovered. In this country the greatest obstacle to good practice in this field is lack of trained factory inspectors. The English factory inspector is a college graduate, considers his position one of dignity and importance, and has permanent tenure. One of the great aims of the Division of Labor Standards is the training of factory inspectors, and in its brief life the division has held four regional schools for factory inspectors. The first one was in Baltimore under the auspices of the Johns Hopkins University School of Medicine. Inspectors from Virginia, West Virginia, North Carolina and Tennessee attended. We had lectures in the morning and visits to factories in the afternoon. We tried to show them where the danger was. The other schools have been held in Pennsylvania and in two groups of Middle Western states. In addition, the Division of Labor Standards has prepared four page leaflets which tell the effects of poisons and dusts, the mode of prevention and the proper treatment.

The working out of codes in cooperation with the American Standards Association and with the Public Health Service is another duty of the Division of Labor Standards. The great problem facing the division at the outset was silicosis. The Division of Labor Standards had as its duty the prevention of silicosis by proper engineering devices, the discovery of such devices and their application in industry. This was the starting point for the four committees on silicosis which made up the National Silicosis Conference, committees of experts in medicine, in engineering, especially ventilation engineering, in the economic and insurance phases of the problem, and in regulation and law enforcement. An important part of the work of the division is rendering special service to the state labor departments many of them fairly new in this work. When I go to Washington, I am asked to take part in a conversation with some labor official faced with a problem with which he does not know how to deal. The division can give him advice and lend him the services of an industrial hygienist with practical industrial experience with ability to make air analyses and to test ventilating apparatus.

Much information comes to the division through its connection with labor concerning dangers in certain occupations. Some of this is erroneous, the men making wrong conclusions from what they see. Much of this information from workmen has a real basis and complaints and compensation claims on the part of workers have brought to light many more industrial dangers than have ever been revealed by physicians' reports. In every state and, so far as I can find, in every industrial country the effort to get doctors to report cases of occupational disease has been unsuccessful. It was the complaints of employees that revealed the toxic action of tetra-ethyl lead, of luminous paint of manganese and of many of the newer solvents. It is for the Division of Labor Standards to listen to the reports of trade union officials and to sift out the facts or to initiate an inquiry which will bring out the facts and show whether or not the workers' fears are justified. I remember in the old days in the rubber industry, when aniline and aniline derivatives were the chosen accelerators, that I was skeptical of complaints from the heat vulcanizing end. I thought the danger was in the compounding room and in the mixing mills. Then the chemist showed me how chemical reactions taking place under the influence of the heat would result in the production some times of aniline, sometimes of aniline derivatives and even of mustard gas.

Thirty years ago the first start was made in this field by the federal government, but the activity of the state governments is of much more recent development. Even now only a minority of the forty-eight states have made a beginning. Very few have worked out a capably functioning division of industrial hygiene and yet it is only in the states that this work can be practically done. The federal government may help in the establishment of such units but it is the state that must run the unit. The best state organization in the country is that of New York State. In 1936 there were more than 1,900,000 factory employees in that state. There were 457,516 accidents reported and 1,500 cases of occupational disease. The department has a personnel of thirty-four: six doctors, eight engineers, seven chemists, five safety men and eight clerical employees. It has a library and its own laboratory. It is expected to inspect and pass on all ventilation equipment, to make chemical analyses of all unknown materials to carry on routine inspections of factories and special inspections on the basis of complaints from workers, and to do research work on problems of dusts and poisons. The relation to the actual factory inspection service is very close yet the physicians connected with the department do carry on research in the dusty and poisonous trades. We must all remember their bulletin on lead poisoning based on the careful examination of 1,480 lead workers, their bulletin on carbon monoxide, and recent articles on ethylene glycol monomethyl ether, methanol acetate, trichlorethylene, and their reports on silicious dusts. The great advantage the department in New York has is that the results of such research are at once the property of the law enforcing and code formulating units of the department, and that the research may be initiated at the request of the nonscientific division when suspicion has been aroused in factory inspection with regard to certain processes in an industry. This is an important point. An indus-

trial hygiene unit should have the closest possible connection with the department whose responsibility is the protection of the health of the workers.

The Labor Department of New York receives a complaint from a trade union that conditions in a certain plant are such as to cause sickness among the workers. The factory inspector reports that a certain new solvent is used there, and the people think it makes them sick. He does not know what the solvent is or whether the sickness is caused by it. The labor department in such a case should question the industrial hygiene unit, and the latter should be ready and able to respond by sending engineers and chemists to determine the hazard and physicians to make a study of the illness. The industrial hygiene unit may be more interested in research than in its application to industry, but the results of its research will be of little value unless they are passed on promptly to the enforcing branch. Imagine a factory in which the personnel department and the medical department work independently of each other, where the doctor might observe a disproportionate number of cases of disability coming from one department but would not inform the personnel management and request an inquiry to determine the cause. Such a system would be considered inefficient. The industrial hygiene unit of the state should be the consultative aid of the Department of Labor.

One function of the New York Department of Labor is to help in settling workmen's compensation claims. This is objectionable to most industrial hygienists, and they seek to avoid any traffic with these controversial matters. Indeed, I believe that in Connecticut the law creating the industrial hygiene bureau in the department of health specifically states that the bureau may not be called on to give help in compensation suits. I cannot see that that is a reasonable stand to take. Compensation suits are far too much in legal hands already. Such a method throws them still more into the hands of the lawyers and the doctors selected by them and makes an impartial decision more difficult. The claimant and the insurance company must be allowed to have their medical experts, but then there should be an appeal to an impartial expert, and where should one look for him except in a governmental body? I sympathize with men who are reluctant to subject themselves to the treatment that lawyers, alone among civilized men, think it proper to deal out to their fellow men if they happen to be on the other side, but I do not see how the branch of the state government that is entrusted with the problems of industrial accidents and diseases can wash its hands of this kind of expert service.

#### The Activities of Independent Agencies in the Field of Industrial Health

DR W. J. McCONNELL, New York. Independent agencies engaged in industrial health work may be classified into general groups of private foundations and national associations, universities, trade associations, insurance carriers, industrial and mercantile establishments and labor groups.

The Air Hygiene Foundation of America, Inc. is a non-profit organization supported by the industries and dedicated to the advancement of industrial health through the study of occupational diseases. Research projects and studies supported by the foundation are in progress at a number of institutions. The foundation has surveyed medical, engineering and legal phases of current occupational disease problems and has developed an exhaustive bibliography and data file on occupational diseases enabling the organization to serve as a clearing house of information on the subject. Abstracts of current occupational disease literature are issued monthly. Three professional committees—medical, preventive engineering, and legal—each composed of specialists in their particular fields are maintained by the foundation.

The American Association of Industrial Physicians and Surgeons was organized in Detroit twenty-four years ago. Scientific exhibits of interest to the industrial physician are features of the annual meeting. A committee has under consideration a field survey of plant dispensary equipment to determine to what extent plant medical equipment can be standardized and what are the approximate costs of adequately equipping plant dispensaries of various sizes.

The American College of Surgeons does excellent work through its Committee on Industrial Medicine and Traumatic Surgery.

The American Medical Association has always published in THE JOURNAL information in the field of industrial health, but emphasis was given the subject a decade ago through the organization of the Section on Preventive and Industrial Medicine and Public Health. The Association authorized in June 1937 the organization of a Council on Industrial Health as a standing committee of the Board of Trustees. The Council was organized in December 1937 and has developed a working organization through the appointment of a secretary and the creation of official committees.

The American Public Health Association for twenty-five years has engaged in the study of a wide variety of public health subjects through the Industrial Hygiene Section, which is one of ten sections of the association.

The American Society of Heating and Ventilating Engineers, through its research laboratory, for a number of years has been conducting studies on the effects of high temperatures and various humidities on workmen. The laboratory recently has studied the reactions of different groups of office workers to air conditioning. A committee of the society is engaged in a study of high humidities such as are found in the textile industries. A joint committee of the society and of the American Society of Refrigerating Engineers has drawn up a code of recommended minimum requirements for comfort air conditioning. Another committee of the society and the U. S. Weather Bureau are conducting a study at the present time for the purpose of establishing weather design factors which may be useful in the design and operation of air conditioning systems.

The American Standards Association is a federation of national associations and governmental departments. It serves as a clearing house through which industrial, technical and governmental groups develop and coordinate their standardization programs in the interests of economy, looking forward toward the development of a single consistent set of national standards. It is the recognized national standardizing agency. Any organization with standards which it feels would be more effective if approved as American standards may present its standards to the association for approval. This association initiates projects in the field of industrial health only when a specific request has been received and after the request has been investigated and approved by the standards council of the association. About 400 standards and safety codes have thus far been approved. The association is developing a safety code for work in compressed air. A code on electroplating is in draft form. The association's reports on 'Fundamentals Relating to the Design and Operation of Exhaust Systems' was the first document of its kind to be prepared. Other subcommittees have been organized to develop standards for rock drilling, grinding, buffing and polishing and similar subjects with particular relation to the use of exhaust systems. An important activity in the field of industrial health is the work of the Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases.

The Illuminating Engineering Society was organized in 1906 for the advancement of the theory and practice of illuminating engineering. Its chief contribution to the field of industrial health lies in its code of lighting for factories, mills and other work places. This code has been officially approved as an American standard by the American Standards Association. The society is engaged at the present time in preparing good lighting practices for specific industries.

The National Safety Council is interested primarily in industrial and public safety. The council's booklets 'The Healthy Worker' and 'Safeguarding Women in Industry' have had wide distribution. The National Safety Act is a monthly paper carries an industrial health section.

The National Tuberculosis Association, through a number of local organizations, have included at one time or another, among other activities, an industrial health program.

The Saranac Laboratory for the Study of Tuberculosis undertakes research studies sponsored by the Trudeau Foundation. They are coordinated with clinical, roentgenologic and engineering field studies in industries in which dust and tuber-

culosis constitute an occupational hazard. Animal experimentation is used to test hypotheses formulated from field data to explain peculiar manifestations of disease and their causation. The problems of study at present fall into two groups, one which concerns the effects of dust alone and a second in which alterations in susceptibility to tuberculosis are of primary interest. While field investigations of certain industries are conducted for the confidential information of those concerned, the many research studies issued by the laboratory and addresses by the members of the laboratory staff are given wide circulation.

The Industrial Health Conservancy Laboratories was established on a fee basis to serve industry in all health problems relating to workers and working conditions. Organized in 1920, it is the oldest privately maintained organization of its kind in the United States. Its field of activity has covered such subjects as industrial intoxications, occupational diseases, industrial hygiene, industrial epidemics, medical organization and authoritative testimony. Three types of services are offered to industry: membership services, retainer services and special and miscellaneous services. The organization issues a booklet describing these services and kindred matters.

Among the independent agencies which are not only conducting research and field investigations in the industrial hygiene field but are offering courses of instruction in industrial hygiene to students and graduates are a number of the universities in every section of the country.

The American Foundrymen's Association's efforts in the field of industrial health are directed toward the development of good practices for the foundry industry and the collection of information helpful in formulating codes for the industry. The Industrial Hygiene Codes Committee of this organization has so far published three good practices reports and is engaged in preparing others.

The National Association of Manufacturers Committee on Healthful Working Conditions recently organized is interested for the present in the coordination of the best practices in industrial medicine in an effort to adapt them to the varying types of manufacturing plants, and the 'selling' of good industrial practices to the industrialists of the country.

The Portland Cement Association has conducted an anticold campaign among the employees of member plants and at present is providing funds for a dust-health study of the cement industry.

Another group of independent agencies actively interested in the promotion of industrial health work is the insurance group. A number of the compensation carriers maintain a laboratory of industrial hygiene for the study of existing industrial health hazards and of measures for controlling them in the plants of the industries which they insure under their workmen's compensation policies. A partial list at least of the compensation companies maintaining industrial hygiene laboratories are the Aetna Life of Hartford, Conn., the Employers Liability of Boston, the Employers Mutual Liability of Wausau, Wis. (laboratory at Milwaukee), Fidelity and Casualty of New York, Liberty Mutual of Boston, Maryland Casualty of Baltimore, Michigan Mutual Liability of Detroit, Travelers of Hartford, Conn., and the Zurich General Accident Liability of Chicago.

The largest group of independent agencies whose activities in the field of industrial health are directed particularly toward safeguarding the health of workmen is the employer group. The duPont organization has erected an institute known as the Haskell Laboratory of Industrial Toxicology, the staff of which determines the toxicity of the many chemical products manufactured by the organization and recommends safe methods of employing them in industrial processes. The Union Carbide and Carbide Chemical Corporation recently has begun a study of the toxicity of some of its products. Many other organizations have established industrial hygiene laboratories for the study and prevention of health hazards encountered in their respective plants. These services are all supplementary to well rounded health programs carried out in each subsidiary of the corporation. Unique features of the medical program of the American Telephone and Telegraph Company are the general health course and the nutrition course for women with certain follow-up activities and the course in safety and first aid for men.

Emphasis is placed on the development of proper health habits conducive to the maintenance of good health and to practical everyday methods of living.

Labor organizations, as a group of independent agencies, appear rather backward in any sustained efforts in the field of industrial health. Attempts have been made by labor organizations to promote health programs, but for some reason best known to themselves these programs were discontinued. A notable exception is the health service rendered by the Union Health Centre to its members. This organization for twenty-five years has acted as the Health Department of the International Ladies Garment Workers Union. With the exception of a single grant of \$20,000 from the Roscnwald Fund, the Union Health Centre has been supported from fees from its members. In 1934 it became an integral part of the International Union.

The group of independent consultants in industrial health is composed of eminent industrial physicians and engineers whose services are available to industrial organizations large or small, that may require consultation service.

#### DISCUSSION ON GOVERNMENTAL INTEREST IN INDUSTRIAL HEALTH

DR CARTER: I want to ask a question about the publishing of these papers. Are you going to publish them in THE JOURNAL or in a bulletin?

DR H. H. KESSLER, Newark, N. J.: They will be published in THE JOURNAL.

DR CARTER: I think we should have a bulletin.

DR KESSLER: In New Jersey there are several medical agencies that are interested in the field of industrial health. We have a Committee on Industrial Health in the state medical society and a new branch of the American Association of Industrial Physicians and Surgeons has been developed. The governor has called a conference on medical care and it is through that conference that a subcommittee on industrial health has been formed. These three groups, and still another group, the New Jersey Sanatorium Officers Association are interested in industrial health and they will have an opportunity for expressing their points of view on certain state programs and governmental programs that will be developed. As Dr. Draper described, and also Dr. Hamilton, the federal government is interested in establishing programs of industrial hygiene throughout the country and so far twenty-five states have adopted this program under the auspices of the state department of health. In New Jersey this program has not yet gotten under way because of opposition of the state department of labor to the establishment of such a program under the auspices of the state department of health.

MR. LOUIS RESNICK, New York: Dr. McConnell overlooked one national health agency in New York, and that is the National Society for the Prevention of Blindness. The society has a very small industrial relations department and has published a book entitled "Eye Hazards in Industrial Occupation, a handbook for state engineers and industrial executives. It is now revising the book and will bring out a new edition in the spring. It has also made a study of eyes saved in industry, in cooperation with the National Safety Council. It has published a number of smaller pamphlets, including "The Self Appraisal of Eye Protective Measures" and a so called program for 100 per cent eye protection. It held joint meetings with the National Safety Council and the American Association of Industrial Physicians and Surgeons in Detroit a few years ago. Those who are interested may write to the National Society for the Prevention of Blindness and get a complete list of its industrial publications. Most of them are available for free distribution.

DR. A. S. LEVY, Chicago: Dr. McConnell pointed out the various independent agencies that have been doing splendid work in trying to increase the health of the worker and the health conditions in industry. He pointed out that the greatest group responsible for this phase of work was the employers' group, also that the least groups are the insurance carrier and working groups. That is a little bit conflicting. From my experience in the field of industry some of the large industrial firms—employers—have done and are doing fine work toward their employees, but the majority of those in the employer group had not been interested greatly with reference to the health of employees or to health conditions in industry until the employees,

governmental agencies and labor groups forced them to take cognizance of the fact. Dr Draper pointed out that there were over 19,000 cases of deafness due to injuries that arose in the course of employment. He pointed out that there were over two million workers exposed to the hazards of dust, there were over one million workers injured and maimed during employment. What good does it do to find a worker suffering from tuberculosis or pneumoconiosis if one is not able to do something for him? What good is it to find a worker suffering from a dermatosis or other conditions when there are no provisions made to take care of him or his family adequately during the course of treatment? The doctor must be considered in this problem. He must be paid for his work. If adequate medical provisions are made with all these problems which were presented for the adequate health protection of industry, we should include also the health and the economic protection of the doctor.

Dr W J McCONNELL, New York. No doubt there are other organizations that I omitted. I regret that I could not give in more detail the work some of these organizations are doing. A number of the directors of those organizations are present and I was hoping that they would perhaps elaborate. I did not intend to give the impression that the insurance carriers were grouped with labor. Perhaps modesty prevented me from emphasizing the excellent work which I think the various insurance companies have been doing in industrial health.

(To be continued)

## RADIO BROADCASTS

The fourth series of programs broadcast in dramatic form portraying fictitious but typical incidents of significance in relation to health by the American Medical Association and the National Broadcasting Company, entitled "Your Health," began Wednesday October 19 and will run consecutively for thirty-six weeks. The program is broadcast each Wednesday over the blue network of the National Broadcasting Company at 2 p m eastern standard time (1 p m central standard time 12 noon mountain time, 11 a m Pacific time).<sup>1</sup>

These programs are broadcast on what is known in radio as a sustaining basis that is the time is furnished gratis by the radio network and local stations and no revenue is derived from the programs. Therefore local stations may or may not take the program, at their discretion, except those stations which are owned and operated by the National Broadcasting Company.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

February 22	Cancer Can Be Cured
March 1	Diabetes
March 8	Water Waste and Sanitation

<sup>1</sup> Owing to program conflicts there will be no Chicago broadcast of the network program. Instead a recording of the program will be broadcast over station WENR at 8 p m each Wednesday. This recording will be an identical rebroadcast of the network program broadcast earlier the same day.

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Bills Introduced*—H J Res 153, introduced by Representative Sirovich, New York, proposes to authorize the Bureau of Marine Inspection and Navigation of the Department of Commerce and the Division of Marine Hospitals and Relief of the United States Public Health Service to investigate, among other things, the percentage of lascar seamen requiring medical attention in American ports and the number put ashore for hospital treatment. H J Res 162 introduced by Representative Sirovich, New York, proposes to establish an annual award in each of the fields of literature, music, art, drama, journalism, medicine, chemistry, physics and mathematics, to be known as Distinguished Service Medal in Arts and Sciences, to foster and encourage the development of science, art and literature in the United States. H R 2975, introduced by Representative Voorhis, California, proposes to amend the Social Security Act by authorizing an initial appropriation of \$10,000,000 and thereafter for each fiscal year a sum sufficient to carry out the purposes of the bill to enable each state to furnish financial assistance or other assistance including but not limited to medical, dental and mental aid to needy transients. H R 2987 introduced by Representative Reed, Illinois, proposes to compensate any employee of the United States government who shall furnish blood for transfusion to a member or former member of the military establishment who is a patient in a government hospital. H R 3141 introduced by Delegate Dimond, Alaska, proposes to extend the benefits of the United States Public Health Service to persons aboard or operating any vessel in fishing operations. H R 3530 introduced by Representative Marx, Minnesota, proposes to authorize an appropriation of \$650,000 to erect a veterans domiciliary unit to provide 700 beds at Fort Snelling, Minnesota, and to provide the necessary auxiliary structures, mechanical equipment and outpatient dispensary facilities. H R 3578 introduced by Representative Cannon, Florida, proposes to authorize an appropriation of \$1,423,000 to construct a marine hospital in or near the city of Miami. H R 3644 introduced by Representative Bradley, Michigan, proposes to authorize an appropriation of \$700,000 to construct a veterans hospital in or near Gladstone, Mich., with a capacity of 150 beds for the accommodation of veterans entitled to such facilities under existing

law and future law." H R 3700, introduced by Representative Peterson, Florida, proposes to authorize an appropriation of such sums as may be necessary to construct a marine hospital in Florida on a site to be selected by the Federal Board of Hospitalization. H R 3941, introduced by Representative Havenner, California, proposes to authorize an appropriation of \$600,000 to construct a 134 bed patient capacity addition to the existing veterans' facility at Fort Miley, Calif., for the treatment of general medical and surgical disabilities. H R 3951, introduced by Representative Smith, Ohio, proposes to amend the recently enacted federal food, drug and cosmetic act so that a manufacturer or distributor of any nostrum favored by the amendment may be enabled, through mail order diagnoses by physicians employed to make them, to sell his wares throughout the country without complying with the labeling requirements imposed on his less favored competitors. A nostrum to be thus favored, however, is to be such as has been 'not dangerous to health and has been effective in relieving the condition for which it is prescribed in at least 1,000 cases a year during the last twenty years preceding the approval of this act.' H R 3999 introduced by Representative Welchel, Georgia, proposes to amend the Social Security Act so as to provide federal financial aid to states to enable them to assist needy individuals who are permanently crippled to a degree that precludes them from being able to engage in a gainful occupation.

### DISTRICT OF COLUMBIA

*Bills Introduced*—H R 3650 introduced by Representative Guver, Kansas, proposes to prohibit within the District of Columbia the manufacture, importation, exportation, transportation, sale, gift, purchase or possession of any spirituous, vinous, malt fermented and all alcoholic liquors whatsoever which may be used as beverages except natural wine for religious services and ethyl alcohol used (1) for compounding or manufacturing medicines for internal use and (2) by physicians, surgeons and dentists as a disinfectant. H R 3808 introduced by Representative Reece, Tennessee, proposes to provide for the use of scientific tests to determine the degree of intoxication of operators of motor vehicles in the District of Columbia whose vehicle causes personal injury or substantial damage to any other vehicle or property.

## STATE MEDICAL LEGISLATION

## Alabama

*Bills Introduced*—S 13 proposes to require the governing body of each county to appropriate annually a sum equivalent to not less than 20 cents per capita of the population of such county, to be used for the maintenance and operation of a full time county health department. H 155 proposes to appropriate \$50,000 annually for the next two years to provide state aid to the several counties for constructing or expanding county and/or district tuberculosis hospitals. H 164 proposes to eliminate the provisions in the present medical practice act requiring that not less than two examinations of applicants for licensure shall be held annually and to provide instead for the holding of examinations annually.

## Arizona

*Bills Introduced*—H 115, to amend the provisions of the medical practice act, proposes, among other things, that holders of certificates and permits to practice medicine and surgery and holders of certificates and permits to practice osteopathy shall be accorded equal rights and privileges by public institutions, officers, and commissions. H 148 proposes to prohibit the retail sale or distribution of any device, appliance or medical agent used in the prevention of venereal disease except by licensed physicians and by licensees of the State Board of Pharmacy.

## Arkansas

*Bill Passed*—H 92 passed the house, February 3 proposing that nothing in the dental practice act shall prohibit or prevent any licensed physician from extracting teeth in an emergency when he shall deem it advisable and when a licensed dentist is not reasonably available.

*Bills Introduced*—S 143 and H 252 propose as a condition precedent to the issuance of a license to marry, that both parties to a proposed marriage present certificates from licensed physicians that they have submitted to physical examination, including a Wassermann and/or Kahn blood test, and a dark field test where indicated, and that, in the opinion of the physicians the parties either are not infected with syphilis or are not in a stage of that disease which may become communicable. House 252 was reported favorably to the House January 31. S 41 and H 222 propose to provide for the payment of compensation to workmen injured in the course of their employment and to require an employer to supply an injured employee with necessary medical, hospital and nursing care. Under both bills an injured workman must accept the physician tendered by the employer, and only if the employer fails or neglects to provide a physician may an injured workman select a physician of his own choice. Neither bill proposes to provide compensation for disability resulting from occupational diseases. H 220 proposes to repeal the existing laws relating to sale and disposition of food and drugs and to enact a uniform food, drug and cosmetic act. S 194 proposes that, whenever in a civil or criminal proceeding issues arise on which the court deems expert evidence desirable, it may appoint one or more experts, not exceeding three on each issue, to testify at the trial. The fact that such experts have been appointed by the court is to be made known to the jury. S 223 proposes to enact a retail sales tax law and to impose a tax of 2 per cent on the gross proceeds derived from sales of tangible personal property. The bill specifically provides that the tax shall apply to "All sales made by physicians, surgeons, optometrists, oculists, opticians, veterinarians, dentists or any other person engaged in rendering personal and professional service in which any tangible personal property is sold or consumed." H 287 proposes to enact a new cosmetic therapy or beauty culture practice act which purports to permit licensees among other things, to remove superfluous hair from the body of any person by the use of the hands, mechanical or electrical apparatus or by the use of cosmetic preparations or antiseptics. This bill was reported favorably to the house on February 7. H 335 proposes to prohibit the operation of a hospital unless licensed by the State Welfare Board. The

board is to be authorized to revoke the license of a hospital having "sanitary conditions and professional conduct" contrary in its opinion to the best interests, safety or welfare of the people. The bill specifically provides that "The standard of ethics as adopted by the American Hospital Association is hereby adopted as a standard by which any hospital in this state shall operate."

## Georgia

*Bills Introduced*—H 190 proposes to strike out those provisions of the medical practice act which require that five members of the Board of Medical Examiners be regular physicians, three to be eclectic physicians and two to be homeopathic physicians. This bill was reported favorably to the house, February 10. H 238, to amend the law permitting the organization of corporations to operate nonprofit hospital service plans, proposes that "at least a majority of the directors of such a corporation must be at all times directors, superintendents or trustees of hospitals which have contracted or may contract with such corporation to render its subscribers hospital service, or a Board of Trustees which shall be approved by the Insurance Commissioner."

## Idaho

*Bill Passed*—S 71, to amend the medical practice act, passed the senate February 3 and the house February 9, proposing, in effect, to permit students who have had training in recognized medical colleges in good standing and who are performing the duties of an intern in any duly organized hospital operating under the supervision of a medical staff freely to perform their duties without being licensed to practice medicine.

## Indiana

*Bills Introduced*—S 173 and H 291 propose to enact a self-styled Uniform Indiana Food, Drug, and Cosmetic Act, to regulate the sale and distribution of foods, drugs, cosmetics and therapeutic devices. H 34 proposes to impose a tax of 1 per cent on the gross income from professional services.

## Iowa

*Bill Introduced*—H 120, to amend the chiropractic practice act, proposes that a license to practice chiropractic "shall authorize the holder thereof to practice chiropractic and to use light, heat, air, water, diet and exercise in the treatment of disease, but shall not authorize the licensee to practice operative surgery, obstetrics, x-ray therapy, or administer or prescribe any drug or medicine included in materia medica."

## Kansas

*Bills Introduced*—H 147 and S 171 propose extensive amendments to the osteopathic practice act. Most important, both bills propose that an osteopath is to have the right "to practice osteopathy in all its branches, which includes operative surgery with instruments, physiotherapy and the use of drugs, as taught and practiced in the legally incorporated colleges of osteopathy of good repute and the right to register under the laws of the United States of America governing narcotics."

## Maine

*Bills Introduced*—H 708 proposes to require osteopaths to renew their licenses annually, to pay an annual fee of \$2, and to condition annual renewal on the presentation by each licensee of satisfactory evidence that he has attended in the preceding year at least two days of the annual "educational" program conducted by the State Osteopathic Association, or its equivalent. H 931 proposes to make stated persons residents of Portland, a body corporate to be known as The Associated Hospital Service of Maine, whose purpose is to establish, maintain and operate a non-profit hospital service plan, whereby hospital care may be provided by hospitals or groups of hospitals with which this corporation has a contract for such purpose to such of the public as become subscribers to said plan under a contract which entitles each subscriber to certain hospital care.



### Massachusetts

**Bills Introduced**—S 396 proposes that no lumbar or spinal puncture shall be made on any patient or inmate of any state institution unless previously thereto a signed written assent is obtained from the patient. H 1401 proposes that no person be required to submit to vaccination or inoculation as a condition precedent to admission to any public school or other institution nor to the exercise of any right, performance of any duty, or enjoyment of any privilege. Any person who vaccinates or inoculates a child, or an adult under guardianship without the written consent of parent or guardian is to be subject to a fine of \$100 or imprisonment for a year or both. H 1407 proposes, in effect, to limit licensure to practice medicine to citizens of the United States or to persons indicating their intention to become such by filing first papers. The bill, however, is not to prevent the board of registration in medicine from permitting foreign specialists to practice in the state for any period the board permits. H 1535 proposes to permit the Department of Public Welfare to establish and maintain health clinics in cities of more than 50,000 population. H 1543 proposes, before a person under complaint or indictment for crime can be committed to a hospital for the insane, that he or she shall have the right to be examined at the expense of the state by two physicians of his own choice. H 1778 proposes to require factories to maintain, in addition to the first aid appliances now required, "the services of a registered nurse for the treatment of persons injured or taken ill upon the premises." H 1827 proposes to require every physician attending a pregnant woman to take or cause to be taken a sample of her blood at the time of first examination and to submit such sample to an approved laboratory for a standard serologic blood test for syphilis. H 1828 proposes, as a condition precedent to the issuance of a license to marry, that both parties to a proposed marriage present physicians' certificates showing that a blood examination of both parties has been made within ten days separately and individually in which a serological complement fixation or flocculation test was made at a regularly approved laboratory and that both tests have been negative for syphilis. A marriage license may issue if any party fails to present the certificate just referred to if he or she presents a physician's certificate that the party has been Wassermann fast during a period of three years and has received not less than forty arsphenamine injections and not less than fifty heavy metal injections. The bill also provides that A test for gonorrhea shall be requested of both applicants for marriage license but this examination shall be voluntary only on the part of the female and may be waived by her if she refuses such an examination. H 1489 proposes that whenever a medical question is in dispute in any case the court may appoint a duly qualified impartial physician to appear and testify and may allow him for so testifying a reasonable fee and necessary traveling expenses. H 1432 proposes to impose an annual occupational tax of \$5 on all persons practicing any profession in the state. S 326 proposes to make it unlawful for any person attached in any capacity to any hospital or sanatorium to aid an attorney to solicit a retainer or other authority to perform legal services for any person confined in the hospital or sanatorium. H 1898 proposes a system of compulsory and voluntary sickness insurance the benefits of which are to consist of cash and all forms of medical dental and hospital services. Persons covered by the Massachusetts unemployment compensation law are included in the compulsory insurance of the bill. All other persons may elect to participate in the voluntary insurance. H 1643 to amend the workmen's compensation act proposes to permit an employer to obtain policies of workmen's compensation insurance excluding from their coverage any or all medical and hospital services and medicines. An employer procuring such a policy is to be solely liable for the obligation excluded.

### Missouri

**Bills Introduced**—H 111 to amend the osteopathic practice act proposes to provide that The system method or science of treating diseases of the human body commonly known as osteopathy and as heretofore or hereafter taught and practiced by colleges of osteopathy recognized and approved by the Missouri

State Board of Osteopathic Registration and Examination, is hereby declared not to be the practice of medicine and surgery within the meaning of the medical practice act. S 29 proposes to require all applicants for licenses to practice any form of the healing art, as a condition precedent to the right to examination and licensure by their respective professional boards, to pass examinations in anatomy, physiology, chemistry, bacteriology and pathology to be given by a board of examiners in the basic sciences which the act proposes to create.

### New Hampshire

**Bill Introduced**—H 291 proposes to repeal existing laws regulating the possession and distribution of narcotic drugs and to enact what appears to be the uniform narcotic drug act. Narcotic drugs, as defined by the bill, are to include coca leaves cannabis, opium and every substance neither chemically nor physically distinguishable from them.

### New York

**Bills Introduced**—A 500 proposes to enact an entire new insurance code. Among other things, the bill contains provisions authorizing the organization of corporations to operate on a nonprofit basis plans either (1) for medical expense indemnity or (2) for hospital service, but not both. Medical expense indemnity, the bill proposes, is to consist of reimbursement for medical care provided through duly licensed physicians and for nursing service and the furnishing of necessary appliances, drugs, medicines and supplies. A 523 proposes to authorize the supplying of all forms of medical, surgical, dental, hospital and nursing care to the public at large without cost by persons in the employ of the department of health. All licensed practitioners of medicine, dentistry, pharmacy and nursing who submit to the provisions of the bill and practice as directed by the department are to receive an annual compensation from the state of up to \$6,000. The bill proposes that the administration of these services be vested in four new divisions to be created in the State Department of Health and that the department exercise exclusive charge and control over all of the public hospitals of the state and exercise complete supervisory powers over all private hospitals. The department is to have power to build or acquire medical supply depots, medical laboratories, hospitals, dispensaries and sanatoriums. A 762 proposes to require any person arrested on suspicion of driving a motor vehicle while intoxicated to submit to examination by a licensed physician designated by the appropriate county or city medical society. The examination must be made within two hours after arrest and is to include coordination and blood or urine tests. A 771 proposes to create a temporary state commission to investigate and analyze the nature and extent of mental disorders and defects, to determine the relationship between mental ailments and crime or criminal tendencies and the legal responsibility and punishment of persons who are mentally sick, for crimes committed by them. A 784 proposes to require a physician treating a case of cancer or other malignant tumor to report the facts to the appropriate health officer. A 794 proposes to enact a separate chiropractic practice act and to create a board of chiropractic examiners to examine and license persons to practice chiropractic. "The practice of chiropractic" the bill defines as the science of locating and the removing of nerve interference in the human body according to chiropractic principles where such interference is indicated or misalignment or subluxations of the vertebral column appear. It excludes operative surgery, prescription or use of drugs or medicine or the practice of obstetrics. A 801 proposes to limit the issuance of licenses to practice medicine dentistry nursing professional engineering and architecture to citizens of the United States. A 340 to amend the law granting hospital liens for services rendered in caring for persons injured through the negligence of another proposes that the fee for filing a claim of lien in the counties comprising the city of New York shall be 50 cents and that the fee for filing a discharge of lien in those counties shall be \$1. S 344 proposes to authorize boards of education to provide children who attend schools other than public with all or any of the health and welfare services and facilities including but not limited to health, surgical, medical,



dental and therapeutic care and treatment, and corrective aids and appliances, authorized by law to be provided children in the public schools. The bill also proposes that the Board of Education in a city may provide for physically handicapped children transportation, home teaching, special classes or special schools, scholarships in nonresidence schools and, on recommendation of the state department of health, surgical, medical, dental or therapeutic treatment, hospital care crutches braces and other supplies. A 569, to amend the insurance law and the membership corporation law in relation to nonprofit health service plans, proposes to authorize the organization of corporations to operate a nonprofit health service plan, including complete medical, surgical and hospital care, to such of the public as become subscribers to the plan. A 737, to amend the medical practice act, proposes to make it an additional ground for suspension or revocation of a license for the holder thereof (1) to have been guilty in any way of unprofessional conduct, or (2) to have advertised by any means for patronage. A 614 proposes to create a temporary state commission to study the dental needs and requirements of the inhabitants of the state and to collect data and statistics looking toward the establishment of a long range state supervised dental program. A 755 proposes to amend the hospital lien act, which specifically gives any person or corporation legally liable for the lien the right to examine hospital records in this matter, but also giving this right of examination to the injured person or his legal representative, in case of death. A 756 proposes to amend those provisions of the medical practice act making it a ground for the revocation or suspension of a license to practice for the holder thereof to advertise for patronage by means of handbills posters circulars, letters stereoptical slides, motion pictures newspapers, radio or magazine but proposes also a similar penalty for advertising for patronage by newspapers.

#### North Dakota

*Bills Introduced*—H 154 proposes to prohibit the operation of maternity homes and hospitals or institutions with maternity beds unless licensed by the State Department of Health. H 170 proposes to deny tax exemption to any hospital "wherein any physician and surgeon who holds a valid and unrevoked license to practice his or her profession in the state is denied the right and opportunity to fully use and enjoy the facilities thereof." H 226 proposes to require all applicants for licenses to practice any form of the healing art, as a condition precedent to their right to examination and licensure by their respective professional boards to pass examinations in anatomy, chemistry, physiology, pathology and bacteriology to be given by a board of examiners in the basic sciences. The board is to consist of one physician and surgeon, one chiropractor, one osteopath and two other members "who shall be of good education in the basic sciences and not engaged in the practice of medicine, osteopathy, chiropractic, or otherwise professionally practicing for a fee for the public in the diagnosis of disease or the treatment of human ailments."

#### Oklahoma

*Bills Introduced*—S 17 proposes to authorize the state commissioner of health to appoint one regularly licensed physician for each county in the state to give medical treatment free of charge to such persons as make affidavit that they are unable to pay for such medical treatment. Such physicians are to be paid from \$150 to \$200 a month may not engage in the private practice of medicine, are to be furnished an automobile by the state and are to receive drugs, medicines, bandages and medical equipment on requisition to the state commissioner. Such physicians are not to perform major surgical operations, which must be performed at the state hospitals. H 131 proposes as a condition precedent to the issuance of a license to marry that both parties to a proposed marriage present a physician's certificate that they are free from syphilis and gonorrhea.

#### Oregon

*Bills Introduced*—H 89, to amend the medical practice act proposes, among other things, (1) to permit the Oregon State Medical Society to nominate, for appointment by the governor, persons it desires to serve on the Board of Medical Examiners, (2) to require the Board of Medical Examiners to meet for the

examining of applicants on the second Tuesday, Wednesday and Thursday in January and the third Tuesday, Wednesday and Thursday in June at Portland, (3) to define "unprofessional dishonorable conduct," which is a ground for the revocation of a license, as "such conduct as would not be indulged in by an ethical physician and surgeon, under all the circumstances taking into consideration the good of the patient and public, the time and place", (4) to require applicants to have had at least two years' premedical education in an approved college or university, to have graduated from a medical school or college on the approved list of the Council on Medical Education and Hospitals of the American Medical Association, and to have completed an internship of at least one year in a hospital approved for internship by the American Medical Association, (5) to make it a ground for revocation for a licensee to make false or misleading statements regarding his skill or the value of his medicine, treatment or remedy in the treatment of any disease or other abnormal condition of the human body or mind or to advertise or hold himself out to treat diseases or other abnormal condition of the human body by any secret formula medicine, method, treatment or procedure, (6) to specify in detail the procedure the board must follow in revoking or suspending a license, and (6) to provide that if a person is found guilty of a misdemeanor under the medical practice act a second time it will be mandatory on the court to sentence him to the county jail for not less than ten days, in addition to whatever other fine or imprisonment is permitted by the act. S 187 proposes to make it a felony, punishable by imprisonment in the state penitentiary for not less than two nor more than five years to provide supply or administer to any pregnant woman any medicine or drug, or substance, or to use any instrument or other means whatsoever with intent to procure miscarriage, unless necessary to preserve life.

#### Pennsylvania

*Bill Introduced*—H 161 proposes to require every physician treating or examining any person suffering from or affected with any communicable, infectious or contagious disease to report the facts to designated health authorities. The bill proposes to make it the duty of the respective health authority to whom the reports are made to remove the persons so reported from private residences and other places to the county hospital or to a state institution providing suitable care. The expense of hospitalization and isolation is to be paid by the diseased person or persons liable under existing laws for his support but if these persons cannot pay such expenses then the care must be rendered and charges made to appropriate districts in accordance with existing law.

#### Texas

*Bills Introduced*—H 10, to amend the medical practice act proposes, in effect, to permit persons to apply or use the principles, tenets or teachings of their church in the ministrations to the sick or suffering by prayer without the use of any drug or material remedy and to charge fees for so doing. H 191 proposes to authorize the organization of corporations to establish and operate nonprofit hospital service plans whereby hospital care may be provided by the corporations to their subscribers through established hospitals and sanatoriums with which the corporations may contract for such care. This bill was reported favorably to the house, Feb. 6. H 195 proposes extensive amendments to the chiropody practice act. Among other things the bill proposes to define a chiropodist as one "who shall treat or offer to treat or diagnose any disease or disorder or any physical deformity or injury, or pathological case or ailment of the human foot, by any system or method either medical, surgical, mechanical manipulative or massage physiotherapy, mechano-therapy, electrical appliance or any other system or method." The bill specifically proposes to prohibit a chiropodist from amputating the human foot, toe or toes or from administering any anesthetic other than local. S 74 and H 148 to amend the medical practice act propose among other things, (1) to limit licensure to citizens of the United States, (2) to prohibit the issuance of a license without examination to the holder of a foreign license if the jurisdiction issuing that license does not afford a similar privilege to Texas licensees, (3) to require

an applicant for licensure after examination, in addition to existing educational qualifications, in effect, to have two years of premedical college work, (4) to eliminate the provisions permitting the issuance of a license to practice obstetrics alone, (5) apparently, to permit a Christian scientist to charge for his services so long as he does not maintain an office for treating the sick, (6) to add several causes for the revocation, suspension or refusal of licenses, including "The use of any advertising statement of a character tending to mislead or deceive the public, and 'Advertising professional superiority, or the performance of professional service in a superior manner'", and (7) to penalize unlicensed practice by a fine of from \$100 to \$500 and/or imprisonment up to thirty days. The present law imposes a fine of from \$50 to \$500 and imprisonment up to six months. H 144 proposes to create a State Department of Hospitalization and Medical Care to provide hospitalization and medical care for the indigent sick and indigent expectant mothers. H 176 proposes to prohibit the operation of a hospital unless licensed so to do by the State Hospital Board, which the bill proposes to create. H 204 proposes to appropriate \$150,000 to the State Health Department to aid and assist the organization and operation of full time county health services. H 245 proposes to authorize the board of county commissioners of any county having a population of more than 30,000 to establish and operate a hospital or sanatorium for the treatment of tuberculosis. Hospitals or sanatoriums established under the bill are to be subject to inspection by the state health officer and to such rules and regulations as the State Department of Health may promulgate with respect to them. H 312 proposes to establish a separate naturopathic practice act and to create an independent board of naturopathic examiners to examine and license persons to practice naturopathy. The bill alleges that

Naturopathy is self-definitive to the same extent as are the terms 'Medicine' and 'Osteopathy' and is the science and art of diagnosing and treating disease by the Natural Methods, such as dietetics, fasting, heliotherapy, hygienic and corrective exercise and psycho-therapy, and the physical methods, such as mechano therapy, massage, neurotherapy, spondylopractic hydrotherapy, thermotherapy, electrotherapy and phototherapy, non-surgical obstetrics and the bio chemical methods such as the use of phytotherapy and the use of foods, vitamins, non-poisonous herbs, roots, barks, seeds, fruits, flowers, vegetable oils and plants containing the tissue-building elements found in the normal body, and hygiene, sanitation and first aid as taught in the chartered and legally authorized schools and colleges of Naturopathy and as shall be taught in these schools and colleges in the future." The bill further states that "The term 'Naturopathic School' shall include any school, by whatever name, teaching Naturopathy under such names as Naturopathy, Natural Therapeutics, Physiological Therapeutics, Physcultopathy, Sanopractic, and the term 'Naturopath' shall include the graduates of these schools." This bill was reported favorably in the house February 8.

#### Utah

**Bills Introduced**—S 85 proposes to prohibit the operation of a maternity hospital unless licensed by the state board of health. S 180 proposes that in any action in which the mental or physical condition of a party is in controversy the court may order the party to submit to a physical or mental examination by a physician designated by the court. S 177 proposes to authorize the organization of corporations to maintain and operate nonprofit hospital and medical service plans whereby hospital and medical care may be provided to such of the public as become subscribers to the plan.

#### Washington

**Bill Passed**—H 58 passed the house January 25 proposing to require every pharmacy or drug store to keep in a suitable book or file the original of prescriptions compounded or dispensed therein and preserving them for not less than five years.

**Bills Introduced**—H 100 to amend the workmen's compensation act proposes to make compensable some twenty-one stated occupational diseases. S 31 to abolish the office of coroner in class A and first, second and third class counties and to vest all the powers and duties of that office in the prosecuting attor-

ney, who is to be authorized to employ licensed physicians, when necessary, to assist him in carrying out the duties formerly performed by the coroner. S 77 proposes that whenever in a civil or criminal proceedings issues arise on which the court deems expert evidence desirable, it may appoint one or more experts, not exceeding three, to testify at the trial. The fact that an expert has been appointed by the court is to be made known to the jury. H 199 proposes to authorize employers to enter into written contracts with third persons for providing their employees with medical and surgical treatment, nursing, hospital services or other services or care contingent on sickness or injury not covered by the industrial insurance law or medical aid act and to collect or retain a portion of their employees' wages for that purpose. H 209 proposes to authorize the organization of corporations to conduct a so-called hospital association business. Such corporations are to be authorized to contract with individuals, families, employees, associations, societies, or with employers for the benefit of employees, for the furnishing of medicines, medical or surgical care and attention, nursing, hospital care, ambulance, dental service or any other service contingent on sickness or accident. Such corporations must obtain a license from the insurance commissioner, must have a paid up unimpaired capital of not less than \$25,000 invested in the same manner as is required by law for the investment of capital stock of domestic insurance companies, must file with the insurance commissioner a bond to guarantee the performance of its contract and shall be subject to examination by the insurance commissioner. H 4 proposes to enact a so-called "Basic Therapy Act," which undertakes to make it "unlawful for any person authorized to practice [any form of the healing art] to practice any method of healing or to use any means of treating any disease, injury, deformity or condition of health which was not taught by his respective school, college or university at the time he graduated therefrom, unless he has taken post graduate work therein or has done special research work in connection therewith or has made a thorough study thereof, in which case he is authorized to practice and use the same."

#### West Virginia

**Bills Introduced**—S 18 proposes to amend and reenact the narcotic drug act enacted in 1935. Among other things the bill proposes to classify cannabis as a narcotic drug and to subject its use to the restrictions imposed by the bill on other narcotic drugs and to eliminate a section in the present law, which would by inclusion of cannabis as a narcotic drug no longer seem necessary, forbidding the retail sale or distribution of cannabis except on the written prescription of a physician, dentist or veterinarian. S 107 proposes to authorize the organization of corporations to operate nonprofit hospital service plans under which hospital care is to be provided by a hospital or a group of hospitals with which such corporations contract, to such persons as become subscribers to the plans. H 156 proposes to make a physician incompetent to testify in any legal proceeding, without his patient's consent, concerning any communication made to him by the patient necessary to enable him to prescribe and treat the case. H 183, to amend the chiropractic practice act, proposes, among other things, to define chiroprody, or podiatry, as "the diagnosis of foot ailments, the dressing, padding and strapping of the feet, the making of models of the feet and the palliative, medical, surgical, manipulative, electrical and mechanical treatment of functional disturbances of the feet as taught and practiced in the schools of chiroprody recognized by the public health council." The bill proposes to prohibit licensed chiroprodists from using the title "Doctor" without the designation "Chiroprodist" or "Podiatrist."

#### Wisconsin

**Bill Introduced**—A 195 proposes to direct the State Board of Control to establish a chiropractic ward at the Winnebago State Hospital for the Insane in which patients of that hospital or other state hospitals for the insane may secure chiropractic service. The management and control of the proposed ward is to vest in a licensed chiropractor who is to be responsible to the Board of Control only. The chiropractor referred to must be paid a salary equal to the salary paid the medical superintendent of the institution.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### ARKANSAS

**State Health Conference**—The Arkansas State Board of Health conducted its annual health conference at Little Rock, Dec 5-6, 1938. The speakers included:

Dr. Allen W. Freeman, Baltimore: Present Tendencies in Rural Health Organization  
Miss Katherine Lenroot, Washington: D. C. Health Needs for Mothers and Children  
Dr. Felix J. Underwood, Jackson: Miss A. Mississippi County Program of Maternal Care  
Dr. Eugene L. Bishop, Chattanooga: Tennessee Administrative Problems in Maternal Control  
Dr. William Dekleint, Washington: D. C. Working Problems Between Health Departments and the Red Cross

### CALIFORNIA

**Society News**—Dr. Charles A. Dukes, Oakland, discussed 'The Voluntary Health Insurance Plan of the California Medical Association' before the San Diego County Medical Society January 20. Dr. Dukes addressed the Los Angeles County Medical Association January 19 on 'Progress Report on the Prepayment Insurance Plan, and Dr. Gösta Dohlman, Lund University, Lund, Sweden, 'State Medicine in Sweden'.

**Cancer Display at Exposition**—An elaborate exhibit showing the many possible causes of cancer has been designed for the San Francisco Golden Gate Exposition. The display is under the supervision of Chauncey D. Leake, Ph.D., professor and head of the department of pharmacology, University of California Medical School. Dr. Alton R. Kilgore, San Francisco, of the California Cancer Commission, and Milton Silverman, Ph.D., director of the Hall of Science of the exposition.

**Personal**—Calvin B. Bridges, Ph.D., known for his work on heredity, died in Los Angeles Dec. 27, 1938, aged 49. Dr. Bridges was active in research on the chromosome theory of heredity and sex determination. He had been a member of the staff of the Carnegie Institution since 1919 and had recently worked at California Institute of Technology, Pasadena.—Dr. Aaron J. Rosanoff, Los Angeles, member of the Los Angeles County Lunacy Commission since 1923 has been appointed director of state institutions, effective January 2. Dr. Rosanoff is a charter member and former president of the Southern California Academy of Criminology.—Dr. Norman F. Sprague, Los Angeles, has been appointed a member of the state board of health, succeeding Dr. George H. Kress. San Francisco, now secretary of the California Medical Association.

### COLORADO

**Annual Registration Due Before March 1**—Every licensee of the State Board of Medical Examiners of Colorado is required by law to register annually, before March 1 with the secretary-treasurer of the board and to pay a fee of \$2 if a resident of Colorado or \$10 if a nonresident. Failure to pay this fee within the time stated automatically suspends the right of a licensee to practice while delinquent. If he nevertheless continues to practice, he is subject to the penalties provided by law for practicing medicine without a license. Failure to pay this fee for three consecutive years results in the automatic cancellation of a delinquent practitioner's license to practice.

### DISTRICT OF COLUMBIA

**Building Program at Gallinger Hospital**—A building expansion program has been made possible at Gallinger Municipal Hospital, Washington, by a WPA grant. The project will include a medical ward building, tuberculosis building, hospital power plant, addition to the nurses home and district morgue, the architecture of all to be in accord with the type now existing at Gallinger. The medical ward building will be six stories high with a capacity of 300 beds and has been planned to care exclusively for internal medicine, leaving the present ward building for surgical cases. The tuberculosis building with a capacity of 225 beds will have five stories. It will care for the local tuberculosis load all of which is now being handled in temporary or obsolete buildings. A three story structure is planned for the nurses' home, adding thirty-nine single rooms.

### FLORIDA

**Changes in Health Officers**—Dr. Kolbein K. Waering, Quincy, health officer of Gadsden County, has been appointed in charge of the Duval County health unit, which has recently been placed on a full time basis. He will be succeeded in Gadsden County by Dr. Irving E. Simmons, who has been supervisor of district number 2 with headquarters in Jacksonville. Dr. William H. Ball, Tampa, has been appointed director of the recently organized health unit in Franklin and Gulf counties.

**Personal**—Dr. Henry Hanson, formerly state health officer and now on the staff of the Pan American Sanitary Bureau in Guayaquil, Ecuador, was recently decorated by the Ecuador government with the Order of Merit recognizing his services in connection with bubonic plague.—Dr. Terry Bird Tavar, has resigned as director of the Lake County Health unit to become executive secretary of the Florida Crippled Children Commission, with headquarters in Jacksonville. Dr. Bird graduated at Tulane University of Louisiana School of Medicine, New Orleans, in 1925.

**New County Society**—The Franklin-Gulf County Medical Society was organized at a meeting in Apalachicola recently with Dr. Chapman I. Dukes Carrabelle president, Dr. Augustus E. Conter, Apalachicola vice president, and Dr. Albert L. Ward, Port St. Joe, secretary-treasurer. Constitution and by-laws were adopted and a formal application was signed by the following charter members: Drs. William H. Ball, Apalachicola; Lule H. Barte, Port St. Joe; Thomas Meriwether, Wewahatcha; James R. Norton, Port St. Joe, and the officers.

### GEORGIA

**The Block Memorial Lecture**—Dr. Myrtelle M. Cannon, curator of the Warren Anatomical Museum, Harvard University Medical School, Boston, will deliver the fifth annual Bates Block Memorial Lecture at the Academy of Medicine Atlanta, February 23. His subject will be 'Changes in the Spinal Cord in Mental Disease and Defect'.

**Winners of the Fischer Awards**—The annual L. C. Fischer Award of the Fulton County Medical Society was presented to Dr. William A. Smith for the best written paper. His work was entitled 'Periodic Paralysis: Report of Two Fatal Cases: Review of the Literature.' For the paper showing the best original research the award went to Drs. Emmet D. Colvin and Rudolph A. Bartholomew. Their paper was entitled 'Behavior of the Basal Metabolism in the Course of Developing Toxemia of Pregnancy: Correlation with Cholesterol, Placental Infarcts and Retinal Examination: Study of 62 Consecutive Adolescent Colored Primigravidae.' Every member of the society is eligible to compete for these prizes. Since 1925, when Dr. Luther C. Fischer established the prizes consisting of \$100 each, they have served to stimulate the members of the society in preparing better papers. Case reports, clinical talks or papers may be submitted.

### ILLINOIS

**Outbreak of Scarlet Fever**—A quarantine was placed on Concordia Teachers College, River Forest, January 31, on account of three cases of scarlet fever among the students; twelve students were under observation. Other students are attending classes but must avoid contacts with the public; newspapers reported February 4. Fifty day students were forbidden to go to classes.

**Society News**—Dr. Delmas K. Kitchen, Detroit, discussed 'Diagnosis and Treatment of Gonadal Immaturity' before the Peoria City Medical Society January 17.—At a joint dinner meeting of the La Salle and De Kalb county medical societies in Ottawa Dec. 3, 1938, Dr. Jay Arthur Myers, Minneapolis, discussed tuberculosis.—At a meeting of the Madison County Medical Society in Alton January 6 Dr. August A. Werner, St. Louis, spoke on the menopause.

**Health Department Sponsors Educational Programs**—The first Southern Illinois Regional Conference was held in Harrisburg January 17-19 under the auspices of the state department of health. The conference was one of a series now being held in districts throughout the state. Mediums of reaching the public include health exhibits, talks and motion pictures. The first conference was held in Aurora in the fifth district, which embraces seventeen counties. A similar assembly convened in the tenth district including Logan, Mason, Cass, Menard and Sangamon counties.

## Chicago

**Outbreak of Influenza**—Sharp increases in influenza have been reported in Chicago, newspapers announced February 11. The Lake Forest High School was closed indefinitely February 9, but no action had been taken by the board of education to close the Chicago schools. A survey made by the school board disclosed that 76,547 pupils and 982 teachers were absent February 10 from 648 public and parochial elementary schools. There were 19,326 students and 212 teachers absent from the city's thirty-eight high schools. It was stated that the student absentees were triple the average number. Newspapers reported that the incidence appeared to be higher outside the city limits.

**Branch Meetings**—Drs. George L. Apfelbach addressed the Evanston Branch of the Chicago Medical Society February 2 on 'Fractures of the Neck of the Femur—Causes of Nonunion', Edmund F. Foley, 'Cirrhosis of the Liver', and Thomas C. Galloway and Eustace L. Benjamin, Evanston, Ill., 'Acute Tracheobronchitis'. The North Side Branch was addressed February 2 by Drs. Rudolf Schindler on 'Gastroscopic Studies of Diseases of the Stomach' and Walter L. Palmer 'Clinical Course and Therapy of Gastric and Duodenal Ulcer'. Dr. Fred M. Smith, Iowa City, discussed 'Diagnosis and Treatment of Coronary Occlusion with Particular Reference to Atypical Forms' before the North Shore Branch February 7. At a meeting of the Englewood Branch February 7 Dr. Bernard Fantus spoke on 'Sulfanilamide in Coccal Infections'.

**Graduate Course in Syphilis**—The department of dermatology in the University of Illinois College of Medicine cooperating with other departments will conduct a graduate course in syphilis in the Research and Educational Hospital, 1819 West Polk Street, beginning February 27. The course, offered under a grant from the federal government with the approval of the state department of public health will run eight weeks and consist of lectures, laboratory demonstrations and the presentation of hospital and dispensary clinical material designed to present to the practitioner a review of the subject and discussion of recent developments in this field. The course will be repeated four times a year. Applications together with a check covering the registration fee of \$10, made payable to the University of Illinois should be sent to the examiner and recorder at 1853 West Polk Street.

## IOWA

**Society News**—Dr. John K. Von Lackum, Cedar Rapids, was chosen president-elect of the Iowa Academy of Ophthalmology and Otolaryngology and Dr. Dean M. Lierle, Iowa City, was installed as president, succeeding Dr. Harry H. Lamb, Davenport, at the recent annual meeting. Dr. Byron M. Merkel, Des Moines, was reelected secretary-treasurer. The next annual session will be held in Iowa City in 1939. Cedar Rapids was chosen for the 1940 meeting. Dr. John T. McClintock, Iowa City, discussed 'Present Status of the Physiology of the Gastrointestinal Tract' before the Linn County Medical Society in Cedar Rapids February 9. Drs. Donald R. Black and George H. Thiele, Kansas City, Mo., will address the Des Moines Academy of Medicine and the Polk County Medical Society March 14 on 'Treatment of Diabetes and Clinical Manifestations of Anorectal Diseases and Their Treatment' respectively.

## LOUISIANA

**Special Society Elections**—Dr. William Harvey Perkins, New Orleans, has been chosen president of the Tuberculosis and Public Health Association of Louisiana, succeeding the late Dr. William H. Seemann. Dr. Monroe Wolf was recently elected chairman of the New Orleans Urological Society. Dr. Hugh T. Bertram, vice chairman, and Dr. James S. Davidson, Jr., secretary-treasurer.

**Personal**—Dr. George H. Hauser, New Orleans, has been appointed city bacteriologist, succeeding the late Dr. William H. Seemann. Dr. George F. Roeling has been named superintendent of the City Hospital for Mental Diseases, New Orleans, succeeding the late Dr. Lionel L. Cazenavette. Dr. Joseph Rigney D'Aunoy has been appointed by the Louisiana State University Medical Center to serve as a member of the board of the Guidance Center of the New Orleans Institute of Mental Hygiene. Dr. Frank R. Gomula, by Mayor Macarty and Dr. John H. Musser, by Tulane University of Louisiana School of Medicine.

## MARYLAND

**Professor McCollum Receives Manufacturers' Award**—Elmer V. McCollum, Sc.D., since 1917 professor of biochemistry, Johns Hopkins University School of Hygiene and Public Health, Baltimore, recently received the annual award of the Associated Grocery Manufacturers of America for outstanding contributions to the scientific knowledge of foods.

**Society News**—The Baltimore City Medical Society was addressed January 20, among others, by Drs. Lawrence R. Wharton and Charles S. Stevenson on 'Genital Tuberculosis and Pregnancy, with Special Reference to Tubal Gestation'. Dr. James M. H. Rowland, dean, University of Maryland Medical School, Baltimore, reviewed a 'History of the Faculty of the University of Maryland between 1830 and 1870' before the Cordell Historical Society January 11. Drs. Julius Friedenwald and Samuel Morrison, both of Baltimore, recently read a paper before the Maryland Academy of Medicine and Surgery entitled 'Clinical Aspects of Gastrointestinal Hemorrhage'.

## MICHIGAN

**Undulant Fever at State College**—An outbreak of undulant fever at Michigan State College, East Lansing, caused the death of one student and the illness of about twenty-one students and as many residents of East Lansing, according to the *Chicago Tribune* February 4.

**Dr. Vaughan Honored**—Henry F. Vaughan, Dr. P.H., health commissioner of Detroit, was honored at a dinner, January 12, marking his twenty-fifth anniversary as a member of the department of health. Mr. Gustavus D. Pope, a member of the board of health since 1918, was toastmaster. A treatise written in 1561 on 'Health Practices of the Time' was presented to Dr. Vaughan from the department. He also received a leather bound volume containing the signatures of all members of the department and 250 letters from persons known in medicine and public health throughout the country. Speakers at the dinner, attended by 1,025 persons, included Col. Edward D. Rich, former teacher of Dr. Vaughan and sanitary engineer at the Michigan Department of Health. Dr. Reginald M. Atwater, executive secretary of the American Public Health Association, New York. Dr. John T. Phair, chief medical officer of health in Ontario, W. Frank Walker, Dr. P.H., New York, Miss Grace Ross, Detroit, president of the National Organization for Public Health Nursing, Mr. Charles Hughes, Detroit, and Bleecker Marquette, executive secretary of the Public Health Federation of Cincinnati. Guests at the dinner included Drs. Henry A. Luce and Henry Cook, president and past president respectively of the Michigan State Medical Society. Henry R. Carstens, president Wayne County Medical Society. Hugo A. Freund, formerly a member of the city department of health. Harold J. Knapp, health officer of Cleveland, and Fred Adams, health officer of Windsor, Ont.

## NEW JERSEY

**Appropriation for Pneumonia Serum**—The public health committee of the Medical Society of New Jersey recently adopted a resolution urging the legislature to appropriate \$25,000 for pneumonia serum to be used in the treatment of persons unable to afford serum. An appropriation of \$10,000 was made recently but \$2,200 worth of serum was used in one week. The legislature appropriated \$25,000 last year.

**Society News**—Dr. William J. Carrington, Atlantic City, president of the Medical Society of New Jersey, and Mr. William H. MacDonald of the state department of health addressed a meeting of the Fourth Judicial District of the Medical Society of New Jersey in December at Silver Lake Inn near Berlin. Part of the evening was devoted to social activities. Dr. James A. Fisher, Asbury Park, is counselor for the district. Drs. Josephine B. Neal, New York, and Fredric F. Elliott, Brooklyn, addressed the Hudson County Medical Society, Jersey City, February 7 on 'Diagnosis and Treatment of Acute Infectious Diseases of the Central Nervous System in Children' and 'Medical Expense Indemnity' respectively.

## NEW YORK

**Study of Distribution of Physicians**—Dr. Joseph S. Lawrence, Albany, executive officer of the Medical Society of the State of New York, has issued a study of the distribution of physicians in the state, tending to show that physicians and hospitals are available to all areas. The highest ratio of physicians to population was in Livingston County, where there is one physician to 1,298 persons, the lowest in Dutchess County, one physician to 478 persons. Livingston County also

has the highest ratio of general hospital beds to population, one to 1,644, the lowest was in Ontario County, one to eighty-four. The report observes that it must be borne in mind that no county is an isolated unit, so that service of physicians and hospitals of adjacent counties are always available. Improved transportation and communication in rural districts have increased the usefulness of the physician, it was pointed out, but the same conditions have led the rural resident to seek the services of the city physician except for emergencies, and in some instances this trend has induced rural physicians to move to the cities, at the same time retaining their rural practices. The study also showed that improved living conditions are attracting young men to locate in the rural areas and that there is no notable difference in the ages of the men in rural districts as compared with those in urban districts. Among other points, Dr. Lawrence's study suggested that nursing service as part of a public health program demands prompt study.

**Academy Offers Lectures on Obstetrics**—The New York Academy of Medicine announces a series of lectures on practical obstetrics Wednesday afternoons, at 4:30 under the joint auspices of the academy and the Medical Society of the County of New York. The following speakers will appear:

- Dr. Thaddeus L. Montgomery, Philadelphia: The Use of Analgesics in Labor, March 1.
- Dr. Joseph N. Nathanson: Syphilis in Pregnancy, March 8.
- Dr. Howard C. Taylor, Jr.: Principles of Hormone Diagnosis and Theories of Endocrine Therapy in Pregnancy, March 15.
- Dr. James Burns Amberson, Jr.: Management of Pregnancy Complicated by Tuberculosis; and Dr. Edwin P. Maynard, Jr.: Heart Disease, March 22.
- Dr. Albert H. Aldridge: Recognition and Management of Abnormal Presentations, March 29.
- Dr. Edward G. Waters, Jersey City, N. J.: Sulfanilamide and Other Therapy in the Treatment of Postpartum Sepsis, Postpartum Sepsis and Pylitis, April 5.

#### New York City

**The Sir Robert Jones Lecture**—Dr. Arthur Bruce Gill, professor of orthopedic surgery, University of Pennsylvania School of Medicine, Philadelphia, will deliver the Sir Robert Jones Lecture February 23 in the auditorium of the Hospital for Joint Diseases. His subject will be "Treatment of Congenital Dislocation of the Hip."

**Harvey Lecture**—Dr. Edwards A. Park, professor of pediatrics, Johns Hopkins University School of Medicine, Baltimore, delivered the fifth Harvey Society Lecture of the season at the New York Academy of Medicine February 16. His subject was "The Pathology of Rickets with Particular Reference to the Changes at the Cartilage Shaft Junctions of the Growing Bones."

**Society News**—Dr. George P. Muller, Philadelphia addressed the Medical Society of the County of Kings January 17 on "Surgical Treatment of Peptic Ulcer" and Dr. Philip I. Nash delivered his inaugural address as president on "Present Day Problems in Medicine."—Dr. Benjamin Burbank, among others, addressed the Brooklyn Thoracic Society January 20 on "The Acute Abdomen During Pneumothorax Therapy."—A symposium on "Mental Disorders of Modern Times" was presented before the International and Spanish Speaking Association of Physicians, Dentists and Pharmacists January 20 by Drs. Gerald H. J. Pearson and Herbert Freed, Philadelphia, Otto Klineberg, Ph.D., Drs. George W. Henry and Stephen P. Jewett.—Dr. Henry W. Louria delivered an afternoon lecture before the Medical Society of the County of Queens January 20 on "Symptoms in the Treatment of Thyroid Disease."

#### OHIO

**Ohio State Assembly**—The annual Post-Collegiate Assembly of the Ohio State University of Medicine will be held in Columbus March 2-4. The formal scientific program will begin Thursday afternoon March 2 with Dr. Charles A. Doan, professor of medicine, presiding. Dr. John H. J. Upham, dean of the medical school, will preside at a program summarizing research in various departments. Clinical talks by faculty members will be presented Friday morning, followed by round table discussions for the rest of the day. Friday evening Dr. Logan Clendening, Kansas City, Mo., will deliver the annual Alpha Omega Alpha Lecture on "The Doctor in Art, Literature and Music." Guest speakers will present the program Saturday morning at the Deshler-Wallick Hotel as follows:

- Dr. Lowell A. Eri, New York: The Effects of New Drugs in the Treatment of Pneumonia.
- Dr. Arthur W. Thomas, chief bureau of child hygiene, state department of health, Cooperating with the Physicians of Ohio.
- Dr. Joseph A. Johnston, Detroit: Factors Which Affect Growth.
- Dr. Virgil S. Counceller, Rochester, Minn.: Ovarian Neoplasms: Their Pathological and Surgical Significance.

This meeting will be followed by the alumni reunion luncheon, at which Dr. Charles T. Atkinson, Middletown, president of the medical division of the alumni association, will preside. The final session at St. Francis Hospital Saturday afternoon will feature talks by Drs. Leslie Bigelow, Columbus, on his association with the late Dr. Starling Loving, former head of the medical college, and Jonathan Forman, Columbus, on the laying of the cornerstone of the St. Francis Hospital and the Starling Medical College ninety years ago. The committee in charge of the assembly consists of Drs. Upham, ex officio, Russel G. Means, chairman, Jonathan Forman, secretary, historian Charles A. Doan, Verne A. Dodd, Herbert M. Platter, Noel Paul Hudson and Isaac B. Harris.

#### OREGON

**Society News**—The Grants Pass Chamber of Commerce entertained the Josephine County Medical Society at a luncheon meeting Dec. 5, 1938, at which Dr. Clarel L. Ogle, Grants Pass, presented views of organized medicine and Dr. Charles L. Coyle, Grants Pass, recent attempts to control syphilis.—Dr. Hans Lissner, San Francisco, addressed the Central Willamette Medical Society, Eugene, recently on "The Many Fold Indications for and Proper Use of Thyroid Substance."—Dr. John H. Hutton, Portland, addressed the Lane County Medical Society, Eugene, Dec. 16, 1938, on "Newer Methods in Anesthesia."

#### PENNSYLVANIA

**Society Sponsors Poster Contest**—The Medical Society of the State of Pennsylvania will for the second time sponsor a health poster contest among school children. The contests will be managed by the county medical societies and the prize winning posters in the county contests will be entered in competition at the next annual meeting of the state society in Pittsburgh in October. It is believed that the health poster contest tends to bring school children and the family physician into closer contact and gives the children an appreciation of the part played in community health by the county medical society.

#### Philadelphia

**General Ireland Gives Potter Memorial Lecture**—Major Gen. Merritt W. Ireland, U. S. Army, retired, will deliver the William Potter Memorial Lecture at Jefferson Medical College February 23 on "Medicine's Debt to the United States Army." General Ireland was surgeon general of the army from 1917 to 1931.

#### SOUTH CAROLINA

**Personal**—Dr. Wofford E. Baldwin, formerly of Chester health officer of Chester County, has been transferred to Oconee County.—Dr. Henry R. Perkins, Rockmart, Ga., has been appointed health officer of Abbeville and Laurens counties.

**District Society Meeting**—The Second District Medical Association held its annual meeting in Columbia January 26 with the following speakers: Drs. Claude C. Coleman, Richmond, Va., on "Management of Acute Head Injuries"; Paul H. Culbreth Jr., Ellenton, "Congenital Hemolytic Jaundice"; and Lucius Emmett Madden, Columbia, "Coronary Thrombosis."

**Annual Bennettsville Meeting**—The Marlboro County Medical Society held its annual New Year meeting and banquet in Bennettsville January 10. On the scientific program the speakers were Drs. Arthur H. London Jr., Durham, N. C., on "Treatment of Pneumonia in Children"; Joseph Decherd Guess, Greenville, "Some Observations Concerning Practical Obstetric Practice"; Frank K. Boland, Atlanta, Ga., "Diseases of the Colon"; and William H. Kelley, Charleston, "Management of the Anemias." After dinner speakers were Drs. James R. DesPortes, Fort Mill, president, and Edgar A. Hines, Seneca, secretary of the South Carolina Medical Association and Mayor Throop C. Crosland of Bennettsville.

#### TENNESSEE

**Venereal Disease Clinic for Negroes**—A new clinic for care of Negroes with venereal disease was opened in Knoxville recently with Dr. Frank A. Faulkner as director and Dr. Napier A. Henderson, Negro physician, as a assistant. An allotment of \$6,000 from federal funds made the clinic possible.

**Society News**—Drs. Paul H. Dietrich and Jesse B. Swafford addressed the Hamilton County Medical Society at Chattanooga, Dec. 15, 1938 on "Roentgen Consideration of Nontuberculous Chest Lesions" and "Inversion of Sex in trans."

and Its Relations to Insanity" respectively — William B Wendel, Ph D., and Dr James W McKinney addressed the Memphis and Shelby County Medical Society Dec 6, 1938, on "The Clinical Significance of Methemoglobinemia" and "Transplantation of the Cornea" respectively

## VIRGINIA

**Graduate Course in Ophthalmology and Otolaryngology**—The University of Virginia sponsored its fifth postgraduate course in ophthalmology and otolaryngology in the medical school, Charlottesville, December 6-9. The instructors were Drs Clarence H Smith, New York; Chevalier L Jackson Philadelphia; Ebenezer Ross Faulkner New York; Romeo A Luongo, Philadelphia; Harry S Gradle, Chicago; Grady C Clay, Atlanta; and James W White, New York.

**Dr McGinnes Goes to Tennessee**—Dr Goldsborough Ford McGinnes, Richmond director of the bureau of communicable diseases in the state health department for seven years, has resigned to become director of a venereal disease project sponsored by the Tennessee State Department of Health, the U S Public Health Service and the University of Tennessee at Memphis, with the cooperation of Memphis and Shelby County. In addition, he will be associate professor of preventive medicine at the University of Tennessee College of Medicine. Dr McGinnes, who graduated from the University of Virginia Department of Medicine, Charlottesville, in 1925, was health officer of Isle of Wight County for a time. After a year at the Johns Hopkins University School of Hygiene and Public Health he served three years as director of laboratories for the state department of health before appointment to his present position.

## WASHINGTON

**Society News**—Dr Ralph H Loe, Seattle, addressed the Spokane County Medical Society, Spokane, January 9 on gastroscopy. —Dr Karl F Meyer, director of the George Williams Hooper Foundation of the University of California, San Francisco addressed the Walla Walla Valley Medical Society at its annual dinner in Walla Walla, January 12, on "The Animal Kingdom—A Reservoir of Disease". —Dr John Guy Strohm, Portland, Ore. addressed the Cowlitz County Medical Society, Longview Dec 21, 1938, on "Diagnosis and Treatment of Kidney and Bladder Stones". —Drs Souren H Tashian and Roger Anderson Seattle addressed the Lewis County Medical Society, Centuria, Dec 12 1938 on the Gruskin test for malignancy and a new clavicle splint respectively.

## GENERAL

**Dr Hartwell Joins Cancer Society Staff**—Dr John A Hartwell, New York, who recently resigned as director of the New York Academy of Medicine after four years in the position has been appointed associate director of the American Society for the Control of Cancer. He will assume the new work April 1.

**Changes in National Society Staff**—Lewis H Carris, managing director of the National Society for the Prevention of Blindness, New York, assumed the title of general director January 1, with Mrs Winifred Hathaway as associate director. Mrs Eleanor Brown Merrill formerly secretary and an associate director, became executive director.

**Fraudulent Salesman and Repair Man**—From Ohio comes a report of a man calling himself Halsey, offering to repair syringes, surgical instruments and apparatus and taking orders for equipment. One physician placed an order and paid in advance. Several weeks passed without word of the order. The physician wrote to Halsey at his alleged address, Halsey and Company, 1209 Broad Street, Pittsburgh and the letter was returned unclaimed.

**New Health Publications**—The Metropolitan Life Insurance Company announces several new and revised pamphlets which it will supply in limited quantities to social and health agencies and other professional groups in connection with health programs that involve the planned use of literature. The pamphlet "Protecting Your Heart" has been revised with the cooperation of the American Heart Association. "Cold, Influenza and Pneumonia" has been revised with more emphasis on pneumonia. A New Day in Health Protection" is based on the company's motion picture on pneumonia. A New Day

Another publication is "When You Are in Your Teens" directed to growing boys and girls, it contains suggestions for stimulating the appetite and securing the greatest good from food, with outlines of meal plans.

**Indexes for Medical Literature**—Central card catalogs of medical libraries are being made in various cities with the aid of workers provided by the Works Progress Administration. The first of the series of catalogs was launched in Philadelphia, where a catalog of about four million volumes has been established at the Pennsylvania Historical Society. The second was made at Cleveland where the union catalog lists about two million books and is housed in Thwing Hall at Western Reserve University; it includes not only Cleveland libraries but others at the University of Cincinnati, Ohio State University, the University of Michigan and the Clement Library at Ann Arbor, Mich. At Washington, D C, a catalog has been made at the Library of Congress. The latest in the series is in Boston, which will be housed in the Boston Medical Library. It is planned to enlarge the Boston project to include the medical collections in Worcester County.

**Southeastern Surgical Meeting**—The tenth annual assembly of the Southeastern Surgical Congress will be held in Atlanta at the Hotel Biltmore, March 6-8. Among the guest speakers will be

Dr Walter Alvarez Rochester Minn Hints in the Treatment of Gastrointestinal Disease  
Dr William Wayne Babcock Philadelphia Interior Exteriorization in Abdominal Surgery  
Dr Meredith F Campbell New York Urologic Surgery in Children  
Dr Morris Fishbein Chicago Editor of THE JOURNAL Fads and Quackery in Healing  
Dr George W Crile Cleveland Surgical Treatment of Essential Hypertension  
Dr Henry H Kessler Newark N J Rehabilitation of the Physically Handicapped  
Dr Ambrose L Lockwood Toronto Canada, Surgical Life Guards  
Dr Austin A Hayden Chicago Hearing Aids—Old and New  
Dr George Gray Ward New York Uterine Displacements

Dr Irvin Abell, Louisville, Ky, President of the American Medical Association, will deliver the C Jeff Miller Memorial Lecture.

**New Group to Advance Pharmacy as a Profession**—A newly organized Association for the Advancement of Professional Pharmacy held its first open meeting in New York January 24 with Henry V Arny, Ph D, former dean of the Columbia University School of Pharmacy, as the guest of honor. Dr Arny delivered an address on "The Development of the Professional Pharmacy Movement". According to an announcement the constitution of the new association requires members to have a registered pharmacist in charge at all times to refer all requests for advice other than pharmaceutical to a member of the public health profession involved and to maintain the professional appearance of the pharmacy at all times. Among other requirements, members must not maintain food service. Among the purposes of the organizations were listed the following: to educate the public to the dangers of self medication to assist the public to a better understanding of the services of the health professions, to encourage more interest in the prescribing of official preparations and to assist in maintaining uniform standards of requirements and ethics.

**Congress on Obstetrics and Gynecology**—The American Congress on Obstetrics and Gynecology, to be held in Cleveland September 11-15, has announced a preliminary outline of the program. The professional groups that will take part in the congress are those interested in and concerned with the problems of human reproduction, maternal welfare and neonatal care. They include medical, nursing, public health and institutional administrative groups. In the mornings there will be special programs for each organization group and subgroups at noon round table discussions, in the afternoons joint sessions for all members of the congress and in the evenings sessions for all members, with speakers of national prominence. Subjects for the afternoon sessions are announced as follows: neonatal care, plans for prevention and control of uterine cancer, extension education on maternal and neonatal care, economic aspects of maternal care and on the last day a correlation and digest of the proceedings. Evening sessions are outlined: legal aspects of maternity Monday, humanitarian aspects, Tuesday, sociologic aspects Wednesday and ethical aspects, Thursday. The membership fee is \$5 which includes a year's membership in the American Committee on Maternal Welfare. Checks should be made payable to Dr Rudolph W Holmes, treasurer and sent to the headquarters office, 650 Rush Street, Chicago. Both scientific and technical exhibits are being developed.



## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Jan 21, 1939

#### Asthma Research

The report of the Asthma Research Council for the year ended Oct 31 1938, has been published. The research clinic at Guys Hospital reports two noteworthy observations. 1 The results of general treatment without specific treatment are at least as good as the results of general treatment combined with specific desensitization to inhalant proteins and better than those of desensitization alone. 2 There is further evidence of the importance of the psychologic factor, this time in the effects of treating rhinorrhea with physiologic solution of sodium chloride alone. The startling fact was that these were slightly better than those of protein desensitization. Thus the psychologic element was found to be of even greater importance than was anticipated. The conclusion from the five years work of the clinic is that protein desensitization and vaccine therapy have not proved sufficiently successful, but they will be continued to see if the methods can be improved.

On the other hand, desensitization has given satisfactory results at the Asthma Clinic of St Mary's Hospital. It is performed either by self inoculation (the patient being given a set for use at home) or by "rush inoculation" (for which he is admitted to the hospital). The reliability of cutaneous reactions was called in question at the last meeting of the Asthma Research Council. The clinic holds that this depends largely on how the tests are carried out. In their opinion they should be only prick tests made vertically down to the cutis vera through the pathophane which is being tested, and this pathophane must usually be as strong as possible. Thus the minimum of surgical intervention is combined with the maximum of pathophane reaction. The false positive reactions which seem to be the bugbear of some asthma clinics are in this way avoided. To simplify the process of desensitization, which at present requires some forty injections, an attempt is being made to alter chemically the antigen so that the dose can be more rapidly increased without undue reactions. To this end an albumin protein complex has been obtained from timothy pollen which has a skin reactive potency of 1 in 5 million and yet retains its hay fever specificity.

At St Thomas's Hospital the value in asthma of respiratory exercises and short wave therapy to the nose and chest have been investigated. In the majority of cases chronic rhinorrhea rapidly cleared up under this treatment and there was a relapse in only a small percentage. The results were better from this combination than from respiratory exercises alone. The latter generally diminished both the intensity and the frequency of the attacks but did not affect any nasal infection present. Similarly, if the precipitating factor, such as an infected antrum, was alone treated by short wave therapy, without breathing exercises, the asthmatic mechanism of the chest remained and attacks were just as severe when some other precipitating factor appeared. The best results were obtained by the combination of exercises and short wave therapy to the antrums, and in the presence of severe bronchitis great relief followed short wave therapy to the chest. Attention to the general health was the only additional treatment. Cod liver oil was given to children under weight.

#### Air Raid Precautions

Air raid precautions continue to be the burning question of the day. This densely populated country, in which more than half the population is urban offers an abundance of targets for such attacks as are now witnessed in China. The Ministry

of health has set up a special department to prepare hospital accommodation, to advise on equipment and to control medical personnel. London is a special problem. It and the surrounding counties have been divided into three zones. In a crisis the inner zone hospitals will remove their ordinary patients to make room for mass surgical procedures, evacuating the wounded to the outer zone as soon as possible after operation. The outer zone hospitals will be placed in situations of reasonable safety and will act as base hospitals. Some of them will be set apart as special centers, neurologic, orthopedic and so on. First aid parties to the number of from twelve to fifteen per hundred thousand of population, each provided with an automobile, are being organized to collect casualties from the streets or other places. They will send the slightly injured home, those who require treatment as walking wounded to first aid posts and those who are stretcher cases by ambulance to the casualty clearing hospitals, which will normally be the local hospitals. On the threat of air attack these hospitals will be freed by evacuation to outlying hospitals of all patients who can be moved. Base hospitals will be in rural areas out of the danger zone and will retain casualties evacuated from the casualty clearing hospitals. It is anticipated that it may be necessary to use buildings other than existing hospitals for this purpose. The official estimate of casualties has never been published but various unofficial estimates have been made. For London they vary from 100,000 in twenty-four hours downward. On the outbreak of war the child population will at once be evacuated from London and the large industrial centers and be billeted in the houses in rural areas, of which a survey has already been made.

#### Assisting Academic Refugees

The Society for the Protection of Science and Learning of which the late Lord Rutherford was president, has rendered great service in finding posts for refugee scholars and researchers. The German persecution has made the continuance of its activities necessary. Meetings will soon be held in all academic centers to promote its work and protest against further threats to intellectual liberty and the freedom of academic life. At the same time the Royal Society will hold a reception for academic exiles in this country as a sign of its sympathy and approval of the work. During the five years of its existence the Society for the Protection of Science and Learning has received active support of university staffs in Great Britain. Individuals and committees have lent assistance to exiled colleagues. There is practically no college or university which is not harboring at least one refugee. Balliol College Oxford, has voted \$5,000 to be spent in assisting exiled scholars, and Christ Church has put aside \$900 a year for three years, in addition to what they were already doing. Glasgow University has made an appeal to its staff for a special levy and at Edinburgh Prof. Dover Wilson will give a special series of lectures on behalf of the assistance funds. Among those who will take part in the meetings are Sir William Bragg (president of the Royal Society), Sir Henry Dale FRS, Professor Gilbert Murray and Sir Richard Gregory.

#### Prof. Rutherford Morrison

The death of James Rutherford Morrison in his eighty-sixth year has removed a great surgeon and teacher. The son of a physician he was born in Durham on the fringe of a coal mining district. He studied medicine in Birmingham and Edinburgh, where he qualified in 1874. The early death of his father made it necessary for him to begin practice, which he did in Hartlepool where he became physician to the local hospital. After fifteen years of general practice he moved to Newcastle, where he was appointed assistant surgeon to the Royal Infirmary. His originality and great teaching power



soon made him famous and he was appointed professor of surgery at the university. As a surgeon he was twenty years ahead of his time. In the late eighties he was doing gastrectomies and colectomies and introduced the method of removing a growth from the lower part of the colon by producing intussusception with an anal tube. Foreign surgeons visited his clinic, remote though it was from London. Long before Crile described his method of clearing the neck, he was doing elaborate dissections for malignant disease of the lip and mouth. He introduced the operation of omentopexy for the radical cure of ascites. The Dutch surgeon Talma had also conceived the idea of producing this collateral circulation, but it was Morison who had the first success. In the great war he introduced what is known all over the world as "bipp" as a prophylaxis against and a cure for wound sepsis. This is a paste consisting of iodoform two parts, bismuth subnitrate one part and paraffin sufficient to make a paste. Its advantage was that a septic wound could, after cleansing, be filled with the paste and sutured without drainage and would heal under a single dressing. The Thomas splint, as the first aid measure for gunshot fractures of the femur, and "bipp" are important advances which have survived the great war.

Of his many publications he is best remembered for his "Introduction to Surgery," a remarkable book reflecting his genius as a teacher. His object was to aid students in thinking out for themselves the problems presented in the wards. His method was the consideration of general principles and their application. Though it appeared as long ago as 1910, it is still popular in its third edition, produced with the assistance of his pupil Prof. C. M. Saint.

## PARIS

(From Our Regular Correspondent)

Jan 14, 1939

### Clinical Aspects of Endometriosis

At the Dec. 14, 1938 meeting of the Académie de chirurgie de Paris, Drs. Gaston Cotte and J. Mathieu of Lyons reported their observation of seventy-eight cases of endometriosis confirmed by microscopic examination. There was a single localization in sixty-one cases and multiple localizations in the others. Single localization includes diffuse endometriosis of the uterus twenty-eight cases, of the tubes thirteen cases, of the ovaries eight cases and of the pelvic peritoneum seven cases.

The diagnosis of endometriosis presents many difficulties. When the endometriosis is only an associated condition no special treatment is indicated but there are cases in which the symptoms are functional and will not be relieved unless the endometriosis is eliminated. Certain symptoms should arouse suspicion, such as dysmenorrhea several years after puberty or in the premenopausal period. The pain occurs on the second or third day of menstruation and not before menstruation, as is customary in dysmenorrhea. A similar clinical history is observed only with certain uterine malformations when a circumscribed hematometra is present, just as it is with certain endometrioses. A dysmenorrhea of the type just described was noted in 75 per cent of the cases. Vaginal examination is of only indirect aid. The presence of pale blue nodules in the posterior cul-de-sac has been considered an important observation but such nodules are rarely found. The palpation of irregular nodules on the uterosacral ligaments also speaks for endometriosis but it must be remembered that in certain cases of parametritis similar nodules are found.

Even when a diagnosis of endometriosis has been made the question arises as to whether radical or conservative measures should be employed. The localization is of aid in making a decision. With peritoneal localization, if the lesion is small

and circumscribed it can be left because there is usually a more important associated condition, such as retroversion or uterine fibroid tumor, which needs attention. Tubal endometriosis may not give rise to any symptoms and be found only on microscopic study. In some cases such a localization may give rise to a hematosalpinx or favor an extra-uterine pregnancy. In only one of eight cases of ovarian endometriosis was this condition the cause of late dysmenorrhea. Such late dysmenorrhea was noted in four of sixteen cases of uterine localization and is of diagnostic value.

Endometriosis, although not to be considered as being of a malignant character, is a steadily progressive lesion whose evolution can be checked only by a natural or artificial menopause.

### OPERATIVE MEASURES

Cotte and Mathieu were opposed to any radical operative measures as advocated by some gynecologists. In over half of their cases, conservative operations sufficed. The administration of ovarian substance only aggravates the symptoms. One should be very sure of the diagnosis before beginning radiotherapy, as premature castration, when the diagnosis was wrong, would be very regrettable.

In cases of endometriosis with multiple localizations, bilateral oophorectomy is indicated. Hysterectomy should be done only if there is an associated lesion in the uterus. Rectovaginal adenomyomas are especially serious localizations of endometriosis. The authors have had very good results following subtotal hysterectomy with removal of both tubes and ovaries.

For the peritoneal forms as associated lesions it suffices to treat these lesions. If the treatment is not successful, more radical measures are indicated.

For localized adenomyoma of the uterus, resection can still be done, but if the lesion is diffuse only hysterectomy can be considered. With tubal endometriosis, the involved tube should be removed. In cases of bilateral involvement the uterus and one ovary should be conserved. With unilateral or bilateral ovarian endometriosis, every effort must be made to conserve an ovary.

### Subacute Bacillus Funduliformis Septicemia

Only twenty-seven cases of *Bacillus funduliformis* septicemia following acute pharyngitis and tonsillitis have been thus far reported. At the Oct. 28, 1938 meeting of the Société médicale des hôpitaux of Paris a case was reported by Dr. Brule and his co-workers of subacute septicemia due to this bacillus which had developed after severe pharyngitis. A man aged 34 was admitted to the hospital with marked prostration, rapid pulse and slight icterus, which appeared out of proportion to the condition of the throat. The bacteriologic examination failed to reveal the presence of diphtheria bacilli. During the next two days there were repeated chills, a high blood urea content and albuminuria. *Bacillus funduliformis* was found in the blood cultures on the first and following days. Death occurred four days after admission. Permission for a necropsy could not be obtained.

Lennerre, Reilly and Laporte in a recent article state that a high blood urea content, marked albuminuria and very marked leukocytosis are found in cases of *B. funduliformis* septicemia as evidence of renal involvement.

In the discussion of Dr. Brule's paper, Dr. Lenegre reported a case of severe *B. funduliformis* infection in a woman aged 23. The symptoms appeared several months after an attack of pharyngitis. The chief clinical features were recurrent high temperatures and severe diffuse pain, sometimes in the abdomen and sometimes in the extremities, with blood cultures positive for *B. funduliformis*. These symptoms receded rapidly after intravenous injection of a preparation containing iodine, naphthamine and sodium salicylate.

## BERLIN

(From Our Regular Correspondent)

Jan 9, 1939

## The Society of Natural Scientists and Physicians

The annual congress of the Society of Natural Scientists and Physicians convened in September at a time of political high tension. This society is distinguished not only for its venerable age but for the opportunities it offers for collaboration between the natural sciences and medical science. Various societies of scientific specialists usually hold their respective congresses just before or just after the larger gathering.

The first general session was dedicated to the problem complex Climate and Life. Ludwig Weickmann of Leipzig delivered the introductory lecture. As first medical speaker Prof. Bernhard de Rudder of Frankfurt on the Main spoke on "Season and Weather in Human Biology." He stated that an initial, direct, clinically observable group of bioclimatic phenomena in man is to be found in the sharply fluctuating seasonal incidence of numerous types of disease. There is no general principle which makes these manifestations comprehensible; rather, each particular, empirically established observation requires separate interpretation. Many seasonal increases in the morbidity of a disease are found to be conditioned by recurrent seasonal external circumstances, which are however quite often not completely recognizable at first glance (for example, tularemia and measles). We have recognized the need for assembling all known factors in the genesis of an illness as well as the great danger that, in study of the seasons problem, omnipresent formal and anatomic correlations may be misinterpreted as etiologic. Nevertheless climatic factors directly affecting human beings are not infrequently first recognizable as such only after more penetrating analysis of their action. Such an influence is best illustrated by the high summer mortality of nurslings, which has been proved a direct result of warm weather. We are just beginning to recognize certain secretory reactions to the estival irradiation, which are especially manifest in an intensified degree in the female organism. Thence a bridge leads to an annual endocrine cycle, the initiation of which appears to take place chiefly through ultraviolet irradiation. Through these channels certain seasonal predispositions to illness appear to come into being.

A second group of meteorobiologic phenomena relate to the "weather pains" which synchronize above all with the appearance of weather fronts and which also relate to the accumulation of a large number of well circumscribed disease entities. The latter often originate in a completely nonspecific manner in that the weather fronts burden the sympathetic nervous system whereas the type of nervous reaction of the individual will depend on his particular physical condition at the particular time. The "biotropic weather front factor" active in such cases is not yet understood; it appears, however, to be related to the descent of air masses, which produce quick changes in water vapor. There seem to participate therein certain atmospheric properties, not yet understood, which in turn affect the human being.

## CLIMATE AND RHEUMATISM

Siegfried Dietrich of Berlin spoke on "The Hereditary Conditionality and the Climatic Conditionality of Rheumatic Disorders." The infection present with these disorders plays a subordinate part; more important are the hereditary constitution, the regular changes in the somatic constitution and the modifying influence of environment. Hereditary conditionality is manifested in rheumatic fever, which, as a familial accumulation, can often be observed through several generations and even under the most varying living conditions. Important familial tendencies to the diseases which precede rheumatic fever have been observed for example a high familial incidence of tonsillitis. However there exists in addition a linking with other constitutionally conditioned diseases (and allergies in particular), so the tendency to become infected with rheumatic fever may

conceivably depend on many hereditary factors. The incidence and form of manifestation of rheumatic fever change regularly according to the patient's age. The youthful groups are particularly imperiled. The tendency to rheumatic fever is observed in all races, although there are slight racial differences in the pathologic diathesis. The geographic distribution of rheumatic fever varies even among people of the same race inhabiting different quarters of the globe. Rheumatic fever is virtually unknown in tropical America, whereas beyond each tropic to the north and to the south the morbidity gradually increases. Even within Germany there are regional differences in the morbidity, which tend to remain constant for decades. Certain communities have also been found which are peculiarly suitable for the early climatic therapy of rheumatic fever. The salubrious advantages of such places may be confined to an extremely restricted zone, which may be surrounded by a region particularly unfavorable for rheumatic patients.

## THE WHITE RACE AND THE TROPICS

The closing paper, on "Adaptability of a Human Being to a Climate Inimical to His Particular Race," was read by the Heidelberg hygienist Prof. Ernest Rodenwaldt. Although the European as an individual may tolerate the tropical climate even under the most trying circumstances, it is doubtful whether he could adapt himself to the tropical climate for long uninterrupted periods or for a lifetime without any pathologic disturbances. Rodenwaldt adduced as a classic illustration of his view that in six millenniums of world history there is no single instance of a successful assimilation of light skinned European races by a hot climate. For Europeans the great danger of tropical diseases has by now been largely if not completely abolished. However, this by no means signifies that the influence of climate has at the same time become unimportant. Individuality here plays a considerable part. Persons whose sympathetic nervous systems are weak or who are allergic encounter greater difficulties than the average. Practical experience has demonstrated, however, that healthy Europeans of every constitutional type between the ages of 20 and 60 can live under the usual conditions offered by colonial life in the tropics without manifestation of constitutional disturbances. But without certain modifying conditions individual acclimatization is impossible; hence the necessity for intermittent furloughs home. Such furloughs may be dictated by psychic considerations as well.

## 'GIANT MOLECULES' "RACE AND CLIMATE"

The chief theme of discussion at the second general session was "Giant Molecules." Other problems taken up at this session were "Protein Synthesis in Physiologic and Pathologic Life" and "Myosin Substances."

Genetics was discussed in the principal medical section. The first speaker was Prof. Fritz Lenz of Berlin, on "Race and Climate." The decisive factor for extinction or survival occurs only in small part through direct climatic influences; climate is much more likely to act as an indirect influence wherein the cultivating effect of ecologic living conditions is of the utmost importance for the racial differentiation. On these bases Lenz develops a theory of ethnogenic selective factors. In his opinion parasites, and microparasites in particular, represent an ethnogenic factor of selection. For example, the selection of malaria, a disease which among inhabitants of tropical lands is usually a childhood disease of quite low mortality, suffices to keep tropical races resistant to malaria. Lenz maintains that the selective process appears to be related indirectly and directly to pigmentation. The more dark skinned the race, the greater its general resistance to malaria. Lenz has come to believe that the dark pigmentation of the colored races is in good part produced by malaria. According to this view the greater resistance of colored races against malaria should not be considered as immunity in the stricter sense but as hereditarily conditioned resistance. Lenz conjectures that, just as malaria may genetically conduce toward dark pigmentation of a race, tuberculosis

may conduce toward a light skin. In every part of Europe under the influence of the Gulf Stream the tubercle bacilli take the place, so to speak, of Plasmodidae as ubiquitous microparasites. Lenz estimates the number of permanent carriers of the tubercle bacillus as at least one third of mankind. Light exerts a recognized prophylactic and curative effect on tuberculosis. Consequently, since fair skin is more permeable to light than dark skin, the fair skin of European races has been preeminently cultivated through tuberculosis. This is not to say that races can be modified at will by climatic or environmental influences. Modifications of the breed through climate affect relatively superficial characters. The matrix of the sum of heritable factors of a race is not conditioned by climate.

His report and the few other congress reports on similar topics all attest the controvertible nature of these questions. Accordingly it is extremely important that problems of ethnogeny should be presented to learned bodies for discussion.

## BUCHAREST

(From Our Regular Correspondent)

Dec 15 1938

### Malaria Therapy in the Patient's Home

Dr Mihail Kraus, neurologist at Timisoara, read a paper at the local medical society on the application of malaria therapy in the patient's home. It was the general opinion that, owing to the unpredictable course of malaria therapy, it should be induced only in institutions where nurses and medical help are always available. Of course, patients with excessive fever and profuse sweating need careful nursing, but this can be assured just as well in a private home. In cases of mania institutional treatment is most suitable because in a home one cannot guarantee the cessation of an irritational condition and the possibility of the occurrence of hallucinations and epileptiform seizures must be reckoned with. When these complications can be expected, home treatment is not desirable. But in the simply demented and melancholic forms, in incipient dementia paralytica and in tabes malaria treatment in the home can be administered without any fear of untoward consequences. In the Vienna clinics not one case of fatal induced malaria has been recorded. What deaths occurred were due to terminal or galloping paralysis. It is advisable to exclude from home treatment very fat or emaciated or very old persons and those suffering from advanced arteriosclerosis, severe myocarditis, hepatic and renal disease, tuberculosis and decompensated heart disease. Satisfactorily compensated valvular diseases form no contraindication to home treatment but require careful control of the heart for the sake of avoiding collapse.

To shorten the incubation period in home treatment, malaria inoculations should be given intravenously and if there is an intelligent person in the house he should take the temperature hourly from the commencement of fever attacks and place compresses on the head and trunk when the fever is highest and at the outset of sweating should give some cardiac stimulant (atrophanthus digitalis or digalen). The attending physician should see the patient as often as his time allows, but at least twice a day. If the patient's strength is considerably deteriorating and disturbances of the pulse rate occur or if anemia and jaundice are marked it is time to stop the fever by the administration of quinine. In view of all this Kraus concluded that physicians may safely undertake to perform malaria therapy in private homes.

### Social Conditions of School Children in Rumania

Dr G. Banu made a clinical anthropologic and social-hygienic study on 2,149 school and nursery children, of whom 1,611 were urban and 538 rural dwellers and 1,107 were boys and 1,042 girls. In every case the nutritional condition, the relation between height, weight and age, the foods consumed the causes of undernourishment and the presence of tuberculosis and syphilis

were studied. The results of the clinical examination, the Pirquet reaction, the Wassermann reaction, radiography and analysis of the feces were recorded on a chart specially compiled by Dr. Banu. A third of the children had more than four living brothers or sisters. In 82 per cent of the cases the parents suffered from some chronic disease. 12.4 per cent of them were orphans, having no father, while 1.6 per cent of the children had neither father nor mother, 62 per cent of the children lived in unhygienic dwellings, only 8.7 per cent had their own rooms, 21 per cent of the children had their own bed and 46.6 per cent shared their bed with another and 17.7 per cent with two others.

### Program of the Supreme Public Health Council

Under the presidency of M. Marinescu, minister of public health, a meeting was held recently and it was decided to carry out in the near future the following program: 1. Regulations will be elaborated according to which the members of the Orthodox Rumanian Monks shall be trained to be able hospital nurses. 2. Plans will be made for the installation of a huge storehouse for public health materials and drugs. 3. New regulations will be compiled for teaching the technique of embalming and also the preparation of the solutions used. 4. In the matter of contraceptives, it was resolved to forbid their use and all propaganda in connection with them. On the other hand all drugs and appliances which serve the purposes of antivenereal propaganda are permitted, and their sale in chemists and druggists shops is allowed. 5. As to the campaign against scarlatina, it was resolved that, until a reliable method of vaccination is adopted, compulsory vaccination will be introduced only in some heavily infected cities and that antiscarlatinal vaccines which have been proved harmless after thorough investigations will be used.

### The Review of Foreign Diplomas

As I wrote in a previous letter, all foreign diplomas issued since the World War have been subjected to review. The commission had to review about 3,500 diplomas, which entailed much work. It found that, with the exception of a few diplomas issued at some obscure foreign universities, all were in order. In about a score of instances, and particularly in the case of Italian diplomas it was found necessary for holders to pass supplementary examinations on one or two subjects, such as public hygiene, pharmacology and forensic medicine.

## Marriages

CHAUNCEY JOHNSON PATTEE, Montreal, Que. Canada, to Miss Barbara Russell Stearns of New Canaan, Conn., Sept. 10, 1938.

RAYMOND LESTER OSBORNE, Orangeburg, N. Y., to Miss Margaret Forbes Unangst of Westwood, N. J., January 22.

EDWARD WILLIAM PHIFER JR., Morganton, N. C., to Miss Mary Adair Edwards of Orlando, Fla., Nov. 5, 1938.

WILLIAM A. MAYNARD, Coleman, Mich., to Miss Mildred Bruskotter of Saginaw, in December 1938.

JOHN H. KENDALL, Richlands, N. C., to Miss Bessie Mae Hood in Washington D. C. at Takoma Park Md. Nov. 3, 1938.

LADISLAUS JOHN KUNSCH, Naperville, Ill., to Miss June McNeeney of West Chicago, Oct. 1, 1938.

HOVER S. PARKER, McMechen, W. Va., to Miss Cora G. Sullivan of Moundsville, Sept. 4, 1938.

LUCIUS BRAYNER KFELS, Lynchburg, S. C., to Miss Evelyn Plowden of New Zion at Sumter, Nov. 26, 1938.

MILTON MORTIMER KENDALL, New York, to Miss Ann Philo of Youngstown, Ohio, Nov. 24, 1938.

ARTHUR J. MERRILL, Atlanta, Ga., to Miss Sara Harrison of Birmingham, Ala., Nov. 25, 1938.

THOMAS M. MULLCAHY, to Miss Ethel Mildred Harlow, both of New York, Nov. 12, 1938.

LOUIS H. MITSCHLIK, to Miss Isabelle Carleton Graves, both of Philadelphia, January 4.

## Deaths

**William Thomas Black** \* Memphis, Tenn., Memphis Hospital Medical College, 1898, professor of gynecology at the University of Tennessee College of Medicine, member of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Southern Surgical Association, Central Association of Obstetricians and Gynecologists and the Southeastern Surgical Congress, fellow of the American College of Surgeons, on the staffs of the Baptist Memorial, St. Joseph and Memphis General hospitals, past president of the Memphis and Shelby County Medical Society and of the Memphis Obstetrical and Gynecological Society, on the advisory editorial board of the *American Journal of Obstetrics & Gynecology* aged 63, died, Dec 10, 1938

**Henry du Rest Phelan** \* Major, U. S. Army, retired, Alameda, Calif., University of California Medical Department, San Francisco, 1893, Université de Paris Faculté de médecine, France, 1903, veteran of the Spanish-American and World wars, entered the medical corps of the regular army as a first lieutenant March 15, 1927, and was retired on the same date for disability in line of duty in June 1930 was promoted to major under a special act of Congress, aged 70, died, Nov 22, 1938, in the Letterman General Hospital, San Francisco

**William J. V. Deacon**, Lansing, Mich., Eclectic Medical University, Kansas City, Mo., 1917, director, bureau of records and statistics, Michigan Department of Health, and formerly epidemiologist, associate professor of preventive medicine at the University of Kansas, 1913-1918, lecturer on vital statistics, University of Michigan, Ann Arbor 1921-1933, and the Wayne University, Detroit since 1927, in 1929 a member of the U. S. Delegation to the International Conference for Revision of List of Causes of Death, Paris, aged 64, died, Dec 20, 1938, at his home in East Lansing, of heart disease

**John H. Murray**, Punxsutawney, Pa., Medico-Chirurgical College of Philadelphia, 1895, member of the Medical Society of the State of Pennsylvania, member of the House of Delegates of the American Medical Association in 1924 and 1927, past president of the Jefferson County Medical Society, aged 71, on the staff of Adrian Hospital, where he died, Nov 16, 1938, of bilateral nephrosis with uremia

**Elizabeth Catherine O'Hearn**, Shenandoah, Pa., Woman's Medical College of Pennsylvania, Philadelphia, 1927 member of the Medical Society of the State of Pennsylvania on the staff of the Locust Mountain State Hospital, aged 36 died Nov 11, 1938 in the University Hospital Philadelphia, of septicemia following sticking of her finger, November 2 while incising a carbuncle

**Thomas Ulysses McManus**, Waterloo, Iowa, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898, member and past president of the Iowa State Medical Society, fellow of the American College of Surgeons, Otolaryngologist to the Allen Memorial Hospital and St. Francis Hospital, aged 65, died, Nov 5, 1938, of pneumonia

**Daniel Franklin Heilman** \* Northumberland, Pa., Medico-Chirurgical College of Philadelphia, 1899, past president of the Northumberland County Medical Society, past president of the board of health, formerly bank president and medical examiner of the public schools, on the staff of the Mary M. Packer Hospital, Sunbury, aged 62, died, Nov 28, of embolism

**Aloysius John Blakely**, Philadelphia, Hahnemann Medical College and Hospital of Philadelphia, 1927, was an associate in pediatrics at his alma mater, on the staffs of St. Luke's Children's, St. Joseph's and St. Mary's hospitals, aged 40, senior in the department of pediatrics at the Hahnemann Hospital, where he died Nov 27, 1938, of heart disease

**Heman Lincoln Chase**, Alstead, N. H., Harvard University Medical School, Boston, 1887, member of the Massachusetts Medical Society, formerly member of the board of health of Brookline, Mass., for many years on the staffs of hospitals in Boston, Worcester and Danvers, Mass., aged 79, died Nov 17, 1938, of cerebral thrombosis

**Joseph Oscar Dicks**, West Chester, Pa., Hahnemann Medical College and Hospital of Philadelphia, 1899, member of the Medical Society of the State of Pennsylvania, fellow of the American College of Surgeons, on the staff of the Chester County Hospital, aged 63, died, Nov 14, 1938, of coronary thrombosis

**John Henry Page** \* Austin, Pa., University of Buffalo School of Medicine 1902 fellow of the American College of Surgeons, past president of the Potter County Medical Society, attending surgeon to the Coudersport (Pa.) Hospital, aged 61, died Nov 26, 1938, of coronary heart disease

**Jesse Samuel Lancaster** \* Torrance, Calif., Northwestern University Medical School, Chicago, 1910, on the staff of the Jared Sidney Torrance Memorial Hospital, aged 55, died, Nov 5, 1938, in a hospital at Los Angeles

**Walter C. Rosser**, Lynchburg, Va., University College of Medicine, Richmond, 1896, member of the Medical Society of Virginia, aged 63, died, Nov 24, 1938, in the Memorial Hospital, of malignancy and tuberculosis

**Willoughby Heath Tebbs Ranshaw**, Covington, Ky., Miami Medical College, Cincinnati, 1907 served during the World War, aged 54, died, Nov 28, 1938, in St. Elizabeth Hospital of mitral regurgitation

**John H. Owens**, Sweet Springs, Mo., Hospital College of Medicine, Louisville, Ky., 1897 member of the Missouri State Medical Association, aged 80, died, Nov 10, 1938, of coronary thrombosis and myocarditis

**Robert Alvin McLurg**, Wilkie, Sask., Canada, Trinity Medical College Toronto, Ont., 1904, member of the school board, past president of the Saskatchewan Medical Association, aged 60, died, Nov 5, 1938

**Martin Luther Wagner**, Peru, Ind., Indiana Medical College School of Medicine of Purdue University, Indianapolis, 1907, served during the World War, aged 61, died, Nov 30, 1938, of heart disease

**David H. Carson**, Kerrville, Texas, John A. Creighton Medical College, Omaha, 1905, member of the State Medical Association of Texas, aged 61, was found dead with a gunshot wound, Nov 2, 1938

**Frederick Henri Gatten**, Montreal, Que., Canada, Laval University Medical Faculty, Montreal 1907, formerly on the staff of the Hospital St. Joseph, Lochme, Que., aged 55, died, Nov 14, 1938

**Jay Standley Terrill**, Bedford, Iowa, Ensworth Medical College, St. Joseph, Mo., 1906 member of the Iowa State Medical Society, aged 56, died, Nov 17, 1938, of rheumatic heart disease

**George Edward Clerk**, Montreal, Que., Canada, Laval University Medical Faculty, Montreal, 1911, served with the Canadian Army during the World War, aged 61, died, Nov 15, 1938

**Joseph Alonzo Peterson**, Oak Park, Ill., Chicago College of Medicine and Surgery, 1908 aged 63, died, Nov 4, 1938 in a hospital at Chicago of cerebral hemorrhage and acute nephritis

**William H. Allen**, Rich Hill, Mo., Louisville (Ky.) Medical College, 1871, member of the Missouri State Medical Association, formerly mayor, aged 90, died, Nov 8, 1938, of heart disease

**Andrew Bell Wilkie**, Darrrtown, Ohio, Cincinnati College of Medicine and Surgery 1902 served during the World War, aged 75, died, Nov 6, 1938, of chronic nephritis and fractured hip

**Lucien Daniel Clark**, Cleveland Heights, Ohio, Toledo Medical College 1898 served during the World War, aged 72 died, Dec 3, 1938, of bulbar paralysis and cerebral hemorrhage

**Sarah A. Poindexter Bent**, Narberth, Pa., Woman's Medical College of Pennsylvania Philadelphia, 1893, medical missionary, aged 70, died, Nov 27, 1938, near Norristown

**John Joseph Winn** \* Norwood, Ohio, Medical College of Ohio, Cincinnati, 1885 aged 80, died Nov 4, 1938, in the Good Samaritan Hospital, Cincinnati, of coronary thrombosis

**Otto G. Waskow**, Chicago, College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902, aged 62, died, Nov 16, 1938

**John H. Neill**, Westfield, N. Y., University of Maryland School of Medicine, Baltimore, 1889 aged 82, died, Nov 13, 1938, of cardiorenal vascular sclerosis

**Ray G. Hill**, Wamego, Kan., Hahnemann Medical College and Hospital, Chicago, 1889, member of the Kansas Medical Society aged 79, died Nov 25, 1938

**George Brown Mills**, Athabaska, Alta., Canada, Trinity Medical College Toronto, Ont., 1896, aged 70, died Nov 17, 1938

**Charles Wesley Shannon**, Bonne Terre, Mo., Missouri Medical College, St. Louis, 1895, aged 81, died, Nov 4, 1938

**Ulysses G. Lipes**, Indianapolis, Fort Wayne (Ind.) College of Medicine 1885 aged 74 died Nov 21, 1938 in Lafayette

**Max Heller**, Brooklyn, Fordham University School of Medicine New York 1919, aged 54 died, Oct 28, 1938

**John B. Washburn**, Delmar, N. Y., Albany Medical College 1882, aged 81 died Nov 27, 1938, of pneumonia

## Bureau of Investigation

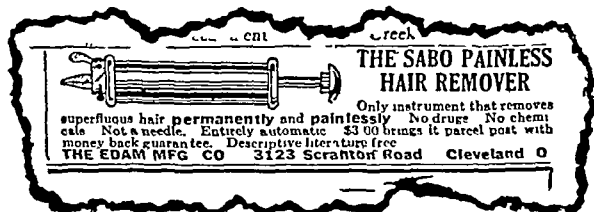
### THE GEORGE A EDAM FRAUDS

#### The Sabo Painless Hair Remover Fake

From two memorandums addressed to the Postmaster General from the office of the Solicitor of the Post Office Department and, in part, from material on file in the Bureau of Investigation of the American Medical Association comes the story that follows of a mail order quack, one George A. Edam of Cleveland.

In 1925 Edam began selling through the mails a device called 'Sabo Painless Hair Remover'. It was a small cylinder about 3 inches long with a metal plunger at one end and metal jaws at the other end. When the plunger was depressed the jaws were extended to grasp an unwanted hair. A trigger at the plunger end released a spring tension that caused the jaws to close and automatically jerk back into the cylinder, pulling from the skin the hair caught in the jaws. In other words the Sabo Painless Hair Remover was merely a convenient method of using tweezers and if sold under truthful claims might have been comparatively unobjectionable.

Edam, who was a wood and metal pattern maker, originated his device with the idea of extracting hairs from portions of the body where they were unwanted and then attempting to deposit such hairs in the scalps of bald-headed persons! But as the experiment in cranial hirsuticulture proved a failure Mr. Edam confined his talents to selling his device for removing hair. He obtained his victims in the orthodox way, by the



"placing of advertisements in certain periodicals and magazines." One of Edam's advertisements is reproduced on this page, it appeared in Macfadden's *Physical Culture* for July 1929.

Edam sold his device under two claims that were false. First, he claimed that it would remove hair "painlessly"; second, that it would remove hair "permanently." It did neither. As long ago as May 1934 the Federal Trade Commission announced that George A. Edam, trading as the Edam Manufacturing Company, had agreed to cease describing his device as one that would permanently remove hair. But Mr. Edam's agreement evidently was made in a pickwickian sense, for he continued for some years to advertise that his tweezers would remove hair permanently.

Three years after the Federal Trade Commission had announced Mr. Edam's promise to tell the truth the Post Office Department in July 1937 notified the Edam Manufacturing Company to show cause why a fraud order should not be issued against it. But Mr. Edam by this time apparently thought that the federal government was an innocuous affair, for neither he nor his company put in any appearance. The Post Office Department through its Acting Solicitor thereupon sent to the Postmaster General a memorandum recommending that a fraud order be issued against the Edam Manufacturing Company, the mails were closed to the concern Aug. 17, 1937.

Did that faze Mr. Edam? It did not! True the Edam Manufacturing Company could collect no mail but all Mr. Edam had to do—and did do—was to pluck out of the vasty deep another trade name and continue to bilk the sufferers from hypertrichosis. The new trade name was Sabo Manufacturing Company, which carried on the business for about a year. Then following still another memorandum from the Solicitor's office the Postmaster General on Aug. 26, 1938 issued another fraud order closing the mails to the Sabo Manufacturing Company.

Whether Mr. Edam will think up another trade name under which to do business remains to be seen.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS BUT THESE WILL BE OMITTED ON REQUEST.

### BRONCHIAL ASTHMA AND HEART FAILURE

*To the Editor*—It is understood that right heart failure is often the cause of death in chronic bronchial asthma. Would digitalis therefore be indicated to pep up the failing muscle?

HERMAN WECHSLER, M.D., Bronx, N.Y.

**ANSWER**—The query is based on a premise which is highly controversial. Several clinical conditions may be followed by failure of the right side of the heart and "asthma" may be but a part of the syndrome, though decidedly not a cause of the circulatory dysfunction. For example, miners' asthma commonly follows such a sequence. Antemortem as well as postmortem examinations may help to clarify the situation. Electrocardiographic studies of fifty cases of bronchial asthma revealed evidence of right ventricular preponderance in but 20 per cent of the series (Kahn, M. H. *Am J M Sc* 173:555 [April] 1927). In another series (Colton, W. A., and Ziskin, Thomas M. *Bull Vet Admin* 13:117 [Oct.] 1936) of eighty-four cases the heart was normal on clinical examination in seventy-nine. Electrocardiographic studies on fifty-six of the eighty-four subjects disclosed myocardial involvement in 20 per cent. In several of these the circulatory dysfunction antedated or was unrelated to bronchial asthma. Six of the total series were examined post mortem, four presented a normal heart, one may have had the cardiac abnormality before or coincident with the symptoms of asthma, and the sixth patient was said to have a slight degree of chronic exudative inflammation of the myocardium. Both left and right ventricular hypertrophy have been reported in a majority of eight cases (Macdonald, I. G. *Ann Int Med* 6:253 [Aug.] 1932).

On the opposite side of the controversy, one finds laboratory as well as clinical evidence (Alexander, H. L., Luten, Drew, and Kountz, W. B. *The Effects on the Heart of Long-Standing Bronchial Asthma* *THE JOURNAL*, March 19, 1927, p. 882) that the heart remains singularly free from injury after continuous bronchial asthma despite the attendant emphysema. This contention is supported by more than 100 necropsies (Lamson, R. W., and Butt, E. M. *Fatal "Asthma"* *THE JOURNAL*, May 29, 1937, p. 1843; Thume, E. T., and Sheldon, J. M. *J Allergy* 9:246 [March] 1938). It appears, therefore, that in no more than from 20 to 33 per cent of patients with asthma can the right side of the heart be implicated. This condition might be the cause of death in a small proportion of such a group.

There are a few generally accepted indications for the use of digitalis, but they do not include "right heart failure." The drug is not without toxic properties and in addition it may add to the discomfort and disability of the patient with asthma. The value of digitalis as a prophylactic against cardiac insufficiency or to "pep up" the failing heart muscle in any patient is likewise a moot question.

### DISCHARGE FROM UMBILICUS

*To the Editor*—What can be done for an offensive discharge from the umbilicus during menstruation? I have two patients, single women, one 17 and the other 23. I have tried to pass a probe but there appeared actually to be no duct in the umbilicus.

HOWARD M. COOPER, M.D., Rutherford, N.J.

**ANSWER**—Nearly always an offensive discharge from the umbilicus is due to lack of thorough cleanliness. In many women, especially obese ones, the umbilicus is deep and unless the tip of a wash cloth or a cotton applicator is used to reach the bottom of the navel, secretions from the skin remain and give rise to a foul odor.

Since in the cases described the discharge is not bloody, the condition is not due to endometriosis. Likewise since the discharge does not contain urine there is no patent urachus from the bladder to the umbilicus. The association with menstruation may be due to the increase in perspiration which some women experience during the menses. It may also be due to the fact that the patients do not bathe at this time, because many women still fear to take cleansing baths while they menstruate. The umbilicus should be thoroughly scrubbed with soap and water just as any other part of the body, but in women who perspire freely it requires special manipulation to keep clean and inoffensive.

## ANGIO-NEUROTIC EDEMA WITH LINGUAL AND OPTIC INVOLVEMENT

To the Editor—A single woman aged 40 without past medical history of importance has for two years suffered attacks of swelling and numbness of the left cheek and swelling and numbness of the tongue. The tongue in an hour or so appears covered by blisters which disappear however and the next day the tongue is coated swollen shaggy and numb on the affected side. The last attack one week ago was accompanied by sudden blindness in the right eye. No other symptoms accompany the attacks: the swelling and numbness of the cheek and tongue last two or three days and then disappear. Physical examination is negative. Laboratory examination of the urine and blood are negative. The fundus of the eye is normal. The visual tests reveal a blind spot which persists ten days after attack. Any suggestions would be appreciated.

RICHARD H. LYON, M.D. Seattle

ANSWER—The patient in all probability has an acute circumscribed edema, also known as angioneurotic edema. This condition was described as early as 1778 by Salpertus, in 1801 by Crichton, in 1848 by Graves, in 1872 by Milton and in 1882 and 1904 by Quincke. It is also known as Quincke's edema. The patient also has the type known as lingual bullosis, in which the tongue becomes covered with multiple vesicles. The blindness is due to a swelling of the optic nerve head. The most important characteristic of this entity is its tendency to appear without reason and after a few hours or days disappear only to return again at some later time. The edema may involve any part of the body, but usually the skin, the subcutaneous tissue and occasionally the mucous membranes are most often affected. The prognosis is extremely dangerous in cases of edema of the lottis because the patient may become asphyxiated unless intubation or tracheotomy is done at once. There is no special treatment. Overeating, worrying and restlessness should be corrected. Tenseness, panic and emotional states should be prevented if possible. Various foods should be eliminated from the diet if such foods are found to produce an attack (allergic). Epinephrine, ephedrine or amphetamine sulfate should be given for the acute attack if possible. Application of ice to the swelling if it is in the eyelid, cheek lip or parotid gland will be found to be helpful in reducing the size of the swelling as well as its duration. It is suggested that a textbook on neurology be consulted for further description.

## RECURRENT BOILS FROM ARSENIC COMPOUND

To the Editor—A mosquito control crew has been using the following modification of a weed killing compound manufactured by the Chipman Chemical Company of Bound Brook, N. J.

Active ingredients	
Dicalcium arsenite not less than	83.33%
Consisting of	
Arsenous oxide not less than	50.00%
Total arsenic (as metallic) not less than	37.87%
Water soluble arsenous oxide not more than	4.00%
Water soluble arsenic (as metallic) not more than	3.03%
Inert ingredients not more than	16.67%

To this standard compound has been added 10 per cent by weight of sodium arsenite. The mixture is dissolved in water and sprayed on the hydrants. The proportion used is approximately 4 pounds of the mixture to 50 gallons of water. After about a week's exposure to the solution the operators became affected with boils mainly on their arms and chests. After about a week's rest the condition of the men improved noticeably. It appears therefore that working with this compound may have some effect on the men which will result in a recurrence of the boils. Please advise whether the continued use of this compound would be detrimental in any way to the health of the men exposed to it.

T. R. GRIFFIN, M.D. St. Petersburg, Fla.

ANSWER—The condition described leads to the presumption that arsenic is the source of the disorder, although neither the nature nor the distribution of the dermatitis is characteristic. However, Rayer (A Treatise on the Theory and Practice of Skin Diseases, Paris, 1826-1827) as early as 1826 described pustulous skin disorders produced by arsenic compounds. In time, the terms "arsenic pock" or "arsenic pox" came into wide use. Usually a dermatitis, following exposure to arsenic-bearing dusts or sprays, is present about the eyelids, base of the nose, neck, armpits, elbows, hands and groins rather than on the chest. Also the lesion customarily is essentially papilliform, followed by ulceration, commonly associated with deep pigmentation and at times followed by keratosis or even neoplastic growth. As to arsenical furunculosis, White (Occupational Affections of the Skin, London, H. K. Lewis & Co., Ltd., 1934) states "Infection rapidly changes papules and vesicles into pustules, which readily burst and the contents reinfect the skin. Pimples and boils then become the prevailing type. Moisture, friction and continued irritation of the arsenic lead to ulcers." Continued exposure is not warranted in the absence of protective measures unless arsenic can be ruled out as the offending agent. These afflicted workers should be examined for other evidences of arsenic poisoning such as disturbances of the digestive, renal and circulatory systems.

## HAY FEVER AND VITAMINS

To the Editor—In the July 10, 1932 issue of *Industrial and Engineering Chemistry* (New Edition) appeared an article by K. Katsuta of the Ohio Agricultural Experiment Station Wooster, Ohio entitled "Hay Fever as a Symptom of Vitamin Deficiency." This article outlined a cure for hay fever consisting of the daily ingestion of four teaspoonful three times daily of cod liver oil plus a cake of yeast. Do you know anything of the present status of this treatment and whether or not further work has been done on it?

CARL P. SHERWIN, M.D. New York

ANSWER—Since vitamin therapy has been tried in almost every disease it is but natural that it should be attempted in hay fever. Crandall and Feinberg (*J. Allergy* 5:515 [July] 1934) gave daily doses of thirty drops of viosterol 250 D to a series of hay fever patients without any noticeable effect. Rappaport, Reed, Hathaway and Struck (*ibid.* 5:541 [Sept.] 1934) reported favorable results from the use of enormous doses of vitamin D in the form of irradiated ergosterol. Apparently these large doses were helpful in conjunction with the regular desensitization therapy. Their experience together with the experiences of others seems to indicate that doses of vitamin D of that magnitude may produce toxic and perhaps even dangerous symptoms. The use of cod liver oil in the doses mentioned by the inquirer has been employed by many physicians without any notable results. In unpublished work carried on at the Allergy Department of Northwestern University Medical School the following vitamin products in ordinary doses have produced no beneficial results in hay fever: vitamin A (carotene and fish oils), vitamin B (brewers' yeast), vitamin C (ascorbic acid), vitamin D (viosterol and fish oils).

## UNUSUAL MIGRAINE

To the Editor—A woman aged 35 has been having what has been diagnosed as attacks of migraine ever since 1932. Before an attack she has a depressed feeling which is soon followed by an excruciating headache. The location of the pain varies from time to time. Sometimes it begins on the right side of the head and goes to the left; again it starts on the left and extends to other parts of the head. During the attack she feels nauseated and vomits occasionally. Without efforts at relief this headache has lasted as long as four or five days, gradually wearing off. Furthermore during the attack light aggravates it. In 1930 the patient had a tonsillectomy after which it was necessary to stop the hemorrhage by suturing. In 1932 she had an appendectomy; the ovaries have not been touched. About two weeks after this operation the first attack of headache began. She did not have another until three years later, then the headaches began to precede each menstrual period. After a few months the headaches began to follow menstruation. During the past year the attacks have appeared twice weekly. A neurologist performed a spinal fluid test as well as a complete neurologic examination and found everything negative. He gave her five typhoid injections without effect. His diagnosis was migraine. An internist then had her skull as well as her gastrointestinal tract roentgenographed with negative results except for the finding of a curved surgical needle at the right angle of the left jaw. He treated her for six months by means of estrogen without any benefit. The patient was finally placed in a hospital for observation and treatment where she remained for six weeks. After a thorough examination nothing organic was found except the needle. She was advised to have the needle removed although she is not conscious of its presence. Ergotamine tartrate (gynergen) gave her relief at first but its efficacy soon wore off. Now she obtains some measure of relief from neoglynergen. Its effect however is also showing signs of diminishing.

M.D. New York

ANSWER—The patient described as having attacks of migraine presents the following unusual points: "onset" after an appendectomy, the presence of a surgical needle at the angle of the left jaw, and gradual diminution of the therapeutic efficacy of gynergen and more recently neoglynergen. If, as stated, the ovaries were not damaged during the operation, the subsequent appearance of the attacks of migraine is most likely coincidental. The needle likewise is probably not productive of the attacks. It should, however, be removed because it may be a source of irritation to the adjacent sympathetic chain.

It is presumed that gynergen is progressively less effective in stopping each succeeding attack and that neoglynergen is likewise less effective in aborting or terminating attacks. Neither is of value in preventing the recurrence of migraine headaches. It is unusual for either to lose their value. If either did so, it would be expected that neoglynergen would fail first because as a rule it is about half as effective as gynergen. Apparently no other instances of developed tolerance to ergotamine have been noted. These facts cause one to suspect (1) an approaching menopause, (2) an increase in the psychogenic aspect of the problem or (3) a progressive organic lesion, such as cerebral aneurysm or neoplasm.

The migraine syndrome is often the summation of abnormalities in the endocrine, psychic, allergic and other fields, resulting in intracranial vasomotor fluctuations. Each field should be thoroughly investigated and any abnormalities corrected. Small doses of emmenin three times a day have been found effective in diminishing the frequency of attacks in similar case.



inherent or acquired deficiency, which allows this patient to become a victim of neuritis, unlike the vast majority of patients who have acute or chronic appendicitis. Treatment by vitamins however, with our present state of knowledge, is to be recommended.

# RESPIRATORY FAILURE IN NEWBORN

To the Editor—A normal full term fetus delivered by an elective cesarean section exhibited complete respiratory failure and died. Autopsy by a competent pathologist revealed grossly only atelectasis of the lungs which was judged to be secondary in nature. A study of the cerebral cortex for evidence of cellular alteration by anoxemia is to be attempted. Twelve hours and eighteen minutes before anesthesia was begun the mother received one dose of sodium amytal 3 grains (0.2 Gm). Two hours and three minutes before anesthesia was begun morphine sulfate one sixth grain (0.01 Gm) with atropine sulfate 1/100 grain (0.0004 Gm) was administered. Nitrous oxide oxygen ether anesthesia was given by a competent physician anesthetist. Twenty three minutes elapsed from the beginning of the anesthesia to the beginning of the operation. Twenty seven minutes from the beginning of the anesthesia to the delivery of the fetus. A second cesarean section by the same operating group and the same anesthetist under similar medication with morphine and the same anesthesia resulted in a cyanosed infant which was resuscitated but developed inhalation (aspiration) pneumonia. The same operating group with other anesthetists but with the same medication and the same anesthetics has over the past two years experienced no fetal complications. Discussion appears directed chiefly to the preoperative medication to the anesthetic itself and to the amount of oxygen necessary to prevent anoxemia.

M D New York

ANSWER—The failure of the respiratory function in the newborn following delivery by cesarean section may be due to several factors. In the first place, narcosis may diminish the sensitivity of the respiratory center or cause a complete cessation of respiratory movements so that this function is not resumed at birth. The various analgesic and anesthetic drugs produce varied degrees of narcosis, depending on the character of the drug and the amount of it used. The barbiturates are more likely to produce a prolonged narcosis in the newborn than are the opiates. The second factor in asphyxia is the anoxemia produced by inhalation anesthetics. Here again the degree of anoxemia would depend on the anesthetic agent used. Snyder and Rosenfeld have shown experimentally in animals that the fetus requires at least 15 per cent oxygen in order that the respiratory movements are not interfered with. Less than 10 per cent oxygen produces an immediate suppression of fetal respiration, which may or may not be permanent, depending on the duration of the anoxemia. Thus, nitrous oxide must be administered with at least 15 per cent oxygen in order to avoid fetal anoxemia. This mixture in itself without the addition of ether will not produce anesthesia in the mother.

When a combination of narcosis and anoxemia exists, the danger of respiratory failure at birth is definitely increased. The exact valuation of the roles of the preoperative medication and the anesthesia in the production of fatal asphyxia of the newborn cannot be ascertained in each instance. Prompt and effective methods of resuscitation will reduce the incidence of serious or fatal asphyxia.

## References

- Snyder F F and Rosenfeld Morris *Am J Obst & Gynec* 36 363 (Sept) 1938
- Snyder F F and Rosenfeld Morris *Intra Uterine Respiration Movements of the Human Fetus* THE JOURNAL June 5 1937 p 1946
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# PERIRECTAL SINUS AND EMPLOYABILITY

To the Editor—Precedents are desired with regard to the employability of a person having a perirectal sinus presumably of tuberculous origin. The discharge is slight. There are no other open tuberculous lesions. The patient's state of health is stabilized and he is considered physically able to carry on his former work. Are esthetic and hygienic considerations so serious that his former employer should consider him unfit to work with other employees and to use the same lavatories? He belongs to the white collar class.

M D New Jersey

ANSWER—No precedents have been found to interfere with the employability of a person having a perirectal sinus due to tuberculosis, without other demonstrable lesions.

# BIBLES IN BRAILLE

To the Editor—I have been asked to get a braille Bible for a blind patient but so far have not been able to locate a supply house that handles the book or knows where to get them. Could you tell me where I could acquire one?

JOHN T FRANCE M D Findlay Ill

ANSWER—Bibles in braille are available at the American Printing House for the Blind 1839 Frankfort Avenue Louisville Ky.



## Medical Examinations and Licensure

### COMING EXAMINATIONS

#### STATE AND TERRITORIAL BOARDS

ALABAMA	Montgomery	June 20 22	Sec Dr J N Baker	517
Dexter Ave	Montgomery			
ALASKA	Juneau	March 2	Sec Dr W W Council	Box 561
Juneau				
ARIZONA	Basic Science Tucson	March 21	Sec Dr Robert I	
Nugent Science Hall University of Arizona	Medical Phoenix	April 11 12	Sec Dr J H Patterson	826 Security Bldg Phoenix
ARKANSAS	Medical (Regular)	Little Rock	June 8 9	Sec State
Medical Board of the Arkansas Medical Society	Dr I J Kosminsky	317 State Line Texarkana	Medical (Eclectic)	Little Rock
Sec Dr Clarence H Young	1415 Main St	Little Rock	June 8 9	
CALIFORNIA	Written examinations	San Francisco	July 10 13	and
Sacramento	Oct 16 19	Oral examinations	(required when reciprocity	
application is based on a state certificate or license issued ten or more				
years before filing application in California)		San Francisco	March 22	
Los Angeles	August 7	and San Francisco	Nov 15	Sec Dr Charles
B Pinkham	420 State Office Bldg	Sacramento		
COLORADO	Denver	April 5 7	Sec Dr Harvey W Snyder	831
Republic Bldg	Denver			
CONNECTICUT	Medical (Regular)	Hartford	March 14 15	Endorse
ment Hartford	March 28	Sec Dr Thomas P Murdock	147 W	
Main St Meriden	Medical (Homeopathic)	Derby	March 14	Sec
Dr Joseph H Evans	1438 Chapel St	New Haven		
DELAWARE	Dover	July 11 13	Sec Medical Council of Delaware	
Dr Joseph S McDaniel	229 S State St	Dover		
DISTRICT OF COLUMBIA	Basic Science	Washington	June 26 27	
Medical	Washington	July 10 11	Sec Commission on Licensure	Dr
George C Ruhland	203 District Bldg	Washington		
FLORIDA	Jacksonville	June 19 20	Sec Dr William M Rowlett	Box 786 Tampa
GEORGIA	Atlanta	June	Joint Sec State Examining Boards	Mr
R C Coleman	111 State Capitol	Atlanta		
IDAHO	Boise	April 4 7	Address: Dir Bureau of Occupational	
Licensure Rm	355 State Capitol Bldg	Boise		
ILLINOIS	Chicago	April 11 13	June 20 22	and Oct 17 19
Superintendent of Registration	Department of Registration and Education	Mr Homer J Byrd	Springfield	
INDIANA	Indianapolis	June 20 22	Sec Board of Medical Registra	
tion and Examination	Dr J W Bowers	301 State House	Indianapolis	
IOWA	Basic Science	Des Moines	April 11	Dir Division of
Licensure and Registration	Mr H W Grefe	State Department of		
Health	Capitol Bldg	Des Moines		
KANSAS	Kansas City	June 20 21	Sec Board of Medical Registra	
tion and Examination	Dr J F Hassig	905 N 7th St	Kansas City	
KENTUCKY	Louisville	June 7 9	Sec State Board of Health	Dr
A T McCormick	620 S Third St	Louisville		
MAINE	Portland	March 14 15	Sec Board of Registration of Medi	
cine Dr Adam P Leighton	192 State St	Portland		
MARYLAND	Medical (Regular)	Baltimore	June 20 23	Sec Dr
John T O'Mara	1215 Cathedral St	Baltimore	Medical (Homeopathic)	
Baltimore	June 20 21	Sec Dr John A Evans	612 W 40th St	Baltimore
MASSACHUSETTS	Boston	March 14 16	Sec Board of Registration	
in Medicine	Dr Stephen Rushmore	413 F State House	Boston	
MICHIGAN	Ann Arbor and Detroit	June 14 16	Sec Board of Regis	
tration in Medicine	Dr J Earl McIntyre	100 W Allegan St	Lansing	
MINNESOTA	Basic Science	Minneapolis	April 4 5	Sec Dr J
Charles McKinley	126 Millard Hill	University of Minnesota	Minne	
apolis	Medical	Minneapolis	April 18 20	Sec Dr Julian F Du Bois
350 St Peter St	St Paul			
MISSISSIPPI	Jackson	June	Asst Sec State Board of Health	Dr
R N Whitfield	Jackson			
MONTANA	Helena	April 4 5	Sec Dr S A Cooney	216 Power
Block Helena				
NEBRASKA	Basic Science	Omaha	May 2 3	Dir Bureau of Exam
ining Boards	Mrs Clark Perkins	State House	Lincoln	
NEW HAMPSHIRE	Concord	March 9 10	Sec Board of Registration	
in Medicine	Dr Fred E Clow	State House	Concord	
NEW JERSEY	Trenton	June 20 21	Sec Dr Earl S Hallinger	28
W State St	Trenton			
NEW MEXICO	Santa Fe	April	Sec Dr Le Grand Ward	155 Sena
Plaza Santa Fe				
NEW YORK	Albany Buffalo New York and Syracuse	June	Chief	
Bureau of Professional Examinations	Mr Herbert J Hamilton	315 Edu	cation Building	State Education Department Albany
NORTH CAROLINA	Raleigh	June 19	Sec Dr William D James	The Hamlet Hospital Hamlet
OREGON	Basic Science	Portland	Feb 25	Corvallis
July 8	and	Portland	Oct 28	Sec State Board of Higher Education
Mr Charles D Byrne	University of Oregon	Eugene		
PENNSYLVANIA	Philadelphia and Pittsburgh	July	Sec Board of	
Medical Education and Licensure	Dr James A Newpher	400 Education	Bldg	Harrisburg
PUERTO RICO	San Juan	March 7	Sec Dr O Costa	Mandry
Department of Health	San Juan			
SOUTH CAROLINA	Columbia	June 27	Sec Dr A Earle Boozer	
505 Saluda Ave	Columbia			
SOUTH DAKOTA	Rapid City	July 18 19	Director Medical Licensure	
Dr G J Van Heusen	State Board of Health	Pierre		
VIRGINIA	Richmond	June 21 23	Sec Dr J W Preston	30 1/2
Franklin Road	Roanoke			
WEST VIRGINIA	Charleston	March 6 8	Sec Public Health Council	
Dr Arthur E McClue	State Capitol	Charleston		
WISCONSIN	Basic Science	Madison	April 1	Sec Prof Robert V
Bauer	3414 W Wisconsin Ave	Milwaukee	Medical	Milwaukee
27 30	Sec Dr Henry J Gramling	2203 S Layton Blvd	Milwaukee	

#### NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the National Board of Medical Examiners and Special Boards were published in THE JOURNAL February 11 page 573

### Rhode Island October Examination

Mr Robert D Wholey, chief, Division of Examiners, reports the oral, written, and practical examination held by the Board of Examiners in Medicine at Providence, Oct 6-7 1938. The examination covered 20 subjects and included 50 questions. An average of 80 per cent was required to pass. Six candidates were examined, five of whom passed and one failed. Four physicians were licensed by endorsement after an oral examination. The following schools were represented:

School	PASSED	Year Grad	Per Cent
Georgetown University School of Medicine	(1931)	86	
Harvard University Medical School	(1936)	86	
Jefferson Medical College of Philadelphia	(1936)	86	
McGill University Faculty of Medicine	(1936)	86	
Regia Università di Napoli Facoltà di Medicina e Chirurgia	(1936)	87	
School	FAILED	Year Grad	Per Cent
Johns Hopkins University School of Medicine	(1936)	86	
School	LICENSED BY ENDORSEMENT	Year Grad	Per Cent
Georgetown University School of Medicine	(1936)	N B M Ex	
Tufts College Medical School	(1937)	N B M Ex	
Temple University School of Medicine	(1932)	N B M Ex	
Hamburgische Universität Medizinische Fakultät	(1932)	N B M Ex	

### Florida November Examination

Dr William M Rowlett, secretary State Board of Medical Examiners, reports the examination held in Jacksonville Nov 14-15 1938. Seventy-four candidates were examined, fifty six of whom passed and eighteen failed. The following schools were represented:

School	PASSED	Year Grad	Per Cent
College of Medical Evangelists	(1934)	75	83
Yale University School of Medicine	(1907)	79	79
Georgetown University School of Medicine	(1931)	76	66
Emory University School of Medicine	(1934)	79	74
(1935) 79 5 (1938) 79 5 80 5 82 5 83 8			
University of Georgia School of Medicine	(1938)	81	8
Northwestern University Medical School	(1929)	84	6
(1932) 82 3 (1933) 84 2 (1937) 87 1 (1938) 87 5			
Rush Medical College	(1922)	84 3	(1932) 85 7
University of Illinois College of Medicine	(1934)	84 3	
University of Louisville School of Medicine	(1938)	76 9	80 3
Tulane University of Louisiana School of Medicine	(1932)	79 1	
(1937) 77 9			
University of Maryland School of Medicine	(1914)	82	8
University of Maryland School of Medicine and College of Physicians and Surgeons	(1939)	81	6
Harvard University Medical School	(1899)	81	9
Tufts College Medical School	(1929)	83	7
University of Michigan Medical School	(1923)	81 6	(1938) 80 6
Washington University School of Medicine	(1929)	84 9	(1938) 80 6
Albany Medical College	(1920)	84	9
Columbia University College of Physicians and Surgeons	(1915)	84	9
(1934) 83 1			
Eclectic Medical College Cincinnati	(1935)	82	2
Ohio Medical University	(1894)	80	3
Ohio State University College of Medicine	(1931)	80	3
(1938) 87 5			
Western Reserve University School of Medicine	(1919)	84	8
University of Oklahoma School of Medicine	(1931)	81	8
Jefferson Medical College of Philadelphia	(1908)	81	8
Temple University School of Medicine	(1933)	81 5	(1937) 81 4
University of Pennsylvania School of Medicine	(1912)	81	2
(1933) 79 8 (1936) 82 6			
Medical College of the State of South Carolina	(1936)	82	6
Univ of Tennessee College of Medicine	(1937)	77 9	(1938) 78 2
Vanderbilt University School of Medicine	(1935)	82	1
University of Vermont College of Medicine	(1929)	83	1
Medical College of Virginia	(1938)	83	1
University of Virginia Department of Medicine	(1921)	83	1
University of Toronto Faculty of Medicine	(1926)	83	1
School	FAILED	Year Grad	Per Cent
University of Arkansas School of Medicine	(1938)	70	2
College of Medical Evangelists	(1933)	70	2
Emory University School of Medicine	(1934)	73	1
Rush Medical College	(1920)	73	1
University of Illinois College of Medicine	(1923)	73	1
Physio-Medical College of Indiana	(1892)	73	1
University of Maryland School of Medicine and College of Physicians and Surgeons	(1916)	69	1
Columbia University College of Physicians and Surgeons	(1904)	71	8
(1905) 65 7			
Ohio State University College of Medicine	(1911)	73	1
Medico-Chirurgical College of Philadelphia	(1914)	74	1
Temple University School of Medicine	(1913)	67	7
University of Pennsylvania School of Medicine	(1917)	70	6
University of Nashville Medical Department	(1908)	73	8
Baylor University College of Medicine	(1936)	66	8
Medical College of Virginia	(1924)	71	3
University of Virginia Department of Medicine	(1937)	71	3
University of Toronto Faculty of Medicine	(1931)	71	3

## Book Notices

**Diseases of the Chest and the Principles of Physical Diagnosis** By George W. Norris A.B. M.D. and H. R. M. Landis A.M. M.D. Sc.D. Diseases of the Bronchi, Lungs, Pleura and Diaphragm. Revised by Simon S. Leopold M.D. Assistant Professor of Medicine and Head of the Department of Physical Diagnosis in the University of Pennsylvania. Philadelphia. Transmission of Sounds Through the Chest. By Charles M. Montgomery M.D. Electrocardiography and the Cardiac Arrhythmias the X-Ray Study of the Heart and Great Vessels and Additional Methods of Cardiac Examination. By Thomas M. McMillan M.D. Physician to the Pennsylvania Hospital Philadelphia. Sixth edition. Cloth. Price \$10. Pp. 1019 with 478 illustrations. Philadelphia & London W. B. Saunders Company 1938.

This edition shows in every detail the march of progress in diseases of the chest over the last two decades. There is much in the first edition that is present today. It must be gratifying to the authors that what was the text of the diseases of the chest for clinicians, private physicians and students alike twenty years ago is still the text today. The edition as compared with the edition of 1917 is larger by more than 200 pages and is still divided into four sections: examination of the lungs, examination of the circulatory system, diseases of the bronchi, lungs, pleura and diaphragm, and diseases of the heart. The authors have been adept in separating the chaff from the wheat, in surveying the great amount of literature and research that has appeared in the world's medical periodicals each year. Through six editions in twenty-one years they have kept step with the times. We would like to refer the reader to the preface of the first edition in order that students may see what the authors hoped to do, what they most assuredly accomplished, as Millet's 'Gleaners' in the field of fact that concerned them, the diagnosis of the diseases of the chest in the last two decades.

It was, indeed, unfortunate that Dr. Landis died during the early work of this edition. By his request, however, during a long illness his task was taken over by an able clinician, Dr. Simon S. Leopold, who as a tribute to the memory of Dr. Landis, took over the latter's role in the revision of the previous edition and rewrote the chapters dealing with bronchial asthma, bronchiectasis, lung abscess, cystic disease of the lung and the relation of the nasal and accessory sinus disease to infections of the lower respiratory tract. The chapter on electrocardiography and the cardiac arrhythmias has been rewritten by Dr. Thomas McMillan, who has also added the chapter on the X-ray study of the heart and great vessels, a study profusely illustrated by diagrams.

With the recent progress of thoracic surgery, more refinement in the diagnosis of pathologic conditions of the chest has become necessary. This necessity has been fully realized by the added procedures of diagnosis, namely diagnostic pneumothorax, bronchoscopy, bronchography, thoracoscopy, roentgenograms, oblique and lateral views of lesions that may be hidden by the heart shadow, mediastinum, spine and domes of the diaphragm. The edition is completely illustrated with reduced prints of the roentgenograms, with postmortem roentgenograms of injected lungs, bronchographic diagrammatic sketches, photographs, charts, tables, colored plates of disease conditions of the chest, photographs of pathologic cross sections, sagittal and cross sections of the torso, and electrocardiograms, thus catering to the visual memory of the students of diseases of the chest.

**Cancer Diagnosis and Treatment. A Handbook for Physicians.** Compiled and edited by the Committee on Cancer Education of the Colorado State Medical Society. Paper. Pp. 75. Denver. Colorado State Board of Health 1938.

This is a handbook in brief and condensed form offered to the physicians of Colorado by the medical society and the board of health of that state as a part of the educational campaign against cancer, a campaign which includes education of the physician in the technical aspects of modern diagnosis and treatment and of the lay public in the recognition of suggestive signs of early cancer and precancerous conditions. The material contained in the handbook is authentic in character, conveniently arranged (except for the absence of an index which would have improved even so small a handbook) and while brief, is sufficiently comprehensive to serve the needs of the general practitioner for whose use it is primarily intended. This booklet is significant not so much for what it contains, useful as that is

but for the fact that it is a joint educational effort by organized medicine and organized public health in Colorado. It is one of the self-imposed programs of self-improvement which characterize the medical profession and which seem to have escaped the notice of many of its self-appointed critics. Attention is called in the introduction to the educational programs of the American Society for the Control of Cancer and its Women's Field Army, which functions in each state under the direction of the state medical society's committee on cancer. Not only as a technical contribution to cancer control in that state but as a manifestation of educational mobilization of all community forces against cancer, this booklet commands attention. Readers outside Colorado would have appreciated some statement in the pamphlet as to its availability outside the state and, if so, at what price and from what source.

**Illustrated Primer on Fractures.** Prepared by the Special Exhibit Committee on Fractures in Cooperation with the Committee on Scientific Exhibit of the American Medical Association. Fourth edition. Cloth. Price \$1. Pp. 90 with 43 illustrations. Chicago. American Medical Association 1938.

In a new format, with an interleaving of blank pages for personal notes or drawings, there has now appeared a fourth edition of the popular *Primer on Fractures*. This is the product of the Special Exhibit Committee on Fractures of the American Medical Association under the chairmanship of Kellogg Speed, printed in cooperation with the Committee on Scientific Exhibit of the Association. The new volume fits any book shelf and can be carried in an automobile pocket for ready reference. In it are found descriptions of the elementary principles of fracture treatment, including emergency care for transportation, with brief explanations of cause, ordinary displacements and X-ray appearances of many of the fractures met in general practice, all illustrated by line drawings spread through the text. Plaster of Paris bandage making and use are stressed and sage advice is given for its employment. A list of splints and materials which can be easily carried in the doctor's automobile or an ambulance is given. The committee for the American Medical Association should be congratulated on this revision for its conservative yet up-to-date instruction, its orderliness and its presentation in a form better adapted than the previous editions for carrying and handling. Every medical practitioner should be armed with this valuable *vade mecum* which conveys so much elementary yet essential information on which he may rely.

**Corpus Iconum Morborum Cutaneorum.** Collected and edited by Louis Nékam, Senator and Professor of Dermatology and Syphilology, Royal Hungarian University, Budapest. Volume 1. Parts 1, 2 and 3. Cloth. Price 194 marks. Pp. 180, 464, 928 with illustrations. Leipzig. Johann Ambrosius Barth 1938.

At the ninth International Dermatologic Congress in Budapest, Sept. 13 to 21, 1935, it was decided to make a further issue of publications devoted to pictorial representations of dermatologic conditions. It was felt that such a publication would do much to produce a universal dermatologic nomenclature, to say nothing of its educational value. Professor Nékam agreed to assume this monumental task, although he had already devoted almost his entire time for two years to ensure the success of the congress. These three volumes are the fruits of these endeavors. He has been assisted in the publication by a staff of Hungarian, as well as by several German, Italian, English and French collaborators. It is unfortunate that the lack of space precludes mentioning them by name.

Part I, a book of 180 pages, is directed to the introduction. In this work it is not the desire to present a textbook but rather a collection of examples of skin diseases with their classification and nomenclature. A morphologic as well as an etiologic classification is submitted to the reader. A valuable table of synonyms assists the reader to a clearer understanding of dermatologic terms. Instead of long descriptions of each illustration with the illustration, 115 pages are then devoted to only a few salient words about each illustration, for this monument comprises 4,566 photographs collected from between 500 and 600 dermatosyphilologists from all over the world. Part I finishes with an excellent index, an item in which the average European volume is lamentably weak.

Parts II and III are devoted to the pictorial illustrations and they are grouped so that the interested reader has an opportunity

to study many variations of the various diseases as collected from different parts of the world. In part II, of 464 pages, is found an immense collection of photographs on syphilis, the related frambesia or yaws, and tuberculosis. For the mycologist there is an enormous material furnished on mycotic diseases with illustrations of their growth, on mediums, and photomicrographs of individual types of organisms. Occupational eruptions and disorders of internal secretion are also well represented.

Part III, of 928 pages, is the zenith of the great work, if this is possible. Much material is furnished to illustrate types of parapsoriasis, a disease difficult for even the dermatologist to classify properly, lymphoblastomas and neoplasms are fully illustrated in all forms and types. There are many excellent representations of the rarer malignant diseases, Paget's disease, Bowen's disease and various nevus conditions. Cutaneous fungous diseases of animals in their relation to man are also faithfully presented in this volume. Diseases of the appendages, hair and nails are presented. Part III also presents many cutaneous disorders in colors.

These three parts of volume V of the publications of the ninth International Dermatologic Congress, and in fact each one a volume in itself, are a monument to Professor Nékám, to the Hungarian school of dermatology and to Hungary itself. The cost of the preparation and production must have been enormous, to say nothing of the weeks and months devoted to it by what must have been loving hands, or it would never have been brought to fruition. Professor Nékám himself has furnished almost one fourth of the illustrations—the ones on fungi being notable.

These volumes are a credit to international dermatology, which knows no national boundaries. The illustrations are almost invariably of a high order and are printed on a fine glossy paper that takes them well. There are enough of them on each disease to make the volumes of highly educational value not only for the specialist but also for the general medical man interested in dermatology. An atlas of cutaneous diseases of this monumental type has never been attempted before, and it will be many years before any one individual so fortunately situated as Professor Nékám and his school of dermatology will attempt to emulate it. The printer and illustrator have done their work well, the type is clear, the format is excellent, and the binding, while not elaborate, is designed to wear well.

The three volumes are unhesitatingly recommended to medical schools, libraries, dermatosyphilologists and medical men in general.

**The Home Book of Medicine** By David Polowe M.D. Cloth Price \$2.75 1 p. 581 with 13 plates New York Greenberg, Publisher Inc. 1938

This book is an attempt at one of the most difficult feats in medical writing for the public, the production of a home book containing sound advice on what to do before the doctor comes, or what to do when there is no possibility that a doctor can be procured. In situations in which a doctor is readily available, such a book should limit itself to general questions of hygiene and healthy living, and perhaps emergency first aid. In that case it would be useless in remote places where medical aid is needed and there is no doctor within miles, or no way to communicate with a doctor in time. The old-time doctor book had detailed instructions for treating the sick without medical advice, the modern book of this type should eschew such suggestions. The volume under review gives the impression of a medical text somewhat written down to the supposedly lower intellectual level of the lay reader. Such writing misses the point. The lay reader is not less intelligent, by and large, than the medical reader. He is simply less well equipped with a background for the comprehension of medical literature. Merely setting before such a reader a somewhat simplified medical book does nothing for him except through its recital of symptoms to tempt him to self diagnosis and through the detailed outline of treatment to suggest that he and not his doctor should be responsible for therapy. To be specific, the chapters on immunity contain much material, such as that on agglutinins and opsonins, of no interest or importance to the lay reader and leave him confused rather than enlightened. The discussion of debridement under tetanus is out of place in a book for the layman. The anatomic chapters in the front of the book are inadequate but at the same time

contain much material of no interest to the nonmedical reader. The illustrations are obviously transplanted from medical text books. What does the lay reader know or care about the bones of the lower extremity, that there are sixty-two bones in the lower extremity, and the exact relationship of the sutures in the skull? The section on the "insanities" is sketchy, inaccurate and totally inadequate. The implication that cancer is a term applicable to all tumors benign as well as malignant, is unjustifiable and will go far to undo the efforts of medical societies and women's clubs, to dispel the unthinking fear of cancer and to cause people to deal boldly with precancerous states. Such subjects as fibro-neuromas, ganglionic cysts, "surgical conditions of the bones" and surgery of the nerves and blood vessels are unsuitable for discussion in such a book, the adequacy of the material itself can be imagined from the fact that the chapter on surgical conditions in adults takes just nine pages. These are but a few points among many. The book contains much good advice and many useful facts. This is readily apparent to the physician, but the book is not intended for the physician. Considering the book as a whole, one is forced to the conclusion that it will do little good in the ordinary home and may do much harm.

**The British Encyclopaedia of Medical Practice including Medicine Surgery Obstetrics Gynaecology and Other Special Subjects** Under the General Editorship of Sir Humphry Rolleston Bt. G.C.V.O. K.C.B. M.D. Volume VIII Leukaemia to Mucous Colic. Cloth Price \$1.75 Pp. 712 with 65 illustrations including 13 plates London & Toronto Butterworth & Co. (Publishers) Ltd. 1938

Volume VIII of the Encyclopaedia of Medical Practice proceeds from "leukaemia" to "mucous colic." It is interesting that these two terms should differ so greatly from the American spelling and usage of the same terms. En route from "leukemia" to "mucous colic" are such interesting main headings as the "lipoidoses," "liver diseases," "lung diseases," "the lymphatic glands," "malignancy," "massage," "meningitis," "mental diseases," "metabolism," "mouth diseases" and "motor neuron diseases." The cooperating writers are among the leaders of British medicine and the writing throughout shows the effect of fine editorial attention. Volume VIII is fully up to the standard of the excellent volumes which have preceded it.

**Sauglingskrankheiten** von Professor Dr. H. Finkelstein Fourth edition. Cloth Pp. 890 with 204 illustrations Amsterdam Elsevier 1938

This edition retains in general form the outline of the previous editions. The various chapters and subjects have, in the main, been revised, rewritten and brought down to date. A chapter on rickets has been added and the older chapters on vitamin deficiencies have been extensively revised. Some new tables have been appended and several color plates on rickets and the skin diseases have been added. The author has incorporated his latest researches on water balance in the chapter on nutritional disturbances and he has included in an outstanding chapter on eczema much of his experimental work on this subject. The literature is brought through the end of 1937. With the advent of the third edition, in 1924, it seemed that the author's book had reached the acme of perfection. Nevertheless in the present edition he has improved on previous editions of his masterful writings. Heinrich Finkelstein's work contains a storehouse of knowledge, replete with the author's large and unique experience. The larger type used in the fourth edition, as well as a better quality of paper, greatly improve the physical format.

**The Conquest of Cholera America's Greatest Scourge** By J. S. Chambers M.D. Professor of Hygiene and Public Health and Director of Student Health Service University of Kentucky. Cloth Price \$1.75 Pp. 366 with 40 illustrations New York Macmillan Company 1938

A most fascinating story that is as interesting as it is authoritative. There will be few readers who can lay this book aside until they have read the last page. The book deals with the epidemic of Asiatic cholera in the United States from its outbreak in 1832 to its conquest in 1892. The reader is taken in word, picture and map along the path of the disease from its first outbreak along the Atlantic coast to the interior valleys and the epidemic in the blue grass country. The second invasion and the gold rush of '49 furnish further thrilling chapters. The contributions of foreign and American physicians and allied workers are discussed and each is given the place and prominence deserved. This volume is a notable contribution to medical history.

**The Clinical Examination of the Nervous System** By C H Monrad Krohn MD FRCP Professor of Medicine in the Royal Frederick University Oslo Seventh edition Cloth Price \$3 Pp 319 with 111 illustrations New York Paul B Hoeber Inc 1938

In the review of the fifth edition of this book it was stated that the book could not be praised too highly, that it contains everything essential and states it in a clear manner, and that nonessentials are omitted. With seven editions in seventeen years its popularity is amply proved. The number of illustrations, mostly inserts and well chosen is greater than in previous editions. So much also has been added to the text that the maximum desirable size for a book of this kind has been reached. When a new edition becomes necessary the author should condense the material and decrease rather than increase the size of the book. It is extremely helpful for students, general practitioners and neurologists alike.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Malpractice Liability of a Corporation for Malpractice**—The New Castle Clinic was a corporation the directors of which were licensed physicians. It was described as "an operating force for a hospital" located in a building owned by the Clinic Realty Company. It employed the help in the building and collected all fees and charges for services rendered by the physicians who had offices in the building. The appellee injured his leg in an automobile accident and was taken to the clinic building. There the appellant physician, a director of the corporation, diagnosed the injury as a dislocation of the hip, which was reduced. The patient was then placed on a cot and returned in an ambulance to his home. Subsequently, it was alleged, other physicians discovered that there had been a fracture of the pelvis and hip socket. Permanent lameness and partial disability resulted. The patient then sued the clinic corporation and the appellant physician. The trial court gave judgment for the patient, and the case came before the Supreme Court of Indiana for review.

The complaint was based on the theory that the corporation was engaged in the practice of medicine and surgery and that it contracted to diagnose and treat the patient's injury. But, said the court, in Indiana it is unlawful for a corporation to practice medicine. Any contract, therefore, made in the name of a corporation, purporting to bind it to diagnose or treat ailments or diseases, is not only ultra vires but unlawful and against public policy. The right to practice medicine and surgery under a license by the state is a personal privilege. It cannot be delegated and a corporation or other unlicensed person may not engage in the practice of medicine by employing one who is licensed to do the things which constitute the practice of medicine.

If a licensed physician employs assistants who work under his direction as assistants in the practice of medicine or surgery, the rule of respondeat superior applies and there are cases, the court said holding that a corporation which has contracted to diagnose or treat disease is estopped from denying that a physician is its agent. It is undoubtedly true that corporations are liable under their ultra vires executed or partially executed contracts, and for the negligence of their agents and servants thereunder, where the contracts are within the apparent scope of their authority or where the other party to the contract could not be presumed to be cognizant of the invalidity. Difficulty arises however in applying the estoppel doctrine without doing violence to sound principle where the contracts involved are not only ultra vires but unlawful as against public policy. The complaint in the present case charged that the corporation contracted to diagnose and treat the plaintiff's ailments that it was negligent in performing the contract. The defense is that the corporation made no such contract because it had no power to make it. An estoppel would deny the corporation the right to assert illegality, notwithstanding there were no facts involved concerning which the patient was deceived or was without knowledge. There can be no estoppel, in the opinion of the

court, on such a basis. Since the corporation could not legally practice medicine, the patient was bound to know that whoever treated him was not acting for the corporation.

The patient came to the hospital, talked to the appellant physician and was treated by him with the assistance of two other physicians. Nothing was said as to whether the services were to be rendered by the physician or by the corporation. The physician was a stockholder and director in the corporation. The facts justify the conclusion that the corporation charged and collected for the use of its hospital facilities and equipment, and for furnishing the services of licensed and qualified physicians and surgeons. Under such a contract the duty of the corporation, in respect to the physicians or surgeons, would be complied with by using reasonable and ordinary care to employ reasonably qualified, reputable, licensed physicians. In such a case the physicians or surgeons are independent contractors. There was evidence from which the jury was justified in believing that, at the time the patient was treated by the appellant physician, there was a fracture of the hip joint and of the pelvis and that these fractures would have been disclosed by a reasonably careful examination of a roentgenogram, taken with ordinary care, or by a reasonably careful fluoroscopic examination. The roentgenogram taken by the appellant physician at the time of the treatment was destroyed because, he testified, he had spoiled it and it was no good. The appellant physician examined a roentgenogram taken by physicians who subsequently treated the appellee and admitted that it showed a fracture of the pelvis and that a roentgenogram taken an hour after the accident should have shown the same thing if the fracture were then present. The jury may have concluded, the court said, that the fracture was there and that the roentgenogram taken by the appellant physician would have disclosed it if taken and developed and examined with that degree of care which might reasonably have been expected from a reasonably careful physician under the standards prevailing at the time in the community. In the opinion of the court, the evidence was sufficient to justify the verdict against the appellant physician.

The judgment of the trial court against the physician was affirmed and the judgment against the corporation, for the reasons stated, was reversed.—*Ittman et al v Baker (Ind)* 15 N E (2d) 365

**Autopsies Liability for Autopsy Performed at Request of Coroner**—The plaintiff sued to recover damages for an unauthorized autopsy performed on his minor son. The county coroner, three physicians who performed the autopsy and an incorporated funeral home in which the autopsy was performed were joined as parties defendant. At the close of the plaintiff's evidence, judgment of nonsuit as to all defendants was entered and the plaintiff appealed to the Supreme Court of North Carolina.

The body of the plaintiff's minor son was discovered in a swimming pool in Greensboro, apparently drowned. The plaintiff lived in Wilmington. None of the next of kin of the deceased boy was in the county in which his body was found. The coroner was called in, and he, on finding no water in the lungs and the neck unbroken had the body removed to the defendant funeral home and called in the three defendant physicians to determine the cause of death. The evidence showed that the autopsy was carefully performed and that there was no mutilation of the body other than an incision 16 inches (41 cm) long, carefully closed and sewn which did not show when the body was clothed for burial. The marks on the body, according to the evidence, were but little more than those which would have been rendered necessary in the ordinary process of embalming. The autopsy revealed that the death was due to an acute heart attack. It was testified that the coroner had said "he had the autopsy performed to determine the cause of death, that he had no suspicion of foul play that no inquest was held." Admittedly no permission from the plaintiff nor any of the deceased's kin was asked or obtained. The plaintiff testified that he would not have given his consent if it had been requested and that the knowledge of the autopsy on the body of his son shocked and unnerved him equally with the news of his death.

The duties and powers of a coroner, the court said, are prescribed by law. No authority is given the coroner, in cases in which he does not suspect foul play and in which no inquest is held or jury summoned to cause on his own initiative an

autopsy to be performed merely to ascertain the cause of death of a person. The statute authorizes an investigation "whenever it appears that the deceased probably came to his death by the criminal act or default of some person," and in such case empowers the coroner "to summon a physician or surgeon and to cause him to make such examination as may be necessary whenever it appears to such coroner is proper to have such examination made." Furthermore, the court continued, the right to perform an autopsy in North Carolina is expressly limited by chapter 209, Acts of 1933, as follows:

The right to perform an autopsy upon the dead body of a human being shall be limited to cases specially provided by statute or by direction or will of the deceased cases where a coroner or the majority of a coroner's jury deem it necessary upon an inquest to have such an autopsy and cases where the husband or wife or one of the next of kin or nearest known relative or other person charged by law with the duty of burial in the order named and as known shall authorize such examination or autopsy.

It follows, said the court that an unauthorized autopsy to determine the cause of death when foul play is not suspected, though ordered by the coroner under color of his office, is in violation of the rights of the next of kin of the deceased and that the coroner is not protected by the official capacity in which he purports to act. The duty to ascertain the limits of his authority and to observe the law, particularly when the rights of others were affected was incumbent on the coroner. The general rule is that when an officer goes outside the scope of his duty he is not entitled to protection on account of his office but is liable for his acts like any private individual.

It also follows, the court said, that the physicians who performed the autopsy at the request of the coroner, on his request that this be done merely to determine the cause of death and without the consent of the next of kin, are equally unprotected from liability for an unauthorized invasion of the rights of those injuriously affected.

There was no testimony that the agents of the defendant funeral home did more than fail to offer objection to the action of the coroner by whom the body was brought to its home, and the court could not perceive how this evidence could be held sufficient to impose liability for an unauthorized autopsy performed by others and with which it had nothing to do.

The court concluded, therefore, that the judgment of nonsuit as to the defendant funeral home should be affirmed and reversed as to the other defendants.—*Gungahons v. Simpson et al* (N C) 197 S E 163

**Workmen's Compensation Act Extent of Loss of Vision, Use of Glasses**—The workman injured his right eye during the course of employment resulting in a 20/100 vision in that eye. With the aid of glasses the vision was normal. Liability was admitted by the employer and compensation was paid for several months. Then the employer's insurer served notice of discontinuance of payments and the workman instituted proceedings under the workmen's compensation act. The industrial commission affirmed an award of a referee based on a 75 per cent permanent partial disability of the right eye and the employer petitioned the Supreme Court of Minnesota for a writ of certiorari.

The question before the court was whether, in computing an award for a fractional loss of vision, such award should be based on the percentage of loss without the use of glasses or whether it should be based on the percentage of loss when such vision is aided by means of a corrective lens. Vision, the court pointed out, is measured by scientific methods. A test recognized by the medical profession for measuring visual acuity is known as the Snellen test and this test is used by the industrial commission as a standard in rating losses of vision. The court could find nothing in the workmen's compensation act to indicate the intention on the part of the legislature that disability after correction is to be the basis for awarding compensation where there has been an eye injury. If such had been the intention the act would have been drafted so to provide. The court could see no more logic in holding that the legislature intended to base disability in any eye case after correction than in holding that in a leg or arm case compensation should be awarded on the extent of disability after the attachment of a brace or any other appliance. The fact that glasses are required to restore vision was to the court evidence of the permanency of the injury and, whether artificial means may partially or

even wholly restore sight, it nevertheless cannot obliterate the effect of the accident causing the injury.

The court was not prepared to say that other tests may not be devised that will replace and improve the so called Snellen test and afford the medical profession and the industrial commission a more nearly perfect way of rating visual acuity. Until such a method presents itself, however, and is recognized by the medical profession as being as good or better, the commission, in the opinion of the court, was justified in using the Snellen test.

The decision of the industrial commission for the workman was therefore affirmed.—*Livingston v. St. Paul Hydraulic Hoist Co* (Minn.), 279 N W 829

**Hospitals Detention of Patients for Nonpayment of Bills**—The plaintiff sued the defendant hospital and its manager to recover damages for unlawfully detaining her in the hospital. At the close of the evidence the action against the hospital was dismissed but judgment was rendered against the manager. The plaintiff thereupon appealed to the Supreme Court of North Carolina.

The plaintiff testified that she entered the hospital for treatment December 7 and planned to go home December 14, that the manager, on being told that she did not have the money to pay her bill, informed her that she could not leave the hospital until the doctor's bill and the hospital bill were paid in full. She believed, she testified, what the manager of the hospital told her, and her departure from the hospital was thereby delayed for several days. No one undertook to restrain her, however, by any kind of force.

False imprisonment, said the Supreme Court, is the illegal restraint of one's person against one's will. It generally includes an assault and battery and always at least, a technical assault. Involuntary restraint and its unlawfulness are the two essential elements of the offense. When no force or violence is actually used, the submission must be to a reasonably apprehended force. The circumstance merely that one considers himself restrained in person is not sufficient to constitute a false imprisonment unless there is in fact a reasonable ground to apprehend a resort to force on an attempt to assert one's liberty. To constitute false imprisonment there must be an exercise of force, or expressed or implied threat of force, by which in fact the person is deprived of his liberty and compelled to remain where he does not wish to remain. The restraint of the person may be caused by threats, as well as by actual force, if the words are such as to induce a reasonable apprehension of force.

Applying these principles of law to the plaintiff's testimony, the court said, it was apparent that neither force nor threat of force was employed to prevent her from leaving the hospital, and though she testified that she thought she could not leave the hospital until the bill was paid nevertheless, without paying the bill, she departed from the hospital without restraint by word or act. For these reasons, the court concluded that the judgment of nonsuit as to the hospital was properly entered. That judgment was therefore affirmed.—*Hoffman v. Clinic Hospital Inc* (N C), 197 S E 161

## Society Proceedings

### COMING MEETINGS

American Association of Anatomists Boston Apr 68 Dr E R Clark  
University of Pennsylvania School of Medicine, Philadelphia Secretary  
American Association of Pathologists and Bacteriologists Richmond Va  
Apr 67 Dr Howard T Karsner 2085 Adelbert Rd Cleveland  
Secretary  
American College of Physicians New Orleans March 21-31 Mr E R  
Loveland 4200 Pine St Philadelphia Executive Secretary  
American Orthopsychiatric Association New York Feb 23-25 Dr  
Norville C La Mar 149 East 73d St New York Secretary  
American Society of Anesthetists New York Apr 14 Dr Paul M  
Wood 131 Riverside Drive New York Secretary  
Arizona State Medical Association Phoenix Apr 13-15 Dr D F  
Harbridge 15 East Monroe St Phoenix Secretary  
Missouri State Medical Association Excelsior Springs Apr 10-12 Dr  
E J Goodwin 634 North Grand Blvd St Louis Secretary  
Pacific Coast Surgical Association San Francisco Oakland Del Monte  
March 28-31 Dr H Glenn Bill University of California Hospital  
San Francisco Secretary  
Southeastern Surgical Congress Atlanta Ga Mar 68 Dr B T  
Beasley 701 Hurt Bldg Atlanta Ga Secretary  
Tennessee State Medical Association Jackson Apr 11-13 Dr H H  
Shoulders 706 Church St Nashville Secretary

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### American Heart Journal, St. Louis

16 643 782 (Dec.) 1938

Paroxysmal and Persistent Hypertension in Association with Lesions of the Adrenal Glands F R Nuzum and J W Dalton Santa Barbara Calif.—p 643

Studies on Coronary Circulation VI Effect of Some Members of the Digitalis Group on Coronary Circulation A M Ginsberg Kansas City Mo O O Stoland and K A Siler Lawrence Kan.—p 663

The Measurement of Venous Pressure by the Direct Method R H Lyons J A Kennedy and C S Burwell Boston.—p 675

\*Unusual Forms of Rhythms Involving the Auriculoventricular Node L N Katz and L G Kaplan Chicago.—p 694

\*Coronary Occlusion Heart Failure and Environmental Temperatures W B Bean and C A Mills Cincinnati.—p 701

Bacterial Endocarditis Superimposed on Syphilitic Aortitis and Valvulitis Clinico-pathologic Study with Five Case Reports Helen E Martin and W L Adams Jr Los Angeles.—p 714

Complete Transposition of the Great Vessels Clinical and Pathologic Features Helen B Taussig Baltimore.—p 728

Some Notes on the Anatomy of the Elephant's Heart R L King Seattle C S Burwell and P D White Boston.—p 734

The Electrocardiogram of the Elephant P D White J L Jenks Jr and F G Benedict Boston.—p 744

**Unusual Forms of Atrioventricular Rhythms**—In the last two years Katz and Kaplan have encountered four cases of unusual atrioventricular rhythm. In a case in which there were carotid sinus hyperirritability and reflex stimulation the differentiation of reciprocal rhythm and the closely resembling condition of sinus bradycardia, nodal escape and interference dissociation with pseudoreciprocal rhythm could be demonstrated. The electrocardiograms of two patients showed variations in the PR (RP) interval, but the RR interval remained constant. The electrocardiogram of another patient showed a short PR interval and a prolonged QRS complex, with a shift in the pacemaker to the sino auricular node following an ectopic ventricular beat, from a patient with severe chronic cardiac disease.

**Environmental Temperatures and Heart Disease**—Bean and Mills studied the influence of temperature on coronary thrombosis and cardiac failure by a review of the literature giving the months in which the acute attacks occurred and by a survey of the records of all patients with noninfectious cardiac failure who were admitted to the Cincinnati General Hospital from Jan 1, 1920, through Dec 31, 1937. The time of onset of the acute attacks in these records was mentioned in 278 instances of 8673 consecutive necropsies. The data obtained show a marked seasonal swing in the frequency of attacks of coronary occlusion. They are almost twice as frequent in winter as in summer. An even greater winter peak is found in the frequency of onsets of noninfectious arteriosclerotic cardiac failure, which occurred about two and a half times more frequently in winter than in summer. Just why syphilitic cardiac failures pursue a course independent of temperature level is not entirely clear. It is probably because syphilitic cardiac disease progresses at a more steady and rapid rate, and therefore the effects of changing temperature produce a less noticeable effect. Greater frequency of infections, especially of the respiratory tract and heightened general body metabolism probably act together to increase the winter hazards of existence for cardiac patients, while the calm warmth of summer brings a period of relative safety. In stormy weather, fluctuations in temperature may produce a strain by means of little known vasomotor reflexes as in angina pectoris while walking in wind or cold weather. Migration out of northern cold and storms either temporarily or permanently is strongly indicated for every patient of limited cardiac reserve.

### American Journal of Public Health, New York

28 1369 1456 (Dec.) 1938

A Century in Arrears A Wolman Baltimore.—p 1369  
The Health of the Nation T Parrin Washington D C.—p 1376  
Present Status of Dental Caries in Relation to Nutrition Nina Simmonds San Francisco.—p 1381

Development of Industrial Hygiene in the United States J J Bloomfield Washington D C.—p 1388

Value of the Vital Statistics Data on Birth and Death Certificates in County Health Work E C Brown Mineola N Y.—p 1398

\*Outbreak of Encephalitis in Man Due to the Eastern Virus of Equine Encephalomyelitis R T Feemster Boston.—p 1403

Rocky Mountain Spotted Fever and Tick Survey in Iowa C T Jordan Des Moines Iowa.—p 1411

\*The Probable Typhoid Carrier Incidence in Mississippi A L Gray Jackson Miss.—p 1415

**Equine Encephalomyelitis in Man**—Feemster gives a chronologic review of the 1938 outbreak in Massachusetts of encephalitis in horse and man due to the eastern virus of equine encephalomyelitis. He states that it is impossible at present to estimate how many human cases of encephalitis due to the equine virus have occurred in the state during the outbreak. Some thirty-eight cases have been under investigation. Thus far the virus has been isolated in eight cases at postmortem examination. If the mosquito is the vector of the natural infection in horses, the spread of the disease in the state can easily be accounted for once a case is introduced. Some of the cases under investigation will have to be eliminated either because another diagnosis will be established or because evidence will not be sufficient to warrant the diagnosis of encephalitis due to the equine virus. As early as 1931 Meyer suggested the possibility of human beings contracting the equine disease. The disease in the severer form is sufficiently different from the usual varieties of encephalitis to be recognized clinically. If some of the milder cases under investigation prove to be due to the same virus, and particularly if the existence of subclinical infections can be established, the recognition of all cases will be difficult unless laboratory means of verifying the diagnosis can be found. The onset in infants was sudden, accompanied by fever, irritability or drowsiness, cyanosis and convulsions. In older children and in the one adult the symptoms were of slower onset, from four to ten days. Headache, frontal in character, and dizziness were the first complaints in the older patients. All patients were semicomatose to comatose on admission and the majority showed continued tremors or muscular twitchings. Rigidity of the neck was a constant feature, as was a tense anterior fontanel in the infants. The suppression of the cutaneous reflexes was constant in the comatose patients, while the Kernig and kindred signs varied markedly. The pupils reacted sluggishly to light. The temperature was invariably high, from 102 to 104 F, and in the fatal cases (twenty-five of the thirty-eight) continued to rise. When recovery took place the fever fell by lysis, becoming normal in four or five days. The spinal fluid showed increased pressure. When the patient lived for more than two or three days there was a drop in both the spinal fluid and leukocyte counts, with a change to the mononuclear type of cell. Convulsions and muscular twitchings marked the course of the disease. In the infants a peculiar edema developed about the eyes and in the upper extremities. Cyanosis was marked in all cases. Deep coma from which the majority of patients never aroused developed shortly after admission. Some cases suspected of being due to the virus have ended in complete recovery but it appears that others will show paralyses, mental changes and other permanent residuals. A number of problems with regard to the disease await elucidation. It is necessary to know whether other reservoirs besides the horse are important. It yet remains to be demonstrated satisfactorily that the mosquito transmits the natural infection among horses. The importance of other insects, especially the recently incriminated tick, as vectors of the disease awaits investigation. The need of having all cases of encephalitis reported to health departments is emphasized by the presence of the equine infections in human beings. The attack rate among horses was low (33 per cent) but the case fatality was high (more than 90 per cent).

**Typhoid Carrier Incidence in Mississippi**—Gray presents the results of a random typhoid carrier survey. It involved 18,577 people in sixteen counties in Mississippi. 1,547 of whom gave a history of having had typhoid as diagnosed by physicians. Those surveyed were classified by age and race as to the total



number in each group giving a history of typhoid. The percentages thus obtained were applied to the total age and race group populations of the state to find the total number of people now living in Mississippi with a history of typhoid. According to these calculations there are 183,230 people in the state with such a history. Of 244 persons with proved typhoid in Mississippi eight or 3.27 per cent of the group, became permanent carriers and were excreting *Bacillus typhosus* more than one year after onset. Applying this percentage to the total of recovered persons living in the state, 183,230 there are about 5,991 typhoid carriers in the state at present, or 288 carriers per hundred thousand of population.

### Am J Roentgenol & Rad Therapy, Springfield, Ill

40 805 958 (Dec) 1938

- The Development of the Forms of Treatment in Carcinoma of Uterine Cervix During the Last One Hundred Years. January Memorial Lecture. H. Schmitz. Chicago—p. 805.
- Observations on Changes Occurring in Benign Giant Cell Tumor Sites Several Years Following Treatment by Conservative Measures. A. Brunschwig. Chicago—p. 817.
- Aneurysms of Aortic Sinuses or Sinus of Valsalva. H. W. Ostrum, B. D. Robinson, C. F. Nichols and B. P. Widmann. Philadelphia—p. 829.
- Roentgenologic Anatomic Study of the Left Auricle Following Postmortem Opacification. R. Heim de Balsac and D. Routier. Paris, France—p. 838.
- \*Roentgenologic Classification and Diagnosis of Silicosis. P. B. Mitz. Washington, D. C.—p. 848.
- \*Bilateral Pleural Collections of Fluid. J. S. Packard. Allenwood, Pa. and B. Gordon. Philadelphia—p. 859.
- Roentgenologic Manifestations of Emphysema with Special Reference to Lipiodol Injection. J. O. Donoghue. St. Louis—p. 863.
- Fractures of the Atlas Resulting from Automobile Accidents. Survey of the Literature and Report of Six Cases. H. F. Platt. Cincinnati—p. 867.
- Cancer of the Ovary and Its Treatment. C. F. Burnham. Baltimore—p. 891.
- Late Bladder Complications Following Application of Radium to the Uterus or Uterine Cervix. Report of Three Cases. A. McNally. Chicago—p. 895.
- Interstitial Use of Low Radium Content Monel Metal Needles in Treatment of Angiomas. H. G. F. Edwards. Shreveport, La.—p. 899.
- Iowa Experiment in Cancer Control. A. W. Erskine. Cedar Rapids, Iowa—p. 903.
- Biologic Measurement of Radiation Quantities. P. S. Henshaw and D. S. Francis. New York—p. 906.
- Studies on Roentgen Cinematography of the Internal Organs and Circulation of the Blood of the Human Body. K. Kikuchi. Tokyo, Japan—p. 913.

### Roentgen Classification and Diagnosis of Silicosis—

Mitz classified, according to the criteria of Sampson, 167 veterans hospitalized for various types of silicosis. The classification is based on the x-ray observations. As the x-ray study of these cases progressed, it was observed that there was a paucity of information regarding the occupational history of the individual patients. In many instances short references were made to a single occupation of the silicotic veterans without indicating the other occupations in which they might have been engaged, the hours of employment, the concentration of the dust particles and other points necessary to establish a diagnosis of silicosis. The inference drawn from a careful study of the roentgenograms of these patients is that the essential requirement in making a diagnosis of silicosis is the correlation of the clinical history, physical changes, a detailed occupational history and the x-ray observations. It is unsafe to depend on any of these data singly; they must be correlated and a decision reached only after a careful study is made of all the data available in each case. The inhalation of silica dust produces certain x-ray changes characterized by an accentuation of the linear markings of the lungs. Such changes are not specific for silicosis, since they are also found in subjects who give a history of inhaling nonsilicicous dusts. Inflammatory processes, infections of various kinds and abnormal circulatory states may also produce x-ray densities which simulate the preliminary x-ray changes, accentuated linear markings found in the early stages of silicosis. It is only when fibrotic nodulations are found in the parenchyma and are present on the roentgenograms and there is a history of employment in a silicicous occupation together with evidence of clinical and physical signs of silicosis, that one is justified in arriving at a diagnosis of this disease. The roentgenologic classification of silicotic disease in the group of veterans according to the terminology of Sampson showed that 29.9 per cent

were classified as first, second or third degree silicosis, 11.4 per cent as silicosis with nontuberculous infection, 42.5 per cent as silicosis with tuberculosis and 15.6 per cent as silicotuberculosis. One case was diagnosed as asbestosis. The most common x-ray observations in silicosis with infection in the order of frequency were mottling, widening of the mediastinum, diffuse haze or shadow extending inward from the lateral pleura of the mid portion of the lungs, prominence of the linear markings, beading along the course of the linear markings, emphysema, discrete nodule formation and a combination of discrete and confluent nodular formation. Those in silicosis with tuberculosis were fuzziness and haziness of the outline of the silicotic nodule, fibrosis, caseation, mottling, emphysema, pleurisy and cavitation. In silicotuberculosis the most frequent x-ray observations were fuzziness and haziness of the outline of the silicotic nodule, fibrosis, mottling, caseation, emphysema, pleurisy and cavitation. Silicosis is difficult to diagnose when emphysema is a coexistent condition. Owing to its presence, certain of the diagnostic signs of silicosis may become obscured.

**Bilateral Pleural Collections of Fluid**—The simultaneous occurrence of a transudate on one side and exudate on the other is rare. Packard and Gordon encountered three such cases in a series of 228 patients with pleural effusions admitted to the Chest Department of the Jefferson Hospital during the last fourteen years. They had been receiving artificial pneumothorax treatments for unilateral tuberculosis, the effusions having developed as a complication on the treated side, the transudates occurred subsequently in the opposite pleural cavity, two without apparent cause. The possible mechanism in one case is discussed. While the etiology of this case is undoubtedly a factor in creating the background for the transudate in the right pleural cavity, the mechanism was essentially physiologic. It appeared that pulling and rotating of the mediastinum were caused by the artificially induced high negative intrapleural pressure on the left side. As a result blood and fluid were sucked from the fine capillaries areas of new growth beneath the pleura and other tissues into the right pleural cavity. Undoubtedly the pumping action of the paradoxically moving diaphragm as a secondary mechanism was largely responsible for aggravating the mediastinal condition. Thus it would seem that the greatest care should be taken in expanding forcefully any lung that has been contracted for a long time because of the possible influence on the opposite pleural cavity. In the management of bilateral collections of fluid the principles of hydrodynamics and aerodynamics are important. The combination of pneumothorax and thoracentesis seems desirable.

### American Journal of Tropical Medicine, Baltimore

18 625 734 (Nov) 1938

- Atabrine Prophylaxis in Malaria. Report of Third Year's Investigations. M. E. Winchester. Brunswick, Ga.—p. 625.
- Relapsing Fever in California. Attempts to Transmit Spirochetes of California Relapsing Fever to Human Subjects by Means of Bite of Vector *Ornithodoros hermsi*. Wheeler, C. M. Wheeler. San Francisco—p. 641.
- Studies on Transmission of Relapsing Fever in North China. II. Observations on Mechanism of Transmission of Relapsing Fever in Man. H. L. Chung and Y. L. Wei. Peiping, China—p. 661.
- Bejel Syphilis as Contagious Disease of Children. E. H. Hudson. Clifton Springs, N. Y.—p. 675.
- Comparison of Strains of Actinomyces Recovered from Human Lesion. J. F. Kessel and E. B. Golden. Los Angeles—p. 689.
- Specific Autogenous Vaccine Treatment of Otiomyces. Preparation of Vaccine. C. M. Mood. Charleston, S. C.—p. 703.
- \*Cure of Plasmodium knowlesi Malaria in Rhesus Monkeys with Sulfanilamide and Their Susceptibility to Reinfection. L. T. Coe. New York—p. 715.
- Clinical Reaction in Vivax Malaria as Influenced by Consecutive Employment of Infectious Mosquitoes. M. F. Boyd and S. F. Kitchen. Tallahassee, Fla.—p. 723.
- Instance of Prolonged Latent Incubation Period in a Patient Infected with a North American Strain of Plasmodium Vivax. M. F. Boyd and S. F. Kitchen. Tallahassee, Fla.—p. 729.

**Malaria Cured with Sulfanilamide**—Coggeshall effected a cure with sulfanilamide for Plasmodium knowlesi malaria in rhesus monkeys. The absence of demonstrable parasites in the blood smears after treatment with sulfanilamide, the inability to transfer infection by the subinoculation of blood or spleen to susceptible animals and the failure of the splenectomized monkeys to relapse is evidence that the infection was eliminated. As a final test for the eradication of infection all monkeys were reinoculated intraperitoneally with one million parasites. The



length of time after treatment varied from twenty-nine to ninety-one days. Each inoculation resulted in an infection followed by recovery from the acute attack in the nonsplenectomized monkeys. The three which had been splenectomized had severe and rapidly fatal infections. All the monkeys became infected when reinoculated. Only the three monkeys which were splenectomized died as the result of their infections. The fact that the remaining seven monkeys had mild infections followed by spontaneous recovery was indicative of a partial residual immunity in the absence of a latent infection.

## Archives of Neurology and Psychiatry, Chicago

41 1222 (Jan.) 1939

- Somnolence Caused by Hypothalamic Lesions in the Monkey S W Ranson Chicago—p 1  
Genesis of Microglia in the Human Brain J Kershman Montreal—p 24  
The Hemato-Encephalic Barrier L S King Princeton N J—p 51  
\*Epileptogenic Cortical Scars Results of Surgical Removal W J German New Haven Conn—p 73  
\*Studies in Mongolism I Growth and Physical Development C E Benda Wrentham Mass—p 83  
Cerebral Arteriosclerosis Signs and Symptoms from Compression and Erosion of Parenchymatous Tissue N W Winkelman Philadelphia—p 98  
Cerebral Circulation I Reaction of Prial Arteries to Epinephrine by Direct Application and by Intravenous Injection M Fog Copenhagen Denmark—p 109  
Congenital Morphologic Abnormalities of the Brain in a Case of Abortive Tuberculous Sclerosis Functional Implications and Bearing on Pathogenesis of So Called Genuine Epilepsy P I Yakovlev Waltham Mass—p 119  
Meningiomas of the Brain G Horrax Boston—p 140  
Treatment of Encapsulated Abscess of the Brain Visualization by Colloidal Thorium Dioxide E A Kahn Ann Arbor Mich—p 158  
Chronic Perivascular Demyelination (Homophasic Cerebrospinal Demyelinating Periangiosis) G Steiner Detroit—p 166

**Epileptogenic Cortical Scars**—The surgical treatment of traumatic epilepsy is at present directed toward removal of the irritative focus. This German points out, requires accurate preoperative localization of the lesion. His report is based on the results in twenty-nine cases after intervals of from one to eight and a half years following cerebral surgical procedures for the treatment of epilepsy. In nineteen of the twenty-nine cases there was complete or partial relief from convulsive symptoms. Frequent major attacks continued in nine cases. The standard operative procedure of complete excision was followed in fourteen of the sixteen cases in which there were cortical scars. The results were satisfactory for eleven patients, four being completely relieved from convulsions and six definitely improved. Frequent major attacks continued in three and one patient died. Of the two remaining cases, lysis of meningeal adhesions was successful in one and failed in the other. Of the four cases of porencephaly, simple uncapping and lysis of adhesions were successful in two and failed in two. The operative procedures were somewhat more varied in the nine cases in which there was cortical degeneration. Complete excision was carried out in three cases with success in two. Incomplete excision was carried out in four cases with success in one and improvement in three. Lysis of meningeal adhesions gave only temporary relief (for one year) in one instance, and excision of motor areas (for the face and arm) failed to control convulsions in one. In spite of the lack of standardization of surgical procedures in the cases of degenerative lesions, favorable results were obtained in six of the nine cases. From these results it is evident that the type of surgical procedure, though important is not the only determining factor in prognosis. In the combined series a second operation with complete excision was performed in two cases because of failure following partial extirpation. The radical procedure was successful in one case that of a degenerative lesion and failed in the other that of a cortical scar. The type of pathologic lesion though probably not without significance was of only slight aid in establishing a prognosis. From a prognostic standpoint the age of the patient failed to show any significant correlation. The temporal span during which convulsive episodes had been present showed a definite prognostic correlation. In seven of the eleven cases of cortical scar in which results were satisfactory the duration of convulsions was not more than two years while in the four failures convulsions were present for more than two years. In four of the six cases of degeneration in which the results were satisfactory convulsions had been present for three years or less while in two of

the three cases of failure convulsions had occurred for more than three years. The group of cases of porencephaly was too small to justify statistical analysis. The maximal frequency of convulsions appeared to have no significant relation to prognosis. Analysis of the anatomic location of the lesion gave little evidence of prognostic significance. The parietal region was found to be the most frequent single site of all types of lesions, and the greatest proportion of satisfactory results was obtained in the group of parietal lesions. A definite traumatic basis was present in thirteen cases, while injury at birth was apparently responsible in seven cases. Previous cerebral operation was the presumptive factor in one case and thrombosis in another. In two cases porencephaly was probably related to prenatal factors, and in one case it was perhaps secondary to infection. No relation could be established between etiologic factors and prognosis. The pathologic lesions ranged from simple degeneration of ganglion cells, through degeneration with glial proliferation, to dense glial or fibrous scars. Definite glial scars were seen in the walls of porencephalic cavities.

**Physical Development in Mongolism**—Benda finds, after the clinical examination of 120 persons with mongolism, that the condition is present at birth. Therefore the influence which leads to the condition of mongolism is predominant during the prenatal period. After birth there are residuals of such an influence, and one finds remarkable retardation in development. Many mongoloid children die in the first years of life. If the child survives the first few years, he adjusts himself fairly well to the biologic conditions of life. Growth is slow but at a low normal level during the first nine years. Increase in height ceases early, and after the fifteenth year few mongoloid persons show further growth. Mongoloid children are usually underweight during the first two years of life. Many become overweight after the fifth year and dystrophia adiposogenitalis is frequent after puberty. The mongoloid skull is not microcephalic at birth but shows lack of growth. All mongoloid children appear microcephalic after six months. Persons with mongolism usually show early ossification and fusion of the epiphyseal lines, even when the condition is complicated by rickets. The investigation has proved that mongoloid deficiency is not a racial mutation but the result of a disturbance which becomes apparent during fetal development. The mongoloid appearance is due to a peculiar formation of the skull and has nothing to do with the Mongolian race or any kind of atavistic regression.

## Endocrinology, Los Angeles

23 681-826 (Dec.) 1938

- \*Diabetes Mellitus Associated with Hyperthyroidism D P Foster and W L Lowrie Jr Detroit—p 681  
Method of Assaying the Potency of Anterior Pituitary Extracts Which Increase Liver Fat J Campbell Toronto—p 692  
Evaluation of the Frank Method for the Determination of Prolan (Gonadotropic Principle) in the Urine of Nonpregnant Women Della G Drips and A E Osterberg Rochester Minn—p 703  
Photocolorimetric Method for Determination of Androsterones in Urine R Aoustad Boston—p 711  
Specific Metabolic Principle of the Pituitary and Its Relation to the Melanophore Hormone D K O'Donovan and J B Collip Montreal—p 718  
Studies of Effects of Pituitary Extracts on Carbohydrate and Fat Metabolism A H Neufeld and J B Collip Montreal—p 735  
The Specific Dynamic Action Test in Castrated and Menopausal Women W M Moffat Santa Barbara Calif—p 747  
Influence of Various Physiologic Substances on Glycogenolysis of Surviving Rat Liver Methods Influence of the Bile Salts H P F Seckel Chicago—p 751  
Id. The Influence of Insulin Added in Vitro H P F Seckel Chicago—p 760  
Insulin Therapy in Mental Diseases D V Conwell and C J Kurth Halstead Kan—p 767  
Effect of Testosterone Propionate on Genital Tract of the Immature Female Rat U J Salmon New York—p 779  
\*Use of Testosterone Propionate in Functional Bleeding S H Geit U J Salmon and J A Gaines New York—p 784  
Influence of Estrogens in Egg Yolk on Avian Blood Calcium M Altman and F B Hutt Ithaca N Y—p 793  
Protamine Insulin Three Practical Points G B Robson and H Gray San Francisco—p 800  
Treatment of Acne Vulgaris with Testosterone Propionate M Mohitch Philadelphia—p 803

**Diabetes Mellitus and Hyperthyroidism**—When diabetes mellitus and hyperthyroidism coexist Foster and Lowrie believe that the diagnosis of diabetes mellitus is usually made first. Certain features during the course of the illness arouse suspicion

that thyroid disease may be a complicating factor. An inability to control the blood sugar and glycosuria with what seems to be a suitable diet and insulin dosage or the failure of a patient to hold his weight or to gain while consuming a diet adequate for either circumstance is significant. These patients also are prone to develop acidosis, especially if they are losing weight or are undernourished. A rapid pulse, intolerance to heat or bedclothes, restlessness, flushing, apprehension, a moist skin and eye signs are all aids to a correct diagnosis, particularly in the younger patient. Forty-two cases of diabetes associated with hyperthyroidism were found in the admissions to the Henry Ford Hospital from 1925 to 1938. During this period there were 214,223 new cases examined. Diabetes was present in 1,616 of these and a total of 1,607 operations for hyperthyroidism were done. Nine patients have died. They had an average survival period of four years and one month. Vascular disease was a primary or complicating factor in all the deaths. Toxic adenoma was present in six. Evidence is presented which would indicate that following thyroidectomy the carbohydrate metabolism was improved. The authors believe that the diagnosis of hyperthyroidism as a complication of diabetes mellitus is being overlooked. When hyperthyroidism is complicating diabetes mellitus, thyroidectomy is indicated. Vascular disease associated with hypertension, since insulin has been available, constitutes the major cause of death in this group. Acidosis is common but can be successfully combated by a high carbohydrate diet and adequate insulin.

**Testosterone Propionate in Functional Bleeding**—Geist and his colleagues used testosterone propionate in the treatment of twenty-five women with functional uterine bleeding. The bleeding was rapidly controlled in all but two of the cases. This improvement was correlated with definite changes in the endometrium, as revealed by suction biopsies performed at intervals before, during and after treatment. In all but four of the women there was no palpable organic disease. Small intramural myomas were present in these four. There were thirteen cases of menorrhagia, five of metrorrhagia and seven of menorrhagia with polymenorrhea. The ages of the patients varied from 24 to 39 years. The duration of abnormal bleeding varied from two months to ten years, with an average of two years. The monthly dosage varied from 300 to 1,000 mg. of testosterone propionate. The highest dosage given any single patient was 2,150 mg. over a period of three months. The testosterone propionate was administered intramuscularly in sesame oil in doses of from 5 to 100 mg. The intervals between doses are determined individually. Normal menses were established in eighteen cases and amenorrhea of one to five months in five. Endometrial biopsies performed during and after the period of testosterone propionate administration revealed disappearance of the secretory phase and inhibition of the proliferative phase, often with regression to the hypoplastic or atrophic state. Following the discontinuation of therapy, the inhibitory effects on the endometrium gradually disappear and normal estrogen and progesterone effects reappear. The authors suggest that the changes in the endometrium following testosterone propionate therapy are the end results of a primary inhibition of the gonadotropic factors of the hypophysis, causing suppression of the ovarian cycle, with consequent cessation of estrogen and progesterone production.

**Treatment of Acne Vulgaris with Testosterone Propionate**—Molitch selected twenty-two young men with acne vulgaris, otherwise healthy for his study. The lesions varied from the mildest to the most severe forms. All the subjects received three weekly intramuscular injections without any local treatment, internal medication or change of diet. Twelve of the patients received injections of the testosterone in sesame oil, whereas the remainder were given only sesame oil. No local or systemic reactions occurred in either group. The treated group was given injections for three months, the dose for the first month was 5 mg. for the second month 10 mg. and for the third month 25 mg. The control group received 1 cc. of sesame oil at each injection. About the same degree of improvement (from 50 to 60 per cent) occurred in the two groups. Seven additional men were treated locally with an ointment containing testosterone propionate with similar results. It is possible that acne vulgaris may be relieved by this product if an associated

hypogonadism is present. The high percentage of improvement obtained in both groups suggests that a definite psychogenic element was present in the subjects. No increase in the incidence of nocturnal emissions or erections was noted.

### Georgia Medical Association Journal, Atlanta

27 461 506 (Dec) 1938

Would You Recognize a Case of Glucoma? S C Howell Atlanta—p 461

Traumatic Perforation of the Intestines Without Visible Injuries to the Abdominal Wall. Report of Cases. Q A Mulkey Millen—p 465

Squamous Cell Carcinoma Arising in a Cystic Teratoma of the Ovary. Report of Case. E S Cardwell Jr and E R Pund Augusta—p 469

Purulent Meningitis Complicating Paratyphoid Fever. Report of Case with Recovery. W E Storey Columbus—p 472

### Journal of Bacteriology, Baltimore

36 571 706 (Dec) 1938

Method of Electrical Conductivity in Studies on Bacterial Metabolism. J B Allison J A Anderson and W H Cole, New Brunswick N J—p 571

Nitrogen Availability as an Aid in Differentiation of Bacteria in the Coli Aerogenes Group. A B Mitchell and M Levine Ames Iowa—p 587

Sugar Alcohols. VII. Utilization of Sorbitol, Styrcitol, Sorbose, Pinitol, Primutitol and Hydroxypruvic Aldehyde by Various Microorganisms. K P Dozois C J Carr and J C Krantz Jr Baltimore—p 599

Bacterial Oxidation Reduction Studies. I. Differentiation of Species of Spore-Forming Anaerobes by Potentiometric Technique. R W H Gillespie and L F Rettger New Haven Conn—p 605

Id. II. Differentiation of Lactobacilli of Diverse Origin. R W H Gillespie and L F Rettger New Haven Conn—p 621

Id. III. Characteristic Potentials of Cultures of Aerobacillus Species. R W H Gillespie and J R Porter New Haven Conn—p 633

Studies on Sterilization and Effects of Air in the Autoclave. A Hoyt A L Charney and Korine Cavell Los Angeles—p 639

### Journal of Experimental Medicine, New York

69 1 178 (Jan) 1939

Vascularization of the Cornea of the Rat in Riboflavin Deficiency and Note on Corneal Vascularization in Vitamin A Deficiency. O A Bessey and S B Wolbach Boston—p 1

A Neoplasm of Monocytes of Mice and Its Relation to Similar Neoplasms of Man. J Furth with assistance of C Breedis New York—p 13

Infectious Myomatosis of Rabbits. Studies of Soluble Antigen Associated with the Disease. T M Rivers S M Ward and J E Smadel New York—p 31

\*Detection of the Virus of Poliomyelitis in the Nose and Throat and Gastrointestinal Tract of Human Beings and Monkeys. S D Kramer B Hoskwith and L H Grossman Brooklyn—p 49

\*A Spreading Factor in Certain Snake Venoms and Its Relation to Their Mode of Action. F Duran Reynals New York—p 69

Mixed Molecules of Hemocyanins from Two Different Species. A Tiselius Uppsala Sweden and F L Horsfall Jr New York—p 83

Molecular Weight of Antibodies. E A Kabat Uppsala Sweden—p 103

Electrophoretic Study of Immune Serums and Purified Antibody Preparations. A Tiselius and E A Kabat Uppsala Sweden—p 119

Lymphatic Pathway from Nose and Pharynx. Dissemination of a Slightly Instilled Vaccinia Virus. J M Coffey and E R Sullivan Boston—p 133

\*Precipitinogen in Serum Prior to Onset of Acute Rheumatism. A F Coburn and Ruth H Pauli New York—p 143

Observations on Relation of the Eye to Immunity in Experimental Syphilis. A M Chesney A C Wood and A D Campbell Baltimore—p 163

**Detection of the Virus of Poliomyelitis**—Kramer and his co-workers recovered four strains of poliomyelitis virus from the nasal washings and feces of human beings and one strain from a monkey killed at the height of the disease. Of the four human strains the first was isolated from the feces of a 14 year old child seven days after the onset of illness, the second strain from the nasal washings of a 6½ year old child five days after the onset of illness and the third and fourth strains from the same patient, a 2½ year old child, nine days after the onset of illness. The single monkey strain was isolated from the upper intestinal segment. The detection of the virus in the nasal washings of two additional patients during convalescence lends further support to the authors' belief that the virus of poliomyelitis is spread by human contact. The recovery of the virus from the feces indicates that the virus withstands the gastric acidity which under normal physiologic conditions tends to keep gastric contents relatively free of bacteria and that improper disposal of feces from patients with poliomyelitis may have serious consequences to the public health, particularly in smaller communities.

munities, in which inadequate sewage disposal may result in contamination of surrounding beaches or even local water systems

**Action of Snake Venoms**—Duran-Reynals tested the spreading factor in snake venom by mixing 0.5 cc of different dilutions of venom with 0.25 cc of diluted India ink and injecting this into one flank of a rabbit. On the opposite side 0.5 cc of saline solution in place of the venom was injected. It was found that the venom of several species of poisonous snakes acts to spread India ink through the skin. The spreading factor is most abundant in the venom of the Viperidae (rattlesnake) family and relatively scant in the venom of Colubridae (proteroglyphs (cobras) family and it is absent from toad venom. Extracts of the supralabial glands of harmless snakes contain only negligible amounts of the factor. Rattlesnake venom heated at from 65 to 100 C loses a large proportion of its toxicity but retains the ability to spread India ink. Rattlesnake venom that has lost its toxicity on standing or on heating markedly enhances the infection produced by bacterial or virus suspension in the rabbit skin. Antivenom serum inactivates both the toxic and the spreading factors of venom.

**Precipitinogen in Serum Prior to Rheumatism**—The evolution of a rheumatic attack involves three distinct clinical phases: (1) an acute respiratory infection usually of not more than three days' duration, (2) an afebrile symptom-free period which may vary somewhat but commonly lasts fourteen days, and (3) the period of acute rheumatism composed of one or more cycles of activity. Coburn and Pauli observed that serums taken at the height of an acute rheumatic attack showed definite precipitation with serums taken within a week before the onset of symptoms. Pairs of serums which reacted with each other were then tested separately against other serums from the same patient. The results of these observations showed that precipitation occurred only between phase 2 and phase 3 serums. In at least six other cases known positive phase 2 serums were tested against each other and known positive phase 3 serums were also tested in pairs. No reactions occurred between any of these combinations. This limitation of the reaction to the combination of phases 2 and 3 furnished a plan on which extensive investigations were based. Serums from phase 2 (and also, when available, from phase 1) were tested as potential antigens against serums from phase 3. A precipitin reaction occurred between serums taken just before and shortly after the onset of acute rheumatism. It recurs with repeated rheumatic cycles.

### Journal of Immunology, Baltimore

25 415 494 (Dec.) 1938

- The An Stability of the Elementary Bodies of Vaccinia J W Beard H Tinkelman Durham N C and R W G Wyckoff Princeton N J—p 415
- Studies of Antimeningococcus Serum II Complement Fixing Activity of Serums from Horses Under Immunization with Suspensions of Living Cells or with Broth Culture Filtrates of the Meningococcus Grace M Sickles and Christine E Rice Albany N Y—p 427
- Some Factors Which Affect the Ultrafiltration of Antipneumococcus Serums A Goodner F L Horsfall Jr and J H Bauer New York—p 439
- Neutralization of Pneumococcus Capsular Polysaccharide by the Antibodies of Type Specific Antiserums A Goodner F L Horsfall Jr and J H Bauer New York—p 451
- Further Studies on the Nonabsorbable Protective Property in Serum from Rats Infected with *Cysticercus Crassicolis* D H Campbell Chicago—p 465
- The Non-specific Nature of the Carbohydrate Portion of Horse Pseudoglobulin R D Coghill and Martha Creighton New Haven Conn—p 477

### Journal Industrial Hygiene & Toxicology, Baltimore

20 593 652 (Dec.) 1938

- Respiratory and Circulatory Adaptation to Acute Anoxia in Silicosis and Cardiovascular Disease M H Seever N Enzer and T J Becker Madison Wis—p 593
- \*Granite Workers' Nasal Resistance in Breathing E C J Urban Barre N Y—p 635
- Lead in the Printing Industry J M Hepler P F Rezin and R W Colina Lansing Mich—p 641

**Granite Workers' Nasal Resistance in Breathing**—The results of a nasal study that Urban made among 139 granite cutters indicate that the nose may play some part as a protective device in workers exposed to dust hazards. However this part appears to be slight and shows its effect only over long periods

of time. At best it is only one of the factors involved in silicosis. Since the great percentage of the granite workers die of an added tuberculous infection other factors such as personal habits, physical condition and infected contacts are more important than nasal efficiency.

### Journal of Pharmacology & Exper Therap, Baltimore

64 355 486 (Dec.) 1938

- Influence of Room Temperature on the Action of Barbiturates J Ravenós Edinburgh Scotland—p 355
- Chronic Effects on Dogs of Feeding Diets Containing Lead Acetate Lead Arsenate and Arsenic Trioxide in Varying Concentrations H O Calvery E P Laug and H J Morris Washington D C—p 364
- Effect of Lead on Rats Fed Diets Containing Lead Arsenate and Lead Acetate E P Laug and H J Morris Washington D C—p 388
- Storage of Arsenic in Rats Fed a Diet Containing Arsenate and Arsenic Trioxide H J Morris and E W Wallace Washington D C—p 411
- The Growth and Reproduction of Rats Fed Diets Containing Lead Acetate and Arsenic Trioxide and the Lead and Arsenic Content of Newborn and Suckling Rats H P Morris E P Laug H J Morris and R L Grant Washington D C—p 420
- Influence of Calcium and Phosphorus on the Storage and Toxicity of Lead and Arsenic R L Grant H O Calvery E P Laug and H J Morris Washington D C—p 446
- Variations in the Arginase Concentrations in the Livers of White Rats Caused by the Administration of Arsenic and Lead H D Lightbody and H O Calvery Washington D C—p 458
- Effects of Vitamin B on Insulin Hypoglycemia and Sugar Tolerance J C Burke and A R McIntyre Omaha—p 465

### Laryngoscope, St Louis

48 847 914 (Dec.) 1938

- Affections of the Cricopharyngeal Fold V E Negus London England—p 847
- Diphtheritic Stenosis of Larynx Complete Loss of Voice Cure by Injuring Bouginage Consisting of Series of Metal Beads E L Myers St Louis—p 859
- \*Radium Therapy for Recurrent Epistaxis in Hereditary Hemorrhagic Telangiectasia J A Weiss Chicago—p 865
- Discussion of the Relation of Nasal Polyps to the Keloid E R Hargett Springfield Ohio—p 870
- Salivary Calculi L R Effler Toledo Ohio—p 877
- Effect of Sulfhydryl Compounds in Otolaryngology W M Fitzhugh Jr San Francisco—p 884

**Radium Therapy for Recurrent Epistaxis**—Weiss reports a case of hereditary hemorrhagic telangiectasia with recurrent epistaxis. Radiation therapy was given to a total dosage of 300 mg hours intranasally and 40 000 mg hours by telerradiation. The beneficial result was temporary. Further treatment with moccasin snake venom has been instituted.

### New England Journal of Medicine, Boston

219 977 1014 (Dec 22) 1938

- Cheyne Stokes Respiration and Auriculoventricular Conduction W J Comeau Boston—p 977
- Lung Abscess Due to Esophageal Overflow D A Sampson Boston—p 982
- Clinical Chart for Chronic Arthritis M G Hall R Sanderson and T Feldman Boston—p 985
- Sulfanilamide in Undulant Fever E C Bartels Boston—p 988
- The Simplification of Laboratory Diagnosis for the General Practitioner H D Levine Bristol N H—p 989
- Progress in Urology F H Colby Boston—p 992

219 1015 1060 (Dec 29) 1938

- Menopause Arthralgia Study of Seventy One Women at Artificial Menopause F C Hall Boston—p 1015
- The Quantitative Determination of Urinary Coproporphyrin K Dobriner and C P Rhoads New York—p 1027
- \*The Significance of Urea Splitting Bacteria in the Formation of Urinary Calculi P Chute Boston—p 1030
- Progress in the Study of Cardiovascular Disease S McGinn Boston—p 1032

**Urea-Splitting Bacteria and Urinary Calculi**—According to Chute urea-splitting bacteria are frequently found in association with and as the apparent cause of the formation of urinary calculi especially recurrent and multiple calculi. The importance of this fact is not generally recognized. A review of all patients with urinary stone entering the Massachusetts General Hospital during 1937 showed that more than half had an infection with a urea-splitting organism as the only apparent cause. The commonest organism (60 per cent) was the proteus bacillus then nonhemolytic streptococci staphylococci Bacillus pyocyanus Bacillus influenzae and Micrococcus flavus in order of frequency. Of the patients with recurrent stones 80 per cent

were infected with urea-splitting bacteria, and 67 per cent with urea-splitting bacteria had multiple or recurrent stones. Thus, recurrent or multiple stones and such infections go hand in hand. These infections, especially those due to the proteus bacillus are often difficult to cure. They are almost never eradicated permanently until existing stones and also stasis have been removed. Chronicity of infection lessens the chance of permanent cure. The use of ammonium chloride as a urinary acidifier in infections of this type is contraindicated. Sulfanilamide has been the most effective form of drug therapy.

### Psychoanalytic Quarterly, Albany, N. Y.

7 421 606 (Oct.) 1938

- Problems of Psychoanalytic Technique O. Fenichel Los Angeles—p. 421  
Use of Automatic Drawing in the Interpretation and Relief of a State of Acute Obsessional Depression M. H. Erickson Elmhurst, Mich. and L. S. Kubie New York—p. 445  
Psychoanalytic Investigation and Therapy in the Borderline Group of Neuroses A. Stern New York—p. 467  
Suicide, Pregnancy and Rebirth Bettina Warburg New York—p. 490  
Dream Observations in a Two Year Four Months Old Baby M. Grotz John Chicago—p. 507  
Preliminary Phases of the Masculine Besting Fantasy E. Bergler, New York—p. 514  
Defense and Synthesis in the Function of the Ego: Some Observations Stimulated by Anna Freud's The Ego and the Mechanisms of Defense T. M. French Chicago—p. 537

### Puerto Rico J. Pub. Health & Trop. Med., San Juan

11 91 198 (Dec.) 1935

- Cytology of Leprosy E. V. Cowdry St. Louis—p. 95  
Some Army Experiences in the Treatment of Tuberculosis by Heliotherapy A. T. Cooper San Juan—p. 124  
Closed Intrapleural Pneumonolysis: Preliminary Analysis of 200 Cases J. Smith, Rio Piedras—p. 138  
\*Clinical and Hematologic Review of Sprue Based on Study of 150 Cases R. M. Suarez San Juan—p. 137

**Clinical and Hematologic Review of Sprue.**—Suarez believes that an accurate clinical diagnosis of sprue is extremely difficult, if not impossible, without the help of the laboratory. In his series of 150 cases all but two are native Puerto Ricans. There were more males (eighty-two) than females (sixty-eight). One third of the patients were less than 40 years of age. Young children and preadolescents and adolescents are frequently attacked by sprue, a point which might be helpful in distinguishing the disease from true pernicious anemia or Addisonian anemia. The general appearance of a few of the older patients, with premature graying of the hair and the color of the skin, renders them indistinguishable from sufferers from pernicious anemia. The loss of subcutaneous fat and the wrinkling and pigmentation of the skin, more marked on the arms and legs, are some of the few external evidences favoring a diagnosis of sprue. The spleen, frequently enlarged or palpable in Addisonian pernicious anemia, was invariably found to be small or of normal size in the present series. Furthermore, although purpuric or scorbutic spots were occasionally observed on the arms and legs of some of the older patients, in not a single case did the ophthalmoscopic examination reveal retinal hemorrhages. With the exception of one case (a patient whose marrow was probably in a hypoplastic state), in which the mean cell volume was found to be 89 cubic microns, the lowest mean cell volume in the series of 150 cases was 102 cubic microns, the highest 220 and the average for the series 123.6 cubic microns. The color index was found below 1 in twenty-three cases and as low as 0.7 and 0.64 in two cases. The highest color index was 2.2 and the average 1.22. The volume index was never below 1, the highest was 2.3 and the average 1.39. The mean cell hemoglobin varied between 26 and 59 micrograms, with an average of 36.6 micrograms. The lowest mean cell hemoglobin concentration was 20 per cent, the highest 45 and the average for the series 26.1 per cent. The hemoglobin ranged from 16.5 to 102 per cent, averaging 66 per cent, the erythrocytes from 690,000 to 4,410,000 per cubic millimeter with an average figure of 2,710,000. The lowest leukocyte count was 1,550, the highest 13,600 and the average 5,280 leukocytes per cubic millimeter. The author regards sprue as primarily a disease of the hematopoietic system and not of the gastrointestinal tract. Despite its low vitamin B content, concentrated liver extract was found to be highly beneficial in the treatment of sprue, including cases with spinal involvement.

### FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

### British Journal of Medical Psychology, London

17 293 394 (Dec.) 1938

- Individualism in Psychotherapy E. A. Bennet—p. 293  
\*Some Etiologic Factors in the Pathology of Stammering I. Laif—p. 307  
The Principles of Criticism F. Kris and E. Gombrich—p. 319  
The Nescience of the Aranda G. Rohiem—p. 343

**Etiologic Factors of Stammering.**—Laif finds that claims to one universal treatment for all cases of stammering are not justified by actual results and that, whereas some disorders of speech yield to one kind of treatment, quite a large number of cases remain unaffected by it. The author attempts an analysis of a few etiologic factors in the onset and cure of stammering by presenting two simple cases from his clinical investigations. These cases illustrate that the causes of stammering and its treatment vary from one case to another. The first case shows that although stammering may have its inception in those factors (fear of parents, guilt because of masturbation, inferiority, imitation and fear of a stammering heredity) which may be regarded as more or less primary, other conditions, such as lack of steady control over breathing and voice and faulty habits of reading, may further complicate the etiology of the disorder during the course of its development. Consequently, no therapeutic measure can be really effective unless, along with the primary factors it takes into account secondary conditions. Besides the analysis of the second patient's difficulties (which were similar to those of the first patient) in a state of relaxation, the author also tried a few exercises of musical drill with him. In addition to this he was assigned a few tasks requiring delicate handling of instruments in the laboratory in order to help him overcome his sense of inadequacy in manual skill. The period of treatment lasted over eleven months after which the patient was completely cured. Oral or phonetic exercises were not resorted to during the entire course of treatment.

### British Medical Journal, London

2 1245 1296 (Dec. 17) 1938

- Sciatica and Its Treatment W. Harris—p. 1245  
Intervertebral Disk Lesions as Cause of Sciatica J. S. Barr—p. 1247  
Orthopedic Aspects of Sciatica W. A. Cochrane—p. 1251  
The Xenopus Pregnancy Test E. R. Elkin—p. 1253  
Use of the Skin of the Female Breast in Plastic Surgery J. F. S. Esser—p. 1256  
Behavior of Tuberculous Cavities in the Lung Under Artificial Pneumothorax Treatment L. Roberts and W. Pagel—p. 1258

2 1297 1350 (Dec. 24) 1938

- Modern Views in the Prevention of Tuberculosis D. M. Dunlop—p. 1297  
\*Four Cases of Weil's Disease Infected from the Same Stream K. M. Robertson—p. 1300  
Mastoid Operations: Further Survey W. Howarth and G. Bateman—p. 1304  
\*Association of Stammering and the Allergic Diathesis A. M. Kennedy and D. A. Williams—p. 1306  
Three Cases of Intussusception in the Adult, with Reference to Etiology C. L. Heanley—p. 1309  
Congenital Deformities of Legs R. Broomhead—p. 1311

**Weil's Disease.**—During the last two years, Roberton treated four cases of leptospirosis. In addition to these he has had under his care three other possible but unproved cases. The diagnosis should escape no one when jaundice associated with nephritis and nitrogen retention follows an acute febrile illness in which headache, severe muscular pain and scattered hemorrhages have been well marked. In the very earliest stages the clinical picture is suggestive enough to make justifiable the use of serum before the diagnosis can be proved. Sudden onset of a severe illness, with headache (quite frequently meningeal signs), high fever, severe pain, great tenderness in the muscles of the extremities, hemorrhages from the nose and the gastrointestinal and urinary tracts and a most characteristic watery suffusion of the conjunctivae should make it possible for the condition to be suspected. If in the presence of these symptoms and signs there is the history of a possible source of infection to which the patient has recently been subjected, serum treatment should be instituted at once without waiting for the dia-

nosis to be confirmed by laboratory studies. A fuller and wider knowledge of the infection and its manifestations should bring to light other cases. Of the four proved cases of Weil's disease, three occurred as the result of bathing in one river. These three patients (boys) recovered. The fourth patient was infected from the same river, in which he worked.

**Stammering and the Allergic Diathesis**—Kennedy and Williams examined a consecutive series of 100 children who stammered. These children were from 5 to 14 years of age. Of the children examined eighty-one were boys and nineteen girls, eighty-nine proved to be right handed and eleven left handed, and a family history of stammering was present in sixty-five cases and absent in thirty-five. Fifty-two children gave a personal history of allergic manifestations. Migraine plus urticaria and/or asthma was complained of by thirty-two, eleven complained of urticaria alone, in eight there was a history of asthma plus eczema and/or hay fever, and one suffered only from eczema. Thirty of these fifty-two children also gave a history of "fastidiousness" with regard to food generally and dislikes or refusals of particular foods or gastrointestinal upsets after them. Of these fifty-two children with a personal history of allergy forty-eight also had a family history of allergy. In thirty-seven cases one or both parents exhibited allergic manifestations and in six a grandparent was the nearest sufferer. An aunt was the nearest relative in four cases and the allergic symptoms were observed in a sister of the child in one case. Thirty-three of the fifty-two children (including the four with no allergic family history) had a family history of stammering. Seven of the fifty-two children were left handed, six of these seven had a family history of allergy and two also a family history of stammering. In the forty-eight children who gave no personal history of allergic manifestations a family history of allergy was obtained in all except one. Fifteen of these children however, gave a history of "fastidiousness" with regard to food generally and dislikes or refusals of particular foods, or gastrointestinal upsets after them. One or both parents of thirty-seven of these forty-seven children suffered from allergy, a grandparent of five, an aunt of two and a sister of three. Thirty-two of the forty-eight children (including the one with no allergic family history) had a family history of stammering. Four of the forty-eight children were left handed and all had an allergic family history. Three also had a family history of stammering. The close and practically constant association of stammering and allergic manifestations in the personal and family histories of the stammerer, as revealed by the present investigation, rather favors the view that there is something more than a mere casual relationship between stammering and the allergic diathesis.

### Lancet, London

2 1395 1448 (Dec 17) 1938

- The Hemolytic Anemias of Childhood L G Parsons—p 1395  
Late Results in Diverticulitis J P Lockhart-Mummery—p 1401  
Fluid Balance in Meniere's Disease T Cawthorne and Mary N Fawcett—p 1404  
Meniere's Syndrome Observation R Peacock—p 1409  
\*Treatment of Rheumatoid Arthritis with a New Gold Salt S J Hartfall H G Garland and W Goldie—p 1410

**Late Results in Diverticulitis**—Lockhart-Mummery analyzes the late results of 136 cases of the more severe types of diverticulitis. Ninety-one patients were operated on and forty-five were not. The latter were treated with frequent doses of liquid petrolatum to keep the contents of the colon liquid. Many of them had further attacks but when they were careful to adhere to the regimen advised the attacks usually ceased and the patients remained in good health for long periods. Nevertheless, two of them died subsequently from the condition, one from sepsis and the other from a sudden perforation and acute peritonitis. Both patients had refused operation. In all the patients not operated on the diverticula have increased both in size and in number. Small diverticula have become large and fresh diverticula have appeared in previously free areas of the colon. This shows that the weakness of the musculature of the intestinal wall and the tendency to herniation of the mucous membrane once started cannot be arrested. There were fifteen deaths in the entire series directly attributable to diverticulitis. In thirteen

cases the abdomen was opened and after the adhesions between the affected part of the colon and other structures were freed the bowel was wrapped in omentum and sewn into place with fine catgut stitches and displaced into the left side of the false pelvis. The patients were saved a colostomy opening and have remained in good health for from six to fifteen years after operation. Three had occasional attacks of pain and tenderness during the first two years but after that no symptoms at all. One patient so treated developed an endocarditis eight years later but is still alive. Colostomy, usually a transverse colostomy, was performed in thirty-eight cases. Of these patients four died. The remaining thirty-four survived for long periods and have remained free from symptoms. There seems to be no doubt that colostomy is the safest and most satisfactory method of treating bad cases of diverticulitis in which medical treatment will not stop repeated acute attacks or serious complications have occurred or threaten. Twelve patients had perforation into the bladder followed by a vesicocolic fistula. Several were treated by colostomy, followed a year later by resection of the affected colon and closure of the vesical fistula. They did well with the exception of the patient in whom fatal endocarditis developed three years after closure of the colostomy. In seventeen cases resection of the affected portion of intestine with temporary cecostomy or colostomy was performed. Four of these patients died but the remaining thirteen made good recoveries and had no further symptoms referable to diverticulitis. These patients are the only ones that can be considered to have been cured in the proper sense of the word. Exploratory abdominal section was performed in forty-three cases (apart from other operations) with five deaths. Appendicostomy was performed in five cases, in these cases in spite of careful medical treatment and a petrolatum regimen acute attacks of diverticulitis recurred. Appendicostomy proved successful, in all but one the attacks eventually stopped and the patients have remained in good health since. In one case attacks of chronic obstruction recurred and a transverse colostomy was made and the appendicostomy opening was closed. Chronic septic foci elsewhere in the body developed subsequently in fourteen cases, which included seven cases of severe arthritis, four of endocarditis and one each of septic iritis, cerebral abscess and subacute combined degeneration of the cord. This suggests that the original diverticulitis was responsible for the foci, as none of the author's thirteen patients successfully treated by resection developed such foci.

**Fluid Balance in Meniere's Disease**—Cawthorne and Fawcett studied the effect of various salt and fluid intakes on the symptoms of Meniere's disease in eleven cases. All but one were affected to a greater or lesser degree by variations in the intake of fluid and salt. Any steps taken to favor the retention of fluid within the body resulted in an aggravation of the symptoms, whereas the reverse was true when excretion of fluid was encouraged. In nine cases this fluctuation of the symptoms was accompanied by variation in the hearing capacity, thus, when the symptoms were more marked the hearing was worse and vice versa. None of the patients under review tended to retain fluid unduly, although they were all sensitive to variations in the salt and fluid intake. It seems that imperfect functioning of the pressure regulating mechanism of the endolymphatic system places the affected labyrinth under the influence of any factors that may effect the secretion or absorption of endolymph on that side. It is not unreasonable to suppose that an increase of the fluid content of the body may favor an increase of the intralabyrinthine pressure. It is recommended that an antiretentional regimen should form part of the investigation of every patient with Meniere's disease.

**New Gold Salt for Arthritis**—Hartfall and his colleagues used methyl glucamide of aurothiodiglycolic acid the total gold content being 50 per cent, in the treatment of fifty cases of rheumatoid arthritis. The dosage has been approximately half that previously used with other gold preparations but the curative results have been equalled or surpassed. Toxic reactions occurred in a fourth of the patients.

## Archives des Maladies du Cœur, Paris

31 1079 1174 (Nov.) 1938 Partial Index

- Severe Cardiac Insufficiency by Nodular Coronaritis Cas. C Iribry, P Soulie and J Lenegre—p 1079
- \*Permanent Arterial Hypertension Obtained by Section of Regulators of Pressure and Its Action on Kidney Mlle G Hærner R Fontaine and P Mandel—p 1090
- Subtotal Thyroidectomy in Cardiopathies of Hyperthyroid Origin With out Classic Signs of Hyperthyroidism E Coelho—p 1099

**Effect on Kidney of Hypertension**—Hærner and her associates report studies on the question whether all types of arterial hypertension which persist for a sufficient length of time will necessarily react on the kidneys. They made experiments on dogs. The hypertension by section of the depressors was performed according to the method of C Højmans, that is, at one session and under morphine-ether anesthesia, they resected on each side the internal portion of the vagus nerve (corresponding to the depressor nerve) and the carotid branch. If this operation is carried out correctly and completely, it induces regularly a permanent arterial hypertension. After this intervention the animals were kept under normal conditions of life and their arterial tension was regularly controlled. After from eighteen to twenty-four months had elapsed a time that was judged sufficient for renal symptoms to develop the authors tested the renal function of the dogs. Summarizing the results of these renal tests they say that two years after hypertension had been induced by sectioning of the nerves regulating arterial hypertension the dogs retained a normal renal function. The hypertension of extrarenal origin did not influence the function of the kidney. Contradictory reports about the microscopic aspects of the kidneys in experimental chronic hypertension induced the authors to make microscopic studies. They performed a unilateral nephrectomy extirpating the right kidney in each of the animals. The animals became readily adapted to the unilateral nephrectomy and the microscopic examination of longitudinal and transverse sections of the extirpated kidney showed no lesion that could be attributed to hypertension.

## Archives Med-Chir de l'App Respiratoire, Paris

13 161 246 (No 3) 1938

- \*Pathogenesis and Treatment of Asthma P De Bersaques and A Berat—p 161
- Extrapleural Pneumothorax R Nissen—p 196
- Pneumolysis Followed by Extrapleural Pneumothorax or Oleothorax as Method of Collapse Therapy in Treatment of Pulmonary Tuberculosis W Schmidt and K Briest—p 202
- Ventral Decubitus in Thoracic Surgery M Iselin and A Julia—p 214
- What Is Disclosed in Profile (Transverse) Poentgenography of Lung P Pruvost—p 223

**Pathogenesis and Treatment of Asthma**—De Bersaques and Berat stress the importance of the constitutional factor in the pathogenesis of asthma and show that an effective therapy of this disorder can be realized only when the complex problem of the asthmatic constitution becomes clarified. By objective and thorough examinations of forty asthmatic patients, they attempted to throw some light on this problem. In the clinical examinations of the asthmatic patients they gave attention to such factors as age, profession, pulse rate, blood pressure and the reflexes. Asthma occurs with equal frequency in the two sexes, but in women the appearance or disappearance of the asthmatic crises is influenced by menstruation, the menopause and pregnancies. They stress the neurovegetative instability, calling attention to the frequency of tachycardia and of exaggerated reflexes in asthmatic patients. Moreover, they show diagrams which indicate that the sphygmolability of asthmatic patients is much greater than that of other persons. In view of the great nervous instability of asthmatic patients, asthma has been designated as a respiratory neurosis. Psychic factors play a part for many asthmatic persons are psychopathic, and psychoanalytic methods effect cure in some cases. Further the authors report their observations on the chemical aspects of the blood and of the urine, on the leukocytic formulas on the basal metabolic tests and on the cutaneous reactions in asthmatic patients. Summarizing their studies on the pathogenesis they emphasize that asthma does not have a single cause but that three factors are of equal importance in the pathogenesis (1) the respiratory factor, (2) the instability of the neurovegetative system and

(3) the hepatic factor. In discussing the therapy of asthma they first take up the treatment. They prefer products containing 0.25 mg of epinephrine and from 0.03 to 0.04 Gm of epinephrine. Thus they avoid as much as possible the brutal and disagreeable vascular reactions and prolong the desired bronchial action. In the treatment during the periods between the attacks they take account of the aforementioned three pathogenic factors. They think that treatment with antiviral vaccine is useful in counteracting the respiratory factor. To modify the neurovegetative instability they recommend sedatives particularly the combination of belladonna, ergotamine and phenobarbital, and sympathicotropic preparations such as ephedrine. To counteract the hepatic disorders they recommend dietetic measures, choleretics and cholecystokinetics and they say that the antitoxic hormone of the liver (discovered by Sato) exerts a favorable action on the evolution of asthma. In the cases in which the existence of an allergen is definitely proved methods of desensitization are indicated. However, the authors think that such cases are rare, because hypersensitivity is the result of a constitutional status in which the liver plays an important part. Except in cases of established anaphylaxis, desensitization should be resorted to only after all other measures have failed.

## Revue Française de Pédiatrie, Paris

14 209 320 (No 3) 1938 Partial Index

- \*Ocular Tests of A Hypovitaminosis in Children of School Age L. Crussade Neimann Thomas and Davidsohn—p 209
- Observations on Treatment of Croup in Last Four Years at Pediatric Clinic of Bologna V Nighori—p 224
- Syndrome of Guillain Barre and Strohl in Children P Gautier G de Morsier and A Bron—p 247
- Verification of Tests on C Hypovitaminosis in Children of School Age Neimann and Dedon—p 253
- \*Nocturnal Enuresis Hypothesis and Treatment J Wertheimer—p 264
- Powdered Buttermilk in Treatment of Acute Digestive Disturbances of Nurslings M Pehu and P Woringer—p 270

**Ocular Tests of A Hypovitaminosis in Children**—According to Crussade and his collaborators, the tests employed for the study of A avitaminosis can be classified in two groups: laboratory tests and clinical tests. The clinical methods are based on the ocular disturbances provoked by A avitaminosis. The authors disregard conjunctival or corneal xerosis and keratomalacia, because these disorders appear only in advanced insufficiencies. Of greater interest, because they appear earlier, are (1) the beginning xerosis revealed by the biomicroscope of Gullstrand and (2) beginning hemeralopia. They describe an adaptometer, which was devised by one of them (Thomas). In employing this adaptometer the child is placed in the dark chamber where it has to look at a strongly illuminated screen for two minutes in order to neutralize the influence of the external light. Then the child is left in absolute darkness for thirteen minutes. Following this the child looks at the lighted page of the apparatus. By means of a diaphragm and of filters, the intensity of the illumination of the lettered page is gradually increased. The minimum illumination necessary to recognize the letters indicates the threshold of contrast in the child. To determine the normal threshold, tests were made on fifteen children who were free from hepatic and ocular disorders and who had been treated for fifteen days with vitamin A. To verify the sensitivity of the apparatus, control tests were made on twenty-five other children. Finally the authors employed their method for the detection of a hypovitaminosis on 210 children of school age. The studies were made during the winter. On the basis of their investigations they reach the conclusion that their method meets the requirements of the Hygiene Committee of the League of Nations, that it is easily employed and that it is of great sensitivity. In subjects who are free from hepatic and ocular disorders, it permits the detection of an existing A hypovitaminosis. Its employment in children of school age revealed that latent vitamin A insufficiency is relatively frequent, especially among the poor classes, in which the children receive an inadequate and unbalanced diet. The authors think that it would be interesting to make control tests during the summer when because of the available vegetables and fruits the diet has a higher vitamin A content.



**Nocturnal Enuresis**—Wertheimer first describes observations on the pollakiuria of nurslings. He found that micturitions were most frequent when the nurslings were in dorsal decubitus, somewhat less frequent when they were in the vertical position and least frequent when they were in ventral decubitus. There was on the average one micturition each in thirty eight, fifty three and 104 minutes, respectively, depending on whether the nurslings were in the dorsal, vertical or ventral position. In view of the relatively frequent coincidence between pollakiuria and nocturnal enuresis, the author suggests that nocturnal enuresis is likewise favored by the dorsal decubitus, that is it is justified to suggest a "hyptiogenesis" (hyptios = lying on the back) of nocturnal enuresis. Moreover if pollakiuria can be reduced by ventral decubitus, the same position might be helpful in the treatment of nocturnal enuresis. The author reports the clinical histories of four children ranging in age between 3 and 11. In all of them the nocturnal enuresis was successfully counteracted by the ventral position.

### Schweizerische medizinische Wochenschrift, Basel

GS 1389 1406 (Dec 24) 1938 Partial Index

- Methods and Aims of Active Vaccination in Virus and Bacterial Infections C Hallauer —p 1389  
\*Vitamin and Ferment Contents of Blood in Course of Infectious Diseases in High Mountains J E Wolf —p 1393  
\*Specific Catalytic Action of Trichlorethylene in Development of Allergic Dermatitis of Microbic Nature E Ramel —p 1395  
Periarthritis Nodosa Kussmaul Mayer A von Albertini and H Nabholz —p 1397  
Influence of Neurosympathetic Toxins on Processes of Infection and Immunity W Frei and E Hess —p 1398  
Vitamin B<sub>1</sub> in Sciatica E Hegg —p 1399

**Vitamins and Ferments in Blood**—Wolf describes studies on the behavior of the vitamin content of the blood in high altitudes. He examined the vitamin content of the blood in healthy persons and patients on the day following their arrival from regions of low altitude and again after a stay of three or more weeks at the high altitude. He found that in the majority of patients with open pulmonary tuberculosis the vitamin A values of the blood were noticeably reduced but that after from three to five weeks in the high mountains a considerable increase could be observed. It is difficult to determine to what extent diet played a part in this increase, but that the high mountain climate as such played an important part is proved by the fact that even in cases in which the appetite was poor and nutrition difficult a considerable increase was observed. In healthy persons the vitamin A values of the blood were likewise higher after several weeks in the high mountains. Studies on the vitamin C content of the blood revealed that of thirty patients with pulmonary tuberculosis only nine had values that were too low, all others had high values the majority even saturation values. These observations contradict those of the investigators who conclude, from a reduced elimination in the urine, that deficiencies exist. The author's observations on the blood do not prove that in pulmonary tuberculosis and perhaps also in other infectious diseases the vitamin C consumption is increased. He suggests that the fever of the infectious process might cause a retention and thus the reduced elimination in the urine would not permit the conclusion that a hypovitaminosis exists. It was found also that the vitamin C values of the blood increase under the influence of the high mountain climate. He detected normal or slightly increased total cholesterol values in many of his tuberculous patients but he noticed a reduction in the cholesterol content of the serum in some of those with acute exudative processes. Like Loewy, he observed that the cholesterol values increased under the influence of the high altitude climate. Finally he gives his attention to the fat-splitting ferments, particularly lipase. On the basis of 250 tests of the lipase content of the serum he concludes that in the majority of cases the lipase values increase in the course of the stay at the high altitude. The height of the lipase titer to a considerable extent parallels the improvement in the pulmonary aspects. It is suggested that the increase in the lipase titer might be the manifestation of the immunity status of the tuberculous organism.

**Trichlorethylene in Allergic Dermatitis**—Ramel discusses the meaning of the term allergy in dermatology and mentions the various manifestations of cutaneous allergy such as urticaria, eczema and parakeratosis psoriasiformis. The latter type of disorder has characteristics of psoriasis as well as of eczema, without being identifiable with either of these dermatoses. As the cutaneous manifestation of an allergic mechanism of microbic nature, parakeratosis psoriasiformis appeared until now as the composite effect of a morbid "antigen-antibody" syndrome in which two elements were necessary but sufficient. Recent investigations, however, demonstrated that this allergic reaction can be subordinated to the specific action of a third element acting in the manner of a catalyzer. The author demonstrates this on the basis of the clinical history of a factory worker who came in contact with trichlorethylene in the course of his work. Renewed contacts with the trichlorethylene elicited new attacks. On the basis of observations made on this patient, the author concludes that the trichlorethylene acts indirectly in the manner of a catalyzer. By means of this catalyzer it is possible to elicit at will an allergic cutaneous reaction the direct and indispensable cause of which appears to be a microbic agent. The microbic agent in the reported case was a hemolytic streptococcus which was obtained from the patches of parakeratosis psoriasiformis reactivated by means of the trichlorethylene test.

### Biochemica e Terapia Sperimentale, Milan

25 489 528 (Nov 30) 1938 Partial Index

- Sulfanilamide and Sulfur Preparations in Therapy of Experimental Typhoid C Callerio —p 500  
\*Action of Vitamins on Hydræmia and Chloridæmia in Nurslings M Pincherle and G Gelli —p 504

**Vitamins for Hydræmia and Chloridæmia in Nurslings**—Pincherle and Gelli made determinations of hydræmia and chloridæmia before and after the administration of vitamins in a group of twenty normal nurslings from 5 to 7 months of age, who were placed in four different groups. Each group was made up of two breast fed infants and three artificially fed with pasteurized cow's milk. Infants in the first and fourth groups had a daily intake of 40 000 international units of vitamin A (first group) and of 0 001 Gm of vitamin D (fourth group) for fifteen successive days. Those in the second and third groups had a daily injection of 0 001 Gm of crystallized B<sub>1</sub> vitamin (second group) and of 500 international units of ascorbic acid (third group) for ten successive days. The amount of water and sodium chloride in the blood was calculated by Bang and Rusniak's methods, respectively. The authors found that before administration of vitamins the amount of water and sodium chloride is normal in the blood of breast fed infants and increased in that of infants who are artificially fed. Vitamins administered have no effect on hydræmia and chloridæmia in breast fed infants whereas they cause diminution of hydræmia and chloridæmia up to normalization of the elements in the blood of infants who are artificially fed. The authors believe that the disturbances of the amount of water and sodium chloride in the blood of infants who are artificially fed are due to a disequilibrium of the endocrine and sympathetic nervous systems from avitaminosis and that both avitaminosis and the endocrine and sympathetic disturbances are controlled by the administration of vitamins.

### Deutsche Zeitschrift für Chirurgie, Berlin

251 281 448 (Dec 10) 1938 Partial Index

- Fractures of Tibial Condyle J Keyser —p 281  
\*Postoperative Sickness H Paschoud —p 298  
\*Etiology of Megaduodenum W Weiss —p 317  
Electric Burns in Four Children and Their Surgical Plastic Treatment H Lempke —p 331  
Juvenile Osteitis Tuberculosa Multiplex Cystoides with Special Consideration of Positive Tuberculin Anergy and the Blood Picture E Bahl —p 349

**The Postoperative Sickness**—According to Paschoud, the principal cause of the disturbances which constitute what Leriche termed 'postoperative sickness' is to be seen in venous stasis. Every surgical intervention through a transient and local influence on the defense mechanisms of the tissues affects three important factors: temperature, pressure and moisture. The lowering of the temperature in the course of the operation affects particularly the local circulation and in a case of



abdominal operations the portal circulation. In the author's experience this cooling process involves even the deeper liver tissues. However, when the operative field is irradiated with infra-red rays at a temperature of 50 C the tissues retain their temperature. Another important postoperative therapeutic measure in prevention of venous stasis and postoperative disturbances is the early postoperative activity of the patient. The infra-red rays are particularly useful in preventing vasomotor disturbances. Another effect of radiation is to be seen in hyperemia, which counteracts pathologic states resulting from venous stasis. Tissues subjected to the influence of inflammation, as in the case of appendicitis, cholecystitis, empyema or peritonitis, are not influenced to the same degree. The infra-red rays here affect only the circulation. The secondary hyperemia, result of the effect of ultraviolet rays, is effective for forty-eight hours after the operation and assures the best local stimulation of vasomotor function.

**Etiology of Megaduodenum**—Weiss reports six cases of megaduodenum in members of the same family in three generations. He considers the incidence of the condition in his cases as a hereditary anomaly. In five of the patients he was able to demonstrate other developmental anomalies of the bowel and the kidneys. His observations support the views of Melchior and Neil to the effect that congenital cases of megaduodenum remain symptom free for many years and exhibit first symptoms under the influence of some unknown cause. Megaduodenum is frequently overlooked, many of the cases are treated for other illnesses, while in still others the condition is discovered in the course of an operation. In the presence of mild disturbances of peristalsis the condition may be treated conservatively. Formidable manifestations require operative intervention. The condition is not improved by a gastro-enterostomy, the second Billroth operation with termino-lateral gastro-enterostomy or a duodenojejunostomy. The best results, according to the author, are to be obtained by the second Billroth procedure with  $\gamma$ -anastomosis after Roux. The author is of the opinion that a careful investigation of the family history in every case of megaduodenum would reveal hereditary characteristics.

### Munchener medizinische Wochenschrift, Munich

85 1977 2016 (Dec 23) 1938 Partial Index

Epidemiology of Field Fever (a Leptospirosis) in Southern Brazil W Rimpau—p 1977

\*Clinical Aspects and Specific Therapy of Field Fever G Joerdens—p 1979

Epidemic Keratoconjunctivitis in Munich and Surroundings R Schneider—p 1981

Problem of Vaccine Therapy of Whooping Cough H Petersen—p 1986

Preventable Violent Deaths in Nurseries and Young Children Fusslin—p 1988

Relations Between Alcohol Odor of Organs of Cadaver and Blood Alcohol Values G Hansen—p 1989

Field Fever in Rural Practice W Lohmuller Jr—p 1993

**Field Fever**—Joerdens reports his observations on eighteen patients with field fever, a spirochetosis, which in previous reports has been designated also as "harvest" fever. Sixteen of the patients had done harvest work but only a few had worked in damp fields and meadows. One patient, a soldier, developed field fever twelve days after return from a furlough, during which he had assisted in harvesting. Another patient, a baker, had not done harvest work, but he had been bathing in a river of the region in which cases of field fever had occurred. The patients suddenly developed high fever, usually with chills, they complained of severe headaches, sensations of dizziness and pains in the limbs. Nearly all the patients were stuporous during the first few days and many had attacks of vomiting, abdominal pains and diarrhea. A characteristic sign at the onset of the disease is a conjunctivitis of varying severity. The blood pressure was low and this hypotension persisted in some of the patients after the discharge from the hospital. During convalescence, bradycardia was frequently observed. In two patients an exanthem resembling that of measles appeared, but it subsided again in the course of forty-eight hours. Serologic examinations of the blood proved positive in all cases. In one case *Leptospira* was cultured from the blood on the second day of the disease. All the patients recovered in the course of two or

three weeks. Six of them were treated with a field fever (rabbit) serum. Three patients were given one intramuscular injection of 10 cc each, in the other three the serum injection was repeated after two or three days. On the basis of his favorable experiences with the field fever serum the author recommends its use, particularly during the early period of the disease. He points out that Rimpau regards field fever as a nonicteric form of Weil's disease. Both disorders are spirochetal fevers and their clinical course is similar.

### Nervenzarzt, Berlin

11 609 664 (Dec 15) 1938 Partial Index

Reduction of Intracranial Pressure H Sprockhoff—p 609

Neurologic Diagnosis of Tumors of Third Ventricle. E Oldberg and Louise Eisenhardt—p 614

\*Insulin Shock and the Eye R Schmidt—p 615

Three New Roentgenographic Methods That Are Important for Neurology B G Ziesdes des Plantes—p 619

Disappearance of Genuine Epilepsy After Epidemic Encephalitis A Werner—p 623

**Insulin Shock and the Eye**—Schmidt says that, since insulin has been introduced into the treatment of schizophrenia, numerous reports have appeared about changes that develop in different organs. Even ocular disturbances, particularly pupillary disorders, have been observed and so the author was induced to make studies on the eyes of schizophrenic patients during insulin shock therapy. His investigations were made on ninety-one patients in the course of 658 attacks of shock. To describe the behavior of the eye under insulin action the more clearly, he differentiates four stages. The first stage extends over the period from the introduction of the insulin to the onset of shock. The second stage is the period of shock which begins, according to the author's opinion, when the patient fails to respond to calling and pinching. The third stage is the period of deep shock during which all reflexes are abolished. The fourth stage covers the period from the administration of sugar to complete awakening. Summarizing his observations on the ocular changes during the various phases of insulin shock, the author says that all patients showed a loss of tonus of the external eye muscles during the third stage, impairment of the sensitivity of the conjunctiva and cornea during the second, the third and the beginning of the fourth stage, and pupillary changes during all four stages. In some of the patients there appeared during the first three stages peculiar positions of the eyes, during the first stage a horizontal nystagmus and during the second, third and fourth stages a hyperemia of the retina and of the choroid. The intra ocular pressure, the refraction, the oculocardiac reflex and the pressure of the retinal vessels showed no deviation from the normal. The reported changes prove that the eyes participate in the processes elicited in the organism by insulin shock. It is noteworthy that the manifestations on the visual organ are not uniform and that an alteration of the sympathetic equilibrium in a certain direction is not observable. None of the patients showed ocular changes traceable to the effect of insulin after the shock therapy was completed.

### Zeitschrift fur Immunitätsforschung, Jena

94 367 532 (Dec 12) 1938 Partial Index

Experimental Investigations on Guinea Pigs on Pathogenesis of Pneumonia H Grossmann and A Terbruggen—p 367

Aspects of Blood in Experimental Infections and Chemotherapy A Feldt and K Schafer—p 396

Studies on Antigenic Characteristics of *Spirochaeta Icterohaemorrhagiae* E Carlinfant—p 426

\*Immunity Against Anthrax G Ivanovics—p 436

Immunity of Newly Born Mammals L Schneider and J Szathmari—p 458

Further Observations on Biology of Gas Bacilli (*Bacillus Perfringens*) H Meisel—p 470

Complement Fixation Reaction in Leptospirosis S Papageorgiu—p 489

**Immunity Against Anthrax**—Ivanovics cites experiments by other investigators which proved that the capsule of anthrax bacilli has antigenic characteristics which differ from those of the body of the bacilli. It was demonstrated that the protective action of the serum was dependent entirely on its content in antibodies from the capsule and that the antibodies from the soma were of no importance in this respect. After reviewing immunization experiments with the R variant of the anthrax bacilli by Bail, the Stamatis and Sterne, Ivanovics describes

his own studies on the mechanism of anthrax immunity. He shows that the immunity of rabbits vaccinated with sterilized edema fluid has no connection with the antibody of the capsule. The capsule antibody could not be demonstrated in the blood of the animals so immunized nor was it possible to counteract the immunity of the animals with purified capsule antibody. Mice that were vaccinated with 1 cc of serum from an immunized rabbit showed hardly greater resistance against anthrax infection than the untreated controls. Rabbits can be successfully immunized with the noncapsulated R variant of the anthrax bacillus. The edema fluid from a guinea pig that has died after infection with the R variant likewise effects immunization in rabbits, in this edema fluid even the highly sensitive serologic examination fails to demonstrate the specific substance of the capsule of the anthrax bacillus. Mice could be immunized neither with edema fluid nor with large quantities of killed capsulated anthrax bacilli.

### Zeitschrift für Urologie, Leipzig

32 777 835 (No 12) 1938 Partial Index

Clinical Differentiation of Cases with Incipient Renal Tuberculosis from Cases with Nonspecific Papillitis Necroticans H. Schneider—p 777

\*Operation for Coral Calculus K. Heusch—p 800

Hemorrhages from Kidneys Congested as Result of Constricting Vessels H. Schneider—p 804

**Operation for Coral Calculus**—Heusch believes that pyelotomy is preferable to nephrotomy but admits that in some instances, such as in cases of a parenchymal calculus or of a fixed coral calculus, an incision into the renal parenchyma cannot always be avoided. However, it is gratifying when even in these conditions pyelotomy can be done instead of nephrotomy. This applies even to calculi that are shaped like antlers. If the anatomic conditions favor a pyelotomy, neither the size nor the extensive ramifications of the coral calculus are a contraindication to pyelotomy. The conditions which favor pyelotomy in the presence of a large anchored coral calculus are (1) good mobility of the pedicled kidney and (2) considerable size and width of the extrarenal portion of the pelvis of the kidney. Under these conditions the technical measures consist in breaking up the easily accessible coral calculus and then removing the fragments. The author reports the clinical history of a woman, aged 43, in whom a large coral calculus was removed by pyelotomy. The kidney was exposed by a slanting incision into the flank. It was moderately adherent to the surroundings, but it was easily pedicled and lifted out. After the kidney had thus been exposed its pelvis was visible and this was opened by a long pyelotomy. After the pyelotomy opening had been spread apart by holding threads, the conical end portion of the coral could be extracted. An attempt to remove the remaining portions of the coral by means of the thumb and forefinger failed and so the calculus was crushed into several pieces and these were removed by means of forceps. The removal was controlled by the palpating finger. A thorough irrigation concluded the cleansing of the renal pelvis. A transrenal fistula was made and after the patency of the ureter had been tested the renal pelvis was sutured. The postoperative course was uneventful. The fistula closed quickly. An examination several months later proved that the patient was free from complaints and that the function of the kidney was excellent.

### Problemy Tuberkuleza, Moscow

Pp 1152 (No 6) 1938 Partial Index

Properties and Methods of Separation of Active Principle of Extract of Leaves of Nut Tree F. L. Shpanir, D. L. Yakinskaya, L. I. Serebrennikova and T. Ya. Aronovich—p 3

Effect of Lymph on Tubercle Bacilli Cultures A. A. Kharkov—p 11

Passive Transference of Skin Tuberculosis Allergy Through Blood Transfusion P. Ya. Polyak—p 20

Primary Tuberculous Effect in Calves P. I. Kokurichev—p 26

Electrocardiographic and Microscopic Studies of Heart in Tuberculous Patients F. B. Lifshits—p 36

Certain Anatomopathologic Peculiarities of Tuberculosis in Puberty S. A. Katsnelson—p 49

Tuberculosis in Malarial Patients Ya. M. Kaziev—p 60

**Tuberculosis in Malarial Patients**—According to Kaziev there exist in the literature two opposing views with regard to the antagonism of tuberculosis and malaria. A number of authors, including Schoenlein, Mutzner and Shirokogorov, point to the rarity of tuberculous lesions in malarial patients. Another

group of authors maintains the opposite, i. e. that malaria aggravates the course of the tuberculous infection. Among the 5,580 patients admitted to the tuberculosis dispensary of the region of Baku, where malaria is endemic, there were 342 malarial patients with pulmonary tuberculosis in various stages. The author studied the incidence of malaria in a group of 1,212 patients with open pulmonary tuberculosis. There were 338 (27 per cent) who likewise had malaria. Thirty-three had recently acquired malaria, forty contracted malaria in the past six months and forty-four within one year, while 254 (75.1 per cent) had malaria for more than one year. By careful study of their histories it was possible to ascertain that in 165 (48.8 per cent) malaria preceded tuberculosis, while in 173 (51.2 per cent) malaria was acquired after pulmonary tuberculosis. The similarity in the symptoms of the two diseases may lead to diagnostic errors. However, the diagnosis of malaria can be established on the history of typical malarial attacks which yielded to specific treatment. Fifty-seven per cent of the tuberculous patients presented a fibrous or fibrous productive form of pulmonary tuberculosis, while cavities were present in 60 per cent. The remaining 43 per cent included severe pneumonic, infiltrative and other forms of pulmonary tuberculosis. Observations of this group over a period of five years revealed progression of the tuberculous process in 112 (33.1 per cent), marked aggravation in twenty-two (6.6 per cent), a stationary course in forty-eight (14.2 per cent), improvement and arrest in 135 (39.9 per cent) and a complete arrest in twenty-one (6.2 per cent). A study of histories of 369 patients dying of pulmonary tuberculosis in 1934 and of fifty-eight dying in 1935 revealed that 17 per cent were also afflicted with malaria. In order to throw light on the course of tuberculosis developing in patients who had had malaria for a long time the author studied a group of 338 open cases of pulmonary tuberculosis. In 165 of these, malaria preceded tuberculosis by from three to five years. Sixty-four and two-tenths per cent of these presented a mild course with predominance of fibrosis. It appeared therefore that the course of pulmonary tuberculosis in old malarial patients runs a milder course. However, in 21.1 per cent of the cases there was a progression of the disease. In the reverse instance, that is, when a tuberculous patient develops malaria, the tuberculous process becomes aggravated. A study of such a group of 173 patients demonstrated that 57.2 per cent of these showed progression and 13.3 per cent remained stationary, while 29.5 per cent improved. On the basis of his observations the author cannot support the theory of antagonism between the two infections since more than one half of the cases in which two infections coexisted showed an aggravation of the tuberculous process.

### Acta Medica Scandinavica, Stockholm

97 163 425 (Dec 13) 1938 Partial Index

Pasteurella in Sputum of Patient Suffering from Chronic Purulent Bronchitis M. D. J. Mulder—p 165

\*Determination of Hemoglobin in Undiluted Blood H. Hesse—p 207

Frequency and Geographic Distribution of Pernicious Anemia in Sweden N. G. Nordensson, Elsa Segerdahl, B. Strandell and C. Wallman Carlsson—p 222

\*Elimination of Cholic Acids in Healthy Animals B. Josephson, G. Jungner and A. Rydin—p 237

\*Elimination of Cholic Acids in Experimental Jaundice G. Jungner, A. Rydin and B. Josephson—p 254

Investigations on Branch Block E. Rud—p 265

Significance of Zinc Content of Insulin Preparations E. H. Vogelenzang and L. A. Hulst—p 307

Indoxylacetyl Compounds as Cause of Blue Fluorescence of Urine Under Ultraviolet Light G. A. Kreuzwendedich von dem Borne—p 311

Hypoproteinemia in Chronic Pemphigus K. Brächner Mortensen—p 329

Osteomalacia as Explanation of Dwarfism K. Secher—p 335

**Determination of Hemoglobin in Undiluted Blood**—Hesse says that Philipsen suggested to him in 1935 that the hemoglobin could be determined in the undiluted blood by hemolyzing the specimen with saponin and simultaneously reducing it with sodium thiosulfate and then placing it into a wedge chamber of capillary height, the wedge of blood color can thus be compared with a standard color. On the basis of this suggestion a hemometer was developed and the exactness of the new method was tested in the laboratory in Copenhagen. The author describes and illustrates the capillary wedge hemometer. He shows that since the quantity of the blood specimen does not

have to be determined, the mouth pipet can be replaced by a hand pipet. By exerting pressure with the finger on the rubber rim, the first drop of blood can be drawn up and more blood flows after, until the anterior chamber is filled. The reagent, which is added, is a powder consisting of a mixture of saponin, sodium thiosulfate and sodium oxalate. By this addition the blood specimen is hemolyzed, reduced and stabilized. By experiments it was demonstrated that within certain limits the quantity of the powder is without influence on the results and for this reason exact measurement of the powder is unnecessary. As soon as the specimen is clear, the capillary chamber is filled, that is, by capillary attraction the blood runs under the wedge piece and the color can be compared at once. In a historical review the author shows that the principle of the capillary chamber was suggested at about the turn of the century but for technical reasons was not perfected. After describing the technical measures that were necessary to insure exact results, the author reviews comparative tests which revealed that the new wedge chamber hemometer for undiluted blood meets all clinical and many scientific requirements.

**Elimination of Cholic Acids in Healthy Animals.**—Josephson and his associates show that, although the elimination of bile acids after oral as well as after intravenous administration has been studied by several investigators some important aspects of this problem still remain unsolved. They decided to study the cholic acid content in blood and bile and to observe the correlation between the blood content and the secreted amounts. They wanted to determine the elimination rate for cholic acid in blood and bile in healthy cats and rabbits, since they intended to use these animals for investigations of the cholic acid elimination under pathologic circumstances. They also made an attempt to determine to what degree an injected amount of unconjugated bile salts could be conjugated in the organism. Further they compared the effects of the injection of cholic acid into a peripheral vein and into a vein of the portal system. Finally they studied the ways in which the bile acids are eliminated from the blood. The experiments revealed that, although absorption is effected for the greatest part in the liver, the walls of the blood vessels also play an important part in the absorption of the bile acids for the results obtained in animals in which the hepatic vessels had been ligated can be explained in no other way. The results after the injection into the portal vein are more difficult to explain. After this type of injection the liver cells suddenly are offered blood, which is a rather concentrated bile salt solution. The most probable explanation of the obviously delayed absorption of bile salts after injection of large doses into the portal vein seems to be either that the liver cells were intoxicated by this overwhelming bile salt supply or that their excreting ability was at once exhausted. In this manner they may become immobilized and the animals may behave like those in which the liver vessels are ligated. This explanation is supported by the fact that when small doses are injected intraportally the reaction was the same as after peripheral injection. Experiments with animals treated with india ink and thorium dioxide solution indicate that the delayed excretion after intraportal injection of large doses probably cannot be explained by a blockade of the reticulo-endothelial cells, since animals so treated reacted normally. The fact that the cholic acid content increases also in peripheral blood during the resorption of great amounts of bile salts from the intestine may have the same cause as the delayed absorption after injection into the portal vein. Bile acids given orally in large amounts, to obtain an abundant flow of bile, may have an effect quite the opposite to that desired if the supply has been too ample. If they are injected intravenously no risk of that type seems to exist. Discussing the observation that during the initial period of about thirty minutes after the injection of sodium cholate the bile acids are excreted in unconjugated form, the authors say that gradually more and more of the excreted acids were conjugated even when their concentration in the bile still was far above the normal. This demonstrates that the conjugation of the bile acids by the formation of their peptide linkage is a time-consuming process and therefore probably of enzymatic character. After citing observations by several other investigators the authors suggest that enzymatic powers may be the cause as well of the peptide synthesis as of the normally occurring synthesis of conjugated bile acids. The

reported experiments have shown that unconjugated bile acid, when rapidly excreted, may escape from this enzymatic power.

**Elimination of Cholic Acids in Experimental Jaundice.**—In this report the same investigators (Jungner, Rydin and Josephson) report their studies on the elimination rate when the tissues are more or less loaded with bile salts. They observed the elimination in previously jaundiced animals, in which they also had ligated the afferent liver vessels before the injection of the bile salt. In the summary they say that the elevation of the bile acids in the blood in obstructive jaundice found by other authors in dogs was confirmed in rabbits and cats. The fact that this elevation appears later in cats than in rabbits was explained by the different elasticity of the bile ducts of these two species. The authors also confirmed the observation of other investigators that the augmentation of the bile salts after cholate injections is much greater in these than in normal animals and that the elimination is greatly delayed. The elimination rate follows a typical curve. An approximate calculation of the total amount of cholates in the blood of the animals four minutes after the injection, however, shows that even in obstructive jaundice a considerable part of the supplied salt disappears from the blood immediately after the injection. In this short time scarcely any urine was formed and an excretion of bile salts through the kidneys could not have taken place. In the preceding paper they demonstrated that the rapid disappearance of cholates in healthy animals could depend not only on fixation in the liver but also on a surface adsorption on the walls of the blood vessels. In the animals with obstructive jaundice this surface adsorption did not take place, which was demonstrated by experiments on cats with both obstructive jaundice and excluded liver circulation. In these experiments the cholate quantity remaining in the blood was about the same as the injected quantity. It seems that the tissues and the walls of the blood vessels were saturated with bile salts. Compared with the experiments on animals with obstructive jaundice and maintained liver circulation, these animals demonstrated the capacity of the liver to fix bile acids even in severe jaundice. The cholic acid content of the blood of animals with toxic hepatitis caused by phosphorus and by carbon tetrachloride was found to be definitely higher than normal but not of the same magnitude as in obstructive jaundice. The elimination curve of injected cholic acids was different from the normal elimination as well as from that of the animals with obstructive jaundice. The first augmentation of cholic acid in the blood after injection was of normal magnitude but the subsequent decrease was delayed. The delay found in the excretion agreed fairly well with the results of the microscopic examinations. This indicates that in hepatitis of this type the tissues still have the ability to absorb the bile salts but that their excretion is diminished as a result of the injury to the hepatic parenchyma. Altogether it seemed that the cholate concentration of the blood after the injections was much more in correspondence with the condition of the liver than was the concentration before the injection. The values found after injection of small doses corresponded fairly well to those after large ones. For these reasons the authors believe that analysis of the cholate concentration in the blood of patients after injections of sodium cholate can serve as a functional test of the liver.

#### Nordisk Medicinsk Tidskrift, Stockholm

16 1889 1932 (Dec 3) 1938

\*Bacteriologic Examinations in Pneumonia in Oslo. E. Waaler and K. Halvorsen.—p. 1889.  
Handwriting and Analysis of Personality. K. G. Dahlgren.—p. 1893.  
Number of Inmates in Safety Institution in Nyköping with Special Regard to Psychopathic Patients. K. E. J. Lemmergaard and J. Ravn.—p. 1898.

**Bacteriologic Examinations of Pneumonias in Oslo.**—Waaler and Halvorsen typed pneumococci in 109 of the 142 cases of pneumonia from Ullevaal Hospital from September 1937 to May 1938. Hemolytic streptococci were isolated in nine cases, *Staphylococcus aureus* in one, Friedlander's bacillus in two and a mixture of hemolytic streptococci and other microbes in five, no pathogenic organism was identified in sixteen mainly because of contamination of material. The most frequent types were III, VII, XVIII, I, IV, X and XII in the order named. The authors find a marked variation in the incidence of types from year to year.

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## PROSTATECTOMY OR TRANSURETHRAL PROSTATIC RESECTION?

A PLEA FOR THE SELECTIONIST

EDWIN DAVIS, M.D.  
OMAHA

Be not the first by whom the new are tried,  
Nor yet the last to lay the old aside  
—Pope

It is obvious that a literal interpretation of Pope's doctrine of conservatism universally applied would be a complete and effectual bar to all progress. Yet most persons would do well to plod the ultraconservative path, leaving the trial of the new to the gifted and venturesome few.

Overenthusiasm inevitably follows the discovery of a new therapeutic agent, particularly that discovery which tends to be startling or which carries with it a dramatic appeal. After overenthusiasm, in varying degree but in definite sequence, come publicity, commercial exploitation, incompetence and abuse, followed by poor results, recognition of defects and dangers, fear, decreased use and overcorrection, until, finally, such merits as may exist become recognized in their true light and the new therapeutic agent (drug or surgical method) reaches stability at its proper level of usefulness (chart 1). This process of trial and evaluation may require months or years. The pernicious practice of blood-letting persisted through the centuries. The changing attitude of the profession toward nephropexy a generation ago afforded a classic example of this cycle, with the exception that the vicious commercial exploitation feature was lacking, in that there were no kidney hammocks on the market. Mercurochrome, mandelic acid and fever therapy, each has had its fling and each its appraisal. A host of other remedies might be cited. The most recent conspicuous example is the magic medicine sulfanilamide, certainly a drug of most unusual merit, although falling somewhat short of enabling the internist to dispense with history taking and physical examination and seeming to be now on the downgrade.

The opinions and ideas concerning transurethral prostatic resection here presented, although based to some extent on personal experience and on the literature, are derived almost wholly from an impartial analysis of opinions contained in personal communications received from 100 American urologists of recog-

nized ability and integrity, arbitrarily and impartially chosen. Letters of inquiry written in an attempt to sense the present trend of opinion were sent during February 1938 to the fellows and active members of the American Association of Genito-Urinary Surgeons and to every tenth name included in the alphabetical roster of diplomates of the American Board of Urology. The list consisted of men of reputation and accomplishment, most of them well known through their writings and all of them competent and without cause for prejudice, although it happened to include those names which have been most conspicuously identified with the development and the popularizing of the transurethral method. I refer particularly to Caulk, T. M. Davis, McCarthy, Alcock and Bumpus. The inquiry was not a questionnaire as such but rather in the nature of a personal communication requesting an opinion. Those solicited were most generous and courteous in response, more than 95 per cent replying. This report consists of a summary and digest of, as well as interwoven quotations from, the first hundred replies received, after duplicate opinions from those associated in the same office or clinic were excluded.

### DIVERGENT VIEWS

By far the most striking impression which one receives as a result of reading these hundred letters is one of amazement that there should be such wide discrepancy in opinion. The transurethral method is extolled to the skies and condemned utterly. There are the extremists and the nihilists. There are those resectionists who recognize no contraindications and no limitations so far as the size of the gland is concerned, and there are those who refer to the transurethral method as "whittling" or "electrocution" and who will have none of it. Writing on this subject in the *British Medical Journal*, Walker<sup>1</sup> states that "in England, perhaps owing to our happy genius for discovering middle courses, these extremes of opinion are seldom encountered."

### CLASSIFICATION

An accurate classification of urologists based on technic employed is as impossible as it is purposeless. Nevertheless it is quite possible to draw certain general conclusions, based on table 1, showing three general groups of urologists, two of which are small minorities: (1) resection extremists, (2) prostatectomy extremists and (3) a large middle group made up of "selectionists." As indicated, there is some overlapping of groups, since even surgeons performing either a very large or a very small percentage of resections are necessarily also selectionists.

Owing to lack of space, this article is abbreviated here. The complete article appears in the author's reprints.

Read before the Section on Urology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

<sup>1</sup> Walker, K. M. Transurethral Resection of the Prostate. *Brit. M. J.* 1:901 (May) 1937.

*Panresectionists* — Included among the resection extremists, who employ this method in at least 90 per cent of cases, there is a small minority, totaling eight, designated panresectionists, who recognize no limitations with respect to the size or shape of the prostate and who perform prostatectomy only on very rare occasions for some mechanical lesion, such as urethral stenosis or ankylosis of the hip, or for the purpose of demonstration to students. Kretschmer<sup>3</sup> has "taken the prostates as they came, big little, hard and soft" and has "refused no patient relief from prostatic obstruction by the transurethral route, irrespective of age or physical condition." Others feel that size in itself is no contraindication. Alcock<sup>4</sup> believes that "the size of the gland has little if anything to do with the indication for prostatic resection" and even states that a large prostate is "easier (for him) than the small." For several years Sisk<sup>5</sup> has "used transurethral resection in almost 100 per cent of cases." Bunpus's<sup>6</sup> statement that "the first year we operated in all the county cases by resection just to prove that it was possible" suggests that perhaps the resectionist views the large prostate as a challenge to his ingenuity and skill. Another example of how far

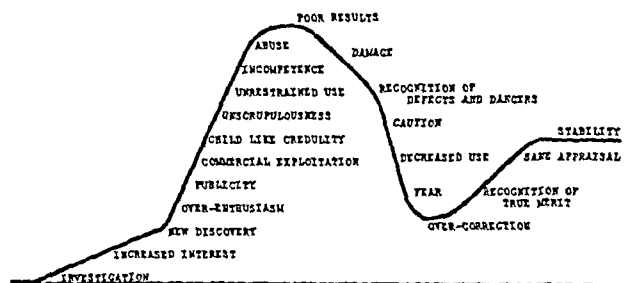


Chart 1—Trial and appraisal, the reaction of the medical profession toward anything new

one may be carried by his enthusiasm is afforded by Thompson's<sup>4</sup> suggestion for prostatic resection through a perineal incision in cases of difficult urethral instrumentation, causing one to wonder why the contraindication to complete clean enucleation of the gland through the existing incision

*Nihilists*—"The number of operations that should be handled with the resectoscope should be somewhere in the neighborhood of one hundredth of one per cent, or less." The point of view of this outspoken nihilist is shared by a small minority, although the entire group (numbering twenty-two) who limit their transurethral activities to "those conditions for which the punch operation was formerly indicated" are essentially nihilists so far as the cutting loop, as applied to benign hypertrophy, is concerned.

*Selectionists*—"Transurethral resection is the ideal method of dealing with obstructions which, by their nature, are unsuitable for enucleation." This concise and expressive statement by G. G. Smith<sup>5</sup> represents the opinion of many. Comments concerning the advisability of selection make up by far the most interesting and instructive material contained in the letters. Well over eighty letters expressing volunteer opinions on this phase of the subject are practically unanimous in favor of selection, although some only to a limited extent. Discrimination is evident among ardent resec-

tionists such as Nesbit and Hamer,<sup>3</sup> the latter of whom feels "that some conditions are more satisfactorily cured with more safety and less time by open operation than by repeated resections." "Obstructing prostatism merits discriminating allocation of method to case rather than case to method" (McCarthy<sup>2</sup>). "I am still selecting my cases for both methods of procedure" (Thomas<sup>4</sup>). Livermore,<sup>6</sup> who believes resection to be "the greatest advance in prostatic surgery since Hugh Young's monumental work," states that it is "not applicable in all cases" and suggests "a happy medium." Indicating his open-mindedness, Osgood<sup>3</sup> is "delighted to use the transurethral method for bars, vesical outlet constrictions and small median lobes," while Rathbun<sup>3</sup> considers resection to be "a very valuable procedure which has been considerably overdone." Chetwood,<sup>7</sup> summarizing over twenty-seven thousand cases of transurethral resection through questionnaire replies, concludes that "caution as well as restraint should be exercised" in transurethral operations, which "should be applied in a selective group of cases." Schmidt<sup>3</sup> believes that "many patients are best operated on by open prostatectomy." Since a number of these quotations are from ardent resectionists, further enumeration of the many opinions of this kind would seem to be unnecessary. It is important to note Walker's<sup>1</sup> statement that the majority of British urologists employ resection "in moderation."

Yet "selection" does not tell the entire story. As Alcock<sup>8</sup> mentions, there are certain well known operators who have devoted themselves almost exclusively to transurethral resection, perineal prostatectomy or suprapubic prostatectomy (for instance, Alcock, Young and Hunt) and have obtained conspicuously good results. Since this "certainly is not fitting the operation to the patient," it is obvious that a skilful and practiced few have succeeded in fitting the patient to the surgeon.

#### TREND

It is significant that of forty-one urologists making specific statements as to trend or tendency in their own work, eight (20 per cent) say that transurethral operations are showing an increase while with thirty three (80 per cent) the trend is toward a decrease. Included in the latter group are a number of formerly high percentage resectionists of wide experience. On the other hand, included in the former group are certain New Englanders of recognized conservatism, while Bugbee,<sup>3</sup> "with accumulated experience," has become "more and more enthusiastic." Another surgeon notes that his "enthusiasm is waning." Culver<sup>3</sup> has submitted accurate yearly figures, beginning in 1932, "with resections increasing from 70 per cent to a peak of 90 per cent in 1934 and then tapering off to 60 per cent in 1937."

#### PUBLIC DEMAND

"My impression is that the public is undergoing a change in opinion" (Hepler<sup>3</sup>). "Insistent demand for 'the needle treatment,' 'the electric method' and relief 'without cutting,' by patients, relatives and physicians, created by premature publicity and commercial exploitation and based on the original misconception that resec-

<sup>3</sup> Personal communication to the author

<sup>4</sup> Thompson G. J. Perineal Prostatic Resection Proc Staff Meet Mayo Clin 12 360 (June 9) 1937

<sup>5</sup> Smith G. G. Urologists Correspondence Club Jan 11 1938

<sup>6</sup> Livermore G. R. Prostatic Resection J Urol 37 549 (April) 1937

<sup>7</sup> Chetwood C. H. Summary of Over Twenty Seven Thousand Cases of Transurethral Prostatic Resection Tr Am A Genito Uro Surgeons 29 213 1936

<sup>8</sup> Alcock N. G. in discussion on Young H. H. Some Problems in Surgical Treatment of the Prostate J A M A 110 283 (Jan 21) 1938

tion is a simple office procedure, without incision and without risk, has had its injurious effect. In this connection, credit should be given Lewis and Carroll,<sup>9</sup> who in 1933, "in the midst of the wild stampede in favor of resection," recognized the limitations and the dangers in connection with this procedure and had the courage to present an outspoken analysis advocating conservatism and caution. They said "It is not only erroneous but dangerously misleading to teach that prostatic resection is minor surgery." This public clamor and increased "prostate consciousness" have been fostered and developed not only by resection propaganda but also by misinformation given wide publicity in syndicated newspaper medical columns, by pernicious faker radio advertisements, and by silly and purposeless feature articles in popular magazines. For instance, under the title "No Cause for Alarm," Maxine Davis in the *Pictorial Review* for January 1938 devoted several columns to startling and lurid misinformation concerning the prostate gland, in an article well calculated to be the occasion for worry by the uninformed and to cause the intelligent reader to wonder how it happens that this author knows something of serious and dire consequence with respect to the prostate gland of which urologists who have devoted their lives to the study of this subject are not aware.

It seems, however, that the same urgent demand no longer exists, and that "the wave of propaganda in favor of resection which has swept the country" (G. G. Smith<sup>5</sup>) is tending to recede. In Shupe's<sup>3</sup> opinion, resection "has run its course, as far as its appeal to the public is concerned" and "patients do not request it any more." Geisinger<sup>3</sup> feels that "patients are now much less assertive" whereas "some time ago they were demanding resections with great unanimity." This author adds "I contributed my part to this overenthusiasm." Patch<sup>3</sup> thinks "that a saner outlook is being regained," and Bransford Lewis,<sup>3</sup> of "Moonlight and Roses" fame, makes the positive statement "We insist on making our own selection of method to the exclusion of the opinion of any one else concerned." "Less public enthusiasm" has been noted by Howze.<sup>3</sup> He says "This presumably is due to the fact that the patients do a great deal of talking among themselves and must tell each other of unsatisfactory results." Finally, selectionists now occasionally witness the spectacle of the patient who himself demands prostatectomy in order to "Have it over with." It therefore seems definitely established that "the stampede has run its course" and that the demand pendulum is swinging back.

#### TIME AND COST

"The question of hospital cost must be weighed against the possibility of recurrent hospitalization" (Randall<sup>3</sup>). It is the prevalent and accepted opinion among physicians and patients that the transurethral method materially lessens the period in the hospital and hence the cost. In view of the fact that herein lies the chief selling point, it is surprising to note that opinion on this phase of the question is by no means unanimous. Many dissenting voices arise, basing their contradiction chiefly on the "prolonged and trying period of convalescence after leaving the hospital" and the obvious fact that the necessity for multiple sittings unquestionably nullifies resection's chief advantage. For instance Green<sup>3</sup> says "The actual convalescence,

even though it is not in the hospital, is longer." Deming<sup>3</sup> believes that "by Hinman's<sup>11</sup> technic," including plastic closure of the prostatic capsule and the perineal incision, following perineal prostatectomy, "a large adenoma may be removed and a healed wound with normal urine obtained in a shorter time than with the transurethral method." "I still think that perineal prostatectomy gets the patient through the operation in just as short a time and with a much better functional result" (G. G. Smith<sup>3</sup>). As ardent and able a resectionist as Bumpus<sup>3</sup> concedes that "suprapubic prostatectomy makes a shorter stay in the hospital than multiple transurethral resections." The suggestion that a shorter period in the hospital, with a lower hospital bill, conserves the patient's funds with which to pay the surgeon hardly seems to have a proper place in a clinical discussion. Postresection complications, such as delayed hemorrhage and persistent residual urine, requiring repetition, necessarily tend to prolong the stay in the hospital and thus to minimize the chief advantage of resection. Making specific reference to the time consumed in the hospital, Turner<sup>12</sup> reported a series of 100 resections with an average

TABLE 1—Classification of Urologists\*

Resection extremists	Panresectionists 95% resections 90% resections	Selectionists	8	21
			5	
			8	
			9	
Prostatectomy extremists	20% (or less) resections Fibrosis bars and carcinomas only Nihilists		19	22
			29	
			8	
			8	

\* Based on 100 responses stating the percentage of prostatic obstructions each is accustomed to remove via the transurethral route.

period in the hospital of thirty-five and one-half days. It is therefore evident that there are two sides to the time question and that the period associated with resection may not be the shorter when measured by duration of symptoms and, sometimes, even when measured by the time in the hospital.

#### ABUSE

"Unfortunately, like other procedures which have been rather extensively exploited, transurethral resection has fallen into the hands of incompetent and unscrupulous persons, who have caused a good deal of damage and discredit to what can be a good procedure. I think this is one of the great advances in the treatment of prostatic obstruction" (Lower<sup>3</sup>). Keyes and Ferguson<sup>13</sup> state that one dealer "has sold more (resection) instruments than there are urologists in the United States." Abuse includes (1) the employment of the resectoscope by those not properly qualified and (2) the performance of unnecessary operations, either because of poor judgment or for other reasons. "Untrained operators are doing too many financial operations" and "I sincerely believe that a great many people are being unnecessarily operated on, the chief reason being one that I hate to mention" are typical comments from well known urologists. "The procedure is being used for chronic prostatitis and other conditions which do not require any operative pro-

<sup>9</sup> Lewis Bransford and Carroll Crayson. Prostatic Re section—Without the Moonlight and Roses. *Urol. & Cutan. Rev.* 37:1 (Jan) 1934.

<sup>11</sup> Hinman Frank. The Modern Operation of Plastic Perineal Prostatectomy. *Tr. Am. A. Genito-Urin. Surgeons* 30:267 1937.  
<sup>12</sup> Turner B. W. Contraindications and Complications Incident to Transurethral Prostatic Resection. *J. Urol.* 37:815 (June) 1937.  
<sup>13</sup> Keyes E. L. and Ferguson R. S. *Urology* ed 6 New York: D. Appleton Century Company, Inc. 1936.



cedure” “I think that almost every one who has had the slightest symptoms arising from prostatic hypertrophy has been resected” “The introduction of the resectoscope has been responsible for the performance of thousands of unnecessary operations” In fairness, however, it should be pointed out that these typical criticisms, from men of national reputation, apply not to the method but rather to certain human traits The obvious and inevitable consequences of abuse are unnecessary deaths, unnecessary suffering, unnecessary expense and undeserved discredit to a very useful procedure

SKILL AND EXPERIENCE

All urologists agree that resection, aptly referred to by Hess<sup>3</sup> as “a specialty within a specialty,” is an undertaking for the expert In fact, majority opinion considers this method to be more difficult and complicated than suprapubic prostatectomy, as to both technical execution and after-care Twenty-one letters refer to this phase of the subject, most of them suggesting that “the attitude of the surgeon toward resection, as well as his mortality rate and end results, bears a direct relationship to his skill and experience” This is too obvious to require discussion Braasch<sup>3</sup> has observed that “the proportion of transurethral resections and prostatectomies done by the urologist varies directly with his ability and experience in this field”

TABLE 2—Comparative Mortality Rates (Davis)

	Total Consecutive Cases	Series Without a Death	Deaths	Mortality Rate
Perineal prostatectomy	741	121	20	2.7%
Transurethral resection	361	107	21	5.8%

Stevens<sup>3</sup> feels “very strongly that there is little done in the field of surgery which has so large a personal factor” and adds that “urologists inadequately trained in surgery will naturally pull hard for the transurethral method, although this by no means implies that all urologists favoring resection are poor surgeons” Bugbee<sup>3</sup> believes that “one should do several hundred resections before one is in any way able to master the technic,” and, confirming this statement, it is a matter of common knowledge that operators who have performed a large series of resections have reported a high initial mortality rate, later conspicuously lowered Obviously, transurethral resection cannot be learned through an apprenticeship or by observation As G G Smith<sup>6</sup> has stated, “Proficiency can be attained only through individual experience” Keyes and Ferguson, recognizing the value of resection, particularly for prostatic sclerosis, refer to the “yeoman resectionists” and to “the ease with which some do and others pretend to do this operation”

MORTALITY RATE

Obviously the mortality rate of transurethral operations varies in inverse ratio with the skill and experience of the surgeon and unquestionably may be made exceedingly low Summarizing mortality reports, Bumpus<sup>15</sup> concludes “It is evident that in the hands of the experienced the mortality should be less than 2 per cent,” whereas McCarthy<sup>2</sup> feels that “the mortality in competent hands should vary from 1 to 4 per cent” In Lower’s<sup>3</sup> opinion, “The greatest advantage of transurethral resection is that it carries a much lower

mortality” Barringer performs 60 to 70 per cent of resections because the “mortality is so much reduced,” in spite of the fact that “all in all the operation is not quite as effectual as prostatectomy” Many others comment on the conspicuously low risk of resection as compared with suprapubic prostatectomy In fact, this is generally accepted, although a discordant note is introduced by such statements as “the low mortality from resection in the hands of the average operator is due to the fact that many of his patients should never have been operated on” It seems very doubtful, however that the “average” resectionist actually has a low mortality rate Negley,<sup>16</sup> analyzing 400 operations on the prostate, half by each method, performed by various general surgeons and urologists in two large hospitals, one charity and the other private, found that the deaths following resection outnumbered those following prostatectomy three to one

A number of operators who use the perineal approach have reported mortality figures distinctly better than their own resection figures and comparing favorably with the figures reported by recognized resection experts My own opinion is in accord with that of McCarthy,<sup>2</sup> who believes that “the mortality of resection in skilled hands, while lower than suprapubic mortality, approximates that of perineal prostatectomy” Cecil<sup>3</sup> does not believe that resection “compares with perineal prostatectomy as to mortality” G G Smith,<sup>6</sup> who likewise has a lower prostatectomy mortality rate, considers that the resection mortality rate in the hands of the “great majority” is “perhaps 10 per cent” and adds that “hundreds of patients are being sacrificed every year by men who are endeavoring to learn the technic of transurethral resection” According to Randall,<sup>3</sup> “the resection mortality is certainly 10 per cent, probably higher” My own mortality rate for perineal prostatectomy, as indicated in table 2, is 2.7 per cent, as compared with a 5.8 per cent resection rate for a series combined with that of my colleague Owens

FUNCTIONAL RESULTS

“The patients seemed happy that they were able to void” and “were mostly satisfied with the result, indeed much better satisfied than I” This honest and delightfully concise expression by MacKenzie<sup>3</sup> of Montreal comes very near to telling the entire story Beer<sup>1</sup> is “impressed by the reports of large numbers of ‘resected’ patients who require continued treatment” and has “no doubt that most resected cases void more readily and have much less residual than prior to operation, but large numbers are not absolutely and definitely cured, as they are after a complete enucleation,” and “pyuria, frequency and dysuria often persist for months or permanently”

Of the hundred letters, fifty-five contain volunteer opinions with respect to the all-important question of the ultimate success of the operation as measured by the completeness and permanence of symptomatic relief Of these, sixteen (30 per cent) express satisfaction with the end result, although in a number of instances this opinion is qualified by such expressions as “if properly done” or “in properly selected cases” “I should say that the results are just as permanent and complete” is the opinion of Caulk,<sup>3</sup> while Crowell<sup>3</sup> believes “that the permanent results are just about as good”

15 Bumpus H C Present Status of Transurethral Resection of the Prostate J A M A 107 494 (Aug 15) 1936

16 Negley J C in discussion on Bumpus and Massey<sup>15</sup>  
17 Beer Edwin in discussion on Kretschmer<sup>10</sup>



The remaining thirty-nine letters (70 per cent) express varying degrees of dissatisfaction, although there is no general condemnation and no denial of a certain percentage of brilliant results. The general tendency is to place great emphasis on such items as continued pyuria, bladder irritability and urinary frequency, although the patients are able to void and are mostly without residual urine. Frequent reference is also made to such postoperative complications as hemorrhage, pelvic cellulitis, stricture, incontinence, late recurrence and infected residual prostatic tissue as a cause of impairment of general health on a focal infection basis.

It is unnecessary to state that many letters refer to patients reported cured by resection who had traveled to other clinics for relief by prostatectomy or local treatments of the bladder without the knowledge of the resectionist. Also a number of urologists report the necessity of subsequent prostatectomy in their own cases of unsuccessful resection. Under this circumstance Hepler's<sup>3</sup> patient inquired "Why didn't you do that in the first place?"

Hepler's<sup>3</sup> experience has been that many patients were not relieved of their prostatism even though there was no residual urine, and Qumby states definitely that "with the very large or badly infected prostate, we get better results from the open operation." Delzell<sup>8</sup> believes "that it is possible to perform resection in about 90 per cent of cases," although "practical results do not justify this operation in over 25 per cent." Beer<sup>10</sup> suggests that "mild prostatitis are frequently worse off after resection," on account of increased infection and urinary frequency following the removal of "some" of the prostatic tissue, despite the reduction in the amount of residual urine. The opinion of many urologists is expressed by Herman, who says that "few resectionists can employ the method as a routine with final results comparable to those obtained by selective methods." A new idea is brought forth by Paine<sup>3</sup> in the suggestion that "the new lease of life and the rejuvenation which elderly men seem to have after a successful enucleation of the prostate depends to a large extent on the removal of the focus of infection" as well as relief from residual urine. He believes that transurethral resection fails in this respect. Of 253 consecutive one year replies received from my own perineal prostatectomy patients in answer to the question "Do you consider yourself well, improved or unimproved?" 82.5 per cent classify themselves as well and 16.3 per cent as improved (table 3). Replies to the same question from a large series of one year resection patients should make an interesting comparison. Keyes and Ferguson say "One fears that ten years after operation, many of the patients may suffer recurrence such as occurs even after prostatectomy." Decidedly, the consensus is that enucleation is more dependable with respect to completeness and permanence of symptomatic relief.

#### MULTIPLE SITTINGS

"Surgeons should aim at a higher ideal" than to advise a certain operation knowing that "repetition may be necessary in order to effect a cure." Randall's<sup>3</sup> condemnation of multiple sittings is concurred in by all but two of the nineteen urologists who voluntarily refer to this phase of the subject, the general thought being that prolongation of the procedure tends to nullify resection's chief advantage. According to Hyde,<sup>3</sup> "there is less trauma to the patient, both physical and

mental, with prostatectomy than with multiple resections," and Bumpus<sup>3</sup> states that "suprapubic prostatectomy makes a shorter stay in the hospital than multiple transurethral resections." If resection is a more tedious ordeal for the patient than prostatectomy, as some urologists (including myself) think, this is doubly significant with respect to multiple resections, although "some patients prefer two, or even three, resections rather than undergo prostatectomy" (Livermore's<sup>6</sup>). Nesbit<sup>3</sup> believes that "the very large gland, which might require multiple resections may be removed as safely by perineal prostatectomy." Colston<sup>3</sup> writes "We are unanimous in condemning multiple resections."

#### THE OPERATION

"For the very large prostate, the 'whittling operation,' as some have called it, is not only inappropriate but even ridiculous, when in a few minutes the hypertrophied lobes may be enucleated in toto, with a permanent cure." By way of interpretation of this statement by Young,<sup>3</sup> I assume personal responsibility for the opinion that resection except in selected cases is infinitely more tedious and tiring and from the point of view of surgeon and patient alike, besides being more time consuming, less certain as to results and no less hazardous than perineal prostatectomy. In other

TABLE 3—Late Functional Results Following Perineal Prostatectomy\*

Patient's Own Opinion	Perineal Prostatectomy	Resection
'Well'	82.5%	?
Improved	16.3%	?
	98.8%	

\* Based on 253 consecutive questionnaire responses after one year.

words, as a result of the expenditure of greater effort on the part of both surgeon and patient, less has been accomplished. Therefore, since these advantages rest with perineal enucleation, the answer to the question as to wherein then lies the justification for routine resection is that certain skilful operators have succeeded in bettering their results of suprapubic prostatectomy by this method. In confirmation of the advantages of perineal enucleation as enumerated, Alcock<sup>8</sup> has graciously reiterated "If I could do a perineal prostatectomy as well as Dr. Young can, I would probably do all my cases by that method."

#### PRELIMINARY DRAINAGE

To the conservative and to those who have established conspicuously good records in prostatic surgery, the necessity for preoperative drainage is axiomatic. One might just as well seriously question the advisability of hemostasis. If one factor were to be named largely responsible for the dramatic lowering of the prostatectomy mortality rate from 40 per cent to practically nil, it would be this. Yet one notes a tendency among resectionists toward minimizing this essential process. For instance, Bumpus and Massey<sup>18</sup> go so far as to say that "transurethral resection has diminished the necessity for preliminary preparation in the majority of cases of hypertrophy of the prostate." A lessening of the drainage period has been urged by Kretschmer<sup>19</sup>

18 Bumpus H. C. and Massey B. D. Transurethral Resection Does It Require as Extensive a Preoperative Preparation as Prostatectomy? California & West Med 46: 89 (Feb.) 1937.  
19 Kretschmer H. L. Transurethral Resection Ann Surg 104: 917 (Nov.) 1936.

and others, although Davis<sup>20</sup> considers that "adequate preliminary treatment is of paramount importance continued until the renal function has become stabilized." Emmett<sup>14</sup> of the Mayo Clinic states that "drainage by catheter is employed only if nitrogen is retained in the blood," while Thompson<sup>21</sup> of the same clinic says "Let me reiterate that preliminary drainage is an absolute essential." For patients with only moderate amounts of residual urine and without impairment of renal function, it is conceded that preliminary drainage may be fairly safely dispensed with before either operation, whereas with a distinct increase in the blood nitrogen content the conservative surgeon would do well to omit this precaution before neither operation. In other words, drainage is essential for poor risks before either operation and for good risks before neither. The logical conclusion is that the duration of drainage should be fitted to the patient rather than to the operation. Personally, I much prefer to drain than be sorry and follow this procedure with all but conspicuously good risks.

The great increase in the number of resections as compared with the number of prostatectomies has been noted by many urologists and is generally recognized. Beebe<sup>1</sup> states that "few clinics in the first thirty years of this century were able to report over 1,000 cases in whom prostatectomy had been indicated and performed, whereas in the last five years a number of clinics have reported over 500 and some even 1,000 to 2,000 cases." This conspicuous increase is explained by the resectionists on the theory that patients now have less fear of prostatic operations and consequently seek relief earlier, but this belief is not shared by others, who claim that many of the operations are unnecessary. One writer suggests that "perhaps it is in such cases that preliminary treatment may be discarded." At any rate, it seems safe to make the statement that, with but few exceptions, the patient in no need of preprostatectomy or pre-resection drainage is in no immediate urgent need of a prostatic operation.

#### THE ESSENTIAL DIFFERENCE

As outlined in the preceding paragraphs, it is the opinion of the majority of urologists that the risk of resection is less than that of suprapubic prostatectomy and about the same as that of perineal prostatectomy (all in good hands), that the duration of the preliminary drainage should depend on the condition of the patient rather than on the method, that the actual procedure is more tedious and time consuming and that, in general, symptomatic relief is less complete and permanent than that following enucleation. The question which then naturally arises is "What is the essential difference between perineal prostatectomy and transurethral resection, and wherein lies the advantage of the latter?"

On the basis of mortality rate, the advantage of resection over operation by the suprapubic route is obvious, but the advantage over operation by the perineal route rests chiefly (if not solely) on the number of postoperative days in the hospital. My own average period of hospital care following perineal prostatectomy is twenty-one days, while Hinman,<sup>11</sup> following his method of plastic closure of the prostatic capsule and perineal incision, has reduced his average figure to seventeen days. He says that "the functional results (of his plastic

closure operation) are as permanent and as good as, or better than, results achieved by any other method." One may be certain that this is an accurate, conservative statement.

Emmett<sup>14</sup> has recently reported an average post-operative period in the hospital of eight days, "remaining almost constant, year to year," following resection at the Mayo Clinic. It would seem reasonable to consider this figure as a minimum average. Giving the full benefit of the doubt to the resectionist by omitting all consideration of later hospitalizations and subsequent "ambulatory treatments," and assuming that the eight-day patients, as well as Hinman's seventeen-day patients, are discharged permanently well, one must conclude that the essential difference, the best available figures for each method being compared, is nine days, which seems rather a cheap price to pay for dependability and permanence.

#### INCONTINENCE

If a substantial increase in the sales of the Cunningham incontinence clamp coincident with the advent of transurethral resection may be considered as an index of the number of cases in which incontinence results from this procedure, it may be stated that the frequency of this complication has been greatly underestimated. A communication from the Bard Company states that the estimated yearly sales of the clamp averaged from 100 to 150 during the ten years preceding 1928 and gradually doubled during the ensuing years to 1933, since which time precise figures are available, these being 384, 473, 720, 684 and 1,008 for the years 1933 to 1937 inclusive. On the basis of 432 for the first quarter of 1938, total sales for the current year should reach 1,700. It is "an ill wind that bloweth no man good."

#### CONCLUSIONS

My own thought has always been that the entire situation may be summed up concisely and fairly accurately by the statement that, whereas resection is the shorter, prostatectomy is both safer and surer. Sacrificing conciseness and brevity for greater accuracy, one may, in the light of information recently obtained, paraphrase this aphorism as follows:

Resection is usually shorter than prostatectomy, as measured by days in the hospital but not as measured by days of convalescence or by actual operating time.

Perineal prostatectomy is decidedly safer than resection in the hands of some surgeons (on the basis of their own resection figures), although there is no essential difference when the best available figures for each procedure are compared.

Prostatectomy by either route in good hands is surer than resection, in that the majority of surgeons agree that enucleation gives more dependable assurance of complete and permanent symptomatic relief.

Concerning resection, the extreme skepticism of one small minority (the nihilists) is balanced by the unbounded enthusiasm of another small minority (the panresectionists), while the great majority, exceeding 80 per cent, recognize both advantages and limitations and favor selection of cases, as determined largely by the size of the gland.

A skilful few, however, rather than fit the operation to the patient have succeeded in fitting the patient to the surgeon.

The choice as to the method of operation is individual so far as the patient is concerned and personal so far as the surgeon is concerned.

20 Davis, T. M. Transurethral Prostatic Resection with Report of 748 Cases. *South. M. J.* 28: 693 (Aug.) 1935.  
21 Thompson, G. J. Transurethral Surgery. *Texas State J. Med.* 32: 735 (March) 1937.

Patients are well served and good results obtained by both groups of skilful extremists

The mortality rate and the functional results of transurethral resection bear a definite relationship to the skill and experience of the operator

The consensus indicates that the public demand for transurethral resection is showing a tendency to decrease

The number of urologists who are tending to decrease their percentage of resections is distinctly greater than the number tending to increase this percentage

The chief if not the sole advantage of resection in the best hands over perineal prostatectomy in the best hands consists in the saving of from nine to fourteen days of postoperative hospital care

Abuse by the incompetent and the unscrupulous has caused undeserved discredit to a very valuable procedure

Transurethral resection, after passing through a typical trial and appraisal cycle, including both abuse and overcorrection, is now approaching the final stage of stability, with a clearly defined field of usefulness

It is my belief that these conclusions, which are not based on my own opinions, are essentially those which any fair-minded person would inevitably reach after reading the same hundred letters

#### SOME REFINEMENTS IN THE TECHNIC OF TRANSURETHRAL PROSTATECTOMY

REED M NESBIT, M D

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The purpose of this paper is to discuss some of the most serious complications which have tended to discredit transurethral resection and to suggest certain refinements in the technic of operation which have been demonstrated to avoid them. These complications are, first, infection and sepsis during the immediate postoperative period, second, traumatic stricture of the pendulous portion of the urethra, and, third, persisting urinary dysfunction, with cloudy infected urine, delayed urinary sepsis and occasional recurrent hematuria

Transurethral resection has become an accepted procedure by all urologists, but little agreement exists regarding the indications for and limitations on this operation. Many able and experienced surgeons believe that it should be performed only for small median lobe hypertrophies, median bars and vesical neck contractures. Other genito-urinary surgeons of equal experience and skill in prostatic operations feel that all obstructive lesions of the bladder outlet, regardless of size, should be dealt with by the transurethral approach. Surely the proponents of extreme conservatism are expressing honest opinions based on personal experiences, they cannot be accused of being entirely wrong in their views. Likewise the advocates of resection in all cases, such as Alcock Bumpus, Davis and Thompson, cannot be accused of being entirely wrong. Perhaps both groups are entirely right. Perhaps these divergent opinions are based on the experiences of men whose technical abilities with this

procedure are vastly dissimilar. Surely this operation, recognized by all as having a place in some cases, must be sound in principle. The inability of any able surgeon or group of surgeons to perform properly any sound operative procedure in all cases should not condemn that operation to the scrapheap. Neither should the superlative technical ability of a few surgeons give license to the universal practice of any difficult operation. Most urologists agree that transurethral resection is indicated in those cases in which complete removal of abnormal tissue can be accomplished. The great and outstanding exception to this rule is in cases of sharply localized early malignant changes in which certainly a perineal exposure with immediate biopsy and radical prostatectomy offers the best hope of survival from cancer of the prostate.

Since infection plays an important part in the morbidity and mortality of operation, its control and prevention are imperative. To perform a complete transurethral prostatectomy and then have the patient die of sepsis is an unhappy and sad commentary on the surgeon and the operation he has performed. It is probably true that sepsis occurs more frequently as a result of the introduction of bacteria which are entirely foreign to the patient than from organisms which the host brings with him when he comes to the surgeon. The careful preparation of the patient for catheterization or instrumentation and the aseptic care of catheters and drainage systems both before and after operation will, in a large measure, reduce sepsis to an unusual complication. It has been the practice at the University Hospital for the past four years to employ a closed, sterile irrigator drainage system for all patients requiring catheter drainage before operation, and its use is part of the postoperative routine. The entire system, wrapped in a sheet is sterilized in the autoclave. Each ward has an available supply. Catheters are introduced with aseptic technic, and the irrigating drainage system is immediately connected. The reservoir bottle is filled with 2 per cent boric acid solution in most cases. When the bladder is grossly infected, 0.25 or 0.50 per cent acetic acid is used. Frequent irrigations with this solution quickly clear up most severe bladder infections. The irrigator system is never disconnected when once put into use, the object being to provide drainage and to prevent the contamination of the bladder by accidental inoculation with organisms foreign to the host. The absence of sepsis which has resulted from the employment of these methods has justified a great enthusiasm for them.

The ultimate result of a perfectly performed resection has occasionally been marred by the development of urethral stricture. This unhappy sequel has been observed by all resectionists who have checked up on their patients but unfortunately has received practically no recognition in the literature. Bumpus aptly remarked that one had better perform some other type of prostatectomy than do a successful resection and then leave the patient with a lesion of the urethra infinitely more debilitating and difficult to treat than his prostatism.

Resectoscopes must of necessity have sheaths of large caliber, most instruments in common use being 28 or 30 French in size. Not all male urethras possess this caliber. Some urethras are normally small, some are small because of previous disease and many are limited in size because of the loss of elasticity which the urethra shares with other tissues in later life. This inelasticity is invariably confined to the penile portion. It has been

the practice of resectionists to dilate such urethras until they can accommodate the resectoscope. Some have even performed internal urethrotomy to attain the desired accommodation for large instruments. In either event the dilation has amounted to rupture or divulsion of the urethral mucosa, which can only result in stricture. Such an injury invariably occurs in the pendulous portion and at the penoscrotal angle where strictures are apt to contract rapidly and are notoriously hard to dilate. The anticipated success of resection has doubtless led to occasional unwarranted disregard of the urethra and irreparable result in some cases.

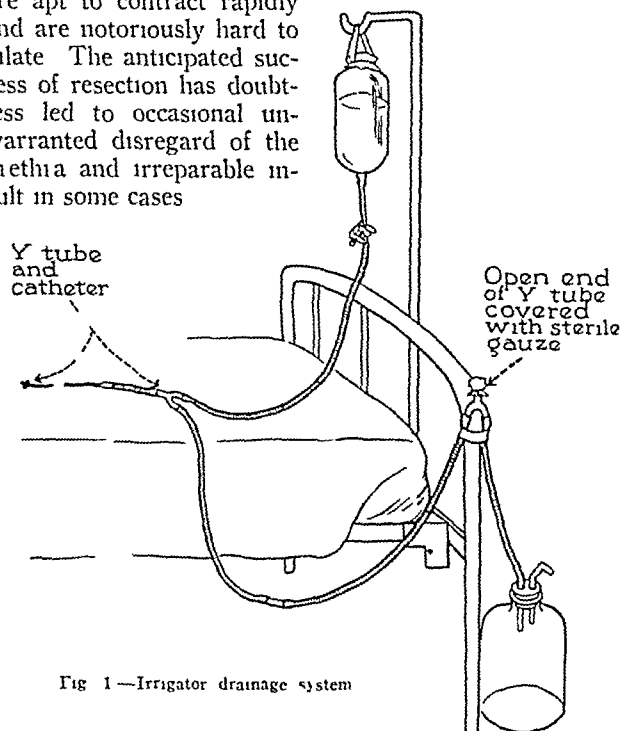


Fig 1—Irrigator drainage system

About a year ago Hugh Cabot suggested a method of averting this disaster to his colleague Dr. Thompson, who subsequently reported its use in one case.<sup>1</sup> In the discussion of Dr. Thompson's report, Dr. Cabot said, "There appears to be no doubt that stricture of the urethra and periurethral abscess with resulting fistula, most commonly at the penoscrotal angle, have been more than occasional complications of transurethral prostatectomy. It is of interest to recall that more than sixty years ago Bigelow encountered the same problem in his masterly reorganization of the operation of lithotomy which he transformed into litholapaxy. He insisted that large instruments were essential to success. Commonly enough, these could be passed but he laid down in one of his earlier papers the doctrine that, in the presence of a small urethra, litholapaxy should be done through a perineal urethrotomy and not through a divulsed urethra. Therefore, I make bold to suggest to the gentlemen of Dr. Thompson's generation, who are developing the operation of transurethral prostatectomy, that they abandon preliminary dilatation of the urethra, that if the instrument will not pass without difficulty they will be well advised to resort to a perineal boutonniere through which to carry out their operation. This wound will require no sutures, will not prolong convalescence and injury to the anterior urethra will be avoided."

Since the enunciation of these sound principles my associates and I have employed perineal urethrotomy in all cases in which the urethra has not easily admitted the free passage of a 30 French steel sound. We have

found it preferable to perform this simple procedure rather than meatotomy when the meatus is small, since even the most carefully managed meatotomy would occasionally result in stricture. Also in a few rare instances in which unusual maneuverability of the instrument was desired and the prostate was excessively long, we elected to make this approach even though the urethra could have easily accommodated the standard resectoscope.

A simple method of performing this procedure consists of introducing a grooved sound of 20 French caliber into the urethra. Gentle pressure on the handle of the sound allows its curve to project into the perineum, where, with its overlying structures, it can be grasped by the thumb and index finger of the left hand. An incision 2 cm long which passes directly down on the sound is now made. The cut edges of the urethral mucosa and the full thickness of the bulb are grasped in Allis forceps and transfixed by anchor sutures. Through this incision the resectoscope sheath is easily and safely introduced. At the end of the operation the catheter or Foley bag may be introduced either through the incision or through the entire urethra, depending on the amount of pre-existing urethral disease. With many showing inflammation of the pendulous portion of the urethra we have felt it desirable to avoid the danger of catheter trauma and have brought the catheter out through the perineal wound. When the catheter is brought out through the urethral meatus we usually take one stitch in the bulb at the site of the urethrotomy incision. A small gauze pack is then introduced into the wound and left in twenty-four hours. If the wound is not packed in this way the skin frequently closes by first intention and a small subcutaneous abscess is apt to develop.

The use of perineal urethrotomy would also permit the safe use of instruments of considerably larger size than those now available, since the bulb and membranous portion of the urethra have a lumen much greater than 30 French. Such instruments would be advantageous in many instances in which rapid resection or removal of large amounts of tissue is necessary. At our suggestion an instrument of 33 French caliber has been made available through the cooperation of Mr. Frederick Wappler. This instrument has been used in a considerable number of cases and the obvious anticipated advantages of its increased size have been realized. Using the standard size McCarthy resectoscope we have regularly been able to remove 1 Gm of tissue a minute in the average case, while with the larger instrument we have found that about 2 Gm of tissue a minute is the average.

During the past year perineal urethrotomy has been performed in 11 per cent of all resection cases. In no instance has the procedure resulted in any complication,

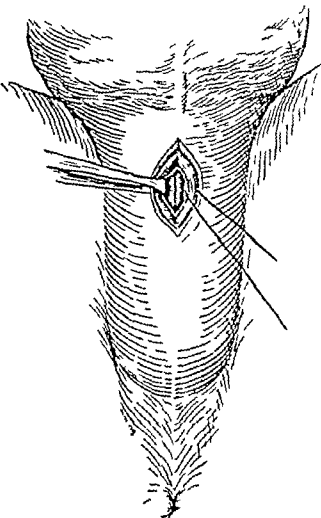


Fig 2—Anchor suture through urethral mucosa and bulb

<sup>1</sup> Thompson, C. J. Perineal Prostatic Resection. *Proc. Staff Meet. Mayo Clin.* 12: 360 (June 9) 1937.

either immediate or remote, that has in any way contributed to postoperative morbidity or discomfort to the patient. On removal of the catheter all but two patients have voided part of their urine from the incision. Many have had completely healed wounds in three days. The longest period of perineal drainage was fifteen days. Complete wound healing occurred in an average of nine days in the entire series. Postoperative check-up examinations on the majority of these patients have shown absence of any evidence of stricture in the region of the bulb, and in most instances one could scarcely see or feel any evidences of the urethrotomy scar.

During the early days of resection there appeared authoritative statements saying that the enlarged gland would shrink in size if one but removed the tissue actually giving rise to obstruction, channelizing the prostatic urethra. Experience has shown that this advice was wrong, in that a gland so resected not only fails to shrink but frequently acts as a focus for urinary sepsis. The researches of Reuben Flocks<sup>2</sup> have been of tremendous importance not only in providing an understanding of the pathologic anatomy of prostatism but also in explaining the reasons for many of the postoperative complications which have tended to discredit this operation. Flocks has shown that about 90 per cent of the hypertrophic mass of tissue derives its blood supply from the urethral arteries, which enter the prostate in the region of the internal sphincter and course distally in the substance of the lateral lobe. In transurethral resections these vessels are cut across and thrombosed at their point of entry into the gland. If the tissue supplied by these vessels is not removed at operation, it necessarily undergoes varying degrees of devitalization and may become infarcted throughout a considerable area. Patients harboring such septic infarcts may suffer recurrent obstruction, persisting abnormalities of urinary function, urinary sepsis and delayed hemorrhages. Their primary need for prostatectomy has not been supplied, and relief from the disability is dependent on the completion of the prostatectomy by either the transurethral route or some other. Thus the researches of Flocks, as well as clinical experience, have abundantly demonstrated that transurethral resection must be, in fact, transurethral prostatectomy. Surgeons who perform this operation must be sufficiently aware of their own technical limitations to employ it only when the gland is of such a size that more or less complete removal of tissue can be expected.

The limitations of this presentation do not permit a description of our technic of transurethral prostatectomy. However, one feature of the technic, which we believe is essential to complete removal of the gland, will be discussed. I refer to third dimensional perception. The instruments which are regularly used to perform this operation provide only visual perception of two dimensions. Perception of the third dimension can be obtained only through the sense of touch by rectal palpation, enabling one to estimate accurately the amount of tissue which must be excised. Pressure exerted upward or medially by the examining finger also aids materially in bringing tissue into the path of the cutting loop or blade of the instrument. Guided thus by the sense of touch as well as by sight, one can avoid the dangers of cutting too deeply in vulnerable areas and can carry resection of tissue accurately down to the readily recognized capsule of the gland.

In the past it has been our practice to perform rectal palpation at numerous times during the course of operation. While the actual cutting maneuvers were being carried out an assistant constantly maintained digital pressure over the area of excision, guiding the operator as to the thickness of the prostatic mass as well as warning him against dangerous areas. Feeling the necessity for simultaneous palpation and cutting by the operator as an added factor of safety as well as of accuracy, we suggested that our instruments be modified to permit this refinement in technic. Such modifications of the resectoscope have been ingeniously worked out by Mr. Wappler, so that the operator can now work entirely with one hand, leaving the other hand free to guide safely the excision of tissue. The use of this modified instrument not only has permitted a refinement of our technic from the standpoint of accuracy and safety but also has permitted an increase in the speed of resection without danger.<sup>3</sup>

#### SUMMARY

Transurethral prostatectomy, when properly performed, shows to advantage over other types of prostatectomy in that it carries a very low mortality rate, the morbidity is less and the period of hospitalization is greatly reduced. An important advantage to the patient is that he is saved the distress and discomfort attendant on the operative wounds incident to open operations.

Transurethral prostatectomy is a sound procedure demanding a high degree of technical skill for its proper execution. Any surgeon possessed of this skill can perform the operation with the expectation of obtaining excellent postoperative results. Such a surgeon will recognize the limits of his own dexterity and perform the operation in only those cases in which he can expect to perform a more or less complete prostatectomy. Other cases he will reserve for more appropriate surgical procedures. His dexterity, skill and experience may warrant his performing resection in 100 per cent or, perhaps, in only 10 per cent of cases.

The able resectionist will guard his patients against morbidity and mortality from needless loss of blood and from sepsis, since these complications have been largely eliminated by modern methods. He will prevent traumatic stricture occurring as a devastating sequela of an otherwise satisfactory prostatectomy.

The able resectionist will continue to bring relief to increasing numbers of sufferers, many of whom will continue to be his medical colleagues.

Refinements in our technic and improvements in our armamentarium have increased the scope of transurethral prostatectomy and have tended to decrease the limitations on it.

#### ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. DAVIS AND NESBIT

DR. H. C. BUMPUS, JR., Pasadena, Calif. Dr. Nesbit emphasized the efficacy with which sepsis can be avoided by using a closed irrigating system both before and after operation. I have employed such a system for five years and have had a minimum of febrile reactions. Formerly, when bladders were irrigated at stated intervals, the introduction of organisms foreign to the host was the rule, for the distal end of the catheter was invariably contaminated. The insurance of good functional results depends on the removal of all the obstructing prostate, not just a portion of it, and this must be done without producing other obstruction in the form of urethral

<sup>2</sup> Flocks, R. H. Arterial Distribution Within the Prostate Gland. Its Role in Transurethral Prostatic Resection. *J. Urol.* 37: 524-548 (April) 1937.

<sup>3</sup> Nesbit, R. M. A Modification of the Stern-McCarthy Resectoscope Permitting Third Dimensional Perception During Transurethral Prostatectomy. *J. Urology* to be published.

stricture Dr Nesbit's report of successfully employing Dr Cabot's suggestion of working through a perineal incision is valuable. This procedure insures against strictures of the anterior part of the urethra, which in the past have been a serious complication of resection. The perineal approach has the added advantage of making it possible by passing a larger caliber instrument to shorten the duration of the operation by more rapidly removing portions of the obstruction. Dr Nesbit's modification of the resectoscope that permits the palpation of the gland while it is being operated on will appeal to all who have formerly depended on the finger of the assistant. Dr Davis presented a poll of what men throughout the country think about transurethral prostatic surgical procedures. The conservatism of this method rather than the enthusiasm for an ingenious instrument and the desire to develop a personal technical skill with it, to my mind, is impressing the urologist more and more. I am in a more fortunate position than Dr Davis in that I have seen prostatectomy under what may be called the three periods during the last twenty-five years under standardized conditions. The first period was before it was possible to estimate preoperative risks by determinations of the blood nitrogen level. The second period may be designated as that in which combined preoperative tests plus the splendid and perfected operative technique developed by Dr Hunt at the Mayo Clinic seemed to have made suprapubic prostatectomy as safe an operation as is humanly possible. Finally, I have participated actively in, the third period of prostatic surgery and can, in retrospect, judge the progress made. When there is available a method of relieving prostatic obstruction that results in less than 2 per cent mortality in patients over 70, may I submit in defense of myself and the other seven members of what Dr Davis calls the totalitarian group the question whether we must apologize for our belief that if the urethra will admit the instrument the gland can be successfully and satisfactorily removed.

DR ALFRED I. FOLSOM, Dallas, Texas. Dr Davis would have one believe that in the days of perineal prostatectomy and suprapubic prostatectomy these two procedures were handed down as Minerva was, "full panoplied from the head of Jove," perfect in all their details. Let no one hark back to the good old days when everything was perfect, because things were not perfect at all. I want to emphasize what Dr Davis said. Prostatic resection is going to become, in an increasing degree, a specialty within a specialty. I do not agree with Dr Davis that it is much more tedious and tiring for the patient, because it isn't, so far as my observations go. It is a highly technical procedure and therefore ultimately is going to rest in the hands of the few surgeons who have a particular type of skill and a particular type of nervous system which will allow them to piddle at this job, because it is a piddling operation. It is a nerve racking and a trying thing to the operator. I would infinitely rather do a suprapubic prostatectomy than a prostatic resection. I have been doing prostatic resections now for seven years and I have had satisfactory results. Is there any reason why I should continue this policy if I were not getting satisfactory results? If all these horrible bugbears that have been depicted were materializing, is there any reason why I should continue this rather than go back to the good old halcyon days of suprapubic prostatectomy, when I had no trouble whatever? Hunt a number of years ago reported from the Mayo Clinic on suprapubic prostatectomy that after 70 the mortality jumped amazingly, and that has been every one's experience. Gundersen reported 100 cases of resection in men over 70 with a mortality of something like 2 per cent. That statement alone is enough to satisfy those who are not convinced that there is real merit in this operation. I have used Dr Nesbit's procedure, it is amazing how nicely it works, and it does give one an amazing movability of the instrument.

DR SIDNEY OLSEN, San Francisco. There are definite indications for the various procedures. The prime factor is the vesical type of obstruction, whether it is a bar of the median lobe or of the posterior commissure or a generalized contraction of the neck, such as one sees with the ring type of hypertrophy and occasionally with malignant change. With the intravesical and the intra-urethral type of enlargement one has another consideration to make. Infection is the big factor, and if its likelihood both before and after operation can be cut down, a lot will have been accomplished. I would ask Dr Nesbit if

he has been trying drainage through the perineum, as he does with external urethrotomy prior to or at the time of resection. Another infection that sometimes prolongs the illness is vesiculitis, which is commonly overlooked. I use vasoligation as a routine to cut down the likelihood of epididymitis, therefore I feel that a course of massage sometimes is indicated following the resection, to clear up some of the pyuria. One of the shortcomings of transurethral resection is that with early carcinoma that can be palpated through the capsule one naturally will think of a perineal procedure for biopsy at least, and probably complete enucleation of the prostate and capsule. But many times a nodule of carcinoma is situated in one of the hyperplastic lobes, and in the transurethral resection one does not always penetrate so deeply as to pick it up. However, with a perineal operation the chances are that one will be able to pick up such a small nodule, at least in cutting through the capsule or in removing the gland in toto. I feel that any type of prostate can be removed by the perineal route unless the patient is physically unable to get in the proper position.

DR B. H. HAGER, Los Angeles. Drs Davis and Nesbit have given a comprehensive analysis of the present day attitude toward prostatic surgical measures. Conflicting views are naturally in evidence, some of which are none too charitable and argue for an unbiased evaluation. I am sure it is not the intention of the speakers to convert urologists to any single procedure. There is no denying that all methods of approach to the removal of the prostate have decided merit. The remarkable results and low mortality from the various techniques now employed are established facts. To adapt a procedure to the patient rather than the patient to the procedure may not always be regarded as good surgical judgment, however, it becomes a matter of personal judgment, based on training, experience and dexterity. In the hands of experts in their respective fields, the choice of operation apparently offers no problem. For the less specialized the greatest good will come from the selection of the method most suitable to the patient and the operator's skill.

DR N. G. ALCOCK, Iowa City. If one is going to relieve obstruction one has to take out tissue. The argument is that with prostatic resection that can be done. Dr Nesbit has made a great contribution to this very thing by using the larger instrument, so that it can be done in a shorter period. I prefer never to operate on a patient for more than forty-five minutes at a sitting. In the average case one should remove from a gram to a gram and a half a minute, and with the larger instrument I know it can be done much more rapidly than that. In fifty consecutive operations done in April and the first part of May the average amount of tissue removed was 31 Gm., which is getting fairly close to taking out the entire prostate. Of course that excludes cases in which one removes only 8 or 10 or 12 Gm., which I think it only fair to exclude because one wouldn't have done a prostatectomy in them. Of these fifty patients there were eight, or 16 per cent, over 80. There are two things that I want to know about any series of prostate operations that are reported: (1) the age in the decades, and (2) the mortality rate in the decades. I believe that if one takes patients with prostatic disease as they come the average age is going to be close to 73. Of these fifty there were eight, or 16 per cent, over 80, and there were 75 per cent over 70. I also want to know how many patients died during the period this series covered. When I had done 1,500 of these operations, eighty-eight patients had died, but during that period I had had 129 deaths among patients who had not been operated on. Knowing those two things, one can visualize the type of series under consideration and get some gauge of the value of the procedure. I think the physician should be privileged to do the operation that he can do best for the patient, and I hope the time never comes when a bureau in Washington or elsewhere is going to tell me what I am going to do for my individual patient. As urologists we are not going to settle this question of perineal operations or suprapubic prostatectomies or resections. The one who is going to decide that is the general practitioner who takes care of the patient after we get through with him.

DR A. B. CECIL, Los Angeles. For years I have been reporting a mortality rate of less than 2 per cent with Young's perineal prostatectomy. One thing that resectoscopy has done has been to bring out the frightful death rate of suprapubic



prostatectomy, a thing never known before. In various clinics throughout this country it has varied from 17 to 90 per cent. All perineal operations such as median perineal prostatectomy, Young's perineal prostatectomy and Chetwood's perineal incision had a low death rate, but with Dr Nesbit's operation the external sphincter must be carefully guarded or incontinence of urine will follow. Incontinence of urine does not follow Young's perineal prostatectomy because, as I have previously pointed out before this section, in this operation the external sphincter is carefully preserved. I see no sense in doing median perineal prostatectomy by means of a resectoscope when one can by Young's method easily expose the prostate and enucleate the obstructing adenoma, which in my hands has required on an average only twelve minutes. I am sure that perineal resectoscopy is an unsurgical procedure and is not the high type of operation which urologists have been trained to perform and which has raised this section to the high position which it occupies. I see nothing remarkable about Dr Thompson's mortality rate, but I should like to ask why his statistics are all for patients over 70 years of age. I should like to ask what happened to patients under 70. Again one hears about hospitalization. When I speak of hospitalization I am speaking of hotelization and all other "izations" until the patient is well, and I am not speaking of persons as cured who are in danger of hemorrhage or embolus or who have burning for months or even years afterward. I am talking about patients who are out of danger and have normal functional results. Furthermore, I have had to reoperate in but one case in the many years that I have been doing Young's perineal prostatectomy.

DR EDWIN DAVIS, Omaha: I congratulate Dr Nesbit on his convincing presentation. If I were to presume to criticize any one, it would be that small minority of physicians who refuse to recognize any indications for resection rather than the small minority who refuse to recognize any limitations. I believe there is no essential disagreement. Let each do that which he does best.

## TREATMENT OF GASTROINTESTINAL TUBERCULOSIS

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This study comprises a group of patients known to have active, far advanced pulmonary tuberculosis complicated by intestinal tuberculosis.

In evaluating the various types of medical treatment suggested for the cure of intestinal tuberculosis, it is necessary to assume that the patients under observation are suffering from active intestinal tuberculosis. It is not our aim in this paper to discuss in detail the methods used in arriving at a clinical diagnosis; they will be submitted for publication at a later date. These methods of diagnosis were followed in approximately 553 cases over a period of five years. Fifty-five patients came to autopsy, and of these the diagnosis was correct for 86.4 per cent. Two of those who survived had tuberculous ulcers of the sigmoid flexure at the onset of treatment, as demonstrated by our proctologist, Dr Clemens Martin. These ulcers were completely healed during the course of treatment (table 1).

The literature makes no mention of any specific drug therapy in the treatment of intestinal tuberculosis, but

in general the high vitamin, high mineral diet has been advocated. Calcium therapy, intravenous, intramuscular or oral, has been recommended by some authors and heliotherapy, with or without emphasis on the diet, by others.

Ringer and Minor<sup>1</sup> in a study of thirty cases of tuberculous diarrhea in 1922 reported encouraging results with from 5 to 10 cc of a 5 per cent solution of calcium chloride given intravenously at frequent intervals.

Later Roberts<sup>2</sup> concluded from his experience with calcium chloride given intravenously in more than seventy cases that the beneficial results justified the use of calcium chloride as a standard treatment, along with heliotherapy and dietetic treatment, for practically all patients showing evidence of gastrointestinal involvement.

Cantarow<sup>3</sup> in 1931 suggested that calcium therapy for the diarrhea of intestinal tuberculosis might be beneficial through its inhibitory effect on peristalsis, through its possible beneficial effect on the local inflammatory process and through its local or general dehydrating effect. In any event, it has a tendency to relieve abdominal pain, intestinal bleeding and diarrhea in most cases.

From the many authors that could be cited concerning the efficacy of calcium therapy one would be led to believe that the two general factors involved are (1) the pharmacologic action of calcium and (2) the replacement of the calcium lost through the dehydrating action of the diseased intestinal tract, together with mineral loss through the sweat glands. Hardt and Palmer<sup>4</sup> through their experiments on intermittent heat sweats emphasized the possible demineralization in tuberculosis. Then Hardt and Sharer<sup>5</sup> reported an appreciable loss of calcium and considerable loss of chlorides through the sweat glands by normal subjects during intermittent periods of sweating.

Bauer, Salter and Aub<sup>6</sup> suggested the intravenous use of calcium to relieve certain types of intestinal and cholecystic pain.

A deficiency of calcium in the circulatory fluids leads to increased excitability of the neuromuscular system, as seen, for example, in tetany. According to the Council on Pharmacy and Chemistry, the administration of calcium salts decreases the neuromuscular irritability in such cases.

Although the diet outlined by us is adequate in calcium for the normal person, it may prove deficient because of the extra losses of calcium from the tissues through the bowel and sweat glands. The good results obtained with calcium therapy may be largely due to the replacement of calcium in the tissues, together with the pharmacologic action of calcium.

The work of Wolbach and Howe<sup>7</sup> indicates that the respiratory and the gastrointestinal tract are more susceptible to infections when there is a vitamin A deficiency. Excessive vomiting and diarrhea, in addition

1 Ringer P H and Minor C L. *Am Rev Tuberc* 5: 876 (Jan) 1922.

2 Roberts E H. *Am Rev Tuberc* 12: 29 (Sept) 1925.

3 Cantarow Abraham. *Calcium Metabolism and Calcium Therapy*. Philadelphia: Lea & Febiger, 1933.

4 Hardt L L and Palmer Alice. *Am J Digest Dis & Nutrition* 4: 489 (Oct.) 1937.

5 Hardt L L and Sharer R R. Paper read before the Chicago Tuberculosis Society in May 1936.

6 Bauer Walter, Salter W T and Aub J C. *Studies of Calcium and Phosphorus Metabolism: Use of Calcium Chloride to Relieve Peristaltic Pain*. J A M A 96: 1216 (April 11) 1931.

7 Wolbach S B and Howe P R. *J Exper Med* 42: 753 (Dec) 1925.

From the City of Chicago Municipal Tuberculosis Sanitarium. Aided by two grants from the Council on Physical Therapy, American Medical Association.

Read before the Section on Gastroenterology and Proctology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 16, 1938.

to other processes interfering with metabolism of fats, might readily lead to a vitamin A deficiency<sup>8</sup>

It has been established by the literature and our clinical experience that deprivation of vitamin B<sub>1</sub> results in anorexia and gastrointestinal hypotonicity. McCarrison<sup>9</sup> as early as 1921 observed intestinal stasis and a degeneration of Auerbach's plexus in animals on diets deficient in vitamin B and diets deficient in vitamins A and B. Russell<sup>10</sup> was able to overcome anorexia by injecting units of crystalline vitamin B<sub>1</sub>. Glassberg<sup>11</sup> stated that in treating uncomplicated malnutrition he has found vitamin B concentrate helpful in enhancing appetite. Vorhaus<sup>12</sup> suggested that so-called secondary beriberi might readily be encountered in association with chronic tuberculous gastro-enteritis. He also found that, when vitamin B<sub>1</sub> deficiency is responsible for anorexia and weakness, response usually follows the

TABLE 1—Comparative Value of the Results of Clinical Diagnosis and of X-Ray and Proctoscopic Examination, Diagnostic Survey of 465 Cases, in Fifty-Five of Which Autopsy Was Done\*

	Positive		Doubtful		Negative	
	No of Cases	Per centage	No of Cases	Per centage	No of Cases	Per centage
Clinical diagnosis	410	86.1	55	11.5		
X ray diagnosis	268	56.2	63	13.2	92	19.3
Proctoscopic examination	19	3.9			336	70.5

Patient Too Ill for Examination

	No of Cases	Percentage
X ray diagnosis	43	8.8
Proctoscopic examination	110	23.1

Fifty Five Cases

	Positive		Doubtful		Negative	
	No of Cases	Per centage	No of Cases	Per centage	No of Cases	Per centage
Clinical diagnosis	48	86.4	7	12.6		
X ray diagnosis	29	52.2	7	12.6	4	7.2
Proctoscopic examination	3	5.4			33	59.4

Patient Too Ill for Examination

	No of Cases	Percentage
X ray diagnosis	1	2.0
Proctoscopic examination	19	34.7

\* Eighty-eight cases have been added since this summary was made

administration of 150 international units of vitamin B<sub>1</sub> daily for two weeks, when the presence of severe deficiency from vomiting diarrhea or gastrointestinal disease renders absorption of the vitamin by oral administration inadequate, he advised the use of crystalline vitamin B<sub>1</sub> solution made especially for parenteral injection.

The Council on Pharmacy and Chemistry<sup>13</sup> states that vitamin B<sub>1</sub> may be of value in correcting and preventing anorexia of dietary origin in certain cases.

The importance of vitamins C and D in the healing of intestinal ulcerations was suggested by Grant<sup>14</sup> in 1926 in her work on guinea pigs. McConkey,<sup>15</sup> in 1929, applying the same principle to patients suffering from

intestinal tuberculosis, used cod liver oil and orange or tomato juice and reported encouraging results. An increased need for vitamin C seems definitely indicated. Faulkner and Taylor<sup>16</sup> studied fifty patients with various infectious diseases who were known to be on diets otherwise adequate in vitamin C, in the presence of chronic, active infection such as advanced pulmonary tuberculosis, additional doses as large as from 300 to 500 mg. were required to bring the blood value up to normal and maintain it there. Radford, de Savitsch and Sweany<sup>17</sup> studied the effects of vitamin C in a series of 111 tuberculous patients. There seemed to be a slight improvement in the blood picture of those treated with daily doses of 250 mg. of crystalline vitamin C over the control group and to a slight extent over those receiving 500 cc. of orange juice daily.

Direct exposure of the skin to ultraviolet rays from the sun or from artificial sources results in the formation of vitamin D within the organism, but the Council on Pharmacy and Chemistry does not recognize statements or implications that vitamin D has all the beneficial effects of exposure to sunshine. Since it has been shown by Tonney, Hoeft and Somers<sup>18</sup> that the ultraviolet content of sunshine in Chicago during October, November, December, January and February is seldom sufficient to produce a minimum erythema dose, it became necessary to resort to artificial radiation instead of natural sunlight in our series of cases. The dose was the same as that adopted by Coulter and Carter<sup>19</sup> in the treatment of pulmonary tuberculosis with ultraviolet radiation. The radiation from both natural and artificial sources was administered by a modified Rolher method to secure a faint erythema over increasing areas of the body, starting at the feet.

Erickson,<sup>20</sup> in a study of eighty-one patients treated with ultraviolet rays at Saranac Lake, N. Y., found that 24.7 per cent had entire relief from symptoms, 47 per cent were much improved, 13.5 per cent were less though definitely improved and 14.8 per cent were unimproved. Some systemic improvement occurred in 85 per cent. The patients were followed for an average of from twelve to eighteen months after symptoms had ceased.

In a series of 360 patients treated with artificial heliotherapy Brown and Sampson<sup>21</sup> found that 24 per cent were apparently cured, 25 per cent were markedly improved and 33 per cent were slightly or considerably helped, while 18 per cent obtained no benefit. In other words, 82 per cent showed signs of improvement.

It is reasonable to assume that when pulmonary tuberculosis is complicated by intestinal tuberculosis a relative avitaminosis and a demineralization are likely to exist. Therefore the need of a high vitamin and high mineral diet for the relief of intestinal involvement becomes apparent. It was our object to give a practical application of the value of a high vitamin, high mineral smooth diet, of calcium therapy and of heliotherapy. We arbitrarily limited our study to patients who had been under treatment for six months or more. The

8 Blackfan K. D. and Wolbach S. B. *J. Pediat.* 3: 679 (Nov) 1933.  
 9 McCarrison Robert. *Studies in Deficiency Diseases*. London Oxford University Press, 1921.  
 10 Russell W. R. *Edinburgh M. J.* 43: 315 (May) 1936.  
 11 Glassberg B. *J. Missouri M. A.* 33: 132 (April) 1936.  
 12 Vorhaus M. G. *Am. J. Digest. Dis. & Nutrition* 3: 915 (Feb) 1937.  
 13 Council on Pharmacy and Chemistry. *New and Nonofficial Remedies*. Chicago: American Medical Association, 1938, p. 471.  
 14 Grant A. H. *J. Infect. Dis.* 39: 502 (Dec.) 1926.  
 15 McConkey M. *Am. Rev. Tuberc.* 21: 627 (May) 1930.

16 Faulkner J. M. and Taylor F. H. L. *J. Clin. Investigation* 15: 472 (July) 1936.  
 17 Radford Molly, de Savitsch Eugene and Sweany H. C. *Am. Rev. Tuberc.* 35: 784 (June) 1937.  
 18 Tonney F. O., Hoeft G. L. and Somers P. P. *J. Prev. Med.* 4: 139 (March) 1930.  
 19 Coulter J. S. and Carter H. A. *The Treatment of Pulmonary Tuberculosis by Ultraviolet Radiation*. *J. A. M. A.* 105: 171 (July) 20, 1935.  
 20 Erickson R. J. *Rev. Gastroenterol.* 3: 238 (Sept.) 1936.  
 21 Brown Lawrason and Sampson H. L. *The Curability of Intestinal Tuberculosis*. *J. A. M. A.* 88: 1472 (May 7) 1927.

groups were treated as follows To study the comparative efficacy of the methods we divided our patients into eight groups

Group 1-A was given the high vitamin, high mineral, smooth diet, plus ultraviolet radiation

Group 1-B was given the same diet as group 1-A, without the radiation

Group 2-A received calcium gluconate 15 grains (1 Gm) by mouth a half hour before meals, plus the diet, plus ultraviolet radiation

Group 2-B received the same treatment as group 2-A except for the ultraviolet rays

Group 3-A received 10 cc of a 10 per cent solution of calcium chloride intravenously twice a week, plus the diet, plus ultraviolet rays

Group 3-B received the same treatment as group 3-A except for the ultraviolet radiation

Group 4-A received 10 cc of a 10 per cent solution of calcium gluconate intramuscularly two or three times a week, plus the diet, plus ultraviolet rays

Group 4-B received the same treatment as group 4-A except for the radiation

All patients were advised to keep the abdomen warm by wearing a flannel abdominal binder Those suffering from constipation were advised to use liquid petrolatum or plain agar as occasion demanded Those with severe diarrhea were given bismuth preparations and opiates as a temporary measure to control it Incidentally, we found that proper care of the mouth is useful from the standpoint of prophylaxis This fact was arrived at in a careful study of fractional sputum examinations in a series of twenty-one cases We were able to show definitely that chewing paraffin and expectorating for one half to three quarters of an hour cleanses the mouth more thoroughly than the use of ordinary mouth washes A detailed report will be submitted for publication at some future date

The diet was smooth and of high vitamin, high calory and high mineral content In cases of excessive perspiration or those of prolonged vomiting or diarrhea, we increased the mineral content by administering from one-half to 1 teaspoonful of table salt in twenty-four hours As a diet we feel that the one outlined by Bergen and Sister Victor<sup>22</sup> is of value in the treatment of intestinal tuberculosis as well as other chronic infections of the bowel The general plan of the diet we administered was similar to that described by these authors Calcium and phosphorus in adequate amounts were supplied by milk, while vegetables, fruits, meats, liver and eggs contributed the required iron Vitamin B, the appetite-stimulating vitamin, was afforded by brewers' yeast tablets, bananas oranges and tomatoes, while milk butter and green vegetables furnished the necessary vitamins A and D Cod liver oil furnished an additional amount of vitamins A and D Each patient was advised to reinforce the diet by taking from 4 to 6 ounces (120 to 175 cc) of orange juice and the same amount of tomato juice daily, in order to get an additional supply of vitamin C (Mimeographed copies of our diet list will be furnished on request)

In paralleling the pulmonary and intestinal pictures we aimed to obtain a common measure of the abatement or aggravation of the symptoms Therefore in evaluating the pulmonary progress of our patients, we found it convenient to deviate from the strict National classi-

fication, without essentially violating its principles We have classified the pulmonary state of our patients as "improved," "stationary" or "worse" "Improved" is a designation applied to states from arrest to quiescence By "stationary" we refer to that vague state of abatement of symptoms attended with a fair degree of comfort but with no pronounced tendency to definite arrest, recovery or aggravation Admittedly, the personal equation will enter greatly into the evaluation of that state, hence it is a somewhat defective classification "Worse" is self explanatory

We have also taken into consideration the various surgical measures employed so far as the pulmonary condition is concerned and have tabulated them in order to determine whether or not the surgical procedure may have some bearing on the improvement not only in the pulmonary but also in the gastrointestinal condition (table 2)

The criteria of gastrointestinal improvement are based on comparison of the symptoms, physical appearances and laboratory examinations, including x-ray and proctoscopic studies and complete analysis of the blood, before treatment is instituted and six months or more after treatment

TABLE 2—Collapse Therapy Its Apparent Bearing on the Treatment of Gastrointestinal Tuberculosis

Group	Gastro Intestinal Condition Improved	Collapse Therapy	Gastro Intestinal Condition Stationary	Collapse Therapy	Gastro Intestinal Condition Worse	Collapse Therapy
1 A	14	10	6	6	3	1
1 B	23	19	7	4	9	3
2 A	22	19	2	2	1	1
2 B	27	23	9	7	8	6
3 A	20	13	2	1	2	1
3 B	18	16	3	0	9	4
4 A	19	17	3	2	3	1
4 B	20	17	3	3	3	2
	163	134	37	25	38	19

In brief, the general group of gastrointestinal symptoms at the onset of treatment includes loss of appetite, nausea, vomiting, abdominal pain, diarrhea or constipation or diarrhea alternating with constipation and loss of weight or failure to gain weight The criterion of improvement is a marked decrease in the frequency as well as in the duration of the symptoms, or their complete amelioration, together with a decided gain in weight or at least a failure to lose weight In a number of instances the gastrointestinal improvement apparently exceeded the pulmonary improvement Improvement in the abdominal condition is characterized by diminution or absence of rigidity and lessening or disappearance of local tenderness Slight to moderate localized abdominal abnormalities may persist even after a marked gain in weight and a complete disappearance of symptoms X-ray evidence of lessened irritability of the bowel usually accompanies symptomatic improvement and diminution of physical signs This has been demonstrated in a number of instances by x-ray examination of the gastrointestinal tract six months or more after medical treatment has been instituted The proctoscope has been of value in two instances in which definite ulcers which could be seen in the lower portion of the bowel before treatment was begun had entirely healed after six months' medical treatment The blood picture failed to show any definite changes characteristic of improvement In fact, in every group there was a

<sup>22</sup> Bergen I A and Mary Victor Sister Diet in Intestinal Disorders I A M A 97: 151 (July 19) 1931

slight tendency for the red blood count to decrease during the six months or more of treatment

The cases studied for this report numbered 238. In reviewing table 3, we find that patients receiving calcium by mouth, intravenously or intramuscularly, with or without ultraviolet radiation, showed a more definite trend toward improvement than did groups 1-A and 1-B, who did not receive calcium. Calcium taken by mouth was as effective as that received intravenously or intramuscularly. The patients receiving calcium gluconate or calcium chloride plus ultraviolet radiation seemed to show a higher percentage of improvement than those on a diet, without calcium, plus radiation. Patients who did not receive ultraviolet radiation, groups 1-B, 2-B and 3-B, showed a lower percentage of improvement than the corresponding groups receiving radiation. Except in group 4-B, in which the improvement was practically equal to that in group 4-A, ultraviolet irradiation apparently decreased the

A high vitamin, smooth, high mineral diet is not as effective alone as with either ultraviolet irradiation or calcium therapy or as ultraviolet irradiation with calcium therapy.

Collapse therapy is an aid in the treatment of gastrointestinal tuberculosis, probably through the improvement in the pulmonary condition and the resulting decrease in the number of bacilli in the sputum.

Cleansing the mouth by chewing paraffin and expectorating for one half to three quarters of an hour after clearing the lungs by coughing is a practical measure in the prevention of intestinal tuberculosis as well as in its active treatment.

#### ABSTRACT OF DISCUSSION

DR DESCUM C. MCKENNEY, Buffalo. In the proctologic service of the Buffalo City Hospital there were 115 patients with pulmonary tuberculosis in various stages, and all with positive sputum were given a sigmoidoscopic examination regardless of intestinal symptoms, and in only four were ulcers found. As many of these patients had gastrointestinal symptoms, it shows that the sigmoidoscope is not of great value in making a diagnosis and also that lesions are situated higher up. In the treatment of gastrointestinal tuberculosis it is difficult to evaluate the worth of the different agents used. The authors have employed the well recognized treatment of high caloric, high vitamin and low residue diet and enhanced the treatment by adding calcium therapy, which they have found of still greater value with ultraviolet radiation. Dr Aitken of the Niagara Sanitarium believes that intestinal tuberculosis is practically always due to pulmonary tuberculosis with cavitation and has stated that since the use of collapse therapy in about 70 per cent of all his cases intestinal disease has been rare except in terminal cases, and that, when present, collapse therapy usually clears it up quickly. My experience parallels his. For acute painful conditions in the anorectal region, such as fissure and abscess, emergency surgery must at times be done. For the best results in less acute conditions, essential surgery should be postponed until the intestinal condition shows improvement, the criterion of which is pulmonary improvement. As in both these conditions there is an avitaminosis and demineralization, the authors' suggestion as to correction should improve surgical prognosis greatly. McConkey, in persistent diarrhea, gives intravenous calcium chloride until relief is obtained and also gives 2 Gm of bone phosphate four times daily to those who usually do not respond well to treatment when they cannot take a quart of milk daily. Intestinal tuberculosis begins in the ileocecal region, no doubt because of the narrowing of the bowel and resulting concentration of ingested tubercle bacilli. The authors' method of mouth cleansing should sidetrack the flow and be a valuable prophylactic measure. When the sputum becomes normal the intestinal condition improves.

DR HARRY GAUSS, Denver. As a preliminary to treatment it is important to decide just what is meant by "intestinal tuberculosis," because there exists a contradiction as to the incidence of this disease. There are, on the one hand, autopsy statistics from such excellent sources as Brown and Sampson, Schweigert, Schwatt and others, who state that from 50 to 80 per cent of those having pulmonary tuberculosis have intestinal tuberculosis. However, common clinical experience looks askance at these figures. At the Trudeau Sanatorium a careful study was made for the incidence of intestinal tuberculosis. In a study of some 1,800 patients with pulmonary tuberculosis they were able to demonstrate clinically intestinal tuberculosis in about 8 per cent of the patients. Yet from the same institution come autopsy statistics to prove that 50 or more per cent of those having pulmonary tuberculosis also have intestinal tuberculosis at the time of autopsy. It is evident that we are dealing with two different concepts, a pathologic and a clinical one. The pathologist is talking about anatomic alterations he finds at the autopsy table, which at times may be nothing more than terminal manifestations of the disease, whereas the clinician is talking about a symptom complex which produces morbidity and which he is

TABLE 3—Comparative Study of the Clinical Progress of Gastrointestinal and Pulmonary Tuberculosis, Percentages

No. of cases	20	39	20	44	24	39	20	26
	Group 1 A	Group 1 B	Group 2 A	Group 2 B	Group 3 A	Group 3 B	Group 4 A	Group 4 B
Gastrointestinal Improved	36	58.8	88	39.4	83.2	59.4	76	77.0
Stationary	32	17.9	8	19.8	8.3	9.9	12	11.5
Stationary and Improved	68	76.7	96	79.2	91.5	69.3	88	88.5
Worse	12	23.0	4	17.6	8.3	29.7	12	11.5
Pulmonary Improved	8	23.0	48	31.7	41.6	99.7	24	27.0
Stationary	6	35.8	36	24.9	37.4	36.3	56	50.0
Stationary and Improved	64	58.8	84	56.6	79.0	66.0	80	77.0
Worse	36	40.0	16	20.4	20.8	33.0	20	23.0
Died (Gastrointestinal Conditions at Death)								
Improved	0	1	1	1	0	1	0	2
Stationary	2	0	0	0	0	1	1	1
Stationary and Improved	2	1	1	7	0	2	1	3
Worse	1	4	0	7	0	6	1	2

symptoms or at least kept them stationary in the larger percentage of cases with or without calcium therapy.

The pulmonary picture to some extent paralleled the gastrointestinal picture. If cases of improved and stationary pulmonary tuberculosis are combined, the number compares favorably with that for a combination of cases of improved and stationary gastrointestinal disease. Patients who received pulmonary collapse showed a relatively greater percentage of intestinal improvement than those who did not receive it. To sum up, of the entire series of 238 patients 163 showed gastrointestinal improvement. Of the improved group 134, or 82.3 per cent, had had collapse therapy. The disease was stationary in thirty-seven, of whom twenty-five, or 67.8 per cent, had had collapse therapy, while of the thirty-eight who were worse only nineteen, or 50 per cent, had had collapse therapy.

#### CONCLUSIONS

Calcium given by mouth, intravenously or intramuscularly appears to have definite therapeutic value in the treatment of intestinal tuberculosis. One method of administration has no particular preference over another.

Ultraviolet irradiation plus calcium therapy seems to have a slightly more beneficial effect than calcium therapy without irradiation.

called on to treat. In Denver we have set up criteria for the determination of intestinal tuberculosis. First, we observe that in adults it occurs usually in those having far advanced pulmonary tuberculosis. Some of the common signs and symptoms are diarrhea, cramps after eating, nausea, abdominal tenderness, pain over the colon and sometimes abdominal rigidity. Some of the x-ray manifestations are spastic filling defects of the ascending colon and increased irritability of the large bowel, and stasis of the small bowel. With the stasis goes segmentation and some dilatation, together with some gastric retention. However, all these signs and symptoms are merely manifestations of increased irritability of the colon and small bowel, and nothing more, and since many other conditions may produce manifestations of increased irritability, such as irritable colon, intestinal parasites and mucous colitis, it is necessary to exclude by careful differential diagnosis all the other things a patient may have, to make sure we are dealing with intestinal tuberculosis and not some other incidental digestive disturbance.

DR CLEMENT L. MARTIN, Chicago. The study just presented adds valuable data to the therapy of tuberculous enterocolitis. It is only by the comparison of this with similar studies that current therapy can be accurately evaluated. Of paramount importance is the question of diagnostic criteria. Agreement must be reached on what constitutes a sound basis for diagnosis. As to proctoscopic examination, it is of little consequence in this disease in institutional cases, diagnosis was made on the basis of the proctoscopic observations in only about 3 per cent of this series. Of course it is higher in the far advanced cases, being 25 per cent in one series of this particular group reported by me several years ago. In general, however, this examination is not particularly helpful in the diagnosis of institutional cases, in too many the disease is above the reach of the proctoscope. If ulcers are seen, it gives evidence of great value and then a direct diagnosis is generally possible. On the other hand, it is of great importance in the differential diagnosis of ulcers in the terminal bowel in ordinary practice. My own experience urges me to emphasize that, outside of institutions for the tuberculous, ulcers visible with the proctoscope are usually not tuberculous. If they are tuberculous, the pulmonary disease is nearly always so advanced and easily diagnosed by roentgenogram that mistakes should be rare.

DR MORRIS WEISSMAN, Chicago. Dr Gauss's suggestions concerning the diagnosis of intestinal tuberculosis are well taken, however, this paper covers treatment only. I should like to amplify a few points that were brought out. Not infrequently in the course of our study we were called on to decide whether a given toxic state was pulmonary or intestinal in origin. The final decision rested on repeated physical examinations over an extended period. Thus we were able to observe the current changes in the physical signs in either system. Quite often the two did not parallel. Not uncommonly the lungs would show improvement in the disease process while the intestine would simultaneously show progression, or vice versa. The more favorable intestinal course observed in the pulmonary collapse cases, while largely accounted for by the removal of a toxicity-generating focus and thus enhancing the defensive body mechanism, may also be due to the fact that those cases very likely are recruited from a class of people who have ample defense mechanisms to begin with, and thus the intestinal involvement is seldom of the fulminating type. In some cases, then, the improvement in the two conditions is merely parallel rather than interdependent. Concerning the general efficacy of the treatment as observed by us it may be stated that even in the cases in which a downgrade course proved inevitable, an amelioration of the distressing symptoms was generally noted. The study bearing on prophylaxis was based on the generally accepted belief that intestinal tuberculosis results from the repeated swallowing of sputum. Anything that would reduce the bacillary content of the sputum would thereby prove good prophylaxis. Paraffin showed the greatest reduction in the bacillary content and hence proved to be an ideal cleanser. There remains to be seen whether the feces will actually show a reduced bacillary content following repeated cleansing of the mouth by paraffin. Should it prove so, we may perhaps look toward a reduction in the incidence of intestinal tuberculosis by the use of paraffin as an oral cleansing agent.

## THE ERYTHROCYTE IN SICKLE CELL ANEMIA

MORPHOLOGY, SIZE, HEMOGLOBIN CONTENT,  
FRAGILITY AND SEDIMENTATION RATE

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In the rapidly expanding literature relating to sickle cell anemia, which now includes more than 140 articles there are numerous descriptions of erythrocytes, the most important of which are in the articles by Emmel,<sup>1</sup> Sydenstricker, Mulherin and Houseal,<sup>2</sup> Huck,<sup>3</sup> Hahn and Gillespie,<sup>4</sup> Hein, McCalla and Thorne,<sup>5</sup> Graham and McCarty,<sup>6</sup> Sharp and Schleicher,<sup>7</sup> and Vaubel.<sup>8</sup> In this paper we shall attempt to combine the observations of others with observations which we have made while studying forty-seven patients with active sickle cell anemia at the John Gaston Hospital in Memphis.

### MORPHOLOGY

When whole blood from a patient with sickle cell anemia is sealed under a cover slip and examined immediately, it is noted that most of the cells are round or oval and that there is a variable number of irregularly shaped cells and elongated and narrow cells with round or pointed ends. As the preparation stands for a period of hours, the carbon dioxide content of the drop increases, the cells expand and their capsules are placed under tension. The cells undergo a series of progressive transformations in shape and structure from round discoid forms to bizarre, multipointed forms (figs 1 and 2). This change may begin during the first hour after the blood is drawn, but as a rule the metamorphosis takes place at a maximal rate in from two to six hours and is usually complete within twelve to twenty-four hours. If the blood is rendered anoxic by placing a tourniquet around the arm or finger for five minutes or longer, the erythrocytes will undergo changes in shape faster than if venous or capillary blood is removed without stasis.<sup>9</sup>

If cells in a given microscopic field are watched during the transformation from one form to another, it is noted that the structural alteration proceeds in various ways. The most common manner of change, which has been well described by Emmel, Hahn and Gillespie and Vaubel, is pictured in figure 1. First there are a thickening of the cell on one side of the disk and a corresponding thinning out of the disk on the opposite

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Read before the Section on Pathology and Physiology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 16, 1938.

<sup>1</sup> Emmel, V. E. Erythrocytes in Anemia. *Arch. Int. Med.* **20**: 586-598 (Oct.) 1917.

<sup>2</sup> Sydenstricker, V. P., Mulherin, W. A. and Houseal, R. W. Sickle Cell Anemia. Report of Two Cases in Children with Necropsy in One Case. *Am. J. Dis. Child.* **26**: 132-154 (Aug.) 1923.

<sup>3</sup> Huck, J. G. Bull. Johns Hopkins Hosp. **34**: 335-344 (Oct.) 1923.

<sup>4</sup> Hahn, E. V. and Gillespie, E. B. Sickle Cell Anemia. Report of Case Greatly Improved by Splenectomy. *Experimental Study of Sickle Cell Formation.* *Arch. Int. Med.* **39**: 233-254 (Feb.) 1927.

<sup>5</sup> Hein, G. E., McCalla, R. L. and Thorne, W. G. *Am. J. M. Sc.* **173**: 763-772 (June) 1927.

<sup>6</sup> Graham, G. S. and McCarty, S. H. *South. M. J.* **23**: 598-607 (July) 1930.

<sup>7</sup> Sharp, E. A. and Schleicher, E. M. *Am. J. Clin. Path.* **6**: 580-590 (Nov.) 1936.

<sup>8</sup> Vaubel, E. *Ergebn. d. inn. Med. u. Kinderh.* **52**: 504-542 1937.

<sup>9</sup> Scrivner, J. B. and Waugh, T. R. *Canad. M. A. J.* **23**: 375-380 (Sept.) 1930.

side The diameter of the cell becomes greater, and the margins of the thinned-out portion become scalloped and shortly afterward pointed. Coincidentally the thickened part of the cell becomes elongated and pointed filaments protrude from its ends and sides. In some cells the area of increased density appears in two places, and in occasional cells there are three foci of hemoglobin

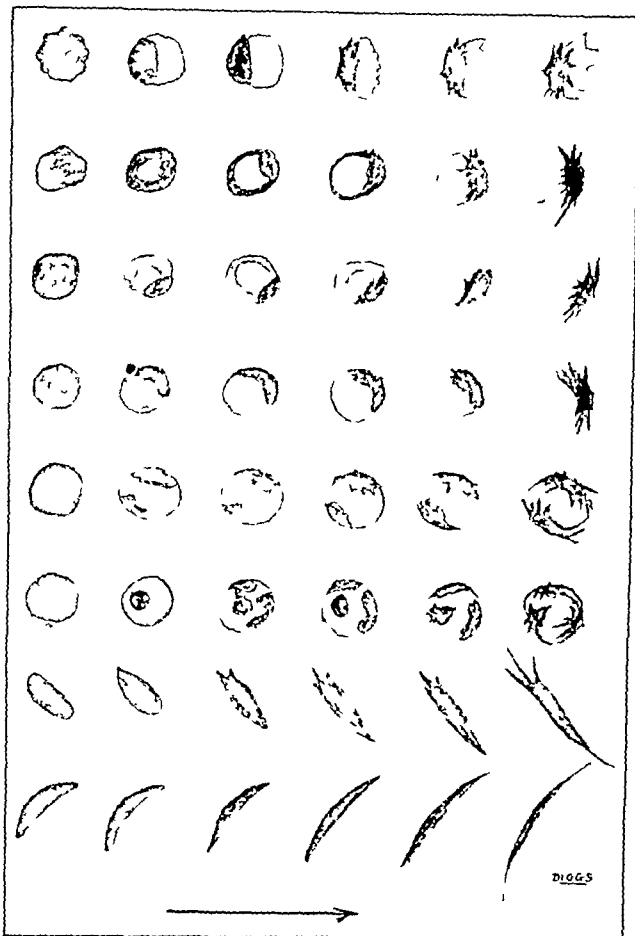


Fig 1—The sequence of morphologic changes in the erythrocytes in sealed moist preparations

condensation, each of which becomes pointed and separated from the others by a thin web of nonrefractive stroma (fig 1). The change from a round cell with even hemoglobin distribution to a many-pointed form, thick in one portion and thinned out like a fish fin in another, takes place within two to four minutes. After the cell has undergone this explosive sort of transformation, there are no further changes for many hours.

Some of the round and oval cells before changing their shape undergo active kneading movements for minutes or hours, rounded elevations appearing on their surface in one place and retractions of surface occurring at others. Finally sharp spicules appear, after which the movements cease as if the restrained forces within the cell had been released. In other cells there is no visible movement or shift in hemoglobin, but barbs of cytoplasm gradually protrude from the surface, giving a cocklebur effect and resembling exaggerated crenation. Graham and McCarty<sup>6</sup> described and illustrated a form of change in which practically all the cells have a needle-like form. We have observed this type of change in a few instances

but have never been fortunate enough to observe cells during their transformation from round to acicular types.

In all the forms of metamorphosis that we have observed, the points, filaments and sheets of cytoplasm that extend beyond the surface are mainly in the plane of the disk rather than perpendicular to its surface (fig 2). Occasionally cells in rouleau formation change their shape without changing their relationship to one another, and in this case the transformed group appears as a stack of needles.

Erythrocytes that are elliptic or of oat or crescent shape at the time the preparation is made do not undergo changes in shape similar to those described for round and oval cells. These cells have evidently already passed through the process, have lost their filaments and finlike appendages and have become irreparably changed in shape. In moist preparation, on standing, they merely protrude one or a few pointed filaments from their ends, or the points already present become longer (fig 1).

Cells which have undergone structural changes previously described (fig 2) are collectively called "sickled cells," although the term in a descriptive sense is inapplicable to any except the cells that are narrow, pointed and curved.

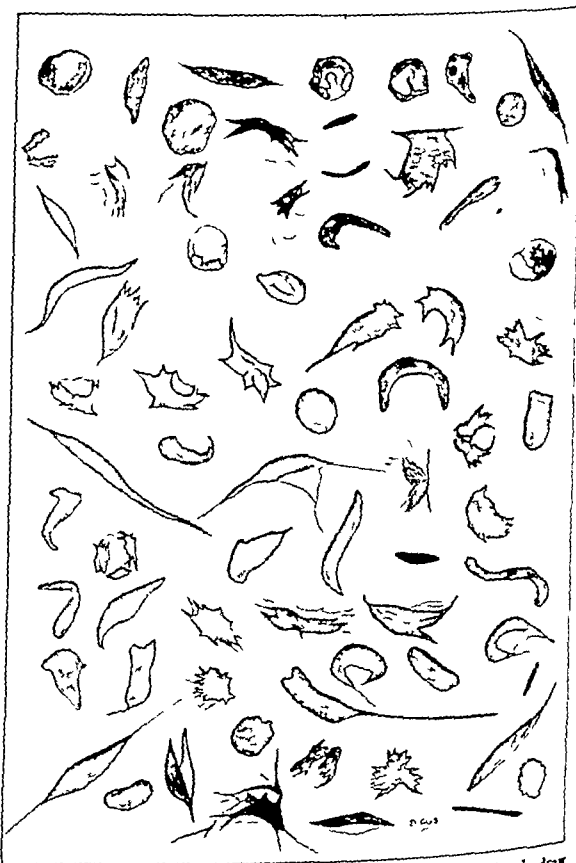


Fig 2—Erythrocytes in sealed moist preparations. Camera lucida drawings.

When blood in sealed moist preparations is exposed to the air by simply lifting the cover slip and immediately replacing it, the cells which have sickled in the bizarre manner will immediately revert to the round form. Oat and crescent shape cells on exposure to air become less pointed and may become elliptic but do not round up.



All the cells, regardless of shape, will become hemolyzed or will round up if left in the sealed moist preparation for days.<sup>5</sup> Some of the bizarre sickled forms will suddenly lose their hemoglobin and leave at the point where they formerly were a faintly visible ghostlike circle. Other cells undergo a slow degenerative change. The finlike appendages disappear, and

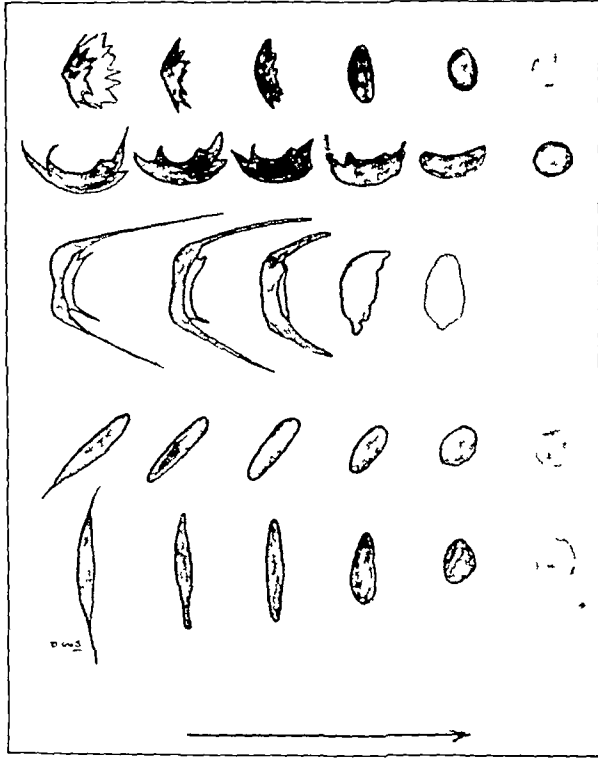


Fig 3—The sequence of morphologic changes in sickled erythrocytes on standing for days in sealed moist preparations

the pointed filaments become shorter and more blunt. Occasionally the filaments break off or little globules form along the filaments, which break off singly or in chains. Granules and vacuoles appear in the cytoplasm, the cells become more pale and the margins less refractive, the diameters decrease and the cells become more spherical (fig 3). Ultimately there is nothing left but amorphous debris.

Cells in moist preparation stained with dyes such as vital red, brilliant cresyl blue and methylene blue show structural transformations similar to those found in unstained preparations.<sup>10</sup> Cells containing reticulum do not sickle as readily or in as bizarre a form as do the more mature cells. Nucleated red blood cells undergo changes in shape even less readily, but they do sickle. The erythrocytes in blood mixed with oxalate, citrate or saline solutions likewise undergo the same type of changes, but if the blood is diluted much the process takes place more slowly or not at all.

Erythrocytes placed in a saline citrate solution in a test tube, sealed with liquid petrolatum and allowed to stand will undergo changes similar to those just described. In order to prevent the cells from rounding up on exposure to air, solution of formaldehyde is added before examination.<sup>11</sup> Red cells exposed to

carbon dioxide in hanging drop preparations or in test tubes undergo similar structural changes.

The erythrocytes in the stained smears of blood from patients with sickle cell anemia resemble those found in moist preparations immediately after the preparation is made (fig 4). Fish fin and multipointed shapes, which are characteristic of the moist preparations after standing, are not seen in their complete form in stained smears, but semblances of these forms can be found on searching. This indicates that at least some of the cells were sickled in the circulating blood and when smeared became fixed by drying before they had a chance to round up completely.

The type of cell which is most characteristic of sickle cell anemia and which is rarely observed in any other condition is the hyperchromatic, elongated form, pointed at each end and curved in the middle (fig 4). These cells may be as long as 50 microns and as narrow as 1 or 2 microns, but the majority are from 10 to 20 microns long and from 2 to 4 microns in their widest diameter. In some smears the sickled cells show degenerative changes in the form of vacuoles or granules and irregularities of margin of the moth-eaten type. Small bacillus-like rods of hemoglobin are found in the smears, which are evidently broken-off bits of cytoplasm from the elongated filaments.

The number of typically sickled forms in stained smears is highly variable with different patients. In numerous patients there are no forms sufficiently typical to warrant the diagnosis of sickle cell anemia.

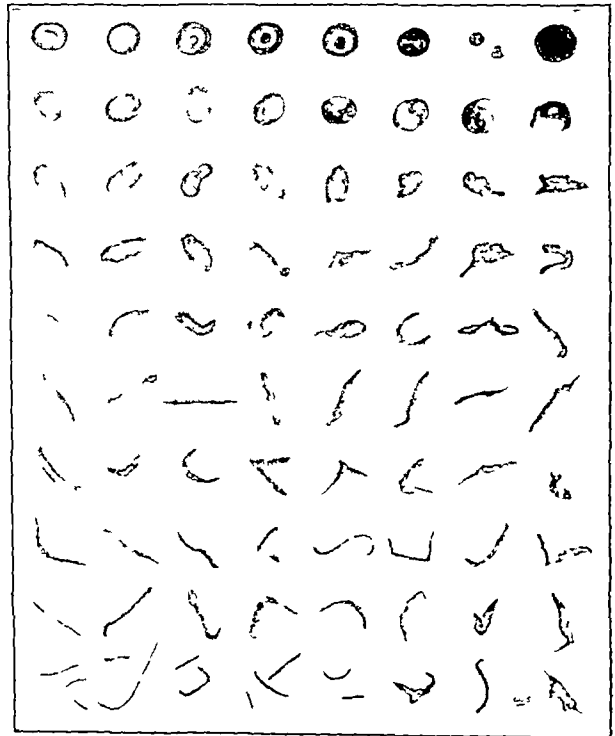


Fig 4—The shape and relative size of erythrocytes in stained smears

from the structure of cells alone. Elliptic and oat shape cells are more numerous in the stained smears than are cells shaped like a sickle, but these forms may likewise be few. There is no sharp line of demarcation between the round, the oval, the blunt elliptic, the elongated elliptic, the elongated with one and with two points and the curved cells with double points

<sup>10</sup> Hansen Pruss O C J Lab & Clin Med 22 311 315 (Dec.) 1936

<sup>11</sup> Beck J S P and Hertz C S Am J Clin. Path 5 325 332 (July) 1935

(fig 4) It is a matter of opinion in counting the percentage of sickled cells, exactly how many there are. The percentage of sickled erythrocytes in cases recorded in the literature and our series is given in figure 5. We have had the opportunity of following a number of patients with sickle cell anemia at frequent intervals for a period of years and have observed that the percentage of double-pointed cells is fairly constant in a given person month after month. That this is not invariably true was shown in Emmel's case,<sup>1</sup> in which there were numerous sickled cells on one occasion and few on another. The percentage of sickled cells is not related to the severity of the anemia.

Haden<sup>12</sup> has recently called attention to a type of abnormality in which there is a central elevation, giving the appearance of a dot within a ring, to which he gave the name "Mexican hat." We have gone back over our slides and have without exception found this form in large numbers in smears from patients with sickle cell anemia. In some smears there are as many as ten or more of these forms to an oil immersion field, and in practically every field there are one or more cells of this type. We have on searching found similar cells in smears from patients with pernicious anemia, hemolytic jaundice, erythroblastic anemia and leukemia but have not observed this form in normal blood. It is possible that this abnormal area of increased density is related in some way to the sickle cell phenomenon and corresponds to the area of increased density seen in most preparations at the beginning of the sickling process.

The size of the round erythrocytes in sickle cell anemia is highly variable. Cells range in size from those as small as platelets to those as large as neutrophils. It is impossible to measure accurately the diameters of cells in smears from patients with sickle cell anemia in which there are many elliptic or oat and sickle shape cells, but with smears from patients with few cells of these forms Price-Jones curves can be made with a fair degree of accuracy. Haden<sup>12</sup> reported no significant abnormality in diameter of erythrocytes or in thickness

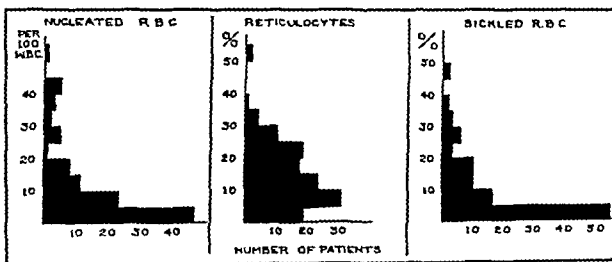


Fig 5—Frequency distribution curves according to the number of nucleated red blood cells per hundred white blood cells, the percentage of reticulocytes and the percentage of sickled red blood cells in stained smears.

of cells in two white patients with mild sickle cell anemia whose spleens had been removed. Wintrobe<sup>13</sup> reported the mean diameter of round cells in two cases of sickle cell anemia as 8.6 and 9.2 microns. Sharp and Schleicher<sup>7</sup> gave values for three cases as 8.6, 8.1 and 7.8 microns, respectively. The mean diameter was determined for ten of our patients in whose smears there were less than 5 per cent elongated cells. Thin dried smears made by the cover slip technique were used.

One thousand cells were measured in each case, an eye piece micrometer with graduations at intervals of 0.7 micron being used. The mean diameters were 7.8, 8.2, 8.4, 8.5, 8.5, 8.8, 8.9, 9, 9.5 and 9.5 microns. The average mean diameter was 8.7 microns. The average mean diameter of erythrocytes of five medical students used as controls was 7.6 microns. The frequency dis-

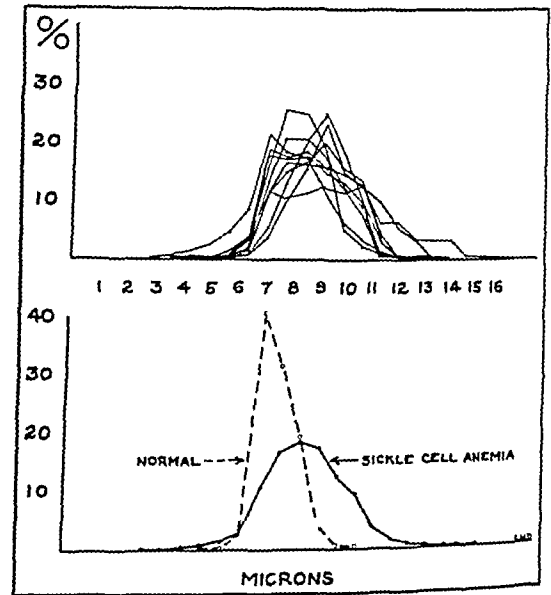


Fig 6—Erythrocyte diameters in sickle cell anemia (Price-Jones curves).

tribution curves of erythrocyte diameters and the composite curves for the ten patients with sickle cell anemia and the five controls are given in figure 6. From these observations it is obvious that there is in sickle cell anemia marked anisocytosis, and the average diameter is greater than normal.

Smears from patients with sickle cell anemia also show striking anisochromia. Diffusely basophilic cells are the rule. Howell-Jolly bodies and nuclear fragments of various types often are found. Stippled cells are seen sometimes and Cabot's rings rarely. Nucleated red blood cells with pyknotic nuclei and red-staining cytoplasm are demonstrable in practically all smears at all times, and occasionally the nucleated red blood cells are more numerous than the white blood cells. The frequency distribution of patients according to the number of nucleated red cells per hundred white cells in stained smears is given in figure 5. The number of immature red cells increases during the febrile sickness and decreases when the clinical symptoms subside. In occasional smears true megaloblasts are seen. Pointed and sickled nucleated red blood cells in various stages of maturity are sometimes found, which proves that the extrusion of the nucleus is not the explanation for the sickling phenomenon.

The percentage of reticulocytes is increased. In our series of forty-two cases in which reticulocyte counts were done, the average reticulocyte percentage was 15. We have seen reticulocyte counts as high as 87 per cent and have often observed counts above 25 per cent. The frequency distribution of patients according to reticulocyte count in our series and in the cases reported in the literature is given in figure 5.

In tissue preparations fixed in formaldehyde the erythrocytes are usually greatly elongated and oat shape, but curved, angular and bizarre forms are also

12 Haden R L and Evans F D. Sickle Cell Anemia in White Race. Improvement in Two Cases Following Splenectomy. Arch Int Med 60 133 142 (July) 1937.  
13 Wintrobe M M. Medicine 9 195 255 (May) 1930.

seen The sickling is less striking in tissues fixed in Zenker's solution A good way to demonstrate the presence or absence of sickling in tissue preparations is to grind up bits of tissue in a mortar and examine drops of this material microscopically The sickling is demonstrable in all tissues but is most marked in sections from the spleen or bone marrow The smaller blood vessels appear to be distended by sickled cells, and it is possible that the abnormal shape of the cells and their great length interferes with the free circulation of blood and is a factor in the production of thrombosis, which is a common feature of this disease<sup>14</sup>

Erythrocytes of the double-pointed type have been observed in the urine, cerebrospinal fluid and fluids from the serous cavities We have also observed three patients with sicklemia who had no true sickled forms in the stained smears of their blood, yet who had in their pleural or ascitic fluid typical sickled cells which would not round up on exposure to air Evidently these cells, under the conditions of anoxemia in a body cavity, had undergone the bizarre type of change, had lost their finlike appendages and multiple points and had become irrevocably sickled This together with the morphologic evidence is fairly reliable proof that the sickled cells in the stained smears of sickle cell anemia were first bizarre in shape and that the true sickled cell is a degenerative form

MEAN CORPUSCULAR VALUES

The mean corpuscular values reported in the literature are few, and the statements made concerning the mean corpuscular volume, mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration are not in agreement We determined the red cell count, hemoglobin content and volume of packed red blood cells of thirty-eight patients with sickle cell

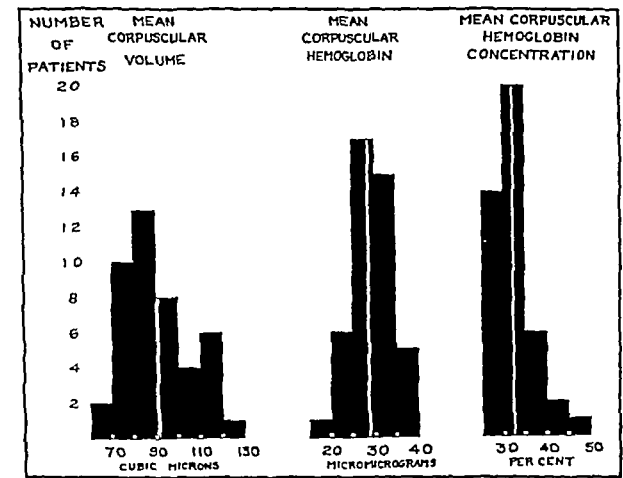


Fig 7—Mean corpuscular values in forty four cases The position of the mean is indicated by the white line

anemia The total number of determinations was 100 When more than one determination was made on the same patient, the average values were taken as representative Pipets and counting chambers certified by the United States Bureau of Standards were used The hemoglobin content was determined by the acid hematin method, with instruments standardized each quarter by the oxygen capacity method of Van Slyke

14 Diggs I W and Chung R E South M J 27 939 845 (Oct.) 1934

The determinations of cell volume were made by mixing 10 cc of venous blood with 20 mg of dried potassium oxalate and centrifuging in a 15 cc graduated centrifuge tube in a size 2 international centrifuge until there was a constant pack The factor 1.09 was used to correct for shrinkage due to the dried oxalate

The frequency distribution of mean corpuscular values for thirty-eight cases of sickle cell anemia in our

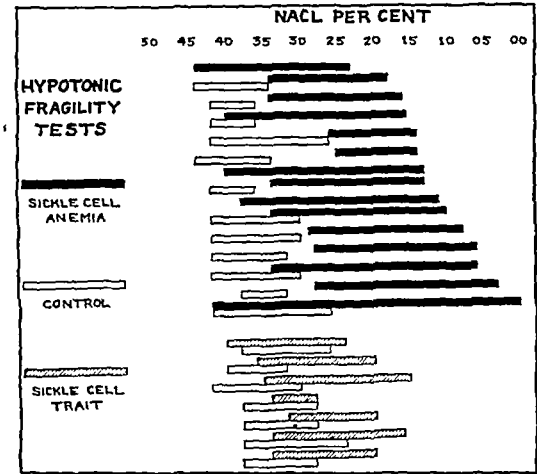


Fig 8—Fragility of erythrocytes in hypotonic solutions in fifteen cases of sickle cell anemia and in seven cases of sicklemia.

series and for six cases reported in the literature are given in figure 7 The average mean corpuscular volume in the forty-four cases was 90 cubic microns, the average mean corpuscular hemoglobin 29 micrograms and the average mean corpuscular hemoglobin concentration 32 per cent

Reliable standards for Negroes are not available, but we have found for a small number of healthy Negroes employed in the hospital values comparable to those for white persons In a control series of determinations made on forty white male medical students by Dr R M Moore in this clinic with our instruments and methods, the average mean corpuscular volume was found to be 86 cubic microns, the average mean corpuscular hemoglobin 29 micromicrograms and the average mean corpuscular hemoglobin concentration 33 per cent These figures are essentially the same as those reported by Wintrobe<sup>15</sup> From these observations the conclusion is drawn that the erythrocytes in sickle cell anemia are usually of the normocytic, normochromic type, with a tendency toward macrocytosis

There was no apparent correlation between the mean corpuscular volume, the mean corpuscular hemoglobin or the mean corpuscular concentration and the reticulocyte count, the number of nucleated red blood cells, the percentage of cells sickled in stained smears, the severity of the anemia or the mean cell diameter

FRAGILITY TESTS

The erythrocytes in sickle cell anemia are more resistant than are normal cells to hypotonic saline solutions The reported fragility tests showed a few instances of normal or of decreased resistance, but the fifty-two reports available in the literature showed that, on an average, hemolysis began in a 0.38 per cent solution of sodium chloride and was complete in a 0.28 per cent solution The results obtained when the fragility

15 Wintrobe M M J Lab & Clin Med 17 899 912 (June) 1932

of the erythrocytes was tested in fifteen of our cases are given in figure 8. In these cases the average values were 0.34 and 0.11 per cent, as compared with 0.42 and 0.32 per cent for the controls. We have confirmed the observation of others that some of the erythrocytes in some of the patients with sickle cell anemia will retain their hemoglobin in distilled water. The increased resistance of the erythrocytes in sickle cell anemia to hypotonic saline solutions is probably explainable by the ability of these cells to alter their shape without placing their membranes under sufficient tension to cause hemolysis.

The fragility of erythrocytes in association with the sickle cell trait in the absence of anemia has been determined in few instances. Cooley and Lee<sup>16</sup> reported no difference in the fragility of the erythrocytes of children with and without the trait. Graham and McCarty,<sup>9</sup> on the other hand, stated that "in a series of 24 meniscocytic bloods we found an average range of hemolysis from 0.39 to 0.19 per cent NaCl and concluded that the resistance was definitely increased." We determined the resistance of the erythrocytes to hypotonic solution in seven cases of sickle cell anemia, using as our end point for complete hemolysis the level at which no cells containing hemoglobin appeared in the sediment on microscopic examination (fig. 8). The average values for this series were 0.35 and 0.2 per cent, whereas in the control group they were 0.39 and 0.27 per cent.

In order to test the resistance to mechanical trauma of the erythrocytes in sickle cell anemia, a hinged board was attached to the shaking device on a manometric Van Slyke machine. Glass tubes containing the oxalated or defibrinated blood to be tested were attached to this board and shaken at the rate of 250 vibrations per minute. It was found that this type of trauma over

*Resistance of Erythrocytes in Sickle Cell Anemia*

Experiment	Hours of Shaking	Percentage of Erythrocytes Destroyed	
		Patients with Sickle Cell Anemia	Controls
L O & L W D	6	62	44
A M C & J B H	8	68	44
L O & A L	7	47	30

a period of hours was not sufficient to cause an appreciable difference in the red cell count or in the cell volume in blood from normal persons or from patients with sickle cell anemia. However, by adding fifty glass beads to each tube and passing carbon dioxide gas continuously through the column of gas above the blood during the process of shaking, the cells were destroyed in appreciable quantities. The carbon dioxide served the dual purpose of making the cells larger and therefore more fragile and of causing the round cells in the blood of sickle cell anemia to become sickled. In three experiments performed under these conditions the cells were destroyed more rapidly in the blood from patients with sickle cell anemia than in that from the controls, as shown in the accompanying table. Determinations of cell volume during the shaking experiments showed values comparable to the red cell counts. Microscopic examination of the specimens of blood containing the sickled erythrocytes revealed more fragments and cellular debris than did microscopic examination of normal blood.

#### SEDIMENTATION RATE

Little information is to be obtained from the literature concerning the sedimentation velocity of erythrocytes in sickle cell anemia. The sedimentation rate was determined for twenty-three of the patients in our series. The total number of determinations was forty-nine. Oxalated blood and 5 cc Cutler tubes were used; the readings were made at five minute intervals for one hour. In four instances the sedimentation rate was 5 mm or less in one hour, and in fourteen instances the rate was less than 10 mm in one hour. Repeated examinations of the sedimentation rate for the same person at different times revealed variable rates, although the degree of anemia did not significantly change. Increased rates could usually be explained by some demonstrable abnormality, such as active tuberculosis, salpingitis or badly infected ulcers of the legs, but in some cases there was no obvious cause for the increased rate. The fact that the sedimentation rate may be normal in spite of severe anemia indicates that the increased rate in these cases is due to some complication, whether it is clinically demonstrable or not. Since the sedimentation rate may be normal in the presence of marked anemia, it is obvious that correction factors based on the degree of anemia are not applicable in this disease.

#### ABSTRACT OF DISCUSSION

DR EDWIN E. OSGOOD, Portland, Ore. The authors have probably given the best summary of the status of the erythrocyte in sickle cell anemia to date. Their study demonstrates that the disease is a normocytic anemia, as the few cases which I have had an opportunity to study in the North seemed to indicate. I should like to ask how they differentiate anemia due to other causes in a Negro with the sickle cell trait from true sickle cell anemia. They have shown that the sickle cell trait is common in Negroes, and it would seem that if such a Negro had anemia of another cause the problem of differential diagnosis would be more difficult. The authors did not have time to stress the differences between ovalocytosis, or familial poikilocytosis, as I prefer to call it, and the true sickle cell phenomenon. Familial poikilocytosis occurs just as commonly in white persons as in Negroes but has no association except an accidental one with anemia. It is relatively common, and the cells may superficially resemble sickle cells in Wright's stain. However, in Wright's stain they are really sausage shaped and the ends are rounded rather than sharply pointed, as so well illustrated for sickle cells. The number of poikilocytes does not increase in familial poikilocytosis in an atmosphere of carbon dioxide or on standing in a moist cover slip preparation as does the number of sickle cells. Dr Warren C. Hunter of the University of Oregon Medical School has studied a considerable family showing familial poikilocytosis, one of whom had anemia due to sinus infection. If these criteria are kept in mind, the differentiation should offer no difficulty.

DR L. W. DIGGS, Memphis, Tenn. The blood smear of sickle cell anemia in which there are few sickled cells may resemble that of other types of hemolytic anemia or secondary anemia, but there are numerous points of differentiation. In the first place one can usually find, on searching, typical oat and crescent forms, which are rarely observed in other blood dyscrasias. The white blood cell count is increased, and there are thrombocytosis and evidence of abnormal regeneration of the bone marrow. The reticulocytes are increased. The erythrocytes are more resistant to hypotonic salt solutions than are normal cells. There is jaundice of a retention type with a negative reaction to the direct van den Bergh test and urobilinuria. The history of chronic anemia and of recurrent febrile illnesses with severe pains anywhere in the body, usually in the joints, bones or abdomen, is fairly characteristic. Important physical characteristics are jaundice, cardiac enlarge-

<sup>16</sup> Cooley, T. B. and Lee, Pearl. Sickle Cell Phenomenon. *Am J Dis Child* 32: 334-340 (Sept.) 1926.

ment, hepatomegaly and ulcers of the legs. In the early stages the spleen is enlarged, but later there is splenic atrophy. As a rule, patients with sickle cell anemia are tall and slender, with long extremities. In some cases roentgenograms reveal a thickening of the skull, with perpendicular striations and patchy osteoporotic and osteosclerotic changes in the long bones. The clinical symptoms and signs together with the laboratory data constitute a definite syndrome, yet sickle cell anemia is often mistaken for other conditions. In practice, sickle cell anemia is not confused with other types of anemia but with acute febrile diseases, such as rheumatic fever, acute arthritis, osteomyelitis, appendicitis, pericarditis, catarrhal jaundice, meningitis and typhoid. In the presence of the sickle cell trait without anemia the erythrocytes appear to be normal in the stained smears, but in moist preparations they assume multipointed and finlike forms. With the elliptic cell trait (ovalocytosis) the erythrocytes are elliptic in the stained smears and do not undergo changes in shape in moist preparations. Pollock and Dameshek and also Cardozo have recently described a third type of abnormality characterized by the presence of elliptic cells which in moist preparations protrude points from their ends and become oat shaped. This type of ovalocytosis closely resembles the sickle cell trait but should not be confused with it.

## GASTROINTESTINAL SYMPTOMS IN DISEASE OF THE BRAIN

HARRY GAUSS, M.D.

DENVER

Gastrointestinal symptoms may arise from sources outside the digestive tract. They may arise from disease within the brain.

The interpretation of abdominal pain is a perennially interesting subject. The topic never grows old, nor can it be said that the subject has ever been fully analyzed and filed away in medical archives. Every new or improved diagnostic agent that is developed renders finer methods available for the interpretation of abdominal pain. Thus the electrocardiograph has helped to establish the fact that certain types of so-called acute indigestion, both fatal and otherwise, are actually coronary disease with referred abdominal pain. In a recent paper I<sup>1</sup> discussed the mechanism by which coronary disease causes acute abdominal pain.

The abdomen has been properly called the barometer or spokesman of the body. The abdomen calls attention to trouble but it does not locate it. The task remains for the physician, who must bear in mind that the responsible organ may be located anywhere in the body. The severity of the abdominal pain is no guide to the location of the causative agent. The most violent type of abdominal pain may arise from causes within the abdomen as in the case of biliary colic, or from causes outside the abdomen as in the case of referred pain from coronary disease. Likewise mild abdominal pain may arise from causes originating either within or outside the abdomen.

Elsewhere I have discussed some common causes of referred abdominal pain. I have pointed out that gastrointestinal symptoms may arise in the psychic apparatus,<sup>2</sup> in the pelvis<sup>3</sup> or in the renal system,<sup>4</sup> as

well as in the cardiovascular system.<sup>1</sup> It is my purpose in this paper to discuss the brain as a source of gastrointestinal symptoms.

My attention was directed to the brain as a cause of digestive disturbances by a patient who manifested vague gastrointestinal symptoms suggestive of gallbladder dyspepsia for a number of months and who subsequently was found to have a pituitary tumor.

**CASE 1—Gallbladder dyspepsia syndrome from pituitary tumor with recovery.** I. S., a man aged 39, who came under observation March 6, 1934, complained of abdominal pain, fullness after meals, bloating and belching, accompanied by a sensation of oppression in the epigastrium. These attacks were precipitated by the eating of fried foods, greasy foods, eggs, smoked meats, coffee and some other foods. At times he experienced sinking spells in the abdomen and general weakness.

The patient was well nourished, weighed 154 pounds (70 Kg.), and was 5 feet 7 inches (170 cm.) tall. His pulse rate was 80, the temperature 97 F., the respiratory rate 14 and the blood pressure 110 systolic, 60 diastolic. The eyes reacted to light and in accommodation. The throat was clear and the tonsils were out. The heart and lungs were normal. In the abdomen the pain was indicated along the costal margin. The liver and spleen were not palpable.

The urine and blood were normal. Analysis with the Ewald test meal showed an absence of free acid and a combined acidity of 12.

X-ray examination of the stomach and intestine revealed nothing unusual about these organs, the gallbladder, however, was poorly visualized and filled and emptied slowly.

A diagnosis was made of gallbladder dyspepsia and achylia gastrica. Treatment for these conditions was prescribed. However, the patient did not improve. On the contrary, he became worse. Three months later, violent headaches and impaired vision developed. An x-ray examination of the skull showed an erosion of the sella turcica, which suggested the presence of a pituitary tumor. An intracapsular enucleation with resection of the capsule of the pituitary tumor was carried out by Dr. A. W. Adson of Rochester, Minn. The microscopic diagnosis of the removed tumor was chromophobe adenoma.

Subsequently the patient had a protracted convalescence with a gradual return of vision of both eyes. The gastrointestinal symptoms subsided after the operation and have not returned. Eighteen months later the patient was able to resume part of his work, and he has since been free from the digestive disturbances.

Stimulated by this experience I made a study of some histories at the Colorado General Hospital of patients with brain tumor who presented gastrointestinal symptoms. In this study I was aided by Drs. J. R. Jaeger and Abe Ravin. These nineteen histories, with the one just given, are presented in condensed form in the accompanying table. Most of the patients entered the hospital in the stage of advanced brain tumor formation, when the neurologic signs and symptoms overshadow the gastrointestinal symptoms, nevertheless the digestive symptoms were noted. However, it is in the early stage of brain disease that the presenting symptoms are apt to be largely digestive. It is at this time that the possible relation of the digestive syndrome to the brain should be kept in mind if an early diagnosis is to be arrived at.

A study of my cases as well as of the literature indicates that certain diseases of the brain are apt to produce digestive disturbances. These are brain tumor, other expanding intracranial lesions, syphilis, epilepsy and migraine. These lesions of the brain produce three types of gastrointestinal syndromes: (1) the dyspepsia syndrome, with nausea, vomiting and abdominal pain, (2) the acute paroxysmal attack which occurs in epi-

From the Department of Medicine, University of Colorado. Read before the Section on Gastro-Enterology and Proctology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

1. Gauss, Harry. Gastrointestinal Symptoms from Cardiovascular Disease. *Am. J. Digest. Dis. & Nutrition* 4: 374 (Aug.) 1937.

2. Gauss, Harry. Nervous Indigestion. *Colorado Med.* 29: 202 (May) 1932.

3. Gauss, Harry. Gastro-Intestinal Symptoms of Pelvic Origin. *Am. J. Digest. Dis. & Nutrition* 3: 891 (Feb.) 1937.

4. Gauss, Harry. The Interrelationship of Gastrointestinal and Renal Disease. *Ann. Int. Med.* 9: 137 (April) 1936.

lepsy, migraine and syphilis and (3) the syndrome of peptic ulcer and other erosions of the upper part of the intestine

#### DYSPEPSIA SYNDROME

Dyspepsia occurs in some instances of brain tumor and other expanding intracranial lesions. The word dyspepsia is employed here in a broad sense to designate a variety of symptoms commonly encountered in

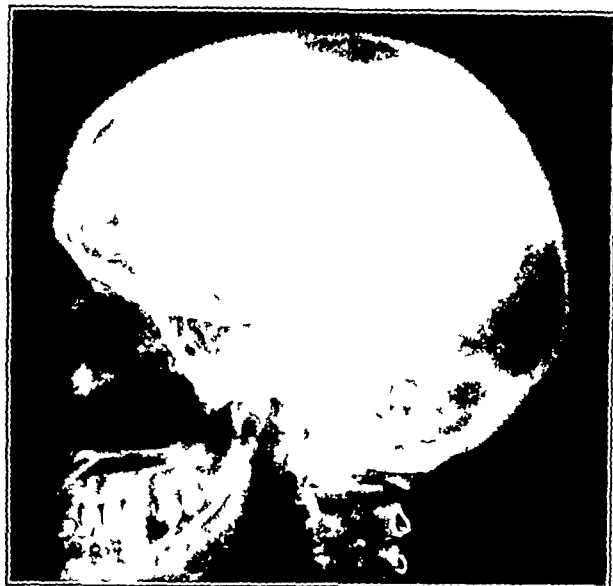


Fig 1—Normal skull of an adult showing an average occipitofrontal diameter, the well defined sella turcica, the usual suture and blood vessel markings and the customary density of the cranial bones. (The roentgenograms and their interpretation were made by Dr. F. A. Schmidt of the University of Colorado.)

patients presenting the abdominal distress syndrome. The following symptoms have been observed: abdominal pain, abdominal consciousness, nausea, vomiting, loss of appetite, morbid hunger, capricious appetite and a dislike for certain foods. In the early stages of brain tumor the patient may present a syndrome strongly suggestive of gallbladder dyspepsia or food allergy. Patient 1 stated that his abdominal distress was aggravated by the eating of fried foods, eggs, smoked meats and coffee.

Nausea and vomiting occur in many cases. They were the commonest of the digestive symptoms in my series. Jaeger<sup>6</sup> has observed that persistent vomiting may be the only indication of an intracranial lesion in the early stage. Disturbances of the appetite may present bizarre pictures. The appetite may be increased, diminished or capricious. Spiller<sup>7</sup> recorded a case of glioma of the pons in which intense hunger was a prominent symptom. Watts<sup>8</sup> described a man with a tumor of the right frontal lobe which began with the sudden appearance of a ravenous appetite. Patient 2 exhibited a capricious appetite. On arising he experienced "morning sickness." He could eat nothing before 10 a. m., when his appetite returned, after which he became ravenously hungry. He died of cerebellar medulloblastoma.

Abdominal pain occurs in some cases and may manifest itself as epigastric distress, pain in the right upper quadrant, diffuse abdominal cramps or a dull umbilical

pain. The pain is commonly recurrent but may be constant and may have no relation to the gastric cycle.

Recently Wechsler<sup>8</sup> reported a series of fourteen cases of disease of the brain in which abdominal pain was one of the presenting symptoms. The pain was often cramping, it involved all portions of the abdomen, sometimes it was associated with nausea and vomiting and it occurred without any relation to the gastric cycle.

These symptoms of dyspepsia which occur in disease of the brain raise the question whether it is possible for intracranial lesions to affect the gastrointestinal tract and so produce the symptoms of abdominal distress.

Wechsler expressed agreement with Watts and Fulton<sup>9</sup> that the irritation of the autonomic representation in the brain points to the probable explanation of the abdominal distress that occurs in disease of the brain and that most evidence points to the premotor area of the cortex, the hypothalamus and the vagus as the regions responsible for abdominal pain. The abdominal pain, however, is mediated by way of lower levels or centers, hence, while abdominal distress does occur in disease of the brain, it has no localizing value diagnostically.

#### PAROXYSMAL ATTACKS

Paroxysmal disturbances of the abdomen are apt to occur in epilepsy, migraine and syphilis.

In epilepsy the abdominal attack occurs during the aura, after the convulsive attack or as an equivalent of the convulsion itself. In so-called abdominal migraine the digestive disturbance occurs as an equivalent of the headache. In neurosyphilis sudden attacks of violent pain occur in the upper part of the abdomen, the so-called gastric crises.

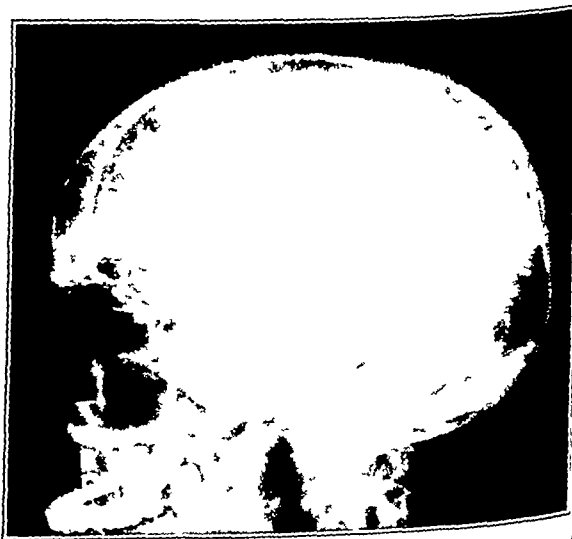


Fig 2 (case 1)—Increase in the occipitofrontal diameter, flattening and enlargement of the sella turcica and erosion of the posterior clinoid process.

During the visceral type of epileptic aura, gastrointestinal symptoms occur commonly. Epigastric distress occurs as a painful burning sensation, sometimes there are peristaltic unrest, nausea, vomiting, cramp, salivation, dryness of the mouth, intense thirst and urge to defecate. During the convulsion involuntary

5 Jaeger J. R. Brain Tumors. *Colorado Med.* 31: 165 (May) 1934.  
6 Spiller W. G. Brain Tumor. *J. A. M. A.* 53: 2078 (Dec. 18) 1909.

7 Watts J. W. The Influence of the Cerebral Cortex on Gastrointestinal Function. *J. A. M. A.* 104: 355 (Feb. 2) 1935.

8 Wechsler I. S. Abdominal Pain as a Symptom of Disease of the Brain. *J. A. M. A.* 105: 647 (Aug. 31) 1935.

9 Watts J. W. and Fulton J. F. The Effect of Lesions of the Hypothalamus upon the Gastrointestinal Tract and Heart in Man. *Ann. Surg.* 101: 363 (Jan.) 1935.



defecation may occur, while at other times abdominal distress may occur as an equivalent of the convulsion itself

The work of Penfield and Gage,<sup>10</sup> of Sherrington<sup>11</sup> and of Watts and Fulton suggests that there is a sensory autonomic representation for the gastrointestinal tract in the cerebral cortex, which accounts for

There are numerous theories to explain migraine. Recently the allergic basis has been strongly advanced. Some writers, however, agree with Critchley and Ferguson<sup>13</sup> that the case for the allergic nature of migraine has been overstated.

Bassoe<sup>14</sup> has pointed out that, just as in epilepsy gastrointestinal symptoms may become the equivalent

Summary of Twenty Cases of Brain Tumor Presenting Gastrointestinal Symptoms\*

Case	Patient	Sex	Age Years	Lesion	Neurologic Symptoms	Gastrointestinal Symptoms	Condition on Discharge
1	I S	♂	39	Chromophobe adenoma of pituitary body	Bilateral hemianopia pallor of disks headache impaired vision	Abdominal pain fullness after meals bloating belching, dislike for certain foods	Improved
2	I B	♂	15	Medulloblastoma of cerebellum	Impaired vision, tremor of left arm exaggerated reflexes bilateral papilledema, nystagmus	Loss of appetite in morning morning sickness nausea, vomiting, polyphagia in afternoon	Died
3	M P	♂	42	Glioma of right frontal lobe	Impaired vision headache loss of memory muscular tremors choked disks	Loss of appetite nonprojectile vomiting, nausea cramps	Died
4	J O	♀	6	Glioma of medulla	Internal strabismus headache nystagmus loss of hearing ataxia facial paralysis on the left side	Projectile vomiting cramps	Improved
5	S B	♂	48	Tumor of right frontal lobe	Muscular weakness dizziness headache loss of memory ataxia papilledema tingling of fingers	Projectile vomiting nausea epigastric distress	Unimproved
6	J W	♀	37	Meningioma on left side	Headache impaired vision ataxia vertigo loss of hearing nystagmus exaggerated reflexes	Nonprojectile vomiting bloating symptoms accentuated by eating epigastric distress	Died
7	M B	♀	11	Astrocytoma of cerebellum	Choked disks ataxia muscular weakness headache convulsions impaired vision	Nonprojectile vomiting, nausea abdominal cramps	Improved
8	N A	♀	7	Glioma of cerebellum	Headache weakness of left arm ataxia	Nonprojectile vomiting foul breath constipation cramps	Unimproved
9	P P	♀	7	Glioma of medulla	Nystagmus, exophthalmos ataxia bilateral papilledema headache	Nonprojectile vomiting nausea loss of appetite abdominal pain cramps	Unimproved
10	D O	♂	4	Cerebellar tumor	Headache convulsions inability to walk ankle clonus nystagmus	Nonprojectile vomiting loss of appetite constipation	Unimproved
11	J J	♀	1½	Ependymoma of cerebellum	Choked disks ataxia exaggerated reflexes retarded growth	Constipation foul breath distention	Died
12	R H	♂	10	Cerebellar tumor	Loss of vision, ataxia internal strabismus headache dizziness	Nonprojectile vomiting cramps abdominal pain	Died
13	W B	♂	38	Tumor of third ventricle	Choked disks ataxia vertigo convulsions headache	Nausea vomiting abdominal cramps	Died
14	P H	♀	30	Glioma of pons	Headache tremor on right side ataxia dizziness impaired hearing nystagmus	Projectile vomiting anorexia epigastric distress	Died
15	L L	♂	34	Infundibular ependymoma	Impaired vision dizziness headache pain and cramps in legs	Nonprojectile vomiting nausea constipation abdominal distress	Died
16	S W	♀	43	Oligodendroglioma of left frontal lobe	Convulsions headache weakness impaired vision confused state	Projectile vomiting nausea abdominal distress anorexia	Improved
17	I A	♀	43	Tumor of cerebellum	Ataxia headache diplopia impaired hearing loss of memory dizziness	Nausea, difficulty in swallowing vomiting epigastric distress	Unimproved
18	M W	♂	72	Glioma of right frontal lobe	Tremor of left hand and leg bilateral papilledema ataxia headache weakness loss of memory	Projectile vomiting pain in upper part of abdomen	Improved
19	A L	♂	53	Tumor of left frontal lobe	Headache falling vision vertigo confused state ataxia bilateral papilledema	Loss of appetite gaseous eructations nausea vomiting epigastric fullness bloating	Unimproved
20	A H	♀	33	Meningioma on left side	Convulsions involving right side headache loss of memory confused state bilateral papilledema	Epigastric sensory aura preceding convulsions	Improved

\* A craniotomy with attempted resection of the tumor was performed in all cases except 5 and 17

the abdominal pain and other symptoms that occur in epilepsy of cerebral origin

Migraine has been described by Riley<sup>12</sup> as a periodic incapacitating headache culminating in nausea and vomiting, often preceded by visual disturbances followed by sleep and occurring against a background of relatively perfect health

of the convulsive seizure, in migraine paroxysms of abdominal pain may be substituted for headache

In abdominal migraine the abdominal pain may become so acute and sharply localized that it simulates acute abdominal disease calling for surgical intervention. Many futile operations have been performed because of the acuteness of the abdominal pain and of the impressions of the existence of so-called acute surgical abdomen

<sup>10</sup> Penfield Wilder and Gage Lyle Cerebral Localization of Epileptic Manifestations Arch Neurol & Psychiat 30 709 (Oct.) 1933

<sup>11</sup> Sherrington C S Remarks on Some Aspects of Reflex Inhibition Proc Roy Soc London (B) 519 1924-1925

<sup>12</sup> Riley H A Migraine Bull Neurol Inst New York 2 429 (Nov.) 1932

<sup>13</sup> Critchley Macdonald and Ferguson F R Migraine Lancet 1 123 (Jan 21) 1933

<sup>14</sup> Bassoe Peter Migraine J A M A 101 599 (Aug 19) 1933

Blitzsten and Brams<sup>15</sup> reported a series of thirty-two surgical cases in which it was later shown that the abdominal pain was an expression of abdominal migraine. Similar reports have been made by Woltman,<sup>16</sup> by Bassoe and by Pollock and Barborka.<sup>17</sup>

Migraine, like epilepsy, is considered by many writers to be an expression of fleeting cerebral pathologic changes and the abdominal pain as resulting from local changes in the brain.

Perhaps of all the cerebral lesions which produce paroxysmal abdominal pain the gastric crisis of neurosyphilis is the best understood. The patient experiences a sudden attack of violent pain in the upper part of the abdomen. The pain radiates in all directions. Commonly it is associated with nausea, vomiting and severe prostration. The attack is variable in duration, lasting from hours to days, and it disappears as suddenly as it came, only to reappear later.

#### PEPTIC ULCER AND EROSIONS

According to Cushing<sup>18</sup> and others, a relation seems to exist between tumors of the brain, peptic ulcer and other perforations of the upper part of the intestine.

Harvey Cushing has given emphasis to this neurogenic theory of peptic ulcer. He demonstrated that a clinical and experimental relation exists between disease of the interbrain and ulcers of the upper part of the alimentary canal. His attention was directed to the neurogenic relation by the disturbing experience of having three patients die from perforation of the upper part of the intestine soon after what appeared to be a successful operation for the removal of an intracranial tumor. He observed eight other patients in whom

and Brown<sup>21</sup> Cushing's views on the neurogenic basis of peptic ulcer are by no means universally accepted. However, the association between tumors of the hypothalamus or its pathways, as well as experimentally produced lesions of the diencephalon, and hemorrhagic ulcers and perforation of the upper part of the intestine cannot be ignored.



Fig. 4 (case 13).—Ventriculogram showing a marked enlargement of the lateral ventricles of the brain as well as of the third ventricle indicative of an internal hydrocephalus. The cranial bones present the beaten silver appearance.



Fig. 3 (case 9).—Enlargement of the occipitofrontal diameter widening of the suture lines and accentuation of the impressioes digitatae or beaten silver appearance of the cranial bones. These signs are considered to be indicative of intracranial pressure. The sella turcica is normal.

intracranial lesions were found to be associated with gastric ulcers. Similar observations have been reported by Grant,<sup>19</sup> by Masten and Bunts<sup>20</sup> and by Vanzant

#### SUMMARY

1. Gastrointestinal symptoms may arise from sources outside the digestive tract.
2. They may arise from disease within the brain.
3. Gastrointestinal symptoms are apt to occur with tumors of the brain, other expanding types of intracranial lesions, epilepsy, migraine and syphilis.
4. Three gastrointestinal syndromes are apt to be produced by the intracranial lesions: (1) the chronic dyspepsia syndrome, (2) the acute paroxysmal attack and (3) the peptic ulcer syndrome.
5. The chronic dyspepsia syndrome includes abdominal distress, nausea, vomiting, and changes in the appetite. This occurs most frequently in association with brain tumors.
6. The acute paroxysmal attack is manifested by sensory and motor disturbances. It occurs in cases of epilepsy, migraine and syphilis.
7. Peptic ulcer and other erosions of the upper part of the intestine occur with tumors and other expanding intracranial lesions.
8. There are no pathognomonic abdominal signs or symptoms of intracranial origin.
9. The following symptoms, however, if otherwise unaccounted for, should suggest the possibility of a lesion in the brain: persistent vomiting, projectile vomiting, bizarre disturbances of the appetite, abdominal distress with or without nausea and vomiting without relation to the gastric cycle.
10. A study of the literature seems to indicate that there is present in the cortex a motor autonomic representation, both inhibitory and stimulating. The prob-

15. Blitzsten N. L. and Brams W. A. Migraine with Abdominal Equivalent. *J. A. M. A.* 86: 675 (March 6) 1926.  
16. Woltman H. W. More Common Neurologic Disorders Associated with Pain. *Minnesota Med.* 7: 193 (March) 1924.  
17. Pollock L. W. and Barborka C. J. Abdominal Migraine. *M. Clin. North America* 11: 1665 (May) 1928.  
18. Cushing Harvey. Peptic Ulcers and the Interbrain. *Surg. Gynec. & Obst.* 55: 1 (July) 1932.  
19. Grant F. C. Brain Lesions and Duodenal Ulcer. *Ann. Surg.* 101: 156 (Jan.) 1935.  
20. Masten M. G. and Bunts R. C. Neurogenic Erosions and Perforations of the Stomach and Esophagus in Cerebral Lesions. *Arch. Int. Med.* 54: 916 (Dec.) 1934.

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able course of this pathway is from the cortex to the hypothalamus, to the red nucleus, to the substantia nigra and to the vagus. Likewise there is present a sensory autonomic representation. Irritation of these pathways is believed to occur in cases of intracranial lesions, thus producing the symptoms.

11 The differential diagnosis between gastrointestinal disease and referred abdominal symptoms originating in disease of the brain is made from a careful consideration of both systems, aided by neurologic and x-ray examinations.

12 Although digestive symptoms may suggest the presence of an intracranial lesion, they are mediated by way of lower levels and hence have no localizing value.

13 There is no royal road to an easy differential diagnosis of acute abdominal pain.

Republic Building

#### ABSTRACT OF DISCUSSION

DR. EDWARD G. BILLINGS, Denver. Gastrointestinal syndromes often arise as a result of some extragastrointestinal disturbance. Disorders of the central nervous system must always be considered and therefore a neurologic study never omitted from the usual examination. However, if the physician stops here he will fail to elicit the true etiology in more than half the patients with symptoms referable to the alimentary system. In the medical clinic of the University of Colorado, in which all gastrointestinal complaint problems are examined, more than half of the patients, ranging in age from 12 to 50 years, with symptoms referable to the alimentary system have neither demonstrable gastrointestinal nor central nervous system disease. In these individuals the gastrointestinal system tends to participate more than the average in their emotional lives. As a result of the motility and secretory phenomena concomitant with the emotivity, symptoms and signs arise which are in truth but a type of "organ language" by which the personality protests to the stresses and strains of life. Nausea and vomiting are often the equivalents of disgust and aversion, anorexia and inappetence may be related to a disorder of mood, abdominal discomfort, ranging from the more vague and insignificant to the most acute and disturbing, is frequently the result of real gastrointestinal participation in such total personality reactions as tension, anxiety and fear. In these personality or psychogenically determined problems, attention to the patient's complete complaint, the setting in which it began, and its evolution in terms of personal and situational factors are the very foundation of the symptomatic, supportive, sublimatory and causal therapies, which in our experience have led to most gratifying results in terms of alleviating the gastrointestinal symptoms of these patients. Dr. Gauss has pointed out that gastrointestinal symptoms may be some of the protean expressions of disturbed functions of the central nervous system. Thus I strongly emphasize but in so doing wish to express that "the mere fact that a gastrointestinal disorder is carried on by neurogastrointestinal processes does not make that disorder nonmental."

DR. THEODORE L. ALTHAUSEN, San Francisco. It has often been said that there is no such specialty as gastroenterology, because a gastroenterologist has to be too well versed in diseases of the kidneys, the chest, and so on. This morning Dr. Bishop told us about the connection between cardiology and gastroenterology, and now Dr. Gauss is adding the study of neurology as a prerequisite for the practice of gastroenterology. To the three syndromes that Dr. Gauss mentioned I should like to add a fourth one, to which I called attention several years ago in the *American Journal of Digestive Diseases and Nutrition*, namely that of functional insufficiency of the liver in diseases of the central nervous system. An instance of gross pathologic changes involving the two organs is Wilson's disease, found chiefly among workers in manganese mines. In this disease there is cirrhosis of the liver associated with degeneration of the lenticular nuclei. In a series of 156 patients without clinical evidence of hepatic disease who were studied by means of liver function tests diseases of the central nervous system proved to be a significant source of potential error. It was

puzzling that the diseases of the central nervous system associated in patients with hepatic insufficiency were not of any one particular type. There were patients with tumors of the brain, with encephalitis, with multiple sclerosis, and others who unaccountably gave positive results with two or more liver function tests. Fernbach pointed out that patients with disorders of the central nervous system are often hypersensitive to insulin. This might invalidate liver function tests based on carbohydrate metabolism, however, it was found that dye excretion tests were equally affected by diseases of the central nervous system in these patients, so this isn't the whole explanation. Hess and Goldstein, Siedhoff, Richet, Jacquelin and Joly, and Crandall also found hepatic insufficiency, as evidenced by the results of several function tests, in various diseases of the nervous system.

#### EPIPHYSITIS OF THE CAPITELLUM OF THE HUMERUS

JOSEPH F. ELWARD, M.D.

WASHINGTON, D. C.

The pathologic process known as epiphysitis or osteochondritis is thus entitled because it involves primarily the articular extremities of bones and for the further reason that the epiphysis is frequently detached or destroyed during the progress of the disease. Osteochondritis and epiphysitis are practically identical, the age incidence of activity of the centers of ossification constituting the distinguishing factor. Accordingly, when the center of greatest activity is situated in the epiphysis, epiphysitis results and, when it is located in the centrum, osteochondritis occurs. Although characterized by a similar course in all the epiphyses, the disease manifests itself in each at the age period of

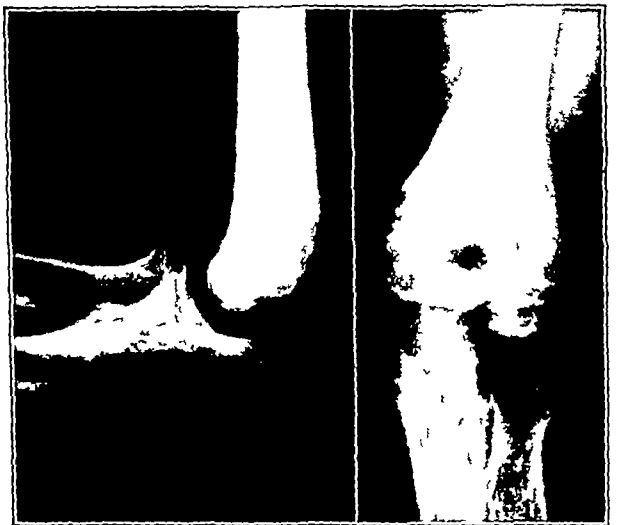


Fig. 1 (case 1)—Nov. 24, 1930

most rapid growth. Hence it has been described by certain writers as osteochondritis of the centers of growth or ossification. Proponents of the infectious theory of the still highly controversial etiology define epiphysitis as a form of acute osteomyelitis in which the focus of infection centers in the epiphyseal cartilage while it exists, and therefore as a malady most frequent in children and adolescents which it is in fact.

The earliest description of the condition properly classifiable as epiphysitis was that contributed in 1869 by Paul Vogt<sup>1</sup> on epiphysitis of the tibial tubercle, which was described both by Osgood<sup>2</sup> and by Schlatter<sup>3</sup> in 1903 and which has since been called Osgood-Schlatter's disease. König<sup>4</sup> in 1887 contributed a description

and by Calve<sup>7</sup> and Perthes<sup>8</sup> in turn in 1910, where upon it received the title of Legg-Calve-Perthes' disease. However, ever since Perthes' classic description in 1913 the disease which he finally denominated osteochondritis deformans juvenilis has been known generally by his name. Meanwhile, as Overton<sup>9</sup> said, Sever<sup>10</sup> had in 1912 contributed an original account of a related disease of the os calcis, which he called apophysitis.

In 1914 Freiberg<sup>11</sup> reported illustrative cases of a disease of the epiphysis of the head of the second metatarsal bone which he designated infraction, although it was later found that neither the anatomic examination nor the clinical evolution confirmed the radiographic appearance of fracture. Thereupon the more appropriate term of osteochondritis of the metatarsal heads, or metatarsal epiphysitis, was substituted. Thus, as Mouchet<sup>12</sup> remarked, the description by Freiberg ante

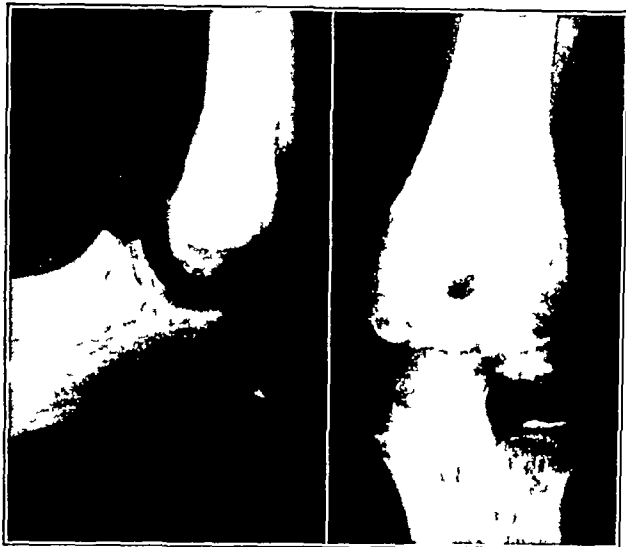


Fig 2 (case 1) —Feb 27 1931

of a condition marked by the appearance of free joint bodies, which resulted from pathologic compression fracture of dead epiphyses, with formation of a wall of bony debris which interfered with bony substitution and induced a process of delimitation, osteochondritis dissecans. In 1908 Kohler<sup>5</sup> published a description of the tarsal scaphoiditis which is now known by his name

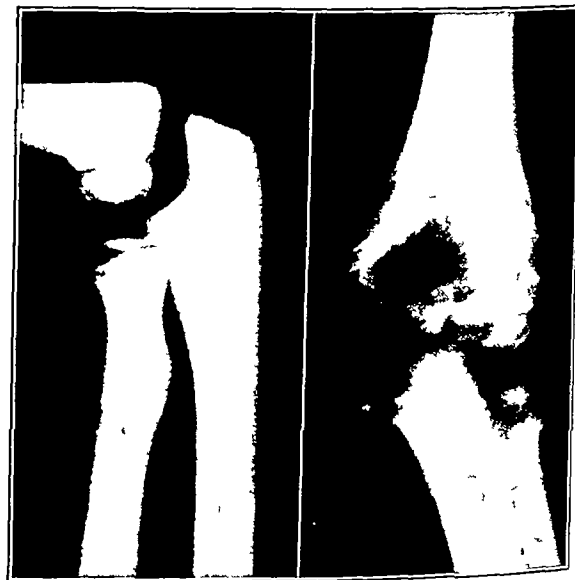


Fig 4 (case 2) —April 24 1937

dated by six years that of Kohler relative to an identical disease of the metatarsals sometimes known as a second Kohler's disease.

Vertebral epiphysitis was first described by Scheuermann<sup>13</sup> in 1921 and osteochondritis of the vertebral body by Calve<sup>14</sup> in 1925. In the same year, Buchman<sup>15</sup> differentiated vertebral epiphysitis from tuberculosis of the spine, to which it bears a similar clinical aspect and from which it is distinguished chiefly by its immediate and favorable response to treatment.

In the foregoing brief historical survey, only the commoner and more familiar disorders of the epiph

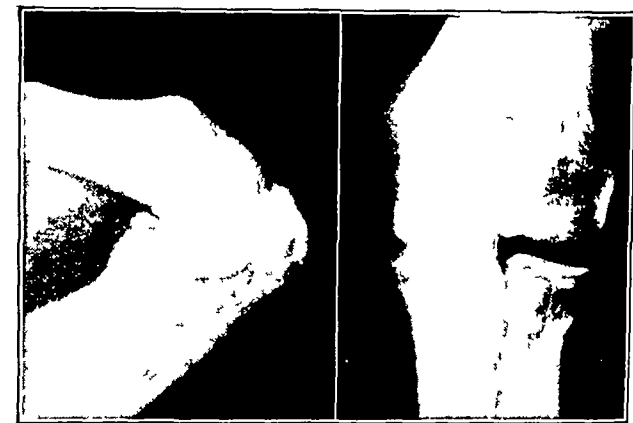


Fig 3 (case 1) —June 1 1937

A peculiar disease of the hip with distinctive signs which served to differentiate it sharply from tuberculosis of the hip joint was reported first by Legg<sup>6</sup> in 1909.

1 Vogt Paul. Ein Fall von Abreissung der Tuberositas tibiae durch willkürliche Muskelcontraction. Berl. klin. Wchnschr. 6: 225-227, 1869.

2 Osgood R. B. Lesions of the Tibial Tubercle Occurring During Adolescence. Boston M. & S. J. 148: 113-117, 1903.

3 Schlatter C. Verletzungen des schnabelförmigen Fortsatzes der oberen Tibiaepiphyse. Beitr. z. klin. Chir. 38: 874-887, 1903.

4 König F. Ueber freie Körper in den Gelenken. Deutsche Ztschr. f. Chir. 27: 90-109, 1887.

5 Kohler A. Ueber eine häufige bisher anscheinend unbekannte Erkrankung einzelner kindlicher Knochen. Verhandl. d. deutsch. Röntg. Gesellsch. 4: 110-112, 1908. München med. Wchnschr. 45: 1923-1925, 1908.

6 Legg A. T. An Obscure Affection of the Hip Joint. Boston M. & S. J. 162: 202-204, 1910.

7 Calve Jacques. Sur une forme particulière de pseudo-coxalgie greffée sur des déformations caractéristiques de l'extrémité supérieure du fémur. Rev. de chir. 62: 54-84, 1910.

8 Perthes G. Ueber Arthritis deformans juvenilis. Deutsche Ztschr. f. Chir. 107: 111-159, 1910.

9 Overton L. M. Osteochondritis of the Growth Centers. Ann. Surg. 101: 1062-1068 (April), 1935.

10 Sever J. W. Apophysitis of the Os Calcis. New York M. J. 45: 1025-1029, 1912.

11 Freiberg A. H. Infraction of the Second Metatarsal Bone. A Typical Injury. Surg. Gynec. & Obst. 19: 191-193, 1914.

12 Diaz Francisco Garcia. Un cas d'ostéochondrite juvénile de la 2<sup>e</sup> phalange du 2<sup>e</sup> orteil. Bull. et mem. Soc. nat. de chir. 54: 986-988 (July 14), 1928.

13 Scheuermann H. Kyphosis Dorsalis Juvenilis. Ztschr. f. orthop. Chir. 41: 305-317, 1921.

14 Calve Jacques. Sur une affection particulière de la colonne vertébrale chez l'enfant simulant le mal de Pott. Osteo-chondrite vertébrale infantile. J. de radiol. et d'électro. 9: 22-27 (Jan.) 1925. J. Bone & Joint Surg. 7: 41-46 (Jan.) 1925.

15 Buchman J. Vertebral Epiphysitis. A Cause of Spinal Deformity. J. Bone & Joint Surg. 7: 814 (Oct.) 1925.

uses have been considered. These are, in the approximate frequency of their occurrence, osteochondritis deformans juvenilis coxae, epiphysitis of the tibial tubercle, epiphysitis of the tarsal scaphoid, epiphysitis of the head of the second metatarsal bone, epiphysitis of the vertebra and osteochondritis dissecans.

However, while it may involve almost any bone, the disease occasionally is observed to appear in regions which seldom or never exhibit its characteristic lesions. Foremost among these usually exempted locations one may place the capitellum of the humerus. In fact, a meticulous search of the literature on the subject and

history were irrelevant. Anteroposterior and lateral roentgenograms (fig 1) showed increased subcortical radiability of the capitellum, indicating possible early inflammatory change. Another roentgenogram (fig 2), taken Feb 27, 1931, showed the capitellum markedly irregular and definitely fragmented. June 1, 1937, a roentgenogram (fig 3) showed the epiphysis solidly united with the diaphysis. There was no roentgenographic evidence of old or recent injury or disease. The patient had excellent dietetic and hygienic care from birth and received no specific treatment, since no radical change in his regimen was necessary. Use of the arm was allowed within the limit of comfort. The symptoms gradually subsided without complications or sequelae. The patient is now 15 years old.

### Reported Cases of Epiphysitis and Osteochondritis

Location or Type of Involvement	Author	Date	Location or Type of Involvement	Author	Date
Tibial tubercle	Vogt <sup>1</sup>	1860	Head of second metatarsal bone	Frelberg <sup>11</sup>	1914
Osteochondritis dissecans	König <sup>4</sup>	1887	Spine	Scheuermann <sup>12</sup>	1921
Epiphysitis	Müller L. Ueber die Verbiegung des Schenkelhalses im Wachstumsalter. Ein neues Krankheitsbild. Beitr. z. klin. Chir. 4: 134-148. 1888. 1889.	1888-1889	Head of humerus	Hass J. Ueber die sogenannte Osteochondritis deformans. Zentralbl. f. Chir. 48: 1089-1090. 1921.	1921
Spine	Kummell H. Ueber traumatische Wirbelerkrankung. Deutsche med. Wchnschr. 21: 180. 1895.	1895	Medial sesamoid of the big toe	Renander, A. Two Cases of Typical Osteochondropathy of the Middle Sesamoid Bone of the First Metatarsal. Acta radiol. 3: 521-527. 1924. 1925.	1924-1925
Tibial tubercle	Osgood -	1903	Pubis	Van Neck, M. Ostéochondrite du pubis. Arch. franco belges de chir. 27: 238-240. (March) 1924.	1924
Tibial tubercle	Schlatter <sup>5</sup>	1903	Clavicle	Friedrich H. Ueber ein noch nicht beschriebenes der Perthes'schen Erkrankung analoges, Krankheitsbild des sternalen Claviculendos. Deutsche Ztschr. f. Chir. 157: 385-398. 1924.	1924
Epiphys of the os calcis	Haglund, Patrik. Ueber Fractur des Epiphysenkerns des Calcaneus nebst allgemeinen Bemerkungen über einige ähnliche juvenile Knochenverletzungen. Arch. f. klin. Chir. 82: 922-930. 1907.	1907	Iliac crests	Buchman <sup>16</sup>	1925
Os tibiale externum	Haglund, Patrik. Concerning Some Rare but Important Surgical Injuries Brought on by Violent Exercise. Lancet 2: 12-15. 1908.	1908	Ischiopubic junction	Valtancoli G. Osteochondrite ischio publica. Chir. d. org. di movimento 9: 281-287. (March) 1925.	1925
Tarsal scaphoid	Köhler <sup>6</sup>	1908	Spine	Calvé <sup>14</sup>	1925
Patella	Köhler <sup>6</sup>	1908	Shoulder joint	Lewin P. Osteochondritis Deformans Juvenilis of the Shoulder Joint. J. Bone & Joint Surg. 9: 456-457. (July) 1927.	1927
Fingers and toes epiphysal disturbance	Thiemann H. Juvenile Epiphysenstörungen. Fortschr. a. d. Geb. d. Röntgenstrahlen 14: 79-87. 1909.	1909	Heads of the metacarpal bones	Mauclair P. Epiphysite des têtes métacarpiennes avec malin un peu creuse. Bull. et mém. Soc. nat. de chir. 53: 1377. (Dec. 17) 1927.	1927
Epiphys of head of femur	Waldenström H. Der obere tuberkulöse Col. lumbard. Ztschr. f. orthop. Chir. 24: 487. 612. 1909.	1909	Capitulum humeri	Panner <sup>16</sup>	1927
Head of femur	Legg <sup>6</sup>	1910	Astragalus	Diaz (Mouchet) <sup>17</sup>	1928
Head of femur	Calvé <sup>14</sup>	1910	Symphysis pubis	Pelerson E. L. Osteochondritis of the Symphysis Pubis. Surg. Gynec. & Obst. 49: 834-838. (Dec.) 1929.	1929
Head of femur	Perthes <sup>8</sup>	1910	Metatarsal epiphysitis	Mouchet Albert. Metatarsal Epiphysitis. J. Bone & Joint Surg. 11: 87-93. (Jan.) 1929.	1929
Semilunar bone (carpal)	Kienböck R. Ueber traumatische Malazie des Mondbeins und ihre Folgezustände. Entartungsformen und Kompressionsfrakturen. Fortschr. a. d. Geb. d. Röntgenstrahlen 16: 77-103. 1910.	1910	First metatarsal bone	Wagner, Ange. Isolated Aseptic Necrosis in Epiphys of First Metatarsal Bone. Acta radiol. 11: 80-87. 1930.	1930
Carpal navicular	Preisler G. Zur Frage der typischen traumatischen Ernährungsstörungen der kurzen Hand- und Fusswurzelknochen. Fortschr. a. d. Geb. d. Röntgenstrahlen 17: 360-362. 1911.	1911	Lower ulnar epiphys	Durso B. H. Osteochondritis Juvenilis of the Lower Ulnar Epiphys. Proc. Roy. Soc. Med. 24: 912. (May) 1931.	1931
Os calcis	Sever <sup>10</sup>	1912	Pseudometatarsal epiphys	Burman M. S. Epiphyses of Proximal or Pseudometatarsal Epiphyses of Foot. Report of Case. J. Bone & Joint Surg. 17: 538-540. (April) 1935.	1935
Fifth metatarsal bone	Iselin H. Wachstumsbeschwerden zur Zeit der Zeit der Knochenentwicklung der Tuberostas metatarsi quinti. Deutsche Ztschr. f. Chir. 117: 129-130. 1912.	1912			

extensive inquiry in person and by correspondence have elicited references to only four instances in which the capitellar epiphys of the humerus was affected.

The first of these cases was contributed by Panner<sup>16</sup> in 1927, Krebs also reported a case in 1927, and Smith<sup>17</sup> contributed a third case in 1928. I am indebted to Dr. Thomas A. Groover for the privilege of reporting the fourth case, hitherto unreported.

A boy aged 8 when first seen, Nov. 24, 1930 complained of slight pain and limitation of motion in the right elbow. There was no account of an injury. The family and the personal

To these unique cases is added a fifth, lately encountered in my own practice.

A boy aged 8, seen first April 24, 1937, had a history of a slight injury sustained several days previously. The chief complaint was pain in the left elbow with limitation of motion. A roentgenogram (fig 4) revealed an intact cortex and a marked increase in subcortical radiability. October 9 a second roentgenogram (fig 5) showed fragmentation, with a definite break in the continuity of the cortex. Roentgen study April 24, 1938 showed the capitellum markedly fragmented (fig 6). This patient has received no specific therapy, since his hygienic and dietetic regimen is satisfactory and no modifications have been deemed requisite.

The accompanying table is believed to be complete and gives the site of involvement, the name of the

<sup>16</sup> Panner H. J. An Affection of the Capitulum Humeri Resembling Calvé-Perthes Disease of the Hip. Acta radiol. 8: 617-619. 1927.

<sup>17</sup> Smith L. A. Epiphysitis of Adolescents with Special Reference to Etiology. Am. J. Roentgenol. 22: 127-130. (Aug.) 1929.

physician who described or reported the case and the date. The use of proper names in connection with this condition is believed to be nonscientific and nondescriptive and serves no useful purpose.

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#### ABSTRACT OF DISCUSSION

DR CARL H PARKER, Pasadena, Calif. I want to add one point to the discussion of this interesting condition. Recently I had the opportunity of studying an epiphysitis of the base of the first phalanx of the great toe. I found it in the acute stage, because the patient had stepped on a nail which penetrated the sole of the foot in that region and it was a question whether the condition was an infection or an epiphysitis. It proved to be an epiphysitis. In talking with

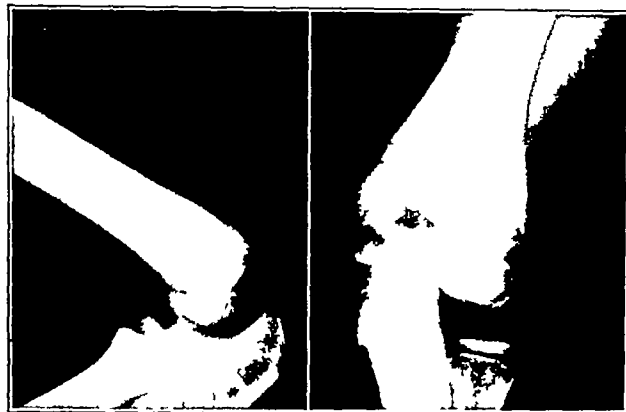


Fig 5 (case 2)—Oct 9 1937

the patient I found that she had had symptoms of Osgood-Schlatter disease. A roentgenogram of her knee showed typical Osgood-Schlatter disease on one side. Further study of the patient disclosed that she had an epiphysitis of the tuberosity of the ischium. The condition was bilateral. There were typical changes though the patient had been entirely without symptoms in this region. In these cases it may be

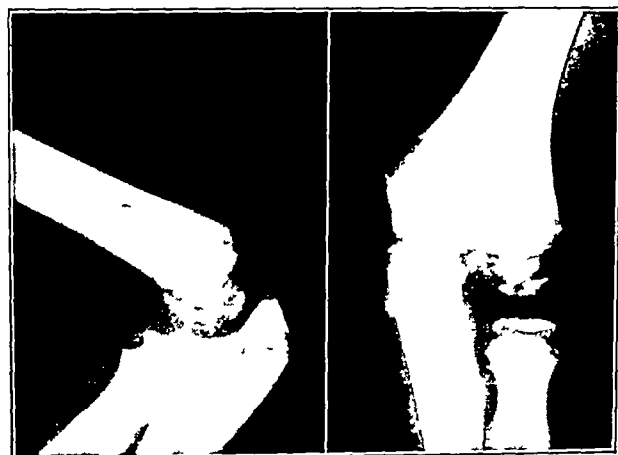


Fig 6 (case 2)—April 24 1938

worth while to make a survey to find instances of multiple epiphysitis, which are not often reported because many of them are symptomless.

DR JOHN PIERSON, Baltimore. Hypothyroidism is a condition which should always be considered in a discussion of the multiple bone lesions which have just been described. This disease frequently produces a granular appearance in one or more epiphyses, which changes may closely simulate those produced by epiphysitis or osteochondritis dissecans.

## PHYSIOLOGIC MOVEMENTS OF THE GASTROINTESTINAL TRACT

AS RECORDED BY THE ROENTGEN KYMOGRAPH

WENDELL G SCOTT, MD

BRUCE KENAMORE, MD

AND

J W LARIMORE, MD

ST LOUIS

Roentgen kymography has been accepted as a diagnostic method in the clinical study of heart disease. The procedure was later applied to the study of the peristaltic movements of the stomach, duodenum, small intestine and colon by Stumpf, Weber and Wetzl,<sup>1</sup> Schilling,<sup>1a</sup> Dahm<sup>2</sup> and Wetzl.<sup>3</sup> Our purpose in this paper is to report and in general to confirm their observations. In doing this we have borrowed freely from their publications and personal communications.

The principles and technic of roentgen kymography must be clearly understood in order to interpret the films, or kymograms, as they are called. The multiple slit kymograph is the achievement of Pleikart Stumpf, who introduced it in 1928<sup>4</sup> and perfected it by 1931.<sup>5</sup> The apparatus is relatively simple and commercially available (fig 1). The essential part is the grid, which is made of a large sheet of lead one-sixteenth inch thick. Narrow, horizontal slits are cut in the grid 12 mm apart. The opening in each slit is 0.35 mm wide. The patient stands with the abdomen against the grid during a single, continuous exposure of one minute for recording the movements of the stomach, thirty seconds for those of the duodenum and six minutes for those of the colon. During the exposure the x-ray film moves slowly down behind the fixed grid. It moves a distance slightly less than the space between two slits, actually 11.5 mm. By this method the movements, or changes in position, of multiple points on the border of the stomach or intestine are recorded simultaneously on the x-ray film as it is moving down behind the grid. The points on the stomach, the change in the position of which with peristalsis is recorded, are those which overlap the slits in the grid. Thus each frame (the space between two white lines on the kymogram) is the record of the excursion of one point at the edge of the stomach as it changes position during the passage of a peristaltic wave. The rapid movements of the stomach are recorded as horizontal or oblique lines, while slow movements are recorded as rounded curves. Areas without movement are recorded as straight perpendicular lines. The width of the slits, their space apart, the time of exposure, the movement of the film or grid and other technical factors vary among roentgenologists.

From the Edward Mallinckrodt Institute of Radiology, Washington University School of Medicine.

Read before the Section on Gastro-Enterology and Proctology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

1 Stumpf, Pleikart, Weber, H. H. and Wetzl, G. A. *Röntgen kymographische Bewegungslehre innerer Organe*. Leipzig: Georg Thieme, 1936, pp. 420-475.

1a Schilling, K. *Ueber die Kymographie des Magens*. Fortchr. a. d. Geb. d. Röntgenstrahlen 50: 30-36 (July) 1934.

2 Dahm, Max. in Stumpf, Weber and Wetzl, pp. 397-420.

3 Wetzl, G. A. *Bewegungen des menschlichen Magens*. Darmkanals im Flächenkymogramm presented at the fifth International Congress of Radiology, September 1937, Chicago.

4 Stumpf, Pleikart. *Die Gestaltänderung des Schlagenden Herzens im Röntgenbild*. Fortchr. a. d. Geb. d. Röntgenstrahlen 28: 103-105 (Dec) 1928.

5 Stumpf, Pleikart. *Das röntgenographische Bewegungsbild und seine Anwendung (Flächenkymographie und Kymoskopie)*. Fortchr. a. d. Geb. d. Röntgenstrahlen 44: 413 (Sept) 1931.



The time of occurrence of movements at different parts of the stomach, intestine or esophagus is readily determined, as all movements that are an equal distance above a white line at the bottom of a frame are recorded at the same instant. For a more detailed

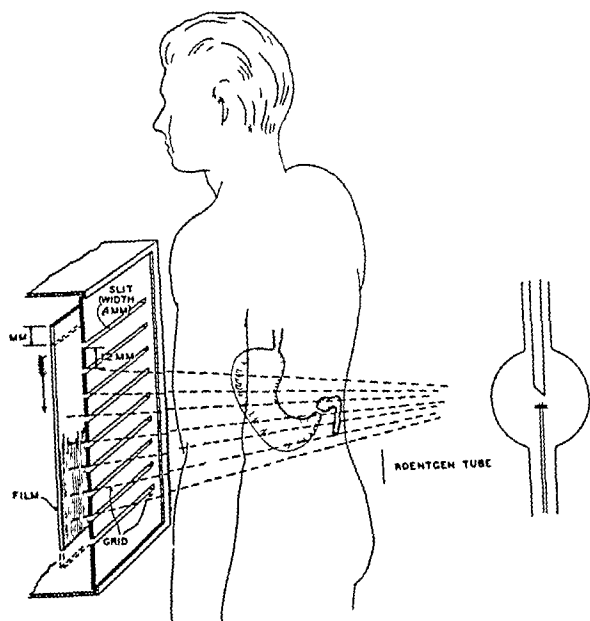


Fig 1—Diagram of roentgen kymograph. The patient stands next to the grid and during a single continuous x-ray exposure of one minute for gastric films (thirty seconds for small intestine and six minutes for colon) the film slowly moves down behind the fixed grid a distance slightly less than the width between two slits. The roentgen kymograph records simultaneously the movements of multiple points on the border of the stomach. These points are the small areas on the gastric silhouette that overlie the slits. Thus the alterations in gastric form resulting from peristaltic activity are recorded in wave form. Each frame is then a record of the change in position of one of these small areas during the passage of a peristaltic wave.

description of the technique and principles of kymography, the reader is referred to the publications of Scott and his associates<sup>6</sup> and that of Hirsch.<sup>7</sup>

#### ESOPHAGUS

The movements of the esophagus have been studied most extensively by Dahm.<sup>8</sup> The esophagus is constantly moved by the transmitted pulsations from the heart and great vessels. These movements can be recorded in detail on a kymogram made while the patient swallows a contrast meal. By analyzing the shape and size of the imparted esophageal movements it is possible to determine the position of the great vessels and cardiac chambers that form the posterior portion of the cardiac silhouette. For example, that portion of the esophagus which is in contact with the aorta will have transmitted aortic movements registered over its border. That part of the esophagus immediately adjacent to the auricle will have auricular movements, and the lower portion, which is in contact with the ventricle, will exhibit ventricular movements. Such kymograms are called esophageal cardiograms.

In studying the peristaltic movements of the esophagus, Dahm<sup>8</sup> measured the speed of progression of peri-

staltic waves. He found that fluids descended more rapidly than a peristaltic wave could pass down the esophagus. A solid bolus of food was aided in its passage by the peristaltic movements. Pastes descended at the rate of about 13 cm in three minutes and peristaltic waves at about 5 cm in three minutes. Fluids descended at the rate of 156 cm in three minutes.<sup>1a</sup> The tonus of the esophagus determines the shape and form of the food bolus. The kymogram is ideal for recording the degree of tonus and peristaltic activity of the esophagus by an objective picture. For this reason it may be used to follow the improvement following treatment of cardiospasm and achalasia. It has been used to record the movements of swallowing and the antiperistaltic movements which occur in stenosis of the esophagus resulting from various causes.<sup>8</sup>

#### STOMACH

The peristaltic waves vary from person to person and in the same person at different times. They are influenced by the type and consistency of foods, by the state of health, by acidity and by psychic phenomena. As a rule the movements are the same under the same physiologic conditions. Because of the wide variations in the normal gastric movements, it is more difficult to recognize abnormal motion from the gastric kymogram than from the cardiac kymogram. It is a basic kymographic principle that only pathologic lesions that alter the physiologic movements of an organ or structure will record kymographic waves varying from the normal. The kymographic studies of the stomach should not be

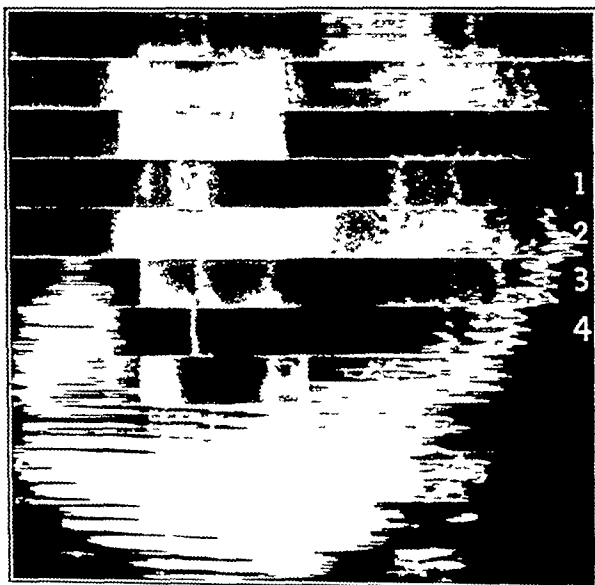


Fig 2—Roentgen kymogram of a partially filled normal stomach to demonstrate the movements of the rugae. They are best visualized in frames 1 to 4. The rugae move at the same time and proceed in the same direction as those of the walls of the stomach. In this frontal projection the amplitude of rugae movement is least in the central portion of the stomach and most near the periphery. With the passage of a peristaltic wave the space between the folds of mucous membrane becomes less and the folds narrower. Only the large waves on the border of the stomach are peristaltic waves. The small serrations are the result of the respiratory movements of the diaphragm.

6 Scott W G and Moore Sherwood. Roentgen Kymography. Its Clinical and Physiological Value in the Study of Heart Disease. *Ann Int Med* 10: 306-329 (Sept.) 1936. Roentgen Kymography in Diseases of the Heart. *J A M A* 107: 1951-1954 (Dec 12) 1936. Scott W G, Moore Sherwood and McCordock H A. Roentgen Kymographic Studies of Cardiac Conditions. *Radiology* 28: 196-210 (Feb.) 1937. Scott W G and Moore Sherwood. Roentgen Kymographic Studies of Aneurysms and Mediastinal Tumors. *Am J Roentgenol* 40: 165-172 (Aug.) 1938.  
7 Hirsch I S. The Recording of Cardiac Movements and Sounds by the Roentgen Ray (Kymophonoroentgenography). *Radiology* 22: 403-422 (April) 1934. 23: 720-737 (Dec.) 1934.  
8 Dahm Max. Die Bewegungen des Oesophagus im Röntgenbild. *Fortschr a d Geb d Röntgenstrahlen* 43: 464-475 (April) 1931.

undertaken alone but should be part of the general roentgenologic investigation. The kymograms are simply a detailed photographic record of the movements transiently observed on the fluoroscopic screen.

8 Dahm Max. Zur Frage einer Antiperistaltik bei Stenosen der Speiseröhre. *Klin. Wchnschr* 17: 347-350 (March) 1938.

The stomach is loosely connected with its surroundings and is affected by extrinsic as well as powerful intrinsic movements. Stumpf<sup>9</sup> classified them as follows:

Passive movements of the stomach

- (a) Respiratory movements due to excursion of the diaphragm
- (b) Transmitted pulsations from the heart and aorta
- (c) Changes due to alteration of intra-abdominal pressure
- (d) Alterations produced by posture
- (e) Movements imparted by adjacent viscera, such as the colon

Active movements of the stomach

- (a) Intrinsic movements of the rugae
- (b) Circular peristaltic movements

By employing the technical factors aforementioned, all the passive movements of the stomach except those of respiration are eliminated from the kymogram, and only the intrinsic movements are recorded (fig 2).

To avoid misunderstanding, certain terms should be defined. Tonus is defined as the resting length of the muscle fibers. Peristalsis is a special form of contractile wave, which maintains the same width as it progresses across an organ in a definite direction. Spasms are contractions in the stomach or intestine which do not progress.

**Movements of the Rugae**—The movements of the rugae are best demonstrated with small amounts of a relatively thick mixture of barium in the stomach. The films may be taken with the patient erect, prone or in each position, depending on the adaptability of the appa-

The only movements of the rugae that are shown kymographically are those which are dependent on the movements of the whole stomach. These movements occur at the same time and proceed in the same direction as those of the walls of the stomach. In the frontal projection the rugae in the middle segment move less from

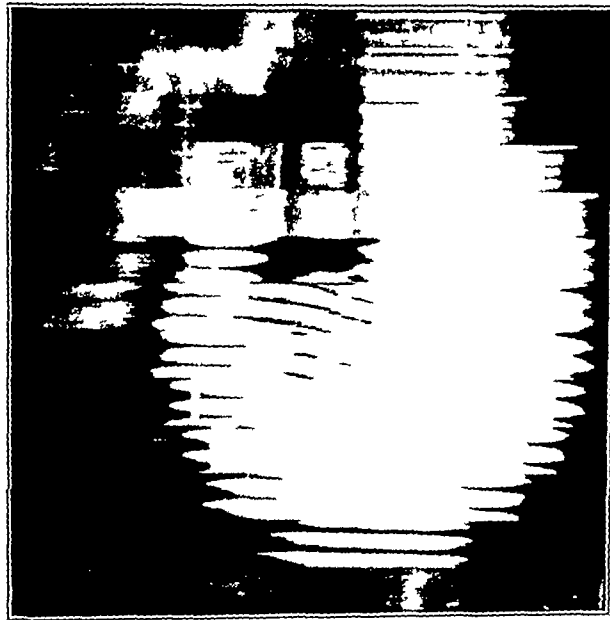


Fig 3—Roentgen kymogram of a filled normal stomach. Analysis of this kymogram is primarily for the study of peristaltic activity. The peristaltic waves in the fundus of the stomach are flat and of small amplitude while those of the pyloric region are deeper, narrower and more powerful. Peristaltic waves average from 2.2 to 3.8 waves per minute. A peristaltic wave lasts from fifteen to thirty seconds. The speed of progression of a wave averages about 25 cm. per minute.

ratus. Forssell's so-called autoplasmic movements of the rugae, which he described as being independent of the muscular walls, have not been recognized. It is probable that such movements occur over a longer period than one minute and for this reason are not recorded.

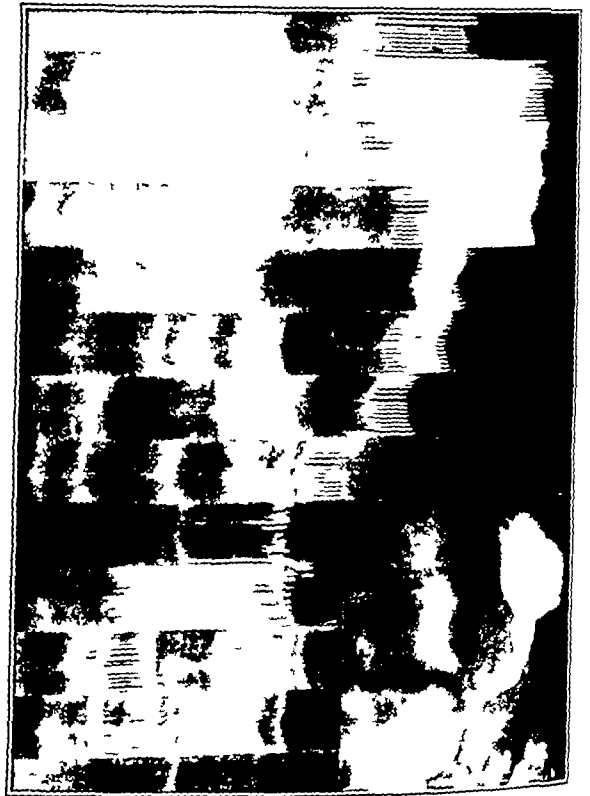


Fig 4—Roentgen kymogram of stomach involved with extensive carcinoma. Note the complete lack of peristaltic activity in the area invaded by the carcinoma. The inset is a conventional roentgenogram.

left to right. However, these may move more from front to back (fig 2). The width of the rugae changes with the passing of a peristaltic wave. At the level of contraction the folds of mucous membrane become narrower and the intervening space between the folds disappears. The movement is similar to that of the folds in an accordion. Kymograms of the rugae are helpful only in the diagnosis of hypertrophic gastritis.

**Movements of the Completely Filled Stomach**—In the stomach filled with the barium meal the kymographic study is primarily that of the peristaltic activity. In general the waves in the fundus of the stomach are flatter and in the pyloric region deeper and narrower, indicating that the peristalsis is more vigorous and rapid. The curves of movement in general are more rounded on the greater curvature than on the lesser (fig 3).

Peristalsis is analyzed on the basis of the following factors: amplitude, frequency, wavelength, speed of progression and tonus. The numerical values for the factors are those obtained by Stumpf<sup>1</sup> after analyzing 100 normal stomachs. We determined these values on twenty-five kymograms of normal stomachs and found them within the limits set by Stumpf.

1. Amplitude is the depth of the peristaltic wave. It is obtained on the kymogram by measuring the distance from the peak to the trough of a wave. It varies

with the degree of tonus and with different locations in the stomach. In the fundus on the larger curvature the amplitude varies from 5 to 10 mm and on the small curvature from 3 to 5 mm. In the pyloric region it varies from 15 to 20 mm.

2 Frequency is the rate of recurrence of peristaltic waves at the same place. It is read from the kymogram by counting the number of peaks in each frame. Since the kymogram was exposed for a minute, the number of these peaks is the frequency per minute. It averages from 22 to 38 waves per minute, which corresponds to a duration in time of about fifteen to thirty seconds.

3 Wavelength is the distance on the border of the stomach between two peristaltic waves at the same phase. It is recognized on the kymogram by noting the frames in which the waves are in a similar position. It varies between 6 and 10 cm.

4 Speed of progression is the rate at which the peristaltic wave passes through the stomach. It is calculated by multiplying the wavelength by the frequency. On the larger curvature it varies from 15 to 40 cm per minute, with an average value of about 25 cm per minute. These figures correspond to those previously obtained by Kastle.

5 The effects of tonus on peristaltic activity were shown in the early works of Cannon.<sup>10</sup> He noted that peristalsis was initiated by the simple stimulus of stretching the muscle fibers. Stumpf demonstrated this by making kymograms of the patient in the supine position with the radiographic table tilted to make the head lowermost. In this position the upper part of the stomach is distended, and peristalsis begins in the cardia. When the patient is in a standing position, peristalsis usually begins in the upper part of the fundus at the greater curvature. Weltz<sup>11</sup> from kymographic studies found that an increase of the tonus augments peristalsis. With a marked fall in tonus the peristalsis disappears. The amplitude of a wave is determined by the tonus. He expressed the opinion that tonus is the primary factor and tends to govern all active movements of the stomach.

*Emptying of the Stomach*—Kymographic studies favor Alvarez's<sup>12</sup> idea, that the emptying of the stomach is primarily caused by reflex changes at the pylorus which are dependent on peristalsis. The kymograms show that the pylorus opens only at a definite position on the peristaltic wave but not every time this position is reached on every peristaltic wave. Every second or third peristaltic wave normally transports chyme into the duodenum. Pyloric opening depends also on fluctuations in tonus, as Stumpf and his associates<sup>1</sup> have noted duodenal filling with an increase in tonus alone and again with peristalsis without variation in tonus. The emptying process is complicated and cannot be explained as a purely mechanical phenomenon. Certain unrecognized reflexes within the musculature must participate in the regulation of emptying.

*Normal Duodenum*—The movements of the duodenum are much faster than those of the stomach, indicating a quick passage of the opaque meal. The movements of the duodenum are as varied as its shape and position. Stumpf and his co-workers have classi-

fied the various ways in which the duodenum fills, but their clinical application is not apparent at this time and will therefore not be discussed.

*Gastritis*—Gutzeit<sup>13</sup> described the gastroscopic appearance of the rugae in hypertrophic gastritis as thickened and irregular, with superimposed areas of granulation and minute ulcerations. The rugae are rigid and their movements are suppressed. These changes are the result of edema and infiltration of the tissues. The chief kymographic signs of gastritis include a decrease in the mobility of the rugae and the failure of the folds to narrow and widen during the passage of a peristaltic wave. With the stomach completely filled, the peristaltic waves are frequently increased in amplitude and speed. These changes are considered to be the result of mucosal irritation. Stumpf expressed the belief that the kymographic films are of practical value in the diagnosis of hypertrophic gastritis. From our meager experience they seem promising.

In persons with atrophic gastritis it is difficult to follow the movements of the folds of mucous membrane, as they are smaller and thinner than in normal persons, and kymography offers little help in the diagnosis.

*Gastric Ulcer*—The roentgenologic diagnosis of gastric ulcer has been established by a large number of workers and is based on the detection of niches, filling defects, spasm, absence of motion fixation and local tenderness on pressure of the affected segment. The kymographic picture is not of diagnostic value but is interesting from the point of view of pathologic movement. In the kymogram the area of the ulcer is without active peristalsis but is affected passively by the movements of the adjacent portion of the stomach. The niche of the ulcer is seen to fill gradually as the tonus of the stomach is increased during the passage of a peristaltic wave. Stumpf has observed that the peristaltic waves in the portion of the stomach distal to the ulcer may be deep and forceful, while above the area of the ulcer retrograde peristalsis is present. The peristaltic wave is usually increased in speed and is smaller on the portion of the greater curvature opposite the ulcer.

In some instances, alterations in the peristaltic motion give rise to clinical symptoms. Deep, turbulent peristaltic waves may give rise to cramplike epigastric pains. In retrograde peristalsis there may be regurgitation, nausea or absence of symptoms. A deepening of the peristaltic wave in the normal direction usually does not cause subjective symptoms. Rapid changes in the type of peristaltic motion usually give rise to various subjective changes. From kymographic films Stumpf has often been able to predict the presence of pain by observing the character of the peristaltic waves and alterations in gastric tonus.

Gastric ulcers which have disappeared as the result of healing do not exhibit abnormalities of movement.

*Ulcer of the Duodenum*—Small niches can now escape observation even if the 6 mm grid which is best adapted for the study of duodenal ulcer, is used. The movements of large ulcers in the duodenum are passive similar to those of gastric ulcer. The films are usually exposed for about twenty seconds. The movements of the duodenum are so complex at the

10 Cannon W. B. The Movements of the Stomach Studied by Means of the Roentgen Rays. *Am. J. Physiol.* 1: 359, 1898. The Movements of the Intestines Studied by Means of the Roentgen Rays. *ibid.* 6: 251, 1902.

11 Weltz G. A. Neue Beobachtungen über Bewegungen im Magen. *Darmkanal Fortchr. a. d. Geb. d. Röntgenstrahlen* 3: 4, 628 (Dec.) 1936.

12 Alvarez W. C. The Mechanics of the Digestive Tract. ed. 2. New York: Paul B. Hoeber, 1929. p. 202.

13 Gutzeit Kurt. Die Gastroskopie im Rahmen der klinischen Magerdiagnostik. *Ergebn. d. inn. Med. u. Kinderh.* 35: 197, 1929.

area of radiologic investigation and the area is so small, that the organ is not well suited for kymographic work.

**Carcinoma of the Stomach**—The roentgenologic characteristics of carcinomatous infiltration have been established as consisting of filling defects, damage to the rugous pattern, rigidity of the gastric wall and absence of peristalsis. Most of these factors are clearly portrayed in the kymogram. Small tumors projecting into the lumen, which are well demonstrated in the conventional roentgenogram, usually do not influence the movements of the stomach. If a wall of the stomach is invaded, an area without regular movements, which is passively moved, appears in the kymogram.

There may be adequate peristaltic movement above the carcinoma, or distal to the infiltrative lesion the movement can be of a different type. Cramer<sup>14</sup> stated that the kymogram should not be avoided in the diagnosis of carcinoma because the lack of action in this area is an indication of the extent of carcinomatous infiltration, and therefore it is of value in determining the operability (fig. 4).

There is often no continuation of peristalsis beyond the defect. One has the impression of two different types of peristalsis, one on each side of the zone of infiltration. This is probably due to an infiltration of a sufficient area of the stomach muscle so that conduction in the muscle fibers is interrupted.

Even Stumpf<sup>15</sup> stated that the differentiation of benign polyposis or mucosal growths in small superficial tumors cannot be recognized, as the kymograms appear similar to those of normal stomachs. It was a hope that kymography would be a factor in the diagnosis of early carcinoma and of early infiltration lesions, but this hope has not been realized.

#### SMALL INTESTINE

Weltz<sup>16</sup> analyzed the movements of the small intestine by the kymographic method and was able to demonstrate (1) the already accepted "segmenting" movement which divides the food column into segments without onward propulsion, supposedly a mixing or churning process, (2) the common peristaltic waves, which are largely responsible for propelling the chyme onward, and (3) a previously unrecognized movement which he terms the "advancing movement through sectional contraction." A segment of the small intestine about one handbreadth wide contracts and squeezes its contents into the adjacent section of the intestine which is hypotonic. This movement is a localized contraction and does not progress down the intestine like a peristaltic wave. The "advancing segmental movement" is usually observed when large quantities of material enter the small intestine rather quickly.

#### COLON

The movements of the colon have been recorded on kymograms by Weltz<sup>16</sup> and Stumpf<sup>17</sup>. Colonic movements which advance the food column occur infrequently, approximately three times in twelve hours. This peristaltic activity recorded in cases of colonic obstruction is somewhat similar to that seen in the stomach. The individual peristaltic movements in the colon were deep, concentric waves lasting from seven

to eight minutes, which is about twenty times slower than gastric peristalsis. The very slow and gradual course of these movements, visible only on kymograms exposed six minutes, is obviously the reason why they have not been previously observed during fluoroscopic examinations.

The work of Weltz and Stumpf also demonstrated that the haustra of the colon undergo a fairly constant, fluttering type of motion as though they were attempting to mold their contents.

Both the peristaltic contractions and the feeble movements of the haustra are clearly demonstrated in their motion picture films made by photographing the image obtained by placing the kymogram in the kymoscope.<sup>18</sup>

#### CONCLUSIONS

1 Roentgen kymography is a practical method for studying the movements of the gastrointestinal tract.

2 The procedure offers a method for recording the details of peristaltic movement in both normal and pathologic stomachs, intestines and colons.

3 Kymography has stimulated an interest in the study of physiologic movements which may lead to a better understanding of functional disorders of the gastrointestinal tract.

4 Kymography is helpful in the diagnosis of gastritis but at this state of development is only of confirmatory value in the diagnosis of gastric ulcer, gastric cancer and zones of infiltration in the wall of the stomach such as syphilis.

#### ABSTRACT OF DISCUSSION

DR CHARLES F. DUDEN, St. Louis. There is a great deal to say about any new concept of any physiologic system. This has been brought more clearly before the members by Dr. Scott and his co-workers, probably, than in any of the previous published reports, which they have referred to adequately. The procedure is new in the realm of gastrointestinal study. It has been fairly well accepted, standardized and used diagnostically in the study of cardiograms and cardiokymograms, but it has not been applied, of course, to anything more than physiologic study in gastrointestinal work. On two or three occasions certain physiologic concepts have been verified by this particular method. The esophageal contractile waves, for instance, of solid boluses of food have been shown to travel approximately 5 or 6 cm in three seconds, and contractile waves of liquids have been shown to amount to from 13 to 15 cm per second. The ordinary contractile waves of the stomach have been shown to travel two or three peristaltic waves per minute, traversing the stomach in from twenty to twenty-five second cycles. It has also been shown here how stretching muscle fibers initiates peristaltic waves. This procedure probably can be referred to as photographic fluoroscopy, in which records are made of fluoroscopic items of the intestinal tract. It certainly offers a great field for checking previous physiologic concepts of the intestinal tract and perhaps for advancing certain elements of physiology of the digestive tract. It can be applied to diagnostic methods in only a supplementary way, however, because from this application or from these studies only the movements of the intestinal tract can be gaged. Nothing can be told of secretions and other things that are vitally important for diagnostic work, but it appears to me that early lesions of the intestinal tract which may not be seen by the naked eye in fluoroscopic manipulations can be demonstrated on kymographic films and the information be of great value. I say it is supplementary. Time will tell. Something has been seen here this morning that may lead in future years to further diagnostic and physiologic studies of the intestinal canal.

14 Cramer H. in IV Internationales Radiologenkongress Zurich 1934 Leipzig Georg Thieme 1934  
15 Stumpf Pleikart Die Flächenkymographie im Dienste der Krebsdiagnostik des Magens Monatschr f Krebsbekampf 4 111 (Jan) 1936  
16 Weltz (footnotes 3 and 11)  
17 Stumpf P. Roentgen Kymography as a Diagnostic Aid Radiology 31 391 397 (Oct) 1938

18 Scott W. G. and Moore Sherwood The Construction of Roentgenkymographs and Kymoscopes Radiology 26 622 629 (May) 1936

A METHOD FOR RECOGNITION OF  
BLOOD SUBGROUPS  $A_1$  AND  $A_2$ AS A MEANS OF AVOIDING TRANS-  
FUSION REACTIONSISRAEL DAVIDSOHN, M.D.  
CHICAGO

It has been recognized for some time that the selection of donors for blood transfusions according to the recognized rules for typing and cross matching of blood does not always assure transfusions without mild, moderate or even severe and fatal reactions, although the surgical procedure was beyond reproach.

Such unexplained reactions are frequent, much more frequent than the reports in the literature would indicate. They brought about an attitude of defeatism in surgeons who take it for granted that some reactions cannot be avoided and who accept that state of affairs as a necessary evil. This is particularly true with regard to reactions that are of only slight or moderate severity.

It is not feasible to review the very large number of contributions dealing with transfusion reactions. Only the more recent ones and only those with sufficient data concerning the blood groups will be referred to. Recently de Gowin<sup>1</sup> analyzed carefully eight fatal reactions in a series of 3,500 blood transfusions. Several references will be made to his case reports.

My purpose in this paper is twofold: (1) to consider the significance of the subdivisions of blood groups A and AB, so-called subgroups  $A_1$ ,  $A_2$ ,  $A_1B$  and  $A_2B$ , as a possible cause of transfusion reactions and (2) to suggest a simple and practical method for the rapid recognition of these subgroups.

What is the evidence that subgroups  $A_1$ ,  $A_2$ ,  $A_1B$  and  $A_2B$  may cause transfusion reactions? I will attempt to show that they may be responsible for reactions for one of two reasons: (1) because there is evidence that they may not be compatible and (2) because with the usual methods subgroups  $A_2$  and  $A_2B$  may not be recognized and may easily be mistaken for other blood groups.

## SIGNIFICANCE OF THE SUBDIVISIONS

Reactions of varying severity and even fatal ones have been reported when a donor of the same blood group as that of the patient was used and the typing and in some cases also the cross matching was done with care and according to all known rules. In some cases the tests were verified after the transfusion in an effort to find an explanation for the reaction. In some, errors were found in the grouping, most frequently due to the use of weak typing serums, in some, various other causes were disclosed and in others the reactions remained a mystery. A careful analysis of some reports fixes the responsibility on the disregard of the role of subgroups.

Statistical data suggest that, in blood transfusions with donors and recipients of the same blood group reactions are particularly frequent when both are of

group A.<sup>2</sup> One writer<sup>3</sup> even suggested that it is safer to use a universal donor for a patient of group A than to use a donor of group A. Ruedel<sup>4</sup> reported thirty-four transfusion reactions. In twenty-one of them blood group A or AB was involved. In thirteen the donor and recipient belonged to the same group, A in six cases and AB in one.

De Gowin<sup>1</sup> observed in his series of eight fatal reactions three deaths in patients of group A given a transfusion with blood of the same group and in a series of sixteen reactions five moderate or severe reactions with the blood in the same combination.

It could be argued that the large number of reactions involving group A is explained by its statistical frequency. This is admittedly a potent argument and it deserves serious consideration. On the other hand there is urgent need for more studies of the kind reported by Blinow,<sup>2</sup> who analyzed the subgroups in thirty-two transfusions of blood A to recipients of the same group. He noted five mild or moderate reactions in twenty-one transfusions when the subgroups of the donor and recipient were identical and nine more severe reactions in eleven transfusions, in two of which blood  $A_1$  was given to an  $A_2$  recipient and in nine of which blood  $A_2$  was given to an  $A_1$  recipient.

In several of his cases recipients of group  $A_1$  were given on one or more occasions blood of the identical subgroup without any reaction, while administration of blood of subgroup  $A_2$  was followed regularly by reactions of varying severity.

The importance of a consideration of subgroups is borne out by the case reports of de Gowin.<sup>1</sup> Patient 6, of group A, received five blood transfusions with blood of the same type but from different donors. Three were followed by severe reactions and two were free from reactions. In patient 13, two transfusions with blood of type A produced severe reactions, while a third transfusion, given between the two, was innocuous. Here too a different donor was used each time.

From the references mentioned and from many others, some of which will be cited later, it seems reasonable to assume that subgroups  $A_1$  and  $A_2$  as well as  $A_1B$  and  $A_2B$  are not always compatible with one another.

What are these subgroups  $A_1$ ,  $A_2$ ,  $A_1B$  and  $A_2B$ ?

As early as ten years after Landsteiner's discovery of the blood groups, von Dungern and Hirschfeld<sup>5</sup> found that blood group A is not homogeneous. They absorbed the serum of a person of blood group B with the red cells of a person of blood group A and noted that the absorbed serum was able to clump the red blood cells of the majority of persons of group A, although it failed to clump the cells of some. This observation was confirmed repeatedly, and it led to the division of group A into two subgroups,  $A_1$  and  $A_2$ , and of group AB into  $A_1B$  and  $A_2B$ . These subgroups differ in their ability to clump when mixed with a standard anti-A serum from a person of group B or of group O. The red blood cells of subgroup  $A_1$  and  $A_1B$  clump much more readily and intensely than do the red cells

From the pathologic laboratories of the Mount Sinai Hospital.  
Because of lack of space this article is abbreviated here. The complete article appears in the author's reprints.

Read before the Section on Pathology and Physiology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 16, 1938.

<sup>1</sup> De Gowin E. L. Grave Sequelae of Blood Transfusions. *Ann Int Med* 11: 1777-1791 (April) 1938.

<sup>2</sup> Blinow N. I. Subgroups  $A_1$  and A and Their Practical Significance. *Soviet Med* 7: 335-348 (Nos. 2 and 3) 1934. Parr I. W. and Kirschner H. A. Hemolytic Transfusion Fatality in Donor and Recipient in the Same Blood Group. *J A M A* 98: 47 (Jan. 2) 1932.  
<sup>3</sup> Blain A. W. Impressions Resulting from Three Thousand Transfusions of Unmodified Blood. *Ann Surg* 80: 917-922 (June) 1929.  
<sup>4</sup> Ruedel C. Do the Usual Precautions Protect Against Blood Transfusion Reactions? *Deutsche Ztschr f Chir* 236: 43-59 1932.  
<sup>5</sup> von Dungern E. and Hirschfeld L. Ueber Gruppenspezifische Strukturen des Blutes. *Ztschr f Immunitätsforsch u exper Therap* Orig S: 26-562 1911.

of subgroups  $A_2$  and  $A_2B$ , which may not clump at all if the agglutinating serum is of a low titer. The failure of red cells of subgroup  $A_2$  to clump is not infrequent, because serums with high titers of iso-agglutinins are quite rare. Of all A bloods, about 80 per cent belong to subgroup  $A_1$ , and about 20 per cent to subgroup  $A_2$ . Subgroup  $A_2B$  seems to be more frequent in proportion to subgroup  $A_1B$  than is subgroup  $A_2$  in proportion to subgroup  $A_1$ . There are considerable ethnic differences in the incidence of the subgroups.

There are two opinions at present concerning the nature of the difference between subgroups  $A_1$  and  $A_2$ . Some writers maintain that the difference is qualitative,<sup>6</sup> and they support their theory by the finding of agglutinin  $a_1$  in subgroups  $A_2$  and  $A_2B$  and of agglutinin  $a_2$  in subgroups  $A_1$  and  $A_1B$ . Agglutinin  $a_1$  clumps the cells of subgroups  $A_1$  and  $A_1B$ . It occurs often particularly in subgroup  $A_2B$ . It reacts best at low temperatures, but in some cases it works also at room temperature and occasionally even at body temperature.

Blinow<sup>2</sup> found in nineteen serums of subgroup  $A_2$  seven with a well developed titer and six with a low titer of agglutinin  $a_1$ . In seventeen serums of group  $A_2B$  the incidence was higher, nine with strong and three with weak agglutinins  $a_1$ .

Agglutinin  $a_2$  is very rare. It seems to be of an entirely different nature from  $a_1$  because it clumps red cells of group O in addition to those of subgroup  $A_2$  and the agglutination of cells is usually more pronounced in group O than in subgroup  $A_2$ .

The concept that subgroups  $A_1$  and  $A_2$  differ qualitatively is opposed by those writers<sup>7</sup> who say that the difference is merely quantitative manifested by a lower avidity of cells in subgroup  $A_2$  for the iso-agglutinating serum. That view is supported by the finding that cells in subgroup  $A_1$  are able to remove all agglutinins from an anti- $A$  serum, but their quantity must be larger and the process of absorption may have to be repeated.<sup>8</sup>

On theoretical grounds the use of a donor of subgroup  $A_1$  for a recipient of subgroup  $A_2$  should be more dangerous than the reverse procedure, because, as will be shown later, persons of subgroup  $A_2$  are more liable to have iso-agglutinins  $a_1$  against red cells of subgroup  $A_1$  and because reactions between the serum of the recipient and the red cells of the donor are most dangerous. In the combination of a donor of subgroup  $A_2$  and a recipient of subgroup  $A_1$  the danger exists too, but it is smaller because iso-agglutinin  $a_2$ , which reacts with red cells of subgroup  $A_2$ , is much less common in subgroup  $A_1$  than iso-agglutinin  $a_1$  in subgroup  $A_2$ .

That these hazards are not merely theoretical speculations is borne out by a case report of de Gown.<sup>1</sup> Patient 5 of group A was given blood of the same type without reaction. Four days later another donor of the same group was used after a preliminary cross matching. A fatal reaction followed, leading to death sixteen days after the transfusion. Retyping of the blood of the donor as well as of the recipient confirmed the original finding of group A. However, the serum

of the patient agglutinated and hemolyzed the red cell of the donor as well as of a person definitely of group O. Apparently the cross matching prior to the blood transfusion did not reveal the incompatibility. There is little doubt that the recipient belonged to group  $A_1$  and had the rare and exceptionally strong iso-agglutinin  $a_1$  and that the donor belonged to group  $A_2$ . That explains why the serum of the patient reacted with the red cell of the usually inagglutinable group O.

Similar risk exists when donors of group  $A_1B$  are used for recipients of group  $A_2B$ . Here the hazard is even greater, because the proportion of persons who have the agglutinin  $a_1$  is larger in subgroup  $A_1B$  than in subgroup  $A_2$ . The danger is enhanced by the opinion that a person of group AB is a universal recipient and that transfusions for patients of that group do not require cross matching. The concept of the universal recipient needs to be revised. It may henceforth be applied only to persons of subgroup  $A_1B$  whose blood is free of agglutinin  $a_2$  and to persons of subgroup  $A_2B$  whose blood lacks agglutinin  $a_1$ .

It is true as already stated that agglutinins  $a_1$  and  $a_2$  are as a rule active only at lower temperatures, but they may occasionally react even at body temperature as happened in de Gown's<sup>1</sup> case 5, already cited. Furthermore, there is no valid reason to assume that the failure to react *in vitro* guarantees that no harm is done *in vivo*, just as the opposite is true and as has been borne out by reported transfusions of incompatible blood which were without any obvious untoward result. It is possible that some of the mild and moderate transfusion reactions and particularly the late reactions are due to subgroup incompatibilities.

In evaluating transfusion reactions it should be considered that the so-called blood group properties A, B and O (the latter has been shown to be a positive antigenic property and not merely an indication of the absence of the other two) are actually present in all tissue cells and not only in the blood cells. The term cell groups would therefore be more appropriate than blood groups.

It seems to me that not enough attention is paid to the mild and moderate transfusion reactions. They are taken for granted and may be partly responsible for the failure of many blood transfusions to be of visible benefit.

The significance of subgroups  $A_1$  and  $A_2$  is not limited to incompatibility between them. There are reports in the literature of serious and fatal reactions due to failure to recognize subgroup  $A_2$ . Typing serums with low titers of iso-agglutinins are responsible. Typing serums are usually collected from typed specimens of blood or from donors with known blood group. Serums with high titers are rare and difficult to obtain. Variations in the strength of iso-agglutinins are known to occur. There is a physiologic variation associated with age in the titers of iso-agglutinins. The majority of newborn children have no detectable iso-agglutinin in their blood, although the agglutinogens are well established. The agglutinins appear usually in the course of the first year of life. Their titer rises gradually until a peak is reached in adolescence. Later a slow decline takes place.

It has been claimed often that there are in some diseases considerable and regular variations in the strength of iso-agglutinins. Most of these reports have not been corroborated. However, it seems well established that patients with chronic leukemia of any type have very

6 Landsteiner Karl and Witt D H. Observations on Human Iso agglutinins. *Proc Soc Exper Biol & Med* 21 389 392 1924. Observations on the Human Blood Groups. Irregular Reactions. Iso Agglutinins in Sera of Group IV. The Factor  $A_1$ . *J Immunol* 11 221 247 (March) 1926. Landsteiner Karl and Levine Philip. On the Cold Agglutinins in Human Serum. *J Immunol* 12 441 460 (Dec) 1926.  
7 Lattes Leone. Individuality of the Blood. New York Oxford University Press 1932 p 72.  
8 Friedreich V. Ueber die Serologie der Untergruppen  $A_1$  und  $A_2$ . *Zschr f Immunitätsforsch u exper Therap* 71 283 315 1931.



weak iso-agglutinins.<sup>9</sup> This is of particular importance because patients with leukemia are frequent recipients of blood, and cross matching tests with their bloods may not furnish the warning that the donor is not compatible.

How can the failure to recognize subgroup  $A_2$  affect a blood transfusion? The most common error is the assumption of group O instead of  $A_2$ , due to a weak agglutinating serum which failed to clump the weak red cells. Cross matching may in such a case be of little help or of no help, because persons of group  $A_2$  have the anti-B agglutinins and they may have an  $\alpha_1$  agglutinin against about 80 per cent of all persons of group A. In other words their serum may behave exactly like the serum of persons of group O. If such a false universal donor is used his blood may cause most severe and even fatal reactions. The danger is greatest if the blood is given to persons of group B or O, who always have agglutinins against  $A_2$  cells. A transfusion reaction due to the fact that a donor's blood of subgroup  $A_2$  with agglutinin  $\alpha_1$  was mistaken for group O was reported by Traum and Witebsky.<sup>10</sup> Mishaps will be more common when donors are selected on the basis of blood grouping alone without subsequent cross matching. A recent report of Levine and Katzin<sup>11</sup> shows that such practice still prevails, particularly with regard to universal donors.

Cross matching of the serum of the recipient and of the cells of the false universal donor may fail to show the true  $A_2$  nature of the donor's subgroup, on account of the low titer of iso-agglutinins in the blood of some patients and the low agglutinability of the cells of the donor, which is merely a repetition of the error that led to the false grouping in the first place.

De Gowin<sup>1</sup> recently reported two fatal transfusion reactions which can serve as excellent illustrations. The donor, used in both cases, and the recipients were determined to be of group O. A severe reaction set in during the transfusion in one case and shortly after in the other. One of the patients died four days and the other ten days after the transfusion. Rechecks of the blood of the patient and of the donor disclosed no incompatibility in either case. Three years later the blood of the donor was typed with a serum of a high titer and found to belong to group A. The subgroup was not determined in this case, but the discovery of the true blood group only after stronger typing serum was used suggests that it was probably  $A_2$ . That reactions do not necessarily follow the use of such incompatible blood is evidenced by the fact that the same donor was used as a group O donor for eight transfusions without reactions.

There is danger of a reaction when a false universal donor (in reality of group  $A_2$ ) is used for a patient of subgroup  $A_1B$ , on account of the possible though very rare presence of the agglutinin  $\alpha_2$  in the serum of persons of subgroup  $A_1B$ . Here the temptation to dispense with the cross agglutination is particularly great, because a presumably universal donor is used for a so-called universal recipient.

One can assume with equal justification the existence of a hazard in the use of a true universal donor for a

recipient of subgroup  $A_1B$  with agglutinin  $\alpha_2$ , because the latter may react with the cells of group O even more readily than with the cells of  $A_2$ .

A similar danger of a reaction between the rare agglutinin  $\alpha_2$  and the blood cells of subgroup  $A_2$  and group O exists when a true universal donor or an  $A_2$  donor mistaken for a donor of group O is used for a recipient of group  $A_1$  with the rare agglutinin  $\alpha_2$ .

One can still read that the so-called universal donor (blood group O) may be used safely without cross matching of the serum and red cells of recipient and of donor.<sup>12</sup> This idea is rapidly losing ground. The modern attitude is that the agglutinins in the serum of donors of group O frequently have high titers and that such donors may be dangerous. Another danger is the frequency of isolysins in the serum of group O, particularly for cells of group A. Such lysins may not be recognized if not thought of and not carefully looked for (de Gowin, case 8). The danger inherent in the use of universal donors is supported by the statistical evidence of the great frequency of reactions of varying severity after their use. Gray<sup>13</sup> had reactions in less than 10 per cent of a series of 500 blood transfusions but in 33 per cent in a series of forty transfusions in which donors of group O were used.

Severe reactions following the use of blood of group O were reported by Pari and Krischner,<sup>2</sup> McCandless,<sup>14</sup> Ruedel<sup>4</sup> and de Gowin.<sup>1</sup> Ruedel saw reactions in four transfusions when the recipient and donor belonged to group O. In de Gowin's series of eight fatal reactions three occurred in patients of type O who received blood of the same type, and six of the sixteen moderate or severe reactions took place in patients of group O given homologous blood. The high titers of iso-agglutinins in the serums of universal donors cannot account for all such reactions and can hardly be advocated as an explanation when the recipient as well as the donor is of type O. It seems likely that false donors of type O (actually of type  $A_2$ ) are responsible for some of these unexplained reactions.

The use of weak typing serums may be responsible for the failure to recognize subgroup  $A_2B$  and for mistaking it for B. This is probably not infrequent, because  $A_2$ , weak as it is by itself, is still more so in combination with B, which seems to have a depressing effect on agglutinin A.

Blood of such a false group B is particularly dangerous when given to a recipient of group B with a strong titer of agglutinins against A. Sometimes cross matching of the bloods may not expose the error if the serum of the recipient has a low titer of agglutinins. As has been mentioned, a low titer of agglutinins in the recipient does not necessarily preclude a reaction, even a severe one. A severe reaction after administration to a patient with blood of group B of 120 cc of blood supposedly of the same group was reported by Beck.<sup>15</sup> A subsequent check showed that a mistake in blood grouping was made and that the donor's blood was actually of group AB. The subgroup was not stated, but it is reasonable to assume that it was  $A_2B$ .

12 Brines, O. A. Fatal Post Transfusion Reactions. *J. A. M. A.* 54: 1114-1116 (April 12) 1930.

13 Gray, J. W. in discussion on Sidbury, J. B. Transfusion in Infancy and Childhood. *J. A. M. A.* 89: 830-862 (Sept. 10) 1927.

14 McCandless, H. G. A Hemolytic Blood Transfusion Reaction with Oliguria. *J. A. M. A.* 105: 952 (Sept. 21) 1935.

15 Beck, Alfred. Abnormal Blood Groups and Blood Transfusions. *Arch. f. klin. Chir.* 177: 699-707 (Oct.) 1933.

9 Davidsohn, Israel. Iso Agglutinin Titers in Serum Disease in Leukemias, in Infectious Mononucleosis and After Blood Transfusions. *Am. J. Clin. Path.* 8: 179-196 (March) 1938.

10 Traum, E. and Witebsky, E. Zur Bedeutung von Untergruppen bei der Bluttransfusion. *Chirurg.* 1: 930-932 (Sept. 1) 1929.

11 Levine, Philip and Katzin, E. M. A Survey of Blood Transfusion in America. *J. A. M. A.* 110: 1243-1248 (April 16) 1933.



The possibility of failing to recognize subgroup A<sub>2</sub> is particularly great with infants and children, whose A<sub>2</sub> property is still weaker than that of adults. There is a well established variation according to age in the strength of the agglutinogens, though this is less marked than in the case of agglutinins.

#### RECOGNITION OF SUBGROUPS

How can these dangers of transfusion reactions due to the failure to recognize subgroups be avoided?

Speaking of unexpected transfusion reactions, de Gowin said "A more plausible interpretation is that for a small number of bloods our present laboratory methods are inadequate to detect all incompatibilities."<sup>1</sup>

A careful analysis of the reports in the literature suggests that in most cases the errors are due to the use

that sheep blood ought in turn to engender in the rabbit an immune serum against human blood of group A. Experiments confirmed his supposition. The serum of some rabbits inoculated with the blood of sheep was found by Schiff and Adelsberger, and by many investigators subsequently, to agglutinate the red cells of group A in much higher dilutions than the cells of groups O or B.

Some authors recommended such rabbit serum for blood grouping purposes.<sup>18</sup> It permits one to overcome two serious drawbacks of human isoserum, for it has a high titer and is readily produced. Thus it helps to eliminate the errors due to not recognizing the weakly agglutinating bloods of group A and due to mistaking them for group O or to mistaking subgroup A B for group B.

TABLE 1—Titration of Serums of Rabbits Inoculated with Boiled and Raw Sheep Red Blood Cells

Rabbit	Dilution of Serums	Titers of Agglutinins for Red Blood Cells of Groups															
		A <sub>1</sub>				A <sub>2</sub>				B				O			
		5 Min	10 Min	15 Min	30 Min	5 Min	10 Min	15 Min	30 Min	5 Min	10 Min	15 Min	30 Min	5 Min	10 Min	15 Min	30 Min
21 Treated with boiled blood	1 2	+++	++++			+++	+++	+++	+++	+	+	+	+	—	—	—	—
	1 4	+++	++++			++	++	++	++	±	±	±	±	—	—	—	—
	1 8	+++	++++			+	+	+	+	—	—	—	—	—	—	—	—
	1 16	++	+++			+	+	+	+	—	—	—	—	—	—	—	—
	1 32	++	+++	+++	+++	+	±	±	±								
	1 64	++	++	++	++	—	—	—	—								
	1 128	++	++	++	++												
	1 256	+	+	+	+												
	1 512	—	—	—	—												
										Result A group titer, dilution 1 10 differential titer, dilution 1 40							
29 Treated with boiled blood	1 2	+	++	++	++	—	—	—	—	±	+	+	+	—	—	—	—
	1 4	+	+	+	+	—	—	—	—	±	±	+	+	—	—	—	—
	1 8	—	±	+	+	—	—	—	—	—	—	—	—	—	—	—	—
	1 16	—	±	+	+	—	—	—	—	Result Serum unsatisfactory							
36 Treated with raw blood	1 2	++++				++++				+	+	+	+	±	±	±	±
	1 4	++++				++++				±	±	±	±	—	—	—	—
	1 8	++++				++++				—	—	—	—	—	—	—	—
	1 16	++++				++++				—	—	—	—	—	—	—	—
	1 32	+++	++++			+++	+++	+++	+++	—	—	—	—	—	—	—	—
	1 64	+++	+++	+++	+++	++	++	++	++								
	1 128	++	+++	+++	+++	+	++	++	++								
	1 256	++	++	++	++	+	+	+	+								
	1 512	++	++	++	++	+	+	+	+								
	1 1024	+	+	+	+	+	+	+	+								
	1 2048	±	+	+	+	—	—	—	—								
	1 4096	—	—	—	—	—	—	—	—	Result A group titer dilution 1 20 or higher serum not suitable for differentiation of subgroup A <sub>1</sub> and A <sub>2</sub>							
	1 9192	—	—	—	—	—	—	—	—								

of typing serums with low titers of iso-agglutinins. Therefore it is imperative that only high titered serums be used for blood grouping, as was advocated by Coca<sup>16</sup> and others. Such serums are not easy to get.

I found that the titers of iso-agglutinins rise after injection of horse serum, particularly when serum disease develops, and I recommended the use of serum from patients with serum disease for blood grouping.<sup>9</sup>

Another source of potent grouping serum for type A cells has been used for several years in Germany but is little known in this country.

Schiff and Adelsberger<sup>17</sup> found that human blood of types A and AB produced in rabbits an immune serum with a high lytic ability for sheep blood. They ascribed this phenomenon to the presence of common antigenic fractions in the blood of sheep and in human blood of groups A and AB.

Seeing that human blood A was capable of producing a lysis against sheep blood, Schiff concluded

There still remains the necessity of differentiating subgroups A<sub>1</sub>, A<sub>2</sub>, A<sub>1</sub>B and A<sub>2</sub>B from one another to avoid incompatibility. Since von Dungern and Hirschfeld<sup>6</sup> reported their observations, several methods have been recommended.<sup>19</sup> Only a few of the more practical methods will be mentioned.

1. With the method of von Dungern and Hirschfeld,<sup>6</sup> serum of group B is absorbed with red corpuscles of subgroup A<sub>2</sub>. It then clumps only red cells of subgroup A<sub>1</sub>. The disadvantages of this method are as follows: High titered serums of group B are necessary, and these are difficult to find. After absorption

16 Coca A F A Slide Method for Titration Blood Grouping Serums J Lab & Clin Med 16 405-407 (Jan) 1931  
17 Schiff Fritz and Adelsberger L Ueber Blutgruppenspezifische Antikörper und Antigene Ztschr f Immunitätsforsch u exper Therap 40 335-367 1924

18 Klopstock Alfred Zur Kenntnis der sogenannten Untergruppen von A Ztschr f Immunitätsforsch u exper Therap 74 211 1932  
19 Charles C Thomas Publisher 1935 Mustakallio E (et al) O A B Blood Groups in Finland Acta Soc med fenn duodecim (ser A fasc 2) 20 1 185 1937 Friedreich V Subgroups A<sub>1</sub> and A<sub>2</sub> Klin Wchnschr 16 753-754 (May 22) 1937 Blinow N I A Simplified Method for Differentiation of Subgroups A<sub>1</sub> and A<sub>2</sub> Soet. khr 349 351 (Nos 2 and 3) 1934 Wolff E and Jonsson B Subgroups A<sub>1</sub> and A<sub>2</sub> with Particular Reference to Paternity Deutsche Zt chr f d ges gerichtl Med 22 65-85 1933 Blinow

the serums do not keep well. Relatively large amounts of red cells of subgroup  $A_2$  must be readily available. According to Klopstock<sup>18</sup> this method is not absolutely reliable. It cannot be used for the differentiation of subgroups  $A_1B$  and  $A_2B$ .

2 Landsteiner and his associates<sup>20</sup> recommended the use of irregular agglutinin  $a_1$  for the recognition of subgroup  $A_1$  and of  $a_2$  for subgroup  $A_2$ . These agglutinins are usually weak, and  $a_2$  is difficult to find.

3 Serum of group B is absorbed with different quantities of red cells of group A. Small amounts of cells of subgroup  $A_1$  will remove completely the anti-A agglutinins, while large volumes (even one half of the volume of serum) of cells of subgroup  $A_2$  will absorb them only partially. According to Friedenreich and Worsaae,<sup>21</sup> the originators of this method, there are no transitions between the two subgroups when tested by means of absorption. This procedure is recognized at present as the standard method, with which the results of the other methods must be checked. However, it is cumbersome and time consuming and requires a great deal of high titered serum of group B and of red cells. It is therefore not very practical as a routine test.

These three methods are the most practical of a long list that have been published, but even the selected methods are not very convenient for routine use. This may be the reason why the determination of subgroups is not done as often as it should be.

To be of value as a routine procedure for blood grouping, the method for differentiation of subgroups  $A_1$  and  $A_2$  must be reliable but at the same time rapid and relatively simple. While considering this need, it occurred to me to attempt a solution of the problem by utilization of the common antigenic fraction of human blood A and of sheep blood.

As stated, Schiff and Adelsberger<sup>17</sup> produced a specific agglutinating serum against human red cells of group A by injecting sheep red cells into rabbits. However, their immune serum did not differentiate subgroup  $A_1$  and  $A_2$ .

The common antigenic fraction of human red cells of group A and of sheep red cells was shown by Schiff and Adelsberger<sup>17</sup> and by me<sup>25</sup> to be related to but not identical with the so-called Forssman heterophilic antigen.<sup>20</sup>

It is known that the Forssman antigen is thermostable and resists boiling. Schiff and Adelsberger were able to remove the anti-A agglutinins from their serum against sheep blood by absorption with boiled sheep cells. That being the case, I decided to try whether the injection into rabbits of boiled sheep blood would produce a serum against human blood A that would act differently toward the cells of subgroups  $A_1$  and  $A_2$ . The result fully justified my expectations.

**Preparation of Typing Serum**—Sheep blood was washed with physiologic solution of sodium chloride and centrifuged after each washing. The procedure was similar to the one used in the preparation of the suspension of sheep red cells for the complement fixation test for syphilis. A 20 per cent suspension of the

cells in physiologic solution of sodium chloride was boiled for thirty minutes on the water bath. Any loss due to evaporation was made up with distilled water. Rabbits were given from four to five intravenous injections of 25 cc of the boiled and thoroughly shaken 20 per cent suspension of sheep cells mixed with 75 cc of physiologic solution of sodium chloride at from three to four day intervals. The later injections were divided into several smaller portions and administered at about thirty minute intervals. Control animals were treated with similar suspensions of raw sheep blood. About seven days after the last injection, blood was obtained from the ears of the rabbits and tested for the presence of anti-A agglutinins.

If the results were satisfactory the rabbits were exsanguinated. Of eleven rabbits five produced satisfactory subgroup specific immune serums, two failed to respond and four died in the course of immunization.

The rabbits injected with boiled and with raw sheep blood produced anti-A group specific agglutinins equally well, however, the serum of the animals inoculated with boiled blood showed a sharp differentiation in the strength of the titer for the two subgroups. The results were confirmed by numerous checks with specimens of blood from 205 persons of group A and AB. 144 of subgroup  $A_1$ , thirty-six of subgroup  $A_2$ , eighteen of subgroup  $A_1B$  and seven of subgroup  $A_2B$ . All the results were corroborated by the absorption method, which is generally accepted as the standard test for the recognition of groups  $A_1$  and  $A_2$ .

It was deemed necessary to develop a technic which would (1) permit prompt recognition of feebly agglutinating subgroup  $A_2$  as well as of strongly agglutinating subgroup  $A_1$  but would not agglutinate either group B or group O, (2) differentiate subgroups  $A_1$ ,  $A_2$ ,  $A_1B$  and  $A_2B$  clearly and unmistakably, (3) be simple and easily carried out and (4) be rapid enough to be applicable as a routine procedure under the conditions of emergencies as they often exist prior to blood transfusions.

**Titration of Rabbit Immune Serums for Typing of Subgroups  $A_1$ ,  $A_2$ ,  $A_1B$  and  $A_2B$** —The serums were inactivated at 55 C for thirty minutes and titrated in different dilutions with specimens of blood of all groups and subgroups. Dilutions of the serums were prepared in test tubes. Approximately 2 per cent suspensions of red blood cells were prepared by adding one drop of whole blood to 1 cc of physiologic solution of sodium chloride. Two drops of the serum dilution were placed on slides within a circle made with a colored wax pencil. A drop of the blood cell suspension was added. The slides were tilted, placed under a Petri dish beside moist filter paper to prevent drying out and examined macroscopically and if necessary microscopically after five, ten, fifteen and thirty minutes. Two dilutions were selected. In one, at the end of five minutes there was distinct clumping of the red cells of subgroups  $A_1$ ,  $A_2$ ,  $A_1B$  and  $A_2B$ , visible macroscopically, but the cells of groups B and O could not be seen macroscopically or microscopically to be clumped even at the end of thirty minutes. This dilution was found to be sufficient for the detection of even the weakest  $A_2$  factor. It was the diagnostic titer for the recognition of blood group A. The second dilution was the one which was capable of giving at the end of five minutes a clear and distinct clumping, recognizable with the naked eye, of red cells of subgroups  $A_1$  and  $A_1B$  but in which the red cells

20 Landsteiner Karl and Levine Philip. On the Racial Distribution of Some Agglutinable Structures of Human Blood. *J Immunol* 16: 123-131 (Feb) 1929. Landsteiner and Witt.

21 Friedenreich V and Worsaae E. De l'existence de sous groupes a l'interieur du groupe sanguin II (A) chez l'homme. *Compt rend Soc de biol* 102: 884-888 (Dec 13) 1929.

25 Davidsohn Israel. Heterophile Antigen in Human Blood. *Arch Path* 6: 632-637 (Oct.) 1928.

26 Davidsohn Israel. Heterophile Antigens and Antibodies. *Arch Path* 4: 776-806 (Nov.) 1927. Buchsinder Leon. Heterophile Phenomena in Immunology. *Arch Path* 19: 841-880 (June) 1935.

of subgroups  $A_2$  and  $A_2B$  at the end of five minutes showed no clumping either macroscopically or microscopically, at the end of ten minutes showed no clumping macroscopically and at the most hardly discernible clumping microscopically and even at the end of thirty minutes showed only clumping which had not become visible to the naked eye. The second dilution was called the differential titer for the recognition of subgroup  $A_2$ .

The titration of rabbit immune serum is recorded in table 1. Serum 21, with an A group titer of 1:10 and with a differential titer of 1:50, is an example of a satisfactory typing serum for the differentiation of the two subgroups. Serum 29 is an example of an unsuitable serum, and serum 36, which was produced with raw sheep cells, has a high anti-A titer but shows no clear-cut differentiation between subgroups  $A_1$  and  $A_2$ . It can be used very well for the recognition of group A.

For table 2, several examples were selected from my records to show how the method works in practice. The first two examples show the behavior of subgroups  $A_1$  and  $A_2$ , the following seven show the behavior of

previous columns. The last column contains the results of absorption of human B (anti-A) serum with two different quantities of the red cells. While cells of subgroup  $A_1$  removed the anti-A agglutinins completely even when only one thirty-second volume was added to the serum, cells of subgroup  $A_2$  failed to do it even with one-half volume. The titers of the serums before the absorption are stated at the foot of the table. This method is the most reliable confirmation of the subgroup. Every determination of the subgroup with the rabbit serum was checked with the absorption method. There was full agreement of the two methods.

**Technic of Typing of Groups A and AB and of Subgroups  $A_1$ ,  $A_2$ ,  $A_1B$  and  $A_2B$** —After the two titers of the immune rabbit serum have been determined with the outlined procedure, the lower dilutions (group A titer) will help to identify the group A and AB specimens and the higher dilution will help to determine the subgroups. At the same time the serum of group A (anti-B) should be set up for the recognition of group B and preferably a type O serum as a control. The results can be read in from five to ten minutes.

TABLE 2—Determination of Subgroups  $A_1$ ,  $A_2$ ,  $A_1B$  and  $A_2B$ , Comparison of Results

Red Blood Cells of Cases	Typing with				Titration with Immune Rabbit Serum				Subgroups	Absorption of Human Serum* (B Anti A)	
	Human Serums		Rabbit Immune Serum Dilutions		++++	+++	++	+		1/2 Volume	1/3 Volume
	A (Anti B)	B (Anti A)	1:10	1:40							
104	—*	+++*	+++	++	8	16	64	128	A <sub>1</sub>	7—	1— (1)
94	—	+++	++	—				16	A	7+	14+ (2)
91	+++	++	+++	++		2	8	64	A <sub>1</sub> B	7—	7— (3)
95	++++	+++	++	++	4	16	32	128	A <sub>1</sub> B	7—	7— (4)
22*	+	+	++	++			16	64	A <sub>1</sub> B	7—	1— (5)
37	++++	++++	+	—				4	A B	56+	110+ (6)
110	++	++	+	—				8	A B	7+	14+ (1)
123	++	++	—	—				8	A B	14+	14+ (8)
233	++	++	+	—				8	A B	14+	14+ (9)

\* Titers of serums before absorptions: Nos. 1, 2, 3, 4, 7 and 8 = 1:16+; No. 6 = 1:224+; and Nos. 5 and 9 = 1:28+.

\* Key for reading results: ++++ = one large clump; +++ = several large particles; ++ = small clumps readily seen with the naked eye; + = only microscopically visible clumping; and — = no clumping, even microscopically.

subgroups  $A_1B$  and  $A_2B$ , of which more examples were selected because they show greater variation in their agglutinability and because it is thought that they are more difficult to separate.

The second and third columns show the results of typing with human serums of groups A and B. The technic was the accepted method of Vincent. Serums with high titers were used. It is apparent that the differences in the agglutinability with the human serums are in no relation to the subgroups. In some instances, as in No. 223 ( $A_1B$ ), the cells clumped much less distinctly (+) than in No. 37 ( $A_2B$ , ++++). The fourth column shows the agglutination with the group dilution of rabbit serum as determined by titration. The cells of subgroup  $A_1$  were clumped more vigorously than those of subgroup  $A_2$ , but there was never the slightest difficulty in seeing the pronounced clumping of any specimen of subgroup  $A_2$ . The clumping of subgroup  $A_1B$  was equally pronounced. Most specimens of subgroup  $A_2B$  had to be read with the microscope, but the clumping was always clearcut and unmistakable. The differential dilution for the separation of subgroup  $A_2$  is recorded in the fifth column. The lucidity of the differentiation is manifest. In the next column the results of titration of the red cells with the rabbit immune serum are recorded to emphasize the differences in titers between subgroups  $A_1$  and  $A_2$ . Then follow the designations of the subgroups as determined in the

#### SUMMARY

Clinical experience, as it is expressed in the literature, suggests (1) that the selection of a donor according to known methods does not assure the absence of blood transfusion reactions, (2) that unexpected reactions are not uncommon when a donor of the same blood group as that of the patients is employed especially when the group is O or A, and (3) that reactions are particularly frequent when so-called universal donors are employed.

Available serologic data suggest (1) that subgroups  $A_1$  and  $A_2$ ,  $A_1B$  and  $A_2B$  are not always compatible, (2) that subgroups  $A_2$  and  $A_2B$  are not infrequently mistaken for blood of other groups, particularly for O and B, and (3) that some transfusion reactions, even fatal ones, are well explained by these circumstances.

The method presented offers two advantages. 1. The high titered, easily produced and highly specific rabbit immune serum permits prompt recognition of blood group A and AB, including the feebly agglutinating subgroups  $A_2$  and  $A_2B$ . 2. A proper dilution of the serum, as determined by titration, makes it possible to differentiate subgroup  $A_2$  from  $A_1$  and  $A_1B$  from  $A_1B$  without delay. Both procedures can be carried out within five minutes.

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27. The determination of subgroups  $A_1$ ,  $A_2$ ,  $A_1B$  and  $A_2B$  for exclusion of paternity is discussed in the reprints.

## ABSTRACT OF DISCUSSION

DR NATHAN ROSENTHAL, New York It seems that the method of approach for the differentiation of two types of group A may be important from a practical standpoint. It will be especially useful for detecting the group AB, which is usually important in paternity tests. Usually this can be done by high titer serum, but if this is not available the new method proposed here may prove very useful. The relation of these blood groups to reactions from transfusions must also be considered. The three main types of reaction are those due first to impurities or foreign protein present in the water or left in the apparatus from previous transfusions. This accounts for most of the chills and to some extent, febrile reactions. By proper cleansing methods, Dr Lewisohn and I have shown that such reactions may be reduced from between 12 and 20 per cent to less than 3 per cent. Second, reactions from incompatible blood are now rather rare. In fact we have seen no such reaction within the past ten years, since proper cross matching can be done in the laboratory. Third, reactions from compatible blood. In the past ten years we have noticed only three such reactions, the symptoms arising are comparable almost identically with those from incompatible blood. We have noted, however, that such reactions are not necessarily related to group A but are found in other groups as well. Fortunately, this type of reaction is very rare. I believe that this additional test for two subgroups of A may prove to be of some importance after further investigation.

DR KATHARINE M. HOWELL, Chicago I have been acquainted with the work of Dr Davidsohn on the differentiation of blood groups  $A_1$  and A, the purpose of which is to decrease the deleterious reactions occasionally following blood transfusions. I have been interested in these studies because our laboratory types blood for five or six thousand transfusions a year and in spite of employing serums of the highest titer available for blood group determinations and the greatest care in the cross matching of serum and corpuscles, an occasional difficulty in typing or an unexplained reaction occurs. This is usually encountered in finding a compatible group A donor for a group A patient, or for the so-called universal recipient, group AB which also contains the A agglutinogens. A serum of high titer is essential for separating  $A_1$  and A and therefore the method described by Dr Davidsohn may be of the greatest advantage since heterophile immune serum almost always has a higher agglutinin titer than the human serum available for blood grouping. The present method for separating  $A_1$  and A by absorption has been found time consuming and not practical for the routine laboratory blood grouping tests.

DR ISRAEL DAVIDSOHN, Chicago Not enough attention is paid to mild and moderate blood transfusion reactions. It was shown that transfused blood remains longer in the circulation of the recipient when the transfusion is not followed by a reaction of one kind or another than when there is a reaction. The danger of not recognizing correctly subgroup AB is illustrated by a case report of Beck, a German surgeon, who had a large experience in blood transfusions. He transfused a patient of group B with the blood of a donor of supposedly the same group. A severe reaction followed. A retyping of the donor disclosed that he belonged to group AB. The subgroup was not determined, but the circumstance that the true group was detected only after stronger typing serum was used suggests strongly that it was subgroup AB. When cells of known blood groups are used as controls to check the group of the unknown serums it is essential to use cells of subgroup  $A_1$  and not of A. Dr Rosenthal referred to the medicolegal application of subgroups. I did not go into it because time did not permit. However I am using the rabbit serum for the differentiation of subgroups  $A_1$ ,  $A_2$ ,  $A_3$  and AB along with anti-M and anti-N typing serums and with the anti A and anti B grouping serums with satisfactory results. The method is particularly valuable for the typing of blood of infants whose agglutinogens are weaker than in later life. Some infants who are found to belong to group O may behave like subgroup i when retested after a few months. The existence of the irregular iso agglutinin  $\alpha$  which reacts with red cells

of group O, supports Schiff's concept of group O as possessing a positive and specific antigenic character that can be determined by proper serums. The new concept should replace the idea that group O is the one without any antigenic agglutinable properties. The symbol O must stand for a letter and not for a number.

SULFANILAMIDE IN TREATMENT OF  
NONSPECIFIC INFECTIONS OF  
THE URINARY TRACT

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During the last eight years great progress has been made in the treatment of infections of the urinary tract. The diagnostic work and the experimental and clinical observations necessary for the foundation of this progress had already been accomplished, but they had not become common knowledge. Before therapeutic advance could be made, a study of the micro-organisms commonly found in the urinary tract had to be supplemented by possible methods of treatment of sufficient value to interest the experimental workers in this field.

As recently as ten years ago it was felt that patients complaining of frequency, urgency and burning on urination did so because the urine excreted by the kidneys was more acid than comfortably could be borne by the mucous membrane of the urinary tract. Soon, however, it was discovered that these patients were relieved when the acidity of the urine was increased, which appeared paradoxical. Cultures of the infecting organism showed that the most common offender, namely the gram-negative bacillus, was inhibited in its growth as the acidity of the urine increased and that the relief afforded the patient was due to the effect of the change in acidity on the infecting organism rather than to the direct action of any drug on the mucous membrane.

Medical therapeutics temporarily gave way to helpful dietary measures, which stimulated studies along these lines, until chemotherapy at length produced experimental and clinical results exceeding the most enthusiastic expectations. There are accordingly today three outstanding therapeutic agents which, when used with careful evaluation of their effect on offending micro-organisms, will go far to relieve patients suffering from urinary tract infections. These are sulfanilamide, mandelic acid and neoarsphenamine. Chief among these in the interest aroused among urologists is sulfanilamide.

Before a more careful analysis of the action of sulfanilamide is made, it should be emphasized that mandelic acid and neoarsphenamine retain a specific place in combating urinary tract infections. It should also be remembered that methenamine, which has proved its worth through the years, remains a valuable adjunct to treatment. No drug has had to stand more rapid investigation of its therapeutic possibilities than sulfanilamide.

Because of the prominence of the patients to whom the drug was first administered, and because of the conservatism of the large medical center which first enthusiastically reported its therapeutic possibilities, sulfanilamide was heralded by the fourth estate as the great medical discovery of the century. By the same

token, less than a year ago one of the early investigators predicted that during the ensuing twelve months the toxic effects of the drug would be responsible for numerous fatalities.

Before this warning could be broadcast to the medical profession, a drug concern not versed in the chemical effects of the solvent combined this new compound with a dangerously toxic liquid, with the result that the lay press grimly counted deaths which were apparently, but not in reality, due to this medical discovery. And so, having withstood the overenthusiasm which frequently accompanies new medical measures, sulfanilamide is now found to be of great therapeutic value in the treatment of genito-urinary infections when it is carefully used, with proper observance of its toxic possibilities and a thorough knowledge of its clinical limitations.

#### REVIEW OF THE LITERATURE

The first applications of sulfanilamide in clinical practice were used in various streptococcal infections in 1935 but it was a foregone conclusion that the success with which the new remedy was employed for a wide variety of infections would stimulate efforts for its use against the organisms peculiar to the genito-urinary tract. Early in the same year Temming,<sup>1</sup> impressed with the rapid improvement of a 7 week old infant suffering from facial erysipelas after administration of sulfanilamide, tried the new remedy with three young infants with pyuria. Given by rectum it produced remarkable results, leukocytes and albumin disappeared rapidly from the urine after an immediate and dramatic drop of the high temperature to normal.

Pernice<sup>2</sup> of the Marburg pediatric clinic was the next to apply sulfanilamide in urologic practice. He gave it orally to eighteen children of various ages, with good results. He proved that the drug is effective not only against streptococci and staphylococci but also against colon bacilli. To prevent recurrence, he gave it for a week after the urine had become normal.

Maraun<sup>3</sup> reported that prontosil<sup>4</sup> had been given orally to thirty-eight children of various ages, in twenty-one of whom infection with *Bacillus coli* or *Bacillus paracoli* was producing severe symptoms. Satisfactory results were obtained in all but five cases.

Unshelm<sup>5</sup> tried prontosil in twenty-three cases of pyuria at the Rostock pediatric clinic with encouraging if not uniformly good results. In all but two instances the infective agent was *B. coli*, in one both *B. coli* and *Proteus ammoniae* were present. Fourteen of the patients were followed for from one to seven months, during which time not one showed pathologic urinary changes. No difference was observed between acute and chronic involvement in the time required to relieve the infection.

Klein<sup>6</sup> in 1936 reported that prontosil was being used in all cases of pyuria in the pediatric clinic of the University of Breslau and that it was given both orally and intravenously, the latter method being preferred for infants.

Early in 1937 Meissner<sup>7</sup> reported his use of sulfanilamide in eight cases of cystopyelitis, seven patients being women and one a man. These patients gave a history of infection of from four days' to several months' duration. In most of the cases *Bacillus coli communis* was the infecting organism, against which sulfanilamide proved to be bactericidal after treatment lasting from three to ten days. In all the drug was given orally.

Turk<sup>8</sup> reported a series of sixteen cases of acute and chronic renal disease in the University of Hamburg Hospital. After two or three days of treatment with sulfanilamide all were free from symptoms, and in an average of five to six days they were also bacteria free. Three patients with pyelitis of pregnancy were clinically cured but were not free from bacteria after treatment.

Helmholz<sup>9</sup> became interested in sulfanilamide as a urinary antiseptic from in vitro experiments which showed it to have a marked bactericidal action on all the common bacteria found in the urinary tract except *Streptococcus faecalis*. He observed that it was effective both in acid and in alkaline urine but more so apparently, in alkaline, that it is present in urine in the free and conjugated form, both of which forms appeared to be bactericidal, but that the conjugated form seemed to be more potent in this respect. He tried the effect of sulfanilamide on six different organisms found in the urine: *Streptococcus faecalis*, *Escherichia coli*, *Aerobacter aerogenes*, *Proteus vulgaris*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus*. He found that *Staphylococcus aureus* was the most easily destroyed, while *Streptococcus faecalis* was the most resistant of the group.

Helmholz and Osterberg<sup>10</sup> observed that sulfanilamide is very useful in treating some conditions with which mandelic acid and the ketogenic diet fail, for example infections due to *Proteus ammoniae*. The organism flourishes in an alkaline urine, in which sulfanilamide is more effective than in acid urine. On the other hand, sulfanilamide failed to have any effect on *Streptococcus faecalis*, which is however controlled by mandelic acid. The results in three series of patients to whom sulfanilamide was administered showed that the urine was definitely bactericidal to organisms commonly found in infections of the urinary tract.

Cook and Buchtel<sup>11</sup> began using the drug with great caution, because of the conflicting reports that had reached them. With very small doses they noted little benefit when the substance was given orally. Later results however, when larger doses were given, were very encouraging. It is their opinion that if the efficiency of sulfanilamide in alkaline urine continues to be demonstrated, the drug should be of inestimable value in treating infections of the urinary tract due to urea-splitting bacteria, with which it has been always impossible to obtain a sufficient degree of acidity to inhibit the growth of the organism.

7 Meissner, Werner. Erfahrungen mit Prontosil bei der Behandlung von entzündlichen Erkrankungen des ableitenden Harnweges, *Med. Klin.* 32: 95 (Jan. 15) 1937.

8 Turk, Hermann. Die Behandlung der Kolpyelozystitis mit Prontosil. *München med. Wchnschr.* 84: 1259 (Aug. 6) 1937.

9 Helmholz, H. F. The Use of Sulfanilamide as a Urinary Antiseptic. *J. Pediat.* 11: 243-247 (Aug.) 1937. The Bactericidal Power of the Urine after Administration of Prontosil by Mouth. *Proc. Staff Meet. Mayo Clin.* 12: 244 (April 21) 1937.

10 Helmholz, H. F. and Osterberg, A. E. The Effect of pH on the Urine on Concentration of Free and Conjugated Sulfanilamide. *Abstracts for Bactericidal Action. Proc. Staff Meet. Mayo Clin.* 12: 661 (Oct. 7) 1937. Rate of Excretion and Bactericidal Power of Sulfanilamide (Prontosil) in the Urine. *Proc. Staff Meet. Mayo Clin.* 12: 377 (June 18) 1937.

11 Cook, E. N. and Buchtel, H. A. The Use of Sulfanilamide (Prontosil) in Urinary Infections. *Proc. Staff Meet. Mayo Clin.* 12: 31 (June 16) 1937. The Use of Sulfanilamide in Treatment of Urinary Infections. *Proc. Staff Meet. Mayo Clin.* 12: 444 (July 14) 1937.

1 Temming, Hans. Ueber Prontosil bei Pyurie. *Kinderärztl. Praxis* 6: 400 (Sept.) 1935.

2 Pernice, Wolfgang. Ueber die Behandlung der kindlichen Pyurie mit Prontosil. *Kinderärztl. Praxis* 7: 304-307 (July) 1936.

3 Maraun, Luise. Zur Prontosilbehandlung des Erysipels und der Pyurie. *Kinderärztl. Praxis* 7: 443-449 (Oct.) 1936.

4 The disodium salt of 4-sulfamidophenyl-2-azo-7-acetylaminol-5-hydroxynaphthylene-3,6-disulfonic acid.

5 Unshelm, E. Zur Behandlung der kindlichen Pyurie. *Arch. f. Kinderh.* 109: 65-84 1936.

6 Klein, Elfriede. Prontosil in der Kinderpraxis. *Med. Klin.* 32: 940-941 (July 10) 1936.

## IDENTIFICATION OF THE INFECTIVE AGENT

In the diagnosis of infections of the urinary tract it is of great importance that the offending organism be identified promptly, in order that appropriate therapeutic measures may be administered. Hence in the second portion of the freshly passed two glass specimen from the male or in a catheterized specimen from the female the gram-positive coccus, the gram-negative bacillus and the paired diamond-shaped *Streptococcus faecalis* have been watched for as the most common offenders. Failing to find these in the urinary sediment, the diagnostician must then eliminate the possibility of a chronic specific infection or an infection due to an acid-fast bacillus.

The physician who uses his microscope only on rare occasions instead of on every occasion will not be able to treat urinary tract infections intelligently. Only rarely is one required to have the elaborate laboratory equipment necessary for identification of the micro-organism by culture. The method described by Pelouze makes gram staining of the centrifuged urinary sediment a quick and easy procedure which should be used at all times.

During the past year, clinical and laboratory data have shown that sulfanilamide is an effective agent in combating the gram-negative bacillus, from the common *Escherichia coli* to the less frequent but more refractory *Aerobacter aerogenes*, as well as the infrequent *Pseudomonas* and the hitherto troublesome and uncontrollable *Proteus ammoniae*.

For those unfortunate persons who are afflicted with a urinary tract infection with *Proteus ammoniae* as the offending organism, sulfanilamide has been a great discovery. For satisfactory results most urinary antiseptics require increased acidity in the urine, which the action of *Proteus ammoniae* has frequently made impossible. It is fortunate that at last there is a bactericidal agent which will act in an alkaline urine, an agent which is invaluable to the patient who is afflicted with this urea-splitting organism, which is so frequently a forerunner of encrusted alkaline cystitis and pyelitis.

It should be remembered that occasionally *Streptococcus faecalis* is found accompanying the gram-negative bacillus and that sulfanilamide has no effect on this organism. Its presence should be suspected and the urine, though clear, examined bacteriologically when the complaints of the patient, such as frequency and burning at urination, persist. *Streptococcus faecalis* (group D, hemolytic streptococcus) may cause extreme discomfort with but little evidence of reaction on the part of the patient in the form of haziness or cloudiness of the urine. It is remarkable how few pus cells will at times be found in urine teeming with this type of bacteria. At such times it is important to investigate microscopically the stained urinary sediment. A routine urinalysis will miss the irritating micro-organism because of the scarcity of white blood cells in the specimen. The discomfort of the patient should emphasize the necessity for close cooperation between the clinician and the laboratory. If its presence is confirmed, intravenous administration of neoarsphenamine may prove a most helpful measure. Clinical results show also that the use of mandelic acid accompanied by increased acidification of the urine is effective in eliminating *Streptococcus faecalis*.

In the case of gram-positive coccus infections other than those due to *Streptococcus haemolyticus*, the clinical

responses have varied considerably and the percentage of satisfactory results apparently does not approach that obtained when the gram-negative bacillus is involved. The gram-positive micrococcus so frequently found in the anterior portion of the urethra of the male may be more effectively eliminated from the urinary tract by sulfanilamide than can the various species of staphylococci. When sulfanilamide does not produce the desired result, small intravenous doses of neoarsphenamine accompanied by oral administration of methenamine should be prescribed.

## TOXICITY OF THE DRUG

My clinical experience in using sulfanilamide in a large number of instances in which the age and general condition of the patient differed over a wide range has confirmed the conclusions of Marshall, Emerson and Cutting,<sup>12</sup> who said:

In spite of the fact that this study indicates that sulfanilamide is a relatively nontoxic substance, the drug is not devoid of toxicity. The minor toxic manifestations to be expected in man from our animal work and from the greater individual variation in diseased patients would seem to be no contraindication to the use of the drug when definite therapeutic indications exist. However, owing to the fact that the drug can possibly produce serious toxic symptoms in the hypersensitive individual, as well as the known occasional idiosyncrasy of a serious nature, sulfanilamide should not be used indiscriminately.

It is well known from experimental study that acidosis is produced by excessive doses of sulfanilamide. Since the excessive dose may vary considerably with each patient, it would seem advisable to reduce the possibility of lessening the alkali reserve by the administration of some alkalinizing agent. Furthermore, the sulfanilamide excreted into the urinary tract is more effective in inhibiting the growth of the invading bacteria when the  $pH$  of the urine is increased. So, from the standpoint of lessening its toxicity and increasing the effectiveness of its action, a moderate dose of sodium bicarbonate or some similar alkalinizing agent should be given in conjunction with the drug.

As it is also observed that a decrease in renal function accompanies an excessive dose of sulfanilamide, caution should be exercised in determining the amount of the drug administered when the age of the patient or the symptoms seem to indicate renal insufficiency. Clinical observations show a wide variation in the apparent renal tolerance for this new compound. Reactions are common, and frequently, in order to obtain the desired result, some of the lesser toxic manifestations, such as lassitude, slight headache, some anorexia or even nausea without vomiting, may necessarily be imposed on the patient. If the dose is within safe limits for the patient, I have usually found that these symptoms subside by the second or third day, even though the dose is maintained as first prescribed. The questions of when and how to prescribe sulfanilamide therefore require for their answer considerable experience in administration of the drug and careful study in each case in which its use is considered advisable.

## DOSE OF SULFANILAMIDE

No standard dose of this drug can be established, since the amount must vary with the individual patient. In a younger person the kidneys will excrete the drug more rapidly and will thus lessen its level in the blood.

12 Marshall E. L., Emerson K. Jr. and Cutting W. C. Para-aminobenzenesulfonamide: Absorption and Excretion. J. A. M. A. 108: 953-958 (March 20) 1937.



On the other hand, if the substance is excreted slowly by the kidneys because of decreased renal function the level in the blood will be higher even though the dose is small.

The ambulatory patient is unable to tolerate the same amount of the drug that may be given safely to a patient resting in bed. This was strikingly illustrated recently in a patient who tolerated satisfactorily 100 grains (6.5 Gm.) of sulfanilamide daily while hospitalized yet had toxic symptoms while taking 40 grains (2.6 Gm.) daily when employed at light manual labor. To emphasize further the wide variation in the doses tolerated by different persons, it is interesting to note that a patient somewhat dissatisfied with this earthly existence took fifty-eight 5 grain sulfanilamide tablets, or 290 grains (18.85 Gm.), at one time, with no more serious effect than a transient decrease in the respiratory rate and a marked drowsiness, both of which symptoms were entirely relieved within twenty-four hours by forced fluids and respiratory stimulants.

In passing, it is worthy of note that while this patient was greatly discouraged because of a subacute specific urethritis and prostatitis which had failed to respond to previous therapeutic measures, the excessively large dose eliminated the infecting organism from his urinary tract.

In the treatment of acute infections of the urinary tract, the various modes by which sulfanilamide can be administered add to its value as a curative agent. When, as so frequently happens, gastrointestinal upsets make oral administration impossible, the drug can be given intramuscularly, subcutaneously, intravenously or by rectum.

#### EVALUATION OF RESULTS

Infections of the upper part of the urinary tract, both acute and chronic, respond well to sulfanilamide therapy when this is applied with due reference to the type of infecting organism and when proper consideration is given to the limitations of any urinary antiseptic in the presence of calculi, stasis or tumors. Sulfanilamide should be borne in mind as a valuable preoperative aid in preventing the troublesome sequelae which may follow surgical procedures, cystoscopic manipulations or other manipulations of the urinary tract. With uncomplicated pyelitis it has been my experience that the course of the infection is considerably shortened both clinically and bacteriologically. I have found that bacillary infections are more easily eradicated by sulfanilamide than are the coccic infections.

With cystitis my results have shown no uniformity. The acute trigonal cystitis often observed in women due to bacillary infection, has responded very well; the acute symptoms often clearing up within twenty-four hours after administration of sulfanilamide. I continue the treatment, nevertheless, until it is evident that all infection has been eliminated. On the other hand, bladder infections occurring after operations on the bladder neck have not yielded at once to sulfanilamide therapy, the infection usually persisting for several weeks despite its administration. However, after all necrotic material has been eliminated I have found this drug to be helpful in relieving residual infections.

With nonspecific prostatitis, although sulfanilamide serves to diminish the extent of the infection, as evidenced by microscopic examination of the expressed prostatic secretion, it has been my experience that recurrence frequently follows, and the prostatitis becomes as pronounced as before. The size of the doses seems to make no difference. The less satis-

factory results obtained in the treatment of nonspecific infections of the prostate gland may be explained by the variation in the type of infecting organism. Prostatitis caused by the gram-negative bacillus may respond rapidly, while the inflammatory condition due to a gram-positive coccus will show little improvement.

#### SULFANILAMIDE AND UNDULANT FEVER

In the southern and southwestern parts of the United States, when one has eliminated all other possibilities in the search for the infective agent, one finds that a considerable percentage of urinary tract infections are due to the micro-organism that causes undulant fever. The public health reports of recent years have shown that no state in the Union is altogether free from this type of disease. In the North, however, where pasteurization of milk is the rule rather than the exception and where Bang's disease has been practically eliminated from dairy herds, this type of urinary tract infection is encountered less frequently. On the other hand, examination of dairy cattle below the Mason and Dixon line has shown that nearly 50 per cent of the milk-producing animals are infected with this important bacterium.

Only within the last two years have satisfactory diagnostic procedures been available, and only since the advent of sulfanilamide has there been a satisfactory therapeutic agent for this type of urinary tract infection.

It is worthy of note that several foreign authors (Groues,<sup>13</sup> Berger and Schnetz,<sup>14</sup> Suchier<sup>15</sup> and Thevenet<sup>16</sup>) have lately drawn attention to the great value of sulfanilamide in the treatment of undulant fever. In the United States Toone and Jenkins<sup>1</sup> have recently reported a case in which the diagnosis was confirmed by blood culture and in which negative cultures followed administration of sulfanilamide over a period of eleven days. Stern and Blake<sup>18</sup> used sulfanilamide effectively in three cases of acute brucellosis.

It is a significant observation that in the sections of the United States where undulant fever is comparatively common there are many instances in which recurrent prostatitis and cystitis have been wrongly attributed to infected teeth, infected tonsils or other possible foci, while the real cause, which is undulant fever, has not been discovered because of failure to realize how widespread is the occurrence of this disease. It is accordingly important that the clinical picture associated with this rather frequent form of urinary tract infection be recognized.

Brucellosis, however, is often more deceptive than the usual classic picture would indicate. The fever is prone to remissions, and during these remissions the patient may or may not suffer from some of the complaints that beset him during the more acute stage. If he happens to consult his physician during one of the intervals, it is easy to see how the true nature of the malady might escape detection.

Sulfanilamide applied in the treatment of urinary tract complications from the disease has shown most

13 Groues Pierre Sur quelques cas de melitococcie traites par le rubiazol seul associe a des agents therapeutiques specifiques de l'artrite. Lyon med 158 615 (Nov. 29) 1936

14 Berger W and Schnetz H Ein Behandlungserfolg bei Meli- Bang mit Prontosil Med Klin 33 594 (April 30) 1937

15 Suchier W Prontosil in Bang's Disease Fortschr d Therap 33 305 (May) 1937

16 Thevenet M V Un cas de melitococcie traite par le rubiazol (per os) Terminaison favorable relativement rapide de la maladie. Lyon med 158 668 (Dec 13) 1936

17 Toone E C and Jenkins A M Undulant Fever (Brucellosis) Treated with Sulfanilamide Report of a Case with Recovery. South M J 31 478 (May) 1938

18 Stern R L and Blake K W Undulant Fever. Its Treatment with Sulfanilamide J A M A 110 1350 (May 7) 1938



satisfactory results. According to my experience, however, it must be supplemented with a carefully administered vaccine to raise the immunologic responses of the patient to a point where the brucellosis will be completely controlled.

#### CONCLUSIONS

Sulfanilamide in the treatment of nonspecific urinary infections is proving to be a valuable addition to the urologist's armamentarium when employed with due caution and in the proper doses. It must be borne in mind that every case is an individual problem, that doses cannot be fixed by any general standard and that reactions are frequently observed. There should be a careful study of each patient, especially with regard to renal tolerance. The blood level of sulfanilamide should be watched throughout the period of its administration. A considerable experience with the drug is required for a proper understanding of its effects and for a proper appreciation of the conditions under which it should be prescribed. With suitable indications and in the right hands sulfanilamide is capable of producing brilliant results in the treatment of nonspecific urinary infections. Failures may be due to lack of proper identification of the infecting organism, since there are wide differences in the susceptibility of organisms within the urinary tract to the action of sulfanilamide.

### THE USE OF SULFANILAMIDE IN 1,625 CASES OF GONORRHEA IN THE MALE

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Dees and Colston<sup>1</sup> introduced sulfanilamide in the treatment of gonorrhea in February 1937. Their preliminary report indicated that it might end the search for a practical check of this widespread venereal disease. Since then, diverse results have been reported. Reuter's<sup>2</sup> most closely approximated the original report, but Potter,<sup>3</sup> in a series of 225 cases, reported only 35 per cent cures. Brunet's<sup>4</sup> percentage of cures was also low. Johnson and Pepper's<sup>5</sup> results were so disappointing as to evoke an editorial<sup>6</sup> in *THE JOURNAL* pointing to less than 50 per cent cures and calling for extreme caution in the use of the drug.

Although the drug itself was completely exonerated by the Council on Pharmacy and Chemistry of the American Medical Association for the deaths follow-

ing the use of Massengill's elixir of sulfanilamide, it is as yet not completely free from this onus in the public mind. Moreover, proof that the drug itself is toxic is adduced by the reports of fatal and near fatal cases by Borst,<sup>7</sup> Young,<sup>8</sup> Schwentker,<sup>9</sup> Marshall<sup>10</sup> and Harvey.<sup>11</sup>

The final estimate regarding the use of sulfanilamide for gonorrhea must rest on a comparison of the beneficial effects with the incidence and frequency of toxic reactions. To this end we wish to contribute the results obtained from its use with 1,625 male patients. The size of this group warrants statistical analysis. The study was limited to male patients, as the proof of cure in women is notoriously difficult to establish.

The first series, 200 consecutive patients, were studied particularly to determine what part the duration of the disease, degree of involvement and degree of side reactions play in the curative response to the drug. For this purpose the patients were given maximum tolerance doses without additional local therapy unless the failure of the drug to control the disease was obvious. Unless contraindicated by serious toxic reactions, treatment consisted of 80 grains (5 Gm.) for two days, 60 grains (4 Gm.) for the following four or five days and from 20 to 40 grains (1.3 to 2.6 Gm.) for at least two weeks. In this series only patients observed for three months were included. They were seen from three to five times weekly during treatment and one time weekly during follow-up. Diagnosis was established by smear or, in a few cases, by positive culture. Proof of cure included (1) complete absence of pyuria and (2) at least three negative smears after provocation by sounds, silver nitrate in the posterior urethra, prostatic massage, the use of alcohol and intercourse. The persistence of pus in the prostatic fluid was disregarded if these tests failed to excite clinical or laboratory evidence of the specific organism. The results in this first series have been correlated in table 1.

This table shows the drug to be of unprecedented efficacy in the treatment of gonorrhea. In 58.5 per cent of the cases cure was obtained in less than one month without accessory local treatment. The exact time of the disappearance of the gonococcus is indeterminable, so the date of cure was considered to be the date of the initiation of the provocative tests if these were followed by no evidence of recurrence. The average time from the first day of treatment to the start of the provocative tests was only twenty-one and one-half days.

A second group of patients, comprising 21.5 per cent of the total patients treated, showed less response to the drug, but, with the addition of local therapy, likewise gave results vastly superior to those obtained with previous forms of therapy. Adjuvant treatment consisted of instillations of mild protein silver for the anterior and acute anteroposterior urethritis. Through and through irrigations of potassium permanganate were used for the chronic anteroposterior infections. Because of the protective action of the sulfanilamide, much earlier use of posterior medication was possible. The average period of cure was only forty-five days.

Read before the Section on Urology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 16, 1938.

From the University of Southern California School of Medicine and the Division of Venereal Diseases, City of Los Angeles Department of Health.

<sup>1</sup> Dees, J. E. and Colston, J. A. C. *The Use of Sulfanilamide in Gonococcal Infections*. J. A. M. A. **108**: 1855 (May 29) 1937.

<sup>2</sup> Reuter, F. A. *Use of Sulfanilamide in 100 Cases of Gonorrhea*. W. Ann. District of Columbia **6**: 117 (May) 1937.

<sup>3</sup> Potter, J. E. *The Use of Sulfanilamide in the Treatment of Gonorrhea and Complications*. Read before the Western Branch of the American Urological Society, July 11, 1937.

<sup>4</sup> Brunet, W. M., Reinhard, C. H. and Shaw, N. D. *Use of Sulfanilamide in Gonorrhea in the Male: Preliminary Report and Warning*. New England J. Med. **218**: 295 (Feb. 17) 1938.

<sup>5</sup> Johnson, S. H. and Pepper, D. Sergeant. *The Evaluation and Dangers of the Treatment of Gonorrhea with Derivatives of the Sulfanilamide-Azo Dyes*. Weekly Roster & M. Digest **33**: 465 (Dec. 11) 1937.

<sup>6</sup> Sulfanilamide and the Leukocytes. editorial. J. A. M. A. **110**: 572 (Jan. 29) 1938.

<sup>7</sup> Borst, J. G. G. *Death from Agranulocytosis After Treatment with Protosil Flayum*. Lancet **1**: 1519-1520 (June 26) 1937.

<sup>8</sup> Young, C. J. *Agranulocytosis and Para-Aminobenzene Sulfonamide*. Brit. M. J. **2**: 105 (July 17) 1937.

<sup>9</sup> Schwentker, F. F. and Gelman, Sidney. *Sulfanilamide Rash*. Bull. Johns Hopkins Hosp. **61**: 136 (Aug.) 1937.

<sup>10</sup> Marshall, E. A. Jr. and Walz, E. M. *Cyanosis from Sulfanilamide*. Bull. Johns Hopkins Hosp. **61**: 140 (Aug.) 1937.

<sup>11</sup> Harvey, A. M. and Janeway, C. A. *Development of Acute Hemolytic Anemia During Administration of Sulfanilamide*. J. A. M. A. **108**: 12 (July 3) 1937.

The results with the forty remaining patients, comprising group 3, must be considered as comparatively unsuccessful. In some, adequate administration was impossible because of toxic side reactions, in others the infection was prolonged or complicated despite the drug

response to the drug is not dependent on the extent of the infection. The one and salient exception, which was repeatedly confirmed, is that sulfanilamide will not clear up a gonorrhea focus until free drainage is established. The most striking examples of this fact were four cases of infected Tyson's glands. The freely draining urethra quickly cleared of all evidence of infection, whereas gonococcus loaded pus could be expressed at each visit from the poorly draining Tyson's glands. Cure was obtained when these glands were destroyed by electrocautery. Similarly, gonorrheal prostatic abscesses and periurethral abscesses failed to respond until digital or surgical rupture, after which rapid progression toward cure was obtained. Because of this concept, patients with acute phlegmonous prostatitis are now given large doses of sulfanilamide to ward off epididymal involvement, and soon thereafter attempts at digital expression of the nondraining pus is attempted. Such patients, who previously often responded poorly to sulfanilamide therapy, now show a most uniform immediate improvement in their condition.

Table 2 illustrates the value of the drug in the treatment of various complications of gonorrhea. The relief of pain in acute epididymitis and the relief of stricture in prostatic involvement were extremely satisfying, often occurring in less than twenty-four hours. With these complications particularly the drug seemed heaven-sent panacea, and only the rare patient failed

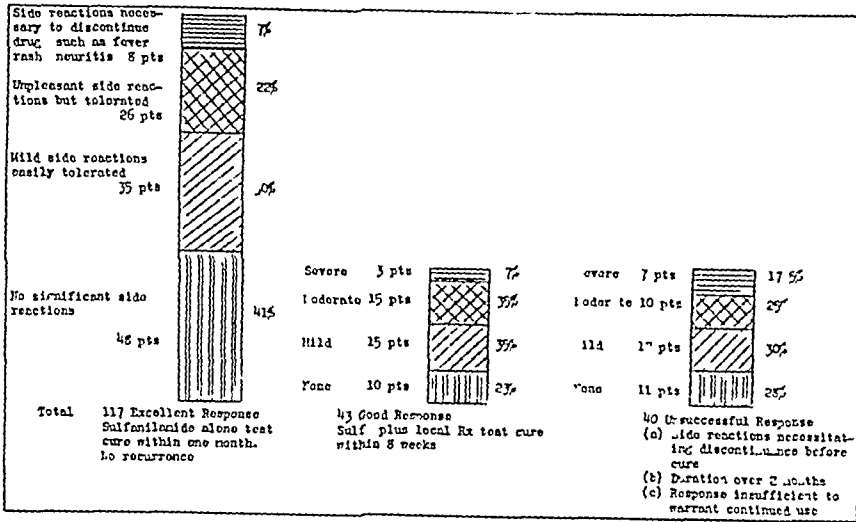


Chart 1—Is response correlated to side reactions of sulfanilamide?

There were nine cases of drug incompatibility, in two there were very severe subjective symptoms, in six administration of the drug had to be discontinued before cure could be obtained because of the fever-rash syndrome and in one toxic cyclopia contraindicated further use. Twenty-one patients showed definite but slow improvement attributable to the added influence of sulfanilamide therapy. In six cases clinical symptoms would abate dramatically each time the drug was used but would recur just as regularly after cessation. In only four cases was there a complete absence of clinical effect.

A review of chart 1 shows two thirds of the patients presenting side reactions, ranging in severity from mild uneasiness to fever, cyanosis and severe dermatitis, necessitating hospitalization or confinement to their home, but, as can readily be seen from the blocked diagrams, the relative incidence of the various degrees of side reactions were essentially the same with all types of therapeutic response. It is probable therefore that the mechanism of cure rests on a basis different from that which produces the constitutional upset.

Potter<sup>3</sup> and Mahoney<sup>12</sup> report the results of sulfanilamide with chronic gonorrhea to be better than those with acute gonorrhea. In this series, as the block figures in chart 2 indicate, there was no significant difference in the ratio of cure to the duration of the infection prior to treatment.

Similarly, cross tabulation of the initial diagnosis with curative response to the drug, as shown in chart 3, shows strikingly similar ratios. Apparently the cura-

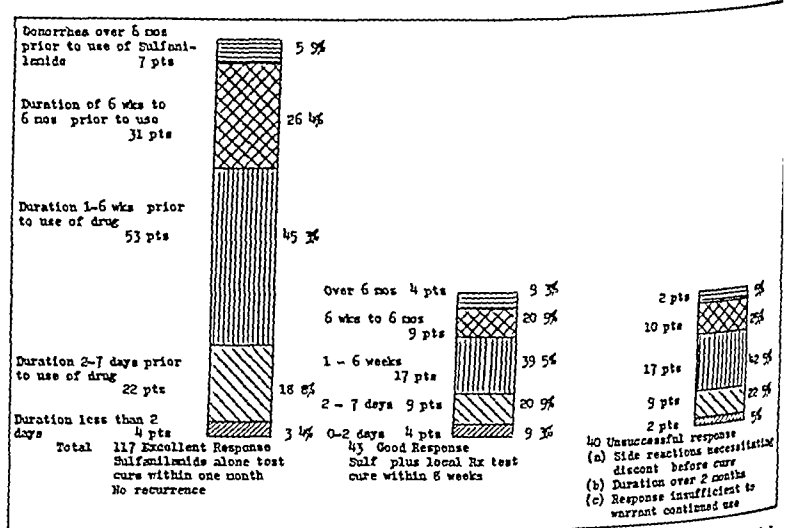


Chart 2—Is response correlated to duration of gonorrhea prior to administration of sulfanilamide?

to respond with at least symptomatic improvement. As will be brought out in an analysis of the second series, sulfanilamide has been of even greater importance in the preventing of these unfortunate complications.

Although no gonorrheal ophthalmia was seen in these 200 cases, the response with this dreaded complication is the most satisfying of all. Of twenty patients treated at the Los Angeles County Hospital, nineteen were cured with dramatic success and the twentieth, although

having a minor relapse, retained the sight in both eyes. This is in keeping with the results quoted by Willis<sup>13</sup>

Only one patient with gonorrheal arthritis was seen in this series and he responded well, but this was contrary to the experience in the urologic section of the county hospital, in which only seven of twenty-two patients obtained much relief.

Table 3 shows the frequency and diversity of the side reactions encountered. Weakness and dizziness are so often present that they should be considered as concomitants rather than as complications. As can be seen, in only a few cases were the symptoms so severe as to contraindicate further use of the drug. The "drunk feeling" and loss of sleep so frequent of occurrence were never followed by serious consequences and were therefore disregarded.

Dyspnea appeared so frequently that suspension of the work was considered during the first days of our study, but continued observation assured us that this alarming symptom is innocuous in the absence of clinical cyanosis.

The truly serious side reactions, as reported by many authors<sup>14</sup> were usually ushered in by an influenza-like syndrome of generalized aching and a temperature ranging from 100 to 103 F. This was usually followed by a rash, which appeared in from twenty-four to forty-eight hours and simulated the eruptions of measles or secondary syphilis. Two of the patients with rash were mistakenly quarantined in the first days of the drug's use. One third of the rashes were of the photo-sensitive type, with sharp lines of demarcation at the covered parts of the body. In only one of these cases was the prognosis doubtful. This patient had generalized edema but went on to a complete recovery in fourteen days.

Investigation of the cases of the toxic rash syndrome revealed an interesting fact pertaining to the urine. From twenty-four to forty-eight hours previous to the onset of rash, the urine became deep orange or slate colored. The color was so similar to that observed in hematoporphyrinuria that examinations for hematoporphyrin were carried out early in June 1937. Because of some technical difficulty the tests were reported as negative, and not until January 1938 did we again try to identify this as the causative pigment. At this time the urine of three successive patients with rash showed positive spectroscopic reactions for hematoporphyrin. The presence of this metabolic disturbance is possibly the key to many of the bizarre neurologic complaints reported and to the occasional nerve palsies reported by Potter<sup>3</sup> and Bucy.<sup>15</sup> Mason, Courville and Ziskind<sup>16</sup> in their monograph on the porphyrins, described similar phenomena and the induction of hematoporphyrinuria

by benzene-derived drugs. Four of this series of patients had definite paresthesias, and another had a definite psychosis during the period of the drug administration. Since our recognition of the significance of the pigment in the urine, we have used its appearance as a signal for discontinuance of therapy, and the incidence of rashes has diminished.

The most serious toxic manifestation was the development of acute toxic hepatitis (reported elsewhere). The patient on his own initiative took 15 grams (1 Gm) of sulfanilamide six weeks after its use had been discontinued because of the fever-rash syndrome.

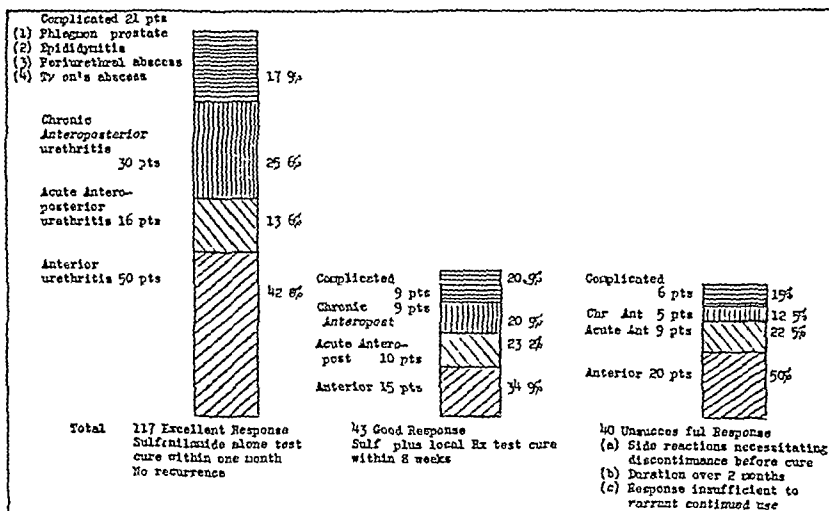


Chart 3—Is response correlated to extent of gonococcal involvement?

Within five hours there developed an urticarial rash, which disappeared in several days, but the patient became progressively worse and on the sixth day was definitely jaundiced. Evidence of liver damage progressed, with the icterus index climbing to 200 and the urea nitrogen content dropping to 8 mg per hundred cubic centimeters of blood. After five weeks of hepatic insufficiency the patient finally recovered, apparently with complete recovery of liver function.

The toxic side reactions may therefore be grouped into four classes:

- 1 The generalized systemic reactions, including malaise and the fever-rash syndrome.
- 2 The hemopoietic depressions, including the agranulocytic and hemolytic anemias reported but not found in this series.<sup>17</sup>
- 3 Toxic involvement of either the central or the peripheral nervous system.
- 4 The sensitization phenomena similar to those which occur with arsphenamine, cinchophen and aminopyrine.

Table 4 emphasizes the necessity for using even greater perseverance in testing for cure and caution before allowing the patient sexual license. There are two factors which may bring this drug into disfavor: the toxic reactions just discussed and the spread of the disease by patients who have been lulled into a false sense of noninfectiveness by the abrupt disappearance of discharge. Pelouze<sup>18</sup> had great stress on the necessity

<sup>13</sup> Willis Thayer. Sulfanilamide in Ophthalmia Neonatorum. *J Biol & Med* 10: 275 (Jan.) 1938.

<sup>14</sup> Hageman F. O. and Blake Francis C. A Specific Febrile Reaction to Sulfanilamide. *J A M A* 109: 642 (Aug. 26) 1937.

<sup>15</sup> Newman Ben A. and Sharlit Herman. Sulfanilamide A Photosensitizing Agent of the Skin. *ibid* 109: 1036 (Sept. 25) 1937.

<sup>16</sup> Bucy Paul C. Toxic Optic Neuritis Resulting from Sulfanilamide. *J A M A* 109: 1007 (Sept. 25) 1937.

<sup>17</sup> Mason Courville and Ziskind. Hematoporphyrin. *Medicine* 12: 355 (Dec.) 1933.

<sup>17</sup> Kohn S. E. Acute Hemolytic Anemia During Treatment with Sulfanilamide. *J A M A* 109: 1005 (Sept. 25) 1937.

<sup>18</sup> Pelouze P. S. Gonorrhea and Sulfanilamide. An Effect Toward Clinical Orientation, read at the fourth annual session of the American Venereal Society, Washington D. C. May 16 1938.

of maintaining the most rigid criteria of cure Carpenter,<sup>19</sup> Jones<sup>20</sup> and others have reported an altered morphologic appearance of the gonococci under the influence of sulfanilamide therapy. Carpenter feels

TABLE 1—Summary of Results in 200 Cases Observed for at Least Three Months

	Number of Patients	Percent of Patients	Complete Symptomatic Relief	Average Days to Cure With Recurrence	Average Days to Test of Cure With Recurrence	Average No. of 5 Grain Tablets of Sulfanilamide
1 Excellent Sulfanilamide alone, test of cure within 1 month, no recurrence	117	58.5	5.9	21	142	
2 Good Sulfanilamide plus local therapy, test of cure within 8 weeks	43	21.5	2	49.2	210	
3 Unsuccessful (a) Side reactions necessitating discontinuance before cure (b) Duration over 2 months (c) Response insufficient to warrant continued use	40	20.0	6	In the who continued use of sulfanilamide	102	160

that greater reliance will have to be placed on cultural methods. Remission must not be confused with cure. In forty-one cases all macroscopic evidence of discharge and microscopic evidence of pyuria disappeared with

TABLE 2—Response to Sulfanilamide of Gonococcal Complications

	1 Excellent Cured with Drug Alone Test of Cure in Less Than 1 Month	2 Good Cure in Less Than 8 Weeks with Local Adjunctive Treatment	3 Unsuccessful	Comment
Tyson's glands	1	2	1	Urethra found clean with Tyson's glands grossly infected
Periurethral abscess	2	2		Excellent response
Epididymitis	10	2	2	Relief of pain in from 4 to 24 hours
Phlegmonous prostate	8	3	3	2 patients with overflow retention voiding in 24 hours
Gonococcal proctitis	1			
Gonococcal adenitis	3	1		
With stricture	2			
With multiple fistulas	2			1 case 9 months previous local therapy other 2 years previous local therapy
Cases at Los Angeles County Hospital				
Gonococcal arthritis	8	2	13	Sulfanilamide least effective particularly chronic
Ophthalmitis	10	1		Dramatic eye saving results

the use of sulfanilamide but cure was disproved by exacerbation which occurred after cessation of therapy or was induced by the provocative tests. In twenty-

three cases this occurred once and in fourteen, twice, and in four there were three distinct remissions without cure. Yet we feel that if the tests of cure are instituted at least a week after all therapy has been discontinued and include passage of sounds, instillation of silver nitrate, prostatic massage to obtain discharge, the use of alcohol, and intercourse, with thorough search of smears after these procedures, the remissions can be definitely differentiated from cure. In only three of the cases in which we had pronounced the patient cured has the last year's observation proved wrong.

The second series, comprising 1,425 patients, as mentioned previously, were treated under a different plan. The limitations of the clinical facilities and the reluctance of the patients to attend the clinic as frequently as we felt necessary prevented the use

TABLE 3—Analysis of Subjective Side Reactions With Sulfanilamide

Symptom	Number of Patients	Percentage of Patients	Comment
Weakness	12	5.6	Most frequent but of little significance
Dizziness	67	23	Same
Dyspnea	60	30	Only 2 patients had to discontinue use of drug on this account
Headache	31	16.5	
Anorexia	32	16	
Drunk feeling	25	12.5	
Sleepiness	22	11	
General aching	19	9.5	
Nausea	19	9.5	
Cyanosis	19	9.5	Oxygen tent for 1 patient 24 hours
Vomiting	9	4.5	
Fever	8	4	
Rash	11	6.5	About 50% photosensitive
Constipation	6	3	
Diarrhea	2	1	
Paresthesia	4	2	
Cycloplegia temporary	1	0.5	
Preordial pain	2	1	
Temporary deafness	1	0.5	
Discontinuance of drug due to side reactions	17	8.5	
Urteritis	1	0.5	
Toxic necrosis liver	1	0.5	Case report elsewhere
Peripheral neuritis	0	0	1 case known outside this series
Hemolytic crisis	0	0	No hemoglobin content less than 50 per cent
Agranulocytosis	0	0	Frequent blood counts with toxic patients 3 cases of comparatively mild leukopenia

maximum tolerance doses of the drug. The previous experience with toxic side reactions convinced us that without close supervision the dangers of a fatal mishap were great. An attempt was made to see the patient at least twice weekly during treatment, and if this was impossible only small doses of sulfanilamide were prescribed. The average patient was instructed to take 8 grains of sulfanilamide for the first two days, but an exception the mildest symptoms called for immediate discontinuance until the next visit. The maintenance doses were definitely less than those prescribed in the first 200 cases. More dependence was placed on accessory local therapy, and this was prescribed early in the course of treatment in most cases. Despite the zealous efforts of the overworked truant officer, it was impossible to keep the patients in attendance until all tests of cure had been completed. The results in this large group probably more closely approximate those which can be expected by the average practitioner and in the public health control of gonorrhea.

19 Carpenter C. M. The Protective Effect of Sulfanilamide Against Gonococcus Toxic in Mice read at the fourth annual session of the American Neisserian Society Washington D. C. May 16, 1938.  
20 Jones W. Ray Sulfanilamide May Revolutionize Laboratory Identification of Gonococci Am. J. Syph. Gonorr. & Ven. Dis. 22: 349 (May) 1938.

Table 5 illustrates what one may expect under these conditions. Forty-seven per cent of the patients showed excellent curative response taking less than a month for cure. With 23 per cent cure was effected with much greater ease and celerity than could ever be expected without the use of sulfanilamide. With 19 per cent the gonorrhea was prolonged over two months or use of the drug could not be continued, because of side reactions. The remaining 11 per cent of the patients so successfully eluded the truant officer that the nature of their response could not be determined.

The occurrence of only sixty-three complications was in great contrast with the proportion of approximately 15 to 20 per cent which was observed in the days antedating sulfanilamide. This was paralleled by a striking reduction in the number of patients with gonorrheal complications admitted to the general hospital. During the last six months of 1936 189 patients were admitted with acute adnexal and metastatic involvement, during the same period in 1937 the figure was reduced to seventy-eight, and less than half of these patients had been given the benefit of sulfanilamide therapy prior to the development of their complications. The comparison of the thirty-one day average of clinic attendance for this series of 1,425 patients with the eighty-three day average for 2,000 patients in 1936 is another proof of the value of this drug.

Of 1,425 patients, 102, or 7 per cent, were unable to tolerate the drug. As can be seen, the fever-rash syndrome occurred in approximately 4 per cent. In none of these cases was the outcome doubtful, probably because of smaller doses of the drug and earlier discontinuance whenever evidence of the peculiar urinary pigmentation occurred.

TABLE 4—Reliability of Curative Criteria (200 Cases)

	One Apparent Relapse	Two Apparent Relapses	Three Apparent Relapses
Complete clinical remission on test of cure	23 patients	14 patients	4 patients
Discharged as cured after tests but returned with recurrence	3	0	0

TABLE 5—Second Series (1425 Patients)

	No of Patients	Percentage
Excellent results—cure in less than one month	681	47.8
Good results—cure in less than two months without development of gonococcal complications	223	22.7
Unsuccessful	267	18.7
One visit	154	10.8
Side reactions causing discontinuance of drug	102	7.1
Average clinical attendance		31.0 days
Average clinical attendance in 1936 prior to use of sulfanilamide		82.8 days

Of sixty-three gonorrheal complications occurring in this series, only fourteen occurred during administration of sulfanilamide. The rest occurred either prior to or after the cessation of its use, making a total of less than 1 per cent of complications during the administration of the drug.

#### SUMMARY

In the first series, with close observation and maximum tolerance doses of the drug, three fifths of the patients showed a cure in less than one month with no

accessory treatment. In another one fifth the results were far superior to what might be expected without the use of sulfanilamide, cure occurring in less than two months and with a mild course. With the remaining one fifth its use could not be classed as a success, either because of intolerance or because of failure of the drug to alter the course of the disease from what might be expected with the usual treatment. The effi-

TABLE 6—Side Reactions Causing Discontinuance of Drug (102 Patients)

	No of Patients	Percentage of Total Patients Treated
Fever-rash syndrome	53	3.80
Subjective	23	1.60
Vomiting and gastrointestinal disturbance	11	0.76
Cyanosis	6	0.42
Low hemoglobin content	3	0.21
Leukopenia	4	0.28
Cyclopia	1	0.70

TABLE 7—Complications Second Series (1,425 Patients)

	No of Patients	Percentage
Total	63	4.4
Present before administration of sulfanilamide	19	1.3
Occurring during administration	14	0.9
Occurring after cessation of therapy	30	2.1

ciency of the drug was found to be independent of the degree of side reactions, the duration of the disease prior to its use or the extent of the involvement of the urinary tract. One exception to this rule was with non-draining gonorrheal recesses. Side reactions were frequent and diverse. Of 1,425 patients treated under conditions which would probably closely approximate the average, 50 per cent showed excellent results, with cure in less than a month, and one fourth had a comparatively mild illness and cure within two months. With the remaining one fourth the results were unknown or were not completely successful, because of intolerance to the drug, or the disease was not appreciably different than before the era of sulfanilamide. None of the 1,625 patients died and none had any marked blood dyscrasia. One almost fatal toxic necrosis of the liver and one alarming attack of cyanosis occurred.

#### COMMENT

Even the most conservative consideration of these results confirms the statement that the use of sulfanilamide is of unprecedented efficacy in the cure of gonorrhea and its complications in the male. Only one other method produced comparable results, the expensive and dangerous hyperpyrexia. Most students of the public health aspect of gonorrhea agree that hyperpyrexia could not be a significant factor in any control program because the expense alone eliminates the possibility of its use by all except the comparatively wealthy. Yet it is well recognized that the gonorrheal reservoir is the mass of young and comparatively indigent persons. Even if government subsidy were to provide the necessary funds, only the overzealous would subject a patient with uncomplicated gonorrhea to a procedure which carries a mortality varying from 0.5 to 5 per cent. Sulfanilamide, on the other hand, is an inexpensive drug, easily administered perhaps, from recent experience, much too easily. Superficially,

it too is subject to the criticism that the treatment is more dangerous than the disease

We concede that with the male the use of sulfanilamide will carry a higher mortality than gonorrhea itself. We do not feel that the danger is inherent in the use of the drug but realize that much self administration will unquestionably lead to some fatalities. Moreover, members of the medical profession must realize that the same fatal outcome may occur with their own prescription unless frequent clinical and laboratory observation is insisted on. We feel strongly, however, that gonorrhea is a disease which cannot be thought of in terms of mortality. It must be realized that the immediate and the distant morbidity of gonorrhea is incomparably more forbidding than simple mortality statistics indicate. In loss of work gonorrhea ranks second only to the common cold. Often a long series of gonorrheal complications have laid the patient up for from weeks to months, resulting in hardship on an entire family of dependents. Not only financially but socially the problem has great significance, because of the untold number of sterile unions directly attributable to gonorrhea in one of the partners. Finally, one must realize that, although for the male gonorrhea carries a negligible mortality, for the female it carries an ultimate mortality of from 1 to 2 per cent, not from the gonorrhea itself but from the pelvic operations it necessitates.

We propound still another argument to warrant our continued use of sulfanilamide in all cases of gonorrhea despite our concession that its use will give a higher mortality than the disease alone. Gonorrhea, like any other highly infectious disease, increases in geometric progression to the number of infected carriers. Candid urologists everywhere admit that heretofore the average duration of gonorrhea as treated throughout the country was not six weeks, as was optimistically written in many textbooks, but probably in the neighborhood of from four to six months. With the aid of sulfanilamide, 75 per cent of the patients should be cured in well less than eight weeks. We feel that this marked decrease in the number of gonorrheal carriers at any one time must inevitably result in the reduction of gonorrhea to a minor control problem from its present forbidding stature.

We feel therefore that sulfanilamide must be considered in the same light as the arsphenamines, of unparalleled value in the control of a widespread and highly communicable disease and a drug which demands caution and intelligence in its use and which, if properly used, should be the solution of what has been a most trying problem from both an individual and a social point of view.

#### ABSTRACT OF DISCUSSION

ON PAPERS OF DR CLARK AND DRs SILVER AND ELLIOTT

DR A. ELMER BELT, Los Angeles. My experience tallies with that of Anson Clark, who has found sulfanilamide effective in dealing with almost all infections of the urinary tract except that by *Streptococcus faecalis*. To this exception I must add infection by *Streptococcus viridans*. I have also found its effectiveness low with the gram negative cocci, especially *Staphylococcus aureus*. Clark's careful summary teaches that a considerable amount of investigation of the patient's condition is necessary in order to use the drug properly. Examination of urinary sediment in the fresh mount and stained specimen, cultures of urine and determinations of pH are advocated. In my experience the level of sulfanilamide in the blood is important, since it has been found that in 50 per cent of cases of failure

there has been a persistently low concentration of the drug in the blood. This may be due to a hypersecretion from too great fluid intake. When a level of only 4 to 6 mg. is present in the blood I lower the fluid intake, discontinue coffee and tea and increase the dose of sulfanilamide until a level of 11 mg. is obtained. In sulfanilamide physicians have at last a urinary antiseptic which acts on both sides of the urinary tract—on the blood and on the urine—and therefore, unlike mandelic acid is effective when the secretory power of the kidney is poor. In patients with an impaired renal secretory mechanism the blood level mounts rapidly and an early estimate may prevent too heavy an intake of the drug. The absorption rate of sulfanilamide is known to be rapid. Absorption is complete within four hours after oral administration. To the list of adverse reaction, cyanosis, dyspnea, acidosis, deafness and nausea, I must add the occurrence of extreme dermatitis and exfoliation of the exposed parts of a man of pink complexion after exposure to sunlight. This lasted ten days in spite of withdrawal of irritants, sunlight and the drug. All other unpleasant side reactions disappear at once after withdrawal of the drug. I am especially proud of the excellent summary presented by Drs. Silver and Elliott of an extremely large group of cases of gonorrhea treated by the Los Angeles Health Department. Work of this nature is often a little casual and uncontrolled, but I have great confidence in the care, accuracy and intelligence of Barney Silver. I wish to enlarge on one point he has made. He has noted that a search for the site of the persistent lesion in patients who have shown recurrences after sulfanilamide therapy often reveals a walled off lesion which has to be treated locally before sulfanilamide becomes effective. This tallies with my experience and leads me to mention the use of sulfanilamide in association with artificial fever. I have found that in 83 per cent of cases of failure with sulfanilamide alone cure was later achieved with a combination of sulfanilamide and artificial fever.

DR JAMES R. DILLON, San Francisco. With the development of chemotherapy it has become incumbent on urologists to study more closely and observe the reaction and response of the patient to the particular treatment, and we are approaching the category of the dermatologist in our ability to shift from one drug or form of treatment to another to meet the individual requirements. It was brought out by Dr. W. F. Braasch a year ago that the specific treatment may eliminate the organism producing the acute condition but that another submerged one will persist as a chronic offender, resisting all efforts at chemotherapy. After a period of chronic inflammatory reaction pathologic and anatomic changes may take place which demand adequate drainage for the kidney and bladder as well as clearing up of foci of infection. I should like to stress two points regarding sulfanilamide. 1. After an infection has responded and has been apparently cured, if a recrudescence is produced by the same organism it frequently fails to respond to the second course of treatment. 2. Patients who sometimes show violent reactions to the customary doses of an ordinary pharmaceutical product of sulfanilamide will frequently tolerate a kind of sulfanilamide carrying a proprietary name and a possibly better guaranty of purity. Damaged kidneys frequently cannot handle heavy doses of any urinary antiseptic, and smaller doses should be used for acute or subacute conditions, with possibly a better result.

DR W. RAY JONES, Seattle. Sulfanilamide, while a most efficient remedy, has multiplied the difficulties of proving the presence or absence of gonococci. Too many sulfanilamide treated persons, classed as cured by the ordinary clinical and laboratory methods, have later communicated the disease. Conversely, there is more difficulty than ever before in proving that other organisms are not gonococci. The Gram stain fails because both gonococci and the other organisms change their characteristics or mutate to meet the change in environmental conditions. The clinician must either be his own technician or work in closest collaboration with one to safeguard the patient in diagnoses of gonorrhea under these conditions. For a presumptive diagnosis it may be necessary to rely on seeing organisms growing on, about and in between the epithelial cells. Points to remember are that gonococci on epithelial cells stain deeply, have sharper outlines and are arranged in better clusters and that the diplococcal arrangement may be irregular. Final diagnosis rests on either finding typical organisms or no typical

forms for a sufficiently long period to justify considering the person noninfectious. Sulfanilamide has multiplied the technician's work and added greater uncertainty to the value of his results.

DR WIRT B. DAKIN, Los Angeles. I wish to present a new "believe it or not" incident. The officers on a submerged submarine noticed that one of their sailors was cyanotic. The vessel was promptly brought to the surface. With hatches open they rushed to their base, where the patient was hospitalized. The submarine's oxygen apparatus was overhauled but nothing found wrong. This incident cost the navy (American taxpayers) about \$5,000. The sailor had been treating himself with sulfanilamide. On being discharged from the navy hospital he consulted a civilian urologist and said "Doctor, you must not repeat what I have told you. If the navy officers found this out I should be hung by the heels from the tallest yardarm."

DR ANSON L. CLARK, Oklahoma City. Dr. Helmholtz has been kind enough to emphasize the infecting organism *Streptococcus faecalis*. In diagnosis when this type of micro organism is present may I make a plea for closer cooperation between the clinician and the laboratory? Recently I had a report from the laboratory of a large hospital that the urine showed short-chained streptococci. Such a report would lead one to believe that sulfanilamide would be of therapeutic value. In examining the slide carefully myself I found the diamond-shaped streptococci in pairs typical of *Streptococcus faecalis*. This organism apparently is not inhibited in its growth by sulfanilamide. May I again suggest that urologists familiarize themselves with brucellosis because of the important effect this type of infection may have on the urinary tract? Therapeutic measures in the treatment of brucellosis vary widely, from administration of vaccines to fever therapy. In my experience a carefully prepared vaccine, such as the Parke Davis product has given the most uniformly satisfactory results. It must be remembered that the dose usually suggested is much larger than should be given if one would avoid the unpleasant complications many have encountered in giving undulant fever vaccine.

DR HENRY F. HELMHOLTZ, Rochester, Minn. I want to emphasize one thing about the bacteriologic examination of the urine. It is outstanding that *Streptococcus faecalis* is the one organism that apparently grows almost as well in a solution of sulfanilamide as it does in a broth culture so that it cannot be hoped that sulfanilamide will cure an infection caused by *Streptococcus faecalis*. In cases in which sulfanilamide has been administered, one not infrequently sees *Escherichia coli* disappear from the urine only to find that a pure culture of *Streptococcus faecalis* remains. In such cases there unquestionably has been a double infection. Owing to the fact that *Escherichia coli* overgrows the various organisms in the urine, it appears to be the only infecting organism. Sulfanilamide therapy eliminates all *Escherichia coli* organisms leaving merely *Streptococcus faecalis* on culture. In going over some of my old records of treatment with methenamine the ketogenic diet and mandelic acid, I found when the infection was clearing up that *Escherichia coli* disappeared first and that a few colonies of *Streptococcus faecalis* remained on the plates. Thus *Streptococcus faecalis* is also resistant to these other forms of therapy, which fortunately will end the infection with a few extra days of treatment. Strangely enough if treatment is discontinued before the urine is sterilized it will be found that within a few days only *Escherichia coli* will be present and it will not be possible to see *Streptococcus faecalis*. This same thing applies to *Escherichia coli* and *Pseudomonas*. At the Mayo Clinic my associates and I have observed two cases now in which after elimination of *Escherichia coli* a pure culture of *Pseudomonas* was obtained. In both cases there were small stones in the kidney and we were never able to clear up the infection. There is one other point I should like to mention namely that *Staphylococcus aureus* apparently is the organism most susceptible to sulfanilamide therapy, and yet the clinical results are poor in cases in which this organism is present. I think this probably indicates that the infection caused by *Staphylococcus aureus* is not a superficial infection but that the deep tissues are involved and the sulfanilamide does not reach the organism in sufficient concentration to kill it. Certainly staphylococcal septicemia and osteomyelitis do not yield readily to sulfanilamide therapy.

## SURGICAL LIGATION OF A PATENT DUCTUS ARTERIOSUS

### REPORT OF FIRST SUCCESSFUL CASE

ROBERT E. GROSS, M.D.

AND

JOHN P. HUBBARD, M.D.

BOSTON

The continued patency of a ductus arteriosus for more than the first few years of life has long been known to be a potential source of danger to a patient for two reasons. First, the additional work of the left ventricle in maintaining the peripheral blood pressure in the presence of a large arteriovenous communication may lead eventually to cardiac decompensation of severe degree. Second, the presence of a patent ductus arteriosus makes the possessor peculiarly subject to fatal bacterial endarteritis. While it is true that some persons have been known to live to old age with a patent ductus of Botalli, statistics have shown that the majority die relatively young because of complications arising from this congenital abnormality. Dr. Maude Abbott<sup>1</sup> presented a series of ninety-two cases which came to autopsy in which it was shown that the patient had had a patent ductus arteriosus without any other cardiovascular abnormality. Of these patients, approximately one fourth died of bacterial endarteritis of the pulmonary artery and an additional one half died of slow or rapid cardiac decompensation. The average age of death of patients in this series was 24 years.

The complications arising from the persistence of a patent ductus arteriosus would seem to make surgical ligation of this anomalous vessel a rational procedure, if such a procedure could be completed with promise of a low operative mortality. Dramatic results have previously been obtained in persons with cardiac enlargement and decompensation resulting from a peripheral arteriovenous aneurysm when the short-circuiting vessels have been ligated or excised. On similar theoretical grounds, future cardiac embarrassment should be averted if a shunt between the aorta and the pulmonary artery could be removed. It would also seem plausible to expect that the shutting off of the anomalous stream of blood pouring into the pulmonary artery would lessen the formation of the thickened endothelial plaques within the pulmonary artery, which are so likely to be the seat of later bacterial infection. The surgical approach to the aortic arch and pulmonary conus having been studied previously in animal experimentation,<sup>2</sup> it seemed within reason that a patent ductus could be adequately exposed in man and possibly ligated without undue danger. It was therefore decided to undertake the operation in a child who presented the classic signs of a patent ductus arteriosus. At the age of 7 years she already had cardiac hypertrophy, which developed presumably from the embarrassment resulting from the anomalous communication. It was to be expected, therefore, that she would have increasingly severe disability in the future, aside from the danger of having bacterial endarteritis develop.

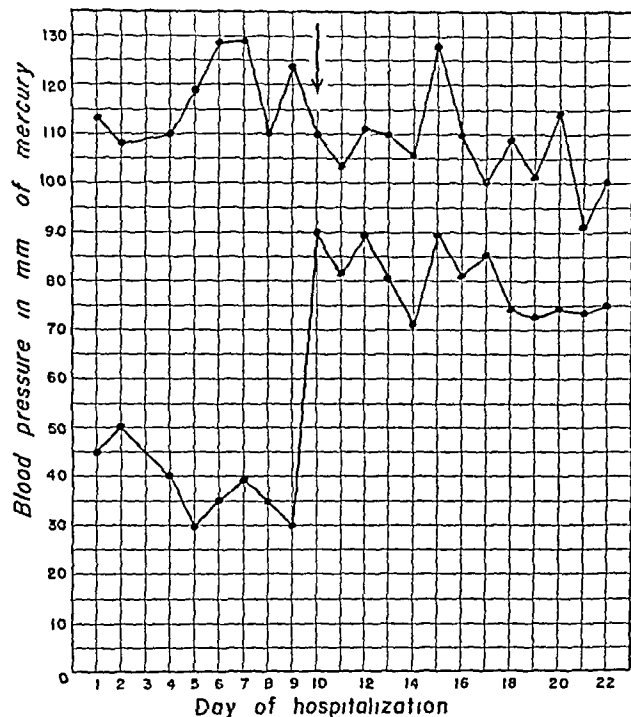
From the Surgical and Medical Services of the Children's Hospital and the Departments of Surgery and Pediatrics of the Harvard Medical School.  
1. Abbott, Maude E., *Atlas of Congenital Heart Disease*, New York: American Heart Association, 1936, pp. 60-61.  
2. Holman, Emile, *Arteriovenous Aneurysm*, New York: Macmillan Company, 1937, pp. 169-178.  
3. Gross, R. E., *A Surgical Approach for Ligation of a Patent Ductus Arteriosus*, New England J. Med. to be published.



## REPORT OF CASE

**History**—L. S., a girl aged 7½ years, entered the hospital Aug. 17, 1938, for study of her cardiac condition. The family history was irrelevant. She was born normally at full term. No cyanosis was noted at birth or during the postnatal period. The records of the hospital where she was born give no information about an examination of the heart at that time. At the age of 3 years she was seen in the cardiac clinic of another hospital, where it was found that she had physical signs suggesting congenital malformation of the heart. At that time she had a precordial thrill and a loud murmur. The carotid pulsations were abnormally marked, and pistol shot sounds could be heard over the brachial and femoral arteries. The blood pressure was recorded in both arms as 104 mm of mercury systolic and 0 diastolic. There was definite cardiac enlargement, as shown by teleoroentgenograms. The diagnosis made at that time was "congenital malformation of the heart with a patent ductus arteriosus."

During the next four years she was seen in several different hospitals, where the same diagnosis was made. At no time



Daily blood pressure readings of the patient with a patent ductus arteriosus before and after operation. Prior to operation the large ductus opening from the aorta produced a low diastolic pressure. Following operative closure of the ductus the diastolic pressure rose to twice its former level. The average daily diastolic pressure preoperatively was 38 mm of mercury. The average diastolic pressure postoperatively was 80 mm of mercury. The arrow points to the time of operation.

had cyanosis been observed. Dyspnea developed after moderate exercise, and her physical activities had been limited accordingly. She had never had peripheral edema or other evidence of cardiac decompensation. Frequently the child had been conscious of "something wrong in the chest" and her mother spontaneously offered the information that she had heard a "buzzing noise" in her daughter's chest when standing nearby.

**Physical Examination**—At the time of admission, the patient was slender and undernourished. The pulsations of the carotid arteries were abnormally forceful. The radial pulse was of the Corrigan type, and a capillary pulsation was readily seen. The veins over the chest were somewhat prominent. There was a precordial bulge. The heart was definitely enlarged by percussion, the enlargement being for the most part to the left. Over the entire precordium there was a prominent coarse thrill which was most intense in the third interspace to the left of the sternum. This thrill was continuous but was accentuated during systole. There was a rough "machinery" murmur heard with maximal intensity over the pulmonic area to the left of the sternum in the second and particularly in the

third interspace. It was continuous throughout the cardiac cycle but like the thrill was greatly accentuated during systole. It was transmitted to the left along the third interspace and into the axilla with only slightly diminished intensity. The systolic element was heard faintly over the vessels of the neck and could be heard clearly in the right axilla and over the mid-thoracic region posteriorly. Blood pressure readings were respectively right arm 115/40, left arm 110/50, right leg 150/55, left leg 140/40 mm of mercury. There was no clubbing of the fingers, and no evidence of peripheral edema. The liver edge was palpable at the costal margin. The examination in other respects was negative.

**Laboratory Data**—A 7-foot x-ray film of the chest showed the transverse diameter of the heart to be 117 cm, compared to an internal diameter of the chest of 20 cm. There appeared to be definite enlargement of the left ventricle. There was questionable prominence of the pulmonary artery. A mottled increased density around the lung hilus was interpreted as representing circulatory congestion. Fluoroscopic examination showed a "hilar dance." An electrocardiogram was normal, showing no deviation of the axis. The red blood count was 5,080,000 cells per cubic millimeter and the hemoglobin was 85 per cent (Sahli). Circulation time with dchydrocholic acid was 10 and 8 seconds, respectively, on two tests.

**Operation**—August 26, operation was undertaken (by R. C. G.) under cyclopropane anesthesia. The approach to the mediastinum was made through the left pleural cavity antero-laterally. Incision was made through the left third interspace, cutting the third costal cartilage, and the third rib was retracted upward. As the left lung was allowed to collapse inferiorly, an excellent view was gained of the lateral aspect of the mediastinum. The parietal pleura covering the aortic arch and left pulmonary artery was then incised and these structures were directly exposed. A large patent ductus arteriosus was found, which was from 7 to 8 mm in diameter and from 5 to 6 mm in length. A palpating finger placed on the heart disclosed a continuous and very vibrant thrill over the entire organ, which was increasingly prominent as the finger reached up over the pulmonary artery. A sterile stethoscope was employed and an extremely loud continuous murmur was heard over the entire heart. When the stethoscope was placed on the pulmonary artery, there was an almost deafening, continuous roar, sounding much like a large volume of steam escaping in a closed room.

A number 8 braided silk tie was placed around the ductus with an aneurysm needle, and the vessel was temporarily occluded for a three minute observation period. During this time the blood pressure rose from 110/35 to 125/90. Since there was no embarrassment of the circulation, it was decided to ligate the ductus permanently. The ductus was too short to tie double and divide, so that ligation alone was resorted to. When the thread was drawn up tight the thrill completely disappeared. The chest was closed, the lung being reexpanded with positive pressure anesthesia just prior to placing the last stitch in the intercostal muscles.

**Postoperative Course**—The child underwent the operative procedure exceedingly well and showed no signs of shock. Prior to operation blood had been taken from a donor in order to have it ready whenever needed, but the patient's condition was so good that it was not given. There was only mild discomfort on the afternoon of the day of operation, and on the following morning the child was allowed to sit up in a chair. By the third day she was walking about the ward. When the skin sutures were removed on the seventh day the wound was well healed, but because of the interest in the case the child was detained in the hospital until the thirteenth day. After the dressing was removed and the chest could be examined adequately the thrill had completely disappeared; there was a faint systolic murmur in the left third interspace which was not transmitted over the precordium, and no murmur could be heard in the axilla, in the neck or over the back. The daily blood pressures which had been taken prior to operation and subsequent thereto showed a striking change in the diastolic levels, as is shown by the accompanying chart. The average of the daily pressures prior to operation had been 114 systolic and 38 diastolic as contrasted with a postoperative daily average of 108 systolic and 80 diastolic.

## SUMMARY

A girl aged 7½ years had a known patency of the ductus arteriosus and beginning cardiac hypertrophy. In the hope of preventing subsequent bacterial endarteritis and with the immediate purpose of reducing the work of the heart caused by the shunt between the aorta and the pulmonary artery, the patent ductus was surgically explored and ligated. The child stood the operative procedure exceedingly well. The most objective finding, which indicated that the serious loss of blood from the aorta into the pulmonary artery had been arrested by operation, was a comparison of the pre-operative and postoperative levels of the diastolic blood pressure. Prior to operation the daily blood pressure showed an average diastolic level of 38 mm of mercury as compared with a postoperative diastolic level of 80 mm of mercury. This is the first patient in whom a patent ductus arteriosus has been successfully ligated.

## Clinical Notes, Suggestions and New Instruments

## SULFANILAMIDE THERAPY IN ACTINOMYCOSIS

EDWIN M. MILLER, M.D. AND EGBERT H. FELL, M.D.  
CHICAGO

As the experience with sulfanilamide enlarges it becomes increasingly apparent that its usefulness covers a wide field. To the long list of diseases favorably affected by its administration has recently been added actinomycosis. Oliver Walker<sup>1</sup> of Liverpool reported a clinical cure of actinomycosis of the lower part of the abdomen in a man aged 23 in whom the disease developed after an operation for ruptured appendix. Compound solution of iodine and potassium iodide had been given for a brief period, without apparent benefit. Sulfanilamide was then employed in 15 gram (1 Gm) doses by mouth three times a day for five days, at the end of which time a definite diminution in the discharge was observed and a disappearance of the sulfur granules was noted. So striking was the improvement that after an interval of ten days sulfanilamide therapy was resumed in the same doses for five more days. When the patient was seen at the end of three months the abdominal wound was entirely healed and the general condition excellent.

The experience which we have to report has to do with an 11 year old white boy who was admitted to the children's surgical ward of the Cook County Hospital Oct 19, 1937. There was a tender inflammatory mass the size of an orange in the middle of the lower part of the abdomen between the umbilicus and the symphysis. The temperature was 101 F and the white blood cell count 14,100. The urine was normal. At first glance it seemed probable that the process was either an appendicular abscess or an infected cyst of the urachus. The swelling had been present for about one week, was associated with a loss of several pounds and had followed a rather prolonged period of difficulty in urination. There was nothing suggestive of an attack of appendicitis. Catheterization did not affect the size or shape of this swelling, although a cystogram seemed to indicate an extramural mass causing pressure on the dome of the bladder. Hot dressings were applied for several days, the skin became more reddened, fluctuation developed and the process pointed at the umbilicus, where spontaneous opening occurred October 29. Eleven days later an incision for better drainage was made over the center of the mass by Dr. Gatewood, and several ounces of thick pus was liberated. The wall was thick and the character of the discharge strongly suggested actinomycosis. After this suspicion had been confirmed by microscopic examination of the granules we were able to elicit from the patient the fact that during the summer months of 1937 he had been in the habit of plowing a good deal in the fields and would often chew bits of grass hay and straw.

All the well known methods of treating actinomycosis were immediately begun. Seven grams (0.45 Gm) of thymol and potassium iodide were given once each day. To the surface of the wound a 10 per cent solution of thymol in cottonseed oil was applied twice daily. Roentgen therapy was started November 19 and continued for four months, sixteen treatments being given at intervals of four to six days. The potassium iodide was gradually increased to 20 grains (1.3 Gm) three times a day. During this regimen he became progressively worse. His temperature ranged between 101 and 102 F, he rapidly lost weight and the process in the lower part of the abdomen became larger and extended toward the right where a new sinus opened just medial to the anterior superior spine. It seemed apparent that if the course of the disease did not change a fatal termination was almost certain. For this reason, purely on an empirical basis, the use of sulfanilamide was begun (Jan 18, 1938), 10 grains (0.65 Gm) being used by mouth three times a day, in addition to the other medication. Almost coincident with this change in therapy, in fact within a week's time, an improvement in the boy's condition was observed. The mass in the lower part of the abdomen gradually became smaller and softer, and the amount of discharge diminished. The patient's appetite returned, he began to pick up weight and his general appearance rapidly improved. By March 25, when he was discharged from the hospital (all medication except sulfanilamide having been stopped) he had gained 10 pounds (4.5 Kg), he was eating well, the mass in the lower part of the abdomen was becoming steadily smaller, and little drainage was present.

The boy has returned frequently to the outpatient clinic for observation. By July 18 the wound at the midline had entirely healed, although a new sinus opening of two weeks' duration in the left lower quadrant was discharging a small amount of pus. August 29 this opening also had closed and on October 1 all wounds were entirely healed. He had gained over 20 pounds (9 Kg) and was eating normally and going to school. When last seen, Nov 16, 1938 and shown at a clinic for alumni of the Cook County Hospital, the boy proudly stated that he weighed over 100 pounds (45 Kg). He was certainly the picture of robust health and showed no ill effects from the continuous taking of sulfanilamide for about ten months.

The evidence in this case leads us to believe that the agent responsible for the improvement and apparent clinical cure of the actinomycosis was the sulfanilamide, because the favorable change in the course of the disease was coincident with its use.

## INEFFECTIVENESS OF SULFANILAMIDE IN RABIES FROM VACCINATED DOGS

BENJAMIN F. HART, M.D. AND ELWIN EVANS, M.D.  
WINTER PARK, FLA.

A white man aged 41, seen because of a mild digestive upset with vomiting and a generalized headache of twenty-four hours duration, strangled when he attempted to drink cold water. He stated that he had been bitten on the upper lip twenty-two days before the onset of symptoms by a neighbor's dog while attempting to retrieve his own dog during a fight in which his dog also was bitten. Since both dogs had been vaccinated against rabies six months previously by the single injection method, he did not consult a physician. The neighbor's dog was reported to have been restless for several days. It was confined but escaped and was struck by an automobile. It died, supposedly from injuries two days after biting the patient. The patient's dog became ill two weeks after the fight and died three days later. Neither dog's head was submitted to the state laboratory for examination for rabies.

The patient had a temperature of 101 F and hyperactive reflexes. He was talkative and apprehensive. Although he could swallow warm water without difficulty, cold water caused spasm of the throat muscles. When he was offered a glass of cold water he reached for it but suddenly exclaimed "I can't do it" and buried his face in a pillow. No abnormality of the throat was found. A smear of material from the throat was negative. The urine showed a trace of albumin and a heavy sediment of amorphous urates but was otherwise normal. The red cell count was 4,700,000 and the white cell count 9,300. The Schilling differential count showed a shift to the left in spite

<sup>1</sup> Walker, Oliver. Sulfanilamide in the Treatment of Actinomycosis. *Lancet* 1: 1219 (Mar. 8) 1938.

of the mild leukocytosis, as evidenced by from 8 to 10 stab cells per hundred leukocytes

After removal to a hospital, the patient became more nervous and could not swallow even saliva, which drooled from his mouth in quantities sufficient to wet his pillow and keep an attendant busy wiping his face. Nervous excitability increased rapidly. Sedatives were given in increasing amounts, in spite of which he did not sleep or rest and it became necessary to shackle him in bed. In twenty-four hours he received a total of 12 grains (0.8 Gm) of pentobarbital sodium rectally, 10 grains (0.6 Gm) of soluble phenobarbital intramuscularly, 60 grains (4 Gm) of chloral hydrate rectally, 1 grain (0.06 Gm) of morphine intramuscularly and 2,000 cc of 5 per cent dextrose in saline solution subcutaneously.

Since there is no known specific drug for clinically developed rabies, sulfanilamide (neoprontosil) was tried. He was given 20 grains (1.3 Gm) intramuscularly every two hours for three doses and then every four hours until a total of 140 grains (9 Gm) had been administered. His temperature continued to rise steadily for sixteen hours, reaching 105 F rectally. He then passed into the paralytic stage, the temperature dropped to 100.4 F rectally and he died six and one half hours later.

CONCLUSIONS

- 1 The single inoculation method of rabies vaccination is unreliable and should not be depended on.
  - 2 Sulfanilamide (neoprontosil) does not seem to alter the progress of the disease in any way.
- 226 East Park Avenue

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT:  
THE COUNCIL WISHES TO EXPRESS ITS APPRECIATION FOR THE VALUE OF ASSISTANCE RENDERED IN THE PREPARATION OF THIS REPORT BY DRs C. C. BUNCH, GEORGE M. COATES, LEF. W. DEAN, EDMUND P. FOWLER, AUSTIN A. HAYDEN, ISAAC H. JONES, DOUGLAS MACFARLAN, HORACE NEWHART, BURT R. SHURLY AND WILLIAM P. WHEAT.

HOWARD A. CARTER, Secretary

MINIMUM REQUIREMENTS FOR  
ACCEPTABLE AUDIOMETERS<sup>1</sup>

- 1 Audiometers shall produce vibrations at frequencies within hearing range (approximately 128 to at least 8,192 cycles per second).
  - (a) They shall be equipped for testing both air and bone conduction.
- 2 Frequencies. (a) Fixed or continuous frequencies from 128 to 8,192 cycles per second. If discrete frequency steps are provided, the tones shall be 128, 256, 512, 1,024, 2,048, 4,096, 8,192 cycles per second. Numerical annotations to be used to designate pitch.
  - (b) The frequency of any test tone shall remain within  $\pm 5$  per cent of the designated value under the manufacturer's specified or indicated operating conditions. Dials shall be marked so that frequencies may be identified readily.
- 3 Attenuation. Audiometers shall be calibrated in decibels, with 5 decibels per step or less. In no case should more than 5 decibel steps integral be used. Tolerances limits to be within  $\pm 1\frac{1}{2}$  decibels per 5 decibel steps and  $\pm 5$  decibels cumulative at any portion of the intensity range calibrated in a room free from extraneous noises. Dials shall be easily read. The term "percentage hearing" shall not be used on dial or charts. Hearing losses shall be reported in decibels loss.
- 4 Range of intensity (air conduction only). The intensity range of the test tones above the normal threshold shall be at least that as follows:

Test Tone Cycles/Sec	Intensity Range Decibels
128	60
256	80
512	85
1,024	90
2,048	90
4,096	90
8,192	90

<sup>1</sup> A clinical audiometer is an instrument for measuring the acuity and range of hearing.

5 Wave form. The purity of tone in the air conduction receiver shall be such that the harmonics at any particular frequency shall be at a level not less than 25 decibels as measured on the closed coupler artificial ear of from 4 to 5 cubic cm in volume, except for discrete frequency of 128, the harmonics shall be at a level not less than 20 decibels.

6 Extraneous noises

- (a) The level above threshold of the sound (for normal hearing people) caused by line noises (hum and commutator ripple) and all other instrument noises shall be at least 60 decibels below the level of the test tone for frequencies of 1,024 cycles per second and higher frequencies, and at least 40 decibels below the level of the test tone for frequencies below 1,024 per second.
- (b) A bone conduction receiver shall be so constructed that it does not produce sound in the air to such an extent that the sound reaching the tympanum through the auditory meatus could influence the validity of the bone conduction measurement. When the bone conduction receiver is placed in approximately the same position as is used in testing bone conduction but is held just off the head instead of in contact, the level of the sound reaching the tympanum shall be at all frequencies at least 5 decibels below the level which the receiver generates by bone conduction when in contact with the head, as judged by a normal ear.

7 Power supply. Either alternating or direct current or battery.

8 Ruggedness of construction. Audiometers shall stand reasonable usage. Employment of readily obtainable and replaceable parts is required.

9 Uniformity in calibration. Audiometers shall be calibrated thus: Intensity in decibels and frequency in number of vibrations per second.

10 Air conduction receiver calibration

NOTE.—While the responsibility for meeting the following requirements is primarily that of the manufacturer, it is recognized that the apparatus necessary for calibration is of somewhat elaborate and special character and it is expected that there will be available central testing agencies acceptable to the Council on Physical Therapy to undertake the calibration of audiometers for those manufacturers who are not in a position directly to equip themselves.

The following method shall be employed for the calibration of audiometer receivers:

- (a) Suitable receivers having permanent characteristics shall be used to determine the threshold of hearing of a large group of normal hearing people in a room free from extraneous noise. The electrical input required to elicit average normal threshold will then be known.
- (b) The calibration of the receiver shall then be transferred to a suitable artificial ear.
- (c) Receivers, having permanent characteristics, may be submitted by audiometer manufacturers for calibration by comparison with the primary standards on the artificial ear.

11 Audiogram or auditory chart. An audiogram blank shall use the same base line for bone conduction results as for air conduction results. The chart shall be as simple as possible. The coordinates of the chart shall be some appropriate number of decibels and octaves or fractions of an octave. In order that the chart may present a suitable visual impression there shall be a ratio of 1 to 2 between the dimension of a 10 decibel step and that of an octave step.

12 Definition of threshold of hearing. The American Tentative Standard Acoustical Terminology defines the normal threshold of audibility as the modal value of the thresholds of audibility of a large number of normal ears of persons in the age group from 18 to 30 years. For purposes of recording, the threshold of audibility at any frequency is the audiometer setting corresponding to the lowest intensity at which the person being tested indicates that he hears the tone more than half of the number of times that it is presented to him.

13 Marketing and advertising. Rules of the Council on Physical Therapy shall be adhered to by manufacturers of acceptable audiometers.

## Council on Pharmacy and Chemistry

### NEW AND NONOFFICIAL REMEDIES

THE COUNCIL PUBLISHED A STATUS REPORT ON SULFANILAMIDE (THE JOURNAL MAY 29 1937 PAGE 1888) THE DRUG WAS LATER ACCEPTED AND A STATEMENT OF ACTIONS AND USES AND OF DOSAGE APPEARED IN THE JOURNAL JULY 11 1937 PAGE 358 A REVISED STATEMENT WAS PUBLISHED OCT 30 1937 PAGE 1454 THE ENORMOUS AMOUNT OF WORK WHICH HAS BEEN DONE WITH THE USE OF THIS PRODUCT WARRANTS A SECOND REVISION OF THE ARTICLE THE COUNCIL AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE AND NOTED INCLUSION IN NEW AND NONOFFICIAL REMEDIES IN 1939 IN PREPARING THIS STATEMENT THE COUNCIL HAD THE COLLABORATION OF DR JOHN S LOCKWOOD DR PERRIN LONG DR W W PALMER AND HIS ASSOCIATES AS WELL AS THE AID OF THE REFEREE AND OTHER MEMBERS OF THE COUNCIL AND THEIR CONSULTANTS  
PAUL NICHOLAS LEECH Secretary

**SULFANILAMIDE** (See New and Nonofficial Remedies, 1938, p 450)

**Actions and Uses**—Originally it was reported that sulfanilamide acts against Lancefield's group A strains of hemolytic streptococcus by virtue of an apparently specific effect on these organisms. More recent clinical evidence suggests that the action of this chemical may affect other organisms, especially certain gram-negative cocci. The evidence suggests that its action may be antibacterial. Experimental evidence indicates that at least one action of sulfanilamide (and possibly the only one of importance) is to render serum, spinal fluid, urine and other tissue fluids unfavorable as mediums for supporting the active multiplication of susceptible bacteria. In consequence, tissue invasion by these organisms may be prevented, production of toxic substances reduced, and the antibacterial mechanisms of the host are permitted to complete the recovery from infection.

Sulfanilamide has been used primarily in infections due to beta-hemolytic streptococci, especially in the treatment of puerperal fever, erysipelas, hemolytic streptococcus septicemia, streptococcal sore throat, surgical infections with hemolytic streptococcus, and in the prevention or treatment of complications of these diseases—notably streptococcal meningitis, peritonitis and suppurative arthritis. Present studies indicate that this drug is useful in the treatment of gonococcal infections. In some cases the results have been most striking while in others the drug has not proved especially efficacious. In this connection it is well to note that the reactions following the administration of the drug are at least occasionally of a serious nature (see below). It has also been used in the treatment of gonorrheal vulvovaginitis in young girls, but recovery from the condition has not always been permanent with this agent. The literature also indicated usefulness in meningococcal infections and possibly gas bacillus infections. It must be remembered however that, because of the extensive application of this relatively new therapeutic agent, its use in these conditions requires caution and careful observation. This is especially true in view of the reactions which are discussed in the following paragraph. The evidence is incomplete at the present time for further consideration of the possible usefulness of this drug in infections by *Bacterium coli*, *Bacterium typhosum* and paratyphosum A and B. Several clinical reports have been published which suggest that *Brucella* infections and trachoma may respond to sulfanilamide therapy but it is not known whether all varieties of these diseases are susceptible. Certain infections of the urinary tract, notably those due to *B. coli*, have responded satisfactorily to sulfanilamide therapy, perhaps because of the high concentration of the drug in the urine. There is some indication that it is useful in pneumonia due to type III pneumococci.

**Toxicity**—No patient should be treated with sulfanilamide unless arrangements are made for daily attention by a physician. This is because of the possibility of serious toxic effects, which, while not frequent are somewhat unpredictable in their occurrence and presumably have as their basis a peculiar idiosyncrasy. Many patients receiving sulfanilamide will show some degree of development of a slate gray type of cyanosis first apparent in the lips and nail beds but later suffusing the entire body. The exact nature of this cyanosis is unknown but it is not in the opinion of most observers, a serious complication and its development in a patient with a serious infection is not an imperative indication for cessation of therapy. The dangerous complications of sulfanilamide therapy are hemolytic anemia, jaundice and agranulocytosis, and sometimes these reactions occur after relatively low dosage. Frequent estimation of the red and white blood cells and hemoglobin is essential for safe use of the drug because if these complications are recognized early the use of transfusions and stopping the drug will usually result in prompt improvement. The drug produces fever with or without cutaneous rashes in certain individuals but such a drug fever usually does not develop until after several days of therapy. It has been

claimed that sulfanilamide induces acidosis and because of this the simultaneous use of sodium bicarbonate has been recommended. Magnesium sulfate should be avoided in patients receiving sulfanilamide because the development of sulfhemoglobinemia, as contrasted to the usual type of cyanosis, has been related by some observers to concurrent magnesium sulfate therapy. It should not be prescribed concurrently with other drugs without full knowledge of possible ill effects such as are encountered, for example, with magnesium sulfate.

**Dosage**—The dose of sulfanilamide in adults in cases of serious infection is about 1 Gm (15 grains) every four hours for forty-eight hours and then from 0.4 Gm (7½ grains) to 0.66 Gm (10 grains) every four hours thereafter. It is usually advisable to continue therapy for a few days after clinical recovery in order to avoid relapse (and in a case of gonorrhea for a minimum of two weeks). Infants will tolerate from one third to one half the adult dose and children from one half to three fourths of the adult dose. Patients who cannot take the drug by mouth may be given subcutaneous injections of a 0.8 per cent solution of sulfanilamide made by adding 8 Gm of pure sulfanilamide crystals to a liter of warm physiologic solution of sodium chloride or 1 per cent sodium chloride solution or, better still, ½ molar sodium lactate solution. The same total dosage may be employed for parenteral as for oral administration, but the injections should be given at six to eight hour intervals. In less serious infections, where no threat to life exists, a lower dosage of from 3 to 4 Gm daily (in adults) is to be recommended, without the larger initial dosage.

## Council on Foods

### ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED

FRANKLIN C BIGG Secretary

### CEROPHYL

**Manufacturer**—Cerophyl Laboratories (Division of American Dairies, Inc.), Kansas City, Mo

**Description**—Dried, powdered mixture of young leaves of wheat, oats and barley, selected and blended to maintain the minimum vitamin potency declared on the package label.

**Manufacture**—The cereals are grown on soil fertilized to produce plants of high mineral and vitamin content. The young rapidly growing leaves are harvested just before they joint by machinery especially designed to prevent the leaves coming in contact with the ground after cutting. No toxic spray materials are used. The method of cultivation precludes contamination with weeds. The freshly harvested leaves are immediately cut into short lengths and dehydrated. Hot flue gas of minimum oxygen content is drawn from a gas furnace through the drying chamber at an initial temperature of between approximately 800 and 900 C. The high initial temperature, which is quickly reduced by the evaporation of moisture from the grass, serves as a flash pasteurization of the surface of the leaves. The entire process of drying requires approximately sixty seconds. The dried material leaves the drier at a temperature of approximately 120 C. The dehydrated leaves are mechanically cleaned, pulverized, stored at -18 C, and packed in hermetically sealed cans under nitrogen.

**Analysis** (submitted by manufacturer)—Moisture 8%, total solids 92%, ash 12%, fat (ether extract) 5%, protein (N × 6.25) 25%, reducing sugars (before hydrolysis) 1.6%, reducing sugars (after hydrolysis) 11.3%, carbohydrate other than crude fiber (by difference) 35%, oxalic acid 0.06%, calcium (Ca) 0.5%, phosphorus (P) 0.5%, magnesium (Mg) 0.2%, potassium (K) 0.5%, sodium (Na) 0.2%, iron (Fe) 0.06%, manganese (Mn) 0.005%, copper (Cu) 0.001%, cobalt (Co) 0.0001%.

**Calories**—2.85 per gram

**Vitamins**—Carotene (provitamin A) (chemical analysis, Peterson modification of the Hart and Gilbert method) 0.5 mg per gram, vitamin B<sub>1</sub> (biologic assay) 3 international units per gram, vitamin G (riboflavin) (biologic and chemical assay) 30 micrograms per gram, vitamin C (chemical titration) 4 mg equivalent to 80 international units per gram. Biologic assay also shows the product to be a rich source of vitamin K and of the grass juice factor.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, FEBRUARY 25, 1939

## THE ADVISORY COUNCIL ON MEDICAL EDUCATION, LICENSURE AND HOSPITALS

At the Annual Congress on Medical Education and Licensure held in Chicago in 1938, a proposal was made by Willard C. Rappleye, chairman of the Advisory Board for Medical Specialties, for the development of a "national council on medical education, licensure and hospitals" made up of representatives of the universities, medical schools, hospitals, practicing profession, specialty boards, state licensing bodies and public health agencies. In connection with this proposal, Dr. Rappleye said, "There are indications that the government may be urged or expected in one form or another to increase more than at present its financial support of medical care, teaching and research. It is important that the profession create in advance an agency for assisting in such a possibility and for making constructive suggestions as to how such activities can best be developed." During the ensuing period Dr. Rappleye has appeared before various organizations of specialists in the field of medicine and has had endorsement in principle at least of this project from some of these organizations. In discussions of this proposal it was suggested that such a movement might divorce from the medical profession its right to determine for itself its relationship to governmental activity in medical practice, delegating that function rather to this super council.

At this year's Annual Congress on Medical Education and Licensure, held in Chicago February 13 and 14 under the auspices of the Council on Medical Education and Hospitals of the American Medical Association, this proposal was advanced in a new form, now being named the Advisory Council on Medical Education, Licensure and Hospitals. Dr. Rappleye is reported to have stated that it is not now anticipated that there will be any governmental association with or support of this project. It is also stated that this council is to function purely as an advisory body for the hearing of

various problems of mutual concern to those represented in the council. It is proposed that this council shall be created with the following representation:

Association of American Medical Colleges	3
American Medical Association	3
American Hospital Association	3
Federation of State Medical Boards of the U S A	3
Advisory Board for Medical Specialties	1
National Board of Medical Examiners	2
American College of Surgeons	2
American College of Physicians	1
American Public Health Association	1
The Catholic Hospital Association	1
American Association for the Advancement of Science	1
Section A	2
Association of American Universities	2
	25

At a meeting of the Council on Medical Education and Hospitals held on February 11, that council decided to recommend to the House of Delegates that such participation be approved, leaving to the House of Delegates of the American Medical Association the decision as to whether or not the American Medical Association will participate through the Council. According to the By-Laws of the American Medical Association "no memorial, resolution, or opinion of any character whatever shall be issued in the name of the American Medical Association unless it has been approved by the House of Delegates." This by-law obviously would limit definitely any action which representatives of the Council on Medical Education and Hospitals could take as participants in the proposed Advisory Council.

On February 14 the Board of Trustees of the American Medical Association held a conference with the directors and the representatives of the American Hospital Association, the Catholic Hospital Association and the American Protestant Hospital Association looking toward mutual consideration of problems in the field of the hospital and of medical practice. In this conference the following resolution was prepared and adopted by the representatives of the Hospital Organizations:

1 The representatives of the American Hospital Association, the Catholic Hospital Association and the American Protestant Hospital Association here present desire to express to the Board of Trustees of the American Medical Association their confidence in the leadership of the medical profession in furthering the excellence of medical service and in aiding the solution of problems of the distribution and provision of medical care.

A second resolution was adopted by the joint meeting:

2 It is moved that the following be the sense of this meeting: This gathering of the Trustees of the American Medical Association and of representatives of the American Hospital Association, the Catholic Hospital Association and the American Protestant Hospital Association express their gratification on the unanimity of opinion developed concerning many phases of the health problems of the Nation achieved by mutual discussion. It is recommended to the American Medical Association, the American Hospital Association, the Catholic Hospital Association and the American Protestant Hospital Association that such joint meetings of their representatives be held for the consideration of problems of mutual concern.

It is proposed, further, that the Board of Trustees of the American Medical Association shall hold in the near future conferences with the authorized representatives

of other organizations in the medical field so as to bring about greater coordination between the activities of the American Medical Association, representing the entire medical profession of the United States, and the special organizations in the field of medical practice. No doubt by such mutual conferences the desired coordination among the practicing medical profession, including the medical specialties, and all the organizations auxiliary to medical practice may become effective.

### THE PROBLEM OF THE REFUGEE PHYSICIAN

In the Organization Section in this issue of *THE JOURNAL* appear statistics collected from various federal governmental agencies as to the number of physicians coming to the United States from foreign countries during the years since 1930. On September 17, 1938, *THE JOURNAL* called attention editorially to the fact that the scope of this problem is definitely limited by several factors: the quotas established by our laws regulating immigration, the total number of physicians likely to be eliminated from Germany and other central European countries, the ages of these physicians, and the opportunities available to them for securing a livelihood in the United States. Unfortunately there are publications, political groups and subsidized agencies in this country which are endeavoring to make prestige and favor for themselves by stirring the motives of selfishness, prejudice and hatred among American doctors. In *THE JOURNAL*, February 11, six distinguished leaders of American medicine urged the medical profession to cooperate with the special committees that have been set up in New York and Boston for helping in this situation. The committees specifically concerned with the problem of the refugee who is a physician are:

Emergency Committee in Aid of Displaced Foreign Physicians, 59 East Fifty-Seventh Street, New York, Dr. Emanuel Libman chairman, Dr. Laurence Farmer executive secretary. This nonsectarian committee deals with a select and small number of prominent scientists for whom positions are found in the field of medicine for research and study.

National Coordinating Committee for Aid to Refugees and Emigrants Coming from Germany, 165 West Forty-Sixth Street, New York, Joseph P. Chamberlain chairman, Miss Cecilia Razovsky executive director. This committee coordinates the activities of the major organizations working in this field.

Boston Committee on Medical Emigres, 114 Riverway, Boston, Dr. David L. Edsall chairman. (The Problem of the Refugee Physician, *THE JOURNAL*, February 11, p. 570).

Various suggestions have come to the American Medical Association urging the establishment of a special committee to handle this problem. Thus far the only action taken by the House of Delegates has been a recommendation to the state boards of medical registration that in the case of foreigners graduates of foreign institutions citizenship be required for license to practice. Every physician knows the right to regu-

late the practice of medicine rests with the individual states. As the letter recently published points out, "in the field of general practice and in the specialties also numerous openings exist for which it is difficult to find qualified American physicians, for example, poorly paid full-time positions and practices in rural communities." If any of the committees can undertake to make a survey to locate such openings, a certain number of the refugees can be absorbed with a minimum amount of disturbance of the rights of American physicians.

The chief difficulties that have arisen in this situation result from the fact that some of the refugees are poorly trained or of low ethical standing, that some find it difficult to adapt themselves to American ways in the practice of medicine, and that many tend to settle in large cities already overcrowded with physicians. Certainly a physician who is poorly trained or of low ethical standing should not be permitted to practice anywhere. Perhaps the difficulties of adaptation can be overcome by well planned instruction. Only the coordinating committees already mentioned, or groups of a similar character, can aid in solving properly the problem of suitable distribution of the refugees to places where they may be useful rather than a foreign body setting up irritation and forcing extrusion.

### RECENT INVESTIGATIONS ON ANTIBODIES

The nature and formation of antibodies constitute a fundamental aspect of immunology. Under the leadership of Belak of Budapest, numerous studies of the relationship of neurologic integration to antibody production have been carried on at the Institute for General Pathology.<sup>1</sup> There it has been shown that stimulation of the parasympathetic by therapeutic doses of pilocarpine increased the titer of specific agglutinins in vaccine therapy. Therapeutic doses of thyroxine or epinephrine, on the other hand, reduced such specific agglutinins.

Illenzy and Borsak<sup>2</sup> of Budapest have recently suggested the plausible hypothesis that the antibody titer is a function of the vegetative nervous system. This hypothesis is an outgrowth of the attack on the theory of preformed antibodies and the championing of the belief that antibodies are new chemical products synthesized by the combined action of reticulo-endothelial cells and other tissues of internal secretion. Under the latter theory widely separated immunogenic functions could become integrated through the nervous system. These investigators tested the effects of therapeutic stimulation and depression of both the sympathetic and the parasympathetic system. Pilocarpine was selected as the parasympathetic stimulant, with atropine as the depres-

<sup>1</sup> Belak S, Saghy J and Cseresznyes L. *Ztschr f d ge exper Med* 52: 559 1926. Belak S and Cseresznyes L. *ibid* pp 567-572. Belak S and von Steigler J. *ibid* 75: 443 1931. Belak S and Szabo, D. *ibid* p 449.

<sup>2</sup> Illenzy, Andras and Jorak Ladislaus. *Zt chr f Immunitat* for ch 19: 79 (Oct) 1938.



sant Ephedrine was used as the sympathetic stimulant. They injected rabbits intravenously with heterologous erythrocytes and obtained an average antiserum yield in hemolytic titer of about 14,000. Rabbits given a subcutaneous injection of 1 mg of pilocarpine hydrochloride from five to ten minutes before immunization yielded an average hemolytic titer of approximately 30,000. A 100 per cent increase in the yield of specific hemolysins, therefore, was attributed to therapeutic stimulation of the parasympathetic. In a second series of tests the average control yield of hemolysins (20,000) was reduced 20 per cent by a previous subcutaneous injection with 0.375 mg of atropine sulfate and reduced at least 70 per cent by previous subcutaneous injection with 1 cc of 1 per cent solution of ephedrine sulfate. Parasympathetic paralysis and sympathetic stimulation, therefore, both reduce the specific antibody yield.

These observations led the Hungarian investigators to assume that the antibody titer is a function of the vegetative tonus at the time of immunization. It has not yet been determined whether there are qualitative as well as quantitative changes in specific antibody yield as determined by initial vegetative tonus. Nevertheless a reasonable explanation of these observations would be that vegetative tonus at the time of intravenous injection of formed antigens determines localized distribution to antibody-forming tissues.

The recent demonstration by Goreczky and Ludany,<sup>3</sup> also of Budapest, that blood drawn from the splenic sinuses is richer in protective antibodies than the systemic blood is additionally suggestive of the mechanism of local tissue immunity. Biochemists have long recognized that the relatively stagnant blood of the spleen is richer in potassium, phosphorus, cholesterol, albumin, euglobulin and noncoagulable nitrogen than carotid blood but poorer in pseudoglobulin. These differences nevertheless have been generally supposed to be due to the local destruction of erythrocytes. The investigators, however, have for the first time applied quantitative immunochemical techniques to the problem of splenic immunity. They found, for example, that in dogs opsonins are from two to ten times higher in titer in splenic sinus blood than in the general circulation and that bacteriolysins are at least 30 per cent greater in amount. (For these titrations B typhi, B anthracis and staphylococcus were used.) Possibly these investigations will lead to a recrudescence of interest in the supposedly obsolete hypothesis which pictured the spleen as the sole source of specific antibodies. While it is doubtful that this theory can be renewed in its entirety, the local splenic synthesis of antibodies would account for the rarity of infectious metastases in this organ and for reduced bacterial resistance following splenectomy. Further studies along these lines will doubtless be productive of much information which may prove ultimately of great practical value.

## Current Comment

### NO CONGRESSIONAL DEFINITION OF NATUROPATHY

In 1933, naturopaths in Iowa sought special privileges from the legislature in the form of a law to enable them to ply their trade without possessing qualifications adequate to protect the public health. Their bill, which failed of enactment, proposed to define naturopathy "according to the definition of naturopathy, enacted by the Congress of the United States of America and the District of Columbia." In the same year, and no doubt in other years, a self-styled "Examining Board of Naturopathic Physicians, Arizona District," incorporated under the laws of Arizona, issued so-called "certificates" to naturopaths, purporting to authorize certificants to "pursue the practice of naturopathy within the corporate powers of this association." It claimed to be acting "under the authority of the American Naturopathic Association" and "by virtue of the definition of naturopathy as set forth in and by an Act of Congress approved February 27, 1929, and verified in and by an Act of Congress approved February 7th, 1931, which Act defines naturopathy." In 1938 a petition, which the court denied, was filed in the circuit court of Jackson County, Mo., to form a corporation with various and sundry powers, including the authority to establish naturopathic schools for the training of students in naturopathy "as defined by Congress under the provisions of House Bill No. 12169 passed and approved by the Seventy-First Congress of the United States in the year 1930." Feb. 8, 1939, a bill was introduced in the legislature of North Dakota proposing to define naturopathy "as provided by an Act of Congress of 1929." There seems little reason for doubt that similar statements have been made by naturopaths at other times in other places. The fact is, the statements of naturopaths to the contrary notwithstanding, the Congress of the United States has never defined naturopathy. A Healing Arts Practice Act for the District of Columbia was approved Feb. 27, 1929, which did provide for a board of naturopathic examiners, it did not define naturopathy but authorized the Commission on Licensure to Practice the Healing Arts to do so. The definition formulated by the commission was unsatisfactory to the naturopaths and May 5, 1930, they caused to be introduced in the House of Representatives of the Seventy-First Congress a bill, H. R. 12169, to define naturopathy more broadly than it had been defined by the commission. This bill passed the House of Representatives Feb. 7, 1931. In the Senate it was referred to the Committee on the District of Columbia, where it died with the adjournment of the Seventy-First Congress. No other bill has since been considered by the Congress proposing to define naturopathy. The fact that naturopaths have apparently considered it necessary to resort to trickery to gain their objectives indicates their disbelief in the inherent merit of their cause. It should be an added reason, in any event, why their appeals should receive scant consideration.

<sup>3</sup> Goreczky, L. and von Ludany, J. *Biochem. Ztschr.* **294**: 104 (1937). *Ztschr. f. Immunitätsforsch.* **94**: 45 (Oct.) 1938.



# ORGANIZATION SECTION

## IMMIGRATION OF ALIEN IMMIGRANT PHYSICIANS

According to material obtained through government agencies, alien immigrants describing themselves as physicians have entered the United States during each fiscal year since June 30, 1930, as shown in table 1

Neither the foregoing figures nor those that follow include alien physicians who entered the United States as tourists and whose stay is accordingly limited. No

TABLE 1—Annual Immigration of Alien Physicians

Fiscal Year Ended June 30	From All Countries	From Germany, Austria	Physicians Listed as Jewish
1931	329	16	38
1932	259	23	34
1933	147	8	41
1934	373	166	163
1935	304	104	137
1936	462	253	273
1937	533	286	319
1938	738	365	475

During the four months July, August, September and October 1938, 482 alien immigrants who described themselves as physicians entered the United States. Of these 390 were Jewish physicians.

evidence has been found to show that any order has been issued undertaking to extend the time during which such alien tourist physicians may remain in this country. No evidence has been found to show that alien physicians find their way into the United States for permanent residence by entering through countries other than those in which they respectively are nationals, as, for instance, German physicians entering the United States by way of some country in South America.

As between the fiscal year ended June 30, 1937, and the fiscal year ended June 30, 1938, the outstanding changes in the numbers of immigrant physicians entering the United States are shown in table 2.

TABLE 2—Increase in Immigration Within Two Years

From	Fiscal Year Ended June 30 1937	Fiscal Year Ended June 30 1938
Germany, Austria	286	365
Italy	14	26
Switzerland	11	25
Canada	79	107

Immigrant physicians from Asia increased from thirteen in 1937 to thirty-three in 1938, the number arriving in the latter year coming from China, ten, India, one, Palestine, twenty and Syria, two. It does

TABLE 3—Racial Stocks Represented

	Fiscal Year Ended June 30 1937	Fiscal Year Ended June 30 1938	Four Months July, October 1938
English	31	36	11
German	98	86	43
Jewish	310	475	390
Irish	11	18	1
Hungarian	7	12	6
Scotch	10	26	10

not necessarily follow, however, that physicians arriving from those countries were not Caucasians.

In racial stocks the numbers entering were as given in table 3.

## SIGNS OF THE TIMES IN PUBLIC HEALTH

HAVEN EMERSON, M.D.  
NEW YORK

Four national professional bodies have within the past few weeks expressed opinions on the proposals of the so called National Health Conference. These four associations, of physicians, hospital administrators, health officers and dentists, independently and by the long established methods of representative and free discussion have arrived at surprisingly uniform points of view on the five proposals of the officials of the federal government which we are told will be the objective of enabling, enforcing and appropriating legislation at the next session of Congress.

We may ignore the errors of fact of social theory and of methods employed by the present federal administration to promote acceptance of its proposals. However it is obvious that the evidence on which the extravagantly phrased descriptions of the existing state of health and medical services in the United States appear to have been based are inadequate to answer the questions at issue or to carry conviction to any but a credulous lay public.

What has been published as a National Health Survey was nothing of the kind, and what was publicized as a National Health Conference was not a conference at all but a sounding board before which a hand-picked and in the main a pre-convinced group of invited guests listened to the report of a technical committee with the doubtful privilege of extemporaneous comments but no opportunity for collective consideration or adop-

tion of the slightest change in the ready-made proposals which they were assembled to endorse.

What we have before us is not a National Health Program in any rational sense of the word in that it has not been conceived on the basis of the respective needs of all parts of the nation nor has it been in any true sense nationally accepted. The five proposals do not constitute a program but proposals for expenditures to supplement and make more effective those functions long recognized and generally carried on with a large measure of success by local and state governments. And under the popular slogan of health are included features of public service which deal exclusively and properly with the sick. Public health practice is a professional specialty as rigorous in its educational disciplines and as distinct in the skills involved as are the chemical specialties in the private practice of curative medicine.

That further extensive gains in the quality and average duration of human life can be attained by the more consistent and adequate employment by civil government of the resources of sanitation and preventive medicine there can be no doubt. To describe the present state of the public health services of our country as grossly inadequate is a mischievous untruth and expresses an emotional unbalance in the thoughts and experience of the technical committee members unworthy of persons trusted with national statesmanship.

We are now in fact the possessors of better general health, are less afflicted with preventable disease, are more secure in the survival of our offspring, to maturity and have an average

expectancy of life greater than that of any population group in the history of man, comparable in size, variety of races and distribution in age, occupation and economic and climatic conditions. We are today at the very zenith of a march of progress toward national health. Never before in this or any other continent have any 130,000,000 people recorded such low death rates as will be reported in the United States for the year 1938 for all causes, for tuberculosis, typhoid, diphtheria and infant mortality. Not in our time has maternal mortality been so low, or the death rate from pneumonia.

And yet the armchair pundits in Washington tell the people of the United States that our public health services are grossly inadequate. Of course this language is used to develop dissatisfaction with the present so that people will tolerate taxation for the future.

We have not in the past awaited the sign of ready money from Washington to expand our public health services for the protection of motherhood, the infant and for childhood, but we have found always that true progress in these aspects of the application of protective medicine to women and children has been no more rapid than the spread of a convinced lay opinion of their necessity. Mere spending of money by federal grants will not bring lower sickness and death rates until the community of city, village, county or state understands and participates through its own officers and professions in the use of the knowledge of preventive medicine.

What do the four professional groups say to the proposal that public health services be expanded? They agree as to the necessity of more and better application of the science of preventive medicine for social ends through government. But they stipulate that the federal government put its own house in order and show in earnest of its good intent by following the example of Canada and England and a score of other nations in consolidating all their health services under one department, with a Secretary for Health in the national cabinet. States and local health departments are weary and bewildered by the duplicating and often conflicting proposals of unrelated bureaus and boards of federal government each with ideas, standards and money grants with strings attached for health improvement.

It takes longer than one four year presidential term, or even two, for federal agents to learn as much about the peculiarities of needs and variety of factors affecting health in the forty-eight several states as the competent officers of local government have long known. Nothing new has been proposed, only a larger grant of money aid to the states from which the money was originally taken to the detriment of their own local programs.

In the spirit of thrifty taxpayers, and with the wisdom of long experience in personal medical relationships, the professional associations warn against any such public expenditures for treatment of diseases of women and children as can best be carried on by the private relationship between doctor and patient.

The professional bodies, particularly the American Public Health Association, previously declared, and continue to hold to their belief, that the indispensable factor in any national health program is the organization of permanent full time health service under nonpolitical qualified professional direction in each unit of local government of sufficient size to support the necessary personnel.

In brief then, sound professional opinion is favorable to the granting of further federal financial aid to states for the promotion of their programs of public health through the expansion of local health organization, the federal interest and promotion to be through a single department, and services to mothers and their children to be so far as possible by the private practitioner of medicine.

Concerning the second proposal of the federal government, dealing with increase of general hospital facilities, we can with advantage note the guarded approval of those who carry the administrative and professional burdens of institutions for the care of the sick.

When and where need exists then and there additional hospitals should be built, if necessary with state and federal aid, but with this important proviso, that careful and detailed first-hand studies of each community concerned be made which

reveal that such need exists and that the hospital when built can be properly administered and maintained.

Furthermore, the American Hospital Association calls the attention of the federal government to the economy of using existing voluntary hospitals, where these are well administered and of good medical standards, instead of building new hospitals out of tax moneys to compete with those supported by voluntary contributions and earnings.

It is a matter of the greatest encouragement to find so clearly expressed the opinion of the federal officials to the effect that, in developing more adequate quantity, quality and financial support for the complete medical care of those found to be unable to meet the cost of this from their own resources, "the role of the federal government should be principally that of giving financial and technical aid to the states in their development of sound programs through procedures largely of their own choice."

This is the only sound way of using the resources of local and state social and governmental ideas and equipment to meet equally varied needs of different communities. Several patterns have already been used in some states and counties, the state and county medical societies taking leadership in protecting the public against commercial medical exploitation and offering such guaranty of quantity and quality of care to the sick poor as the physicians and officers of local government agree on as necessary and reasonable in cost. It may be remarked in passing that no system of payment for medical care of the indigent sick so far proposed or put into effect will equal in its cost to the taxpayers what the physicians in practically every county of the United States have been giving at the most modest schedule of charges, freely year in and year out, at their offices, and in the wards and outpatient services of hospitals and similar institutions. What the medical profession is primarily concerned with is that the community accept the burden of cost which their own wealthy patients and private philanthropy can no longer carry.

That a high quality of care has been given to the sick poor in the past is generally admitted and is attested by adequate statistical proof of the reduction in morbidity and mortality to their present low levels among such persons.

Some people will always need medical attention, but the reasons for this are not largely, if at all, the inability of these sick to pay for the cost of necessary treatment but chiefly result from ignorance, superstition and misinformation growing out of religious beliefs and faith in the promotion of advertised medicaments. That anything like one third of the sick now lack medical care or that an even larger proportion of the population are hindered from gainful employment by preventable and remediable but uncared for disease, as the peroration of the technical committee would try to persuade us with statistics and emotional publicity, is just so far from the truth that it will be forgotten by the public and by the physicians of this country who know it is not so.

It would be nearer the truth to say that catastrophic economic disorder and resultant disadvantages to the wage earner are the causes of some illness than that neglected sickness is the main factor in any substantial amount of unemployment. Probably one of the largest factors other than the worldwide breakdown of international commerce and the discrepancy between technologic increase in the capacity of industry to produce and the purchasing ability of the consumer is that sanitation and public health have saved lives and prolonged them beyond the years of optimum employment faster than industry has been able to expand its payroll. I am inclined to believe that a fair estimate of the lives saved by preventive, personal and public health services in the past thirty years in the United States would closely correspond with the number of persons now unemployed.

Three of the four professional bodies expressed frank opposition to compulsory insurance to meet the cost of medical care of sickness, what is generally and always erroneously called health insurance. The fourth, the American Public Health Association, did not endorse this and by ignoring it presumably expressed its disapproval.

It is obvious that all the most responsible professional opinion representative of the medical sciences and administrations is to the effect that, for most if not all fractions of our population

now, compulsion to participate in a federal or state scheme of insurance for personal care in sickness is undesirable.

Coupled with this is evidence of confidence in the already proved value of the many applications of organized thrift to prepay for the cost of hospital care, i. e. hospital service insurance.

Approval is expressed also for cash indemnity insurance plans intended to cover the costs of emergency or prolonged illness, and expansion of workmen's compensation to cover the cost to the individual of industrial illness. Indemnity insurance to assist persons at various income levels to meet the cost of their sickness out of their own resources is also approved in principle on a voluntary basis.

The fifth item of the federal proposals, insurance against loss of wages during sickness, has met no opposition and is endorsed by the American Medical Association with the reservation that the attending physician should not be held responsible for certification of the degree or duration of disability from illness.

It remains now for each local and state health administration to determine its own line of development in respect to those objects for which substantial grants will doubtless be provided by the traditional munificence of the taxing powers of the Congress, to be distributed to the states on certain formulas of population, wealth, sanitary need and special health hazards.

On what basis is the best application of preventive medicine to be built? Certainly on the four elements, the practicing physician, the local health departments, visiting or public health nursing, and an educated public.

The state and county medical societies and the corresponding state and local health officers agree on objectives and methods of cooperative work of a preventive nature. There are, however, two matters that will require the most thoughtful joint consideration in the immediate future. One is the threat to public health services from inclusion under the health officer of services for the indigent sick and the other is the decision whether services for the sick at taxpayers' expense shall be administered by a department of welfare under lay direction or by a medical officer devoted exclusively to this function or acting as a bureau chief within the local department of health.

Even if the county medical society achieves a satisfactory contractual relation with local government for caring for the sick poor in their homes, there will be needed administrative supervision of this work to assure approximately uniform excellence of professional services and to prevent inequality in payment for equal responsibility and skill. This will call for a physician of ability and judgment. In large cities and in communities where the indigent sick are already served by

a strongly staffed and well controlled hospital and dispensary system it may well be that the medical chief of the care of indigent sick will be independent of the health department. Already we have large cities where the charter assigns to the department of hospitals responsibility for care of all sick who are eligible for free medical care, whether in hospitals, at dispensaries or in the home. The least promising method to be proposed is to have care of the sick poor administered by physicians as subordinates in a welfare or relief organization of the local government.

Quite apart from the administrative organization that may be set up with the assistance of combined federal and state funds is the effect of this new communal sickness service on the public support of and interest in the standard functions of the department of health.

Usually in American life, prestige, public concern, publicity and political influence go where most public money is spent and the largest number of public employees are engaged. We can rest assured that money will be always appropriated for the care of the sick. The sick must be served. It has taken generations to teach our communities that investment in health is a proper object of public expenditure. The public knows that the health officer can prevent some diseases. What the public does not know is that few if any of even our best qualified health administrators, whether medical or lay, are qualified for responsibility of supervision of standards or quality in the clinical practice of curative medicine.

We must expect on the experience of other countries that, if government actually operates on any compulsory insurance scheme a considerable amount of the services for the sick for people at low income levels, the cost of medical care of these people will be largely increased, perhaps doubled by the cost of administration. We have good reason also to suspect that the quality of care will deteriorate and that the amount and duration of complaints of illness and the amount of medications used will all markedly increase.

The present cause of lack of well qualified medical care for those really needing it, and wanting it but not receiving it, is chiefly ignorance of available resources, and it would appear that such sick persons are included in not more than 5 per cent and in various samplings less than 0.5 per cent of the total population.

It is as much the duty of the medical profession to warn the public against extravagant and utopian schemes of all inclusive commercial or governmental provision of medical care with their inevitable inferiorities as it is to assure a constantly improved standard of personal services to the sick on the basis of private economic and professional relationship.

## OFFICIAL NOTES

### ANNUAL CONGRESS ON INDUSTRIAL HEALTH

*First Annual Meeting held in Chicago Jan. 9 and 10, 1939*

*(Concluded from page 647)*

DR. LEON U. GARDNER, Saranac Lake, N. Y. in the Chair

TUESDAY, JANUARY 10—AFTERNOON

#### A General Surgeon Views Industrial Surgery

DR. HARRY E. MOCK, Chicago. Industrial surgery differs in no wise from any other type of surgery. The term is a misnomer. Surgery of trauma is the correct terminology. Industrial medicine and industrial hygiene differ in no wise from any other type of medicine or of preventive medicine. Every physician, whether connected with industry or not must deal with the same type of illnesses as are found in industry. While a major portion of the occupational diseases come from industry yet the products of modern industry scattered throughout the homes, schools, offices and even our hospitals often carry the hazards of occupational diseases with them. Industrial medicine and surgery is not a specialty comparable to other specialties in the field of medicine and surgery. Rather it is the application of the best principles of medicine and surgery to a group

of people connected with a given industry. In 1917 I published the first book ever written on industrial medicine and surgery, per se. The purpose of this book was not the development of a new specialty but rather to elucidate the humanitarian part medicine could play in the preservation of the lives and limbs of the working force of any industry. Prior to 1910 many industries had company surgeons whose sole job was the care of the employees injured while at work. Too often these were only 'pot-boiling jobs' and the surgical care rendered the injured was all too inadequate. In the rapid development of modern industry in the three decades prior to that time human life was held all too cheaply. The establishment of medical departments in a large number of industries during the early years of 1900 made human conservation the firm foundation of production. With the growth of this form of medicine the field has extended into the living and home conditions of the working forces, gradually resulting in closer cooperation with the public health authorities. In fact this form of practice has become a vital factor in the nation's health.

To the politicians, who suddenly have awakened to these economic and social advancements, social security is apparently a new discovery filled with the greatest of political potentialities. The prevention of accidents, better medical and surgical care for the sick and injured employee and allied welfare movements,

giving greater security to the worker, such as profit sharing plans, mutual benefit associations, loan plans for aid in case of illness, and often pension systems, have been in vogue for many years. All were accomplished by the process of education and gradual evolution. With a few exceptions, none of these movements improving the economic and social status of the working man and woman were brought about by legislation. True, new laws have appeared on the statute books of the majority of states providing employees' compensation for injuries, control of working hours, especially for women, control of the working age for children and protection against occupational diseases, but in every instance these laws have not been thrust on the people but have been the result of the educational programs and the demands of medicine and similar groups for these needed laws. We have long since learned that the most lasting changes for good are those which are voluntarily grasped by the people. In these days of governmental legislation for great economic changes and so-called social security, those in control of the government should realize that the voluntary adoption of such changes by the people themselves is far better than paternalistic force.

The organization of the Council on Industrial Hygiene by the American Medical Association is the result of thirty years of educational work in the field of industrial medicine and surgery.

The medical centers will soon be overcrowded with specialists, and many will be forced to seek a practice in the smaller communities. Here they will lack fellow specialists to meet these emergencies, and they will be forced to become general surgeons. Traumatic cases will comprise at least a fourth of their practice. Whether their trauma cases come from the industries of that community, from the homes or from the streets they must be competent general surgeons if they are to meet the situation. The time is past when a surgeon can consider trauma cases as a side issue. Any surgeon who is bored by the treatment of injuries of whatever character should refuse to treat such cases. The treatment of trauma requires a general surgical knowledge, an alertness in diagnosis, a passion for daily detail that can last for weeks and months, and an enthusiasm for results that will be a driving force until the patient is eventually restored as far as is possible. After the emergency is met and the patient's life saved for further treatment, the wise surgeon, if the injured portion of the body warrants, will seek the aid of the specialist.

Many industries refer their injured employees to the neighborhood doctor. As the number of these cases increases, many of these doctors are forced to limit their practice more and more to the care of the ambulatory injured employee. Thus, all over the country there are a great many surgeons who are doing so-called industrial surgery. In reality, their work is minor surgery limited largely to the treatment of injuries. The proper care of these minor surgical conditions is just as important a field in surgery as is the care of the major conditions. Too often, surgeons well equipped to do this minor surgery seek, without sufficient training in general major surgery, to care for the major cases. When difficulties arise they seek aid from the specialist. Too often great human suffering and even loss of life and limbs would be prevented if the given case had been turned over earlier to the general surgeon familiar with major surgery or to the specialist. On the other hand, recognition of the principles of medical ethics in this form of surgery as regards consulting with and helping a fellow physician in the care of his patient would go far toward correcting this evil. Many of these surgeons practicing minor surgery in an industrial center are far more competent in the care of the minor case than are many of our great surgeons whose practice is limited chiefly to major surgery.

The majority of industries depend on insurance companies to pay the compensation and the hospital and surgical care for their injured employees. Many of these industries retain a personal interest in their injured, endeavoring to see that they receive the best of care and that when cured they are given a job once more. Too many industries, however, feel that they have met the situation when they pass the responsibility to the insurance company. Their interest in their injured employee ceases and his future economic independence is of

little concern to them. Certain ones of these insurance companies seek only the cheapest hospital and surgical service for these patients. But during the last twenty years one has witnessed the swing of most insurance companies from cheap, inadequate surgical service to the use of good surgeons, no matter what the cost.

The criticism is heard that the injured employee does not have free choice of his surgeon. The railroad companies and many of the great industries, recognizing that the employee's choice often results in poor service, have selected staffs of surgeons to care for their injured. The insurance companies usually will not interfere if the choice of the physician or surgeon by the injured person is good, and proper care is being given. Occasionally the employee's choice is so poor that the insurance company insists on procuring a competent surgeon. In answer to this criticism it is safe to say that today the injured workman in industry receives just as good service as and often better service than does the average individual injured in his home or on the street, who has free choice of his physician or surgeon. Unquestionably, there are many flaws and many loop-holes for abuses under the present administration of employee's compensation and the furnishing of surgical service, either by industry or by its elected insurance agency, but the injured employee is far better protected and the type of surgery he receives is far superior than was true thirty years ago.

A few outstanding surgical changes which have occurred during my years of experience in surgery of trauma are worthy of note. We have come to recognize that shock, which is present in all serious injury cases, must be treated first if deaths are to be prevented. In the field of accident prevention "safety first" has become a household slogan. "Shock first" is herewith proposed as a much needed surgical slogan. Blood transfusion, seldom done thirty years ago, is now one of the greatest life saving procedures in severe trauma accompanied with shock or hemorrhage. There are certain emergency life saving operations that must be performed at once if life is to be saved—the ruptured spleen or liver, perforations of the bowel or intestine, torn blood vessels within the neck, chest or abdomen. Here the oxygen tent, new forms of anesthesia, blood transfusions and other modern methods of keeping the patient alive while undergoing the emergency operation are aiding in saving some of the most desperate cases. Skull fractures, far more common than formerly, are not being rushed to the operating room for subtemporal decompressions as was true thirty or even ten, years ago. The operative rate in skull fractures has dropped from around 36 per cent to 10 per cent and the mortality rate from around 40 per cent to from 17 to 25 per cent. More attention is being paid to overcoming serious crippling conditions. The aftermaths of injury which formerly were considered permanently disabling are now yielding to reconstructive surgical measures aided by the proper and judicious use of physical therapy and occupational therapy. These and many other advancements in the field of traumatic surgery have been brought about to a large extent by surgeons responsible for the care of the injured in industry.

Thirty years ago, except for a few small railway surgical associations, there were no special surgical groups interested in traumatic surgery. Today there are at least twenty outstanding railway surgical associations, stimulating the interest of many of our best surgeons on the subject of trauma. There are several local and state associations, or institutes, of traumatic surgery. Today, in the great majority of cases, the injured worker receives as good surgical care as the wealthiest individual of the land. Medical schools are teaching students the principles of good traumatic surgery. Surgery of trauma is rapidly becoming one of the greatest fields of surgical endeavor.

#### MEDICAL SERVICE TO SMALL INDUSTRIAL PLANTS

##### Statement of the Problem

DRS VICTOR G. HEISER and DONALD M. SHAFER, New York.  
Out of a total of 45 million gainful workers in America it has been estimated that 15 million people are employed in commercial units of less than 500, and they are the bread-

winners for about 75 million people. In a survey of the problems of industrial hygiene in a typical industrial area in the United States it was found that the workers were exposed to fifty specified substances and conditions. Of this number about 20 per cent of the workers were exposed to carbon monoxide and about 10 per cent to emery dusts, 10 per cent to lead and the same percentage to quartz dusts. Also it was found that about 42 per cent of the workers were subjected to potential accident hazards due to unguarded machinery.

It is a general belief that the hazards of industrial poisons are present chiefly in the large companies and seldom in the small ones. We doubt that this is true because the small companies generally use the same materials as the larger companies and although in one particular plant they may not have the number of hazards that the large companies do, small industry in general uses the same substances that large industry does and consequently is exposed to the same hazards.

There is reason to believe that the individual workman in the small plant is exposed to more hazards or to the same hazard in more ways than the man in the large plant. This is ascribed to the fact that in many small plants, because of the limited number of employees, each man must carry out two or more steps in the manufacturing process. Thus he may come in contact with more than one potential poison or with the same poison in different states or manners. In neither case is he as familiar with the methods of protecting himself as is the workman in the large plant. For the number of man-hours worked, the small plant has more time loss due to industrial accidents and more frequent accidents than in the large plant. This greater loss is attributed to the lack of a medical service, to a less well organized program of accident prevention and to a want of appreciation of the cost of these losses by the small manufacturer. With this same premise holding true, it is believed that the time loss and absenteeism due to occupational disease is also greater in small factories. A number of statistical studies indicate that absenteeism due to nonoccupational accident and disease is greater in the small than in the large plant.

The problem of record keeping among the small manufacturers is one on which the whole campaign of endeavoring to bring adequate medical care to their workers is founded. There are few if any records kept among the small companies that show anything more than just the absences. There must be a test group established that will provide adequate records of absenteeism and its true causes and the results must be carefully studied to determine a method of record keeping most suitable for the small manufacturer. Because of the tremendous loss due to illnesses of from one to three days, the study of short term absenteeism must be an integral part. Some efforts are already under way to try to define the present status of absenteeism among the smaller companies. The National Industrial Conference Board is at work on such a survey.

After the small manufacturer has been convinced of the extent of loss by means of his records he will probably demand a solution for his problem. At this point we must be able to provide him with information regarding the personnel and the manner of operation of an adequate medical unit. This is the point at which the small manufacturer usually balks, because he feels that in a company the size of his there is no way in which he can afford to have adequate medical care. At present this usually results in the employment of a physician in the vicinity on an emergency basis. Almost always his choice of the physician in the first place is due to personal friendship or hearsay. Medical care of this nature seldom results in anything more than patching up an injured workman. The small manufacturer is usually definitely humanitarian and greatly concerned with the welfare of his men, but the cost of adequate medical care by the usual means is prohibitive. It has been estimated that the upper limit in the cost of medical care that the average small manufacturer can afford is about \$13.50 a man annually, and if such care is to be generally adopted it will have to start at a much lower figure. In the beginning at least the annual cost for the small manufacturer should not be over \$10 a man. The equipment necessary for a small employer to purchase must not demand a large cash outlay. Some small manufacturers have indicated

that they felt \$350 to be the most they could devote to the setting up of a medical unit.

The tremendous, complex problem brought up by the small manufacturer's need for medical care is essentially educational in nature. The small manufacturer himself must first of all learn his need for help from the establishment of comprehensive records, and then what an industrial medical service can do for him. He must be shown how it will influence the quality and quantity of his production, what it will do for his workmen, how it will affect his costs of compensation, how he can justify the additional expense to his stockholders or partners, in short, that it is not welfare work or philanthropy but 'good business.'

The National Association of Manufacturers is at present cooperating with the National Industrial Conference Board in a survey of the practices of the small industrialists. It is cooperating with state manufacturing associations in the advancement of industrial hygiene consciousness among their members. It is in contact with various trade associations in their activities to promote industrial medical care. Furthermore, many of the state departments of health and labor and the federal agencies have been visited and the value of cooperation between industry and government has been strengthened and confirmed as the best means of an equitable relationship in the advancement of the care of the worker.

The National Association of Manufacturers has prepared a pamphlet entitled "Do Good Working Conditions Pay?" written for the benefit of the manufacturer alone, addressed entirely to him, and phrased in popular language.

This educational program directed toward the manufacturer must be preceded or paralleled by education of the physician. The doctor who undertakes to care for the workmen of a factory must know the potential industrial hazards of that factory's processes and materials. He must know therapy, prevention and diagnosis, and he must know workmen. The education of the doctor so that he may serve industry in a manner of real value to industry and of real credit to his profession is I believe, part of the program of the Council on Industrial Health.

#### The Private Physician and His Occupational Disease Work

DR CAREY P. MCCORD, Detroit. Whatever may be entailed in changing industrial conditions, it is expectable that the employer will be charged with increasing responsibilities for his workers' health. At this time it is most uncertain that these increased employer responsibilities for worker health protection will lead to augmented medical facilities on the work premises or instead that the responsibility of the employer will be met indirectly through taxation, insurance contributions or related devices. However, unless great changes early appear in the conduct of either industry or medicine or in both, there are reasons to believe that the greater proportion of industrial health work will be carried out, as at present, by the general practitioner and his consultants.

When an industrial worker is injured or acquires an occupational disease at once many more problems arise than the procurement of treatment of the injury. Among others there may arise problems connected with employer liability, compensation, insurance, security of the family during the breadwinner's absence, rehabilitation, the prevention of further cases of the same injury or occupational disease. The private practitioner is often handicapped in connection with the meeting of nonmedical or semimedical problems of the injured industrial worker. The private practitioner seldom knows industrial operations practices, chemicals or exposures. He may draw worker patients from twenty-five different industrial plants. It is seldom true that this physician knows much about any of the activities carried out on the premises of any of these twenty-five plants. It may be asserted that at least one half of the spurious claims for compensation or common law suits are in part due to the unfamiliarity of the physician with industrial practice and materials. The injured workman ordinarily has his interests better served by the company physician and his consultants. The old idea that industry maintains a medical department largely to thwart the injured workman is fantastic. Industry regards its trained workers as its most

valuable asset and is far more concerned in their well being than any casually selected physician. While a definite need exists for the highly skilled industrial physician, working on the plant premises, only a low percentage of the plants are of such size as to warrant his services as part of the industrial organization. In these tens of thousands of plants the services of the private practitioner are valuable, but if he is to be accepted as a definite ally of industry and its workers he must accept responsibility for many other types of activities than the amputation of fingers, the suturing of wounds, the treatment of burns, and so on. There is a great clamor from industry and its workers for a better understanding on the part of the physician of industrial health problems. Thus far the average private practitioner has not shown a disposition better to understand nor is he greatly inclined to undertake more than the direct care of the patient's trauma. In short, he treats the injury but does not treat the worker. The private practitioner in handling occupational diseases encounters unusual difficulties. He not only encounters difficulties but he may make other difficulties both for his patient and for the employer.

The complaint has been made that medical schools do not furnish students with any adequate training with regard to occupational diseases. There is doubt that any medical school should undertake extensive training of this character as part of the undergraduate curriculum. The total number of disabling occupational diseases is far smaller than is widely believed. In Michigan during the past twelve months only 1,014 occupational disease cases were reported to the state department of health, but in this state there are 6,142 physicians. This means that every physician on the average will see only one case of an occupational disease about every six years. Since there are possibly 2,000 different substances in industry that may bring about occupational disease injury, it is remarkable that physicians do as well as they do. All students should be given fundamental training in occupational diseases. The second educational responsibility is the need for the training of much larger numbers of consultants in occupational disease work. It is remarkable that the internist is so little familiar with occupational diseases particularly with regard to causative factors and that even in large industrial communities there is such a dearth of qualified occupational disease consultants. This fact makes many good general practitioners loath to undertake occupational disease work because they feel that in so doing they must accept full responsibility. In every industrial community a fair number of practitioners consistently refuse this type of case for various reasons. These patients may seek the ministrations of a lower class of physicians.

A difficulty that the private practitioner creates for himself is too great acceptance of the patient's own statements as to the cause of his disease. Almost every worker hopes that any disease that may be his lot may be traced to work as the cause. On this account his history statements are prone to be colored with dubious assertions as to exposures to dusts, vapors, gases, mists and what not. The physician may be so little familiar with industry as to fall into error—may make himself ridiculous and may pave the way for controversies and lawsuits. Another difficulty that besets the physician is conflicting classifications. In some states hernia by law is classed as an accident, in others as an occupational disease. Carbon monoxide poisoning is widely accepted as an accidental injury but in some states is specified as an occupational disease. Many substances may produce an injury under one set of circumstances and an occupational disease under another. A further diagnostic difficulty may arise because so many industrially used substances are designated by trade names or code names that conceal their identity. A physician taking the history of a worker patient may seek to learn the substances handled in the course of employment. This worker may reply that he fills cans with "B-72". The physician may inquire as to the constituents of "B-72" and may be told by the workman that it is a mixture of "M-20" with "H-40" and "L-97". These may be the only names known in the entire department with reference to such chemicals. If the full facts were known, it would be somewhat as follows. This workman was engaged

in filling cans with a paint and varnish remover (B-72). This in turn represents a mixture of wood alcohol (M-20) with benzene (H-40) and a synthetic wax (L-97). All physicians may encounter difficulty in obtaining from the employer adequate information as to the chemical nature of the substances which the workman may have handled. This may not represent any unwillingness on the part of the employer to disclose this information, rather, the employer himself may not possess these facts. This situation is at the present time causing so much difficulty throughout the land that it may prove necessary to seek legislative action requiring adequate labeling of industrial materials of poisonous nature.

There is not available to the general practitioner any comprehensive but well condensed books suited to his needs. It is of course impossible that any thin book may be prepared that unflinchingly will furnish the general practitioner a full complement of occupational disease information, but the fact still remains that a useful purpose will be served by making available to all physicians a practical textbook on occupational diseases built around the needs of the patient.

While the total number of cases of occupational diseases per physician annually is low, the aggregate number is high both as to variety and as to numbers of patients. A larger number of cases of occupational diseases are never recognized or at least remain unreported. In every industrial state and many large industrial cities, public agencies should be maintained for the purpose of furnishing services to the practitioner, the employer, the patient and the labor unions, all on an unprejudiced basis, making available almost unlimited information on occupational diseases and industrial hygiene. The private practitioner should somewhat change his attitudes toward the services that he may render the industrial workman, losing sight to some extent of his immediate injury and instead render his services to the workmen as a whole, to his employer and to the community.

#### Means for Accomplishment

DR. GLENN S. EVERTS, Philadelphia. It has been demonstrated in Philadelphia since 1926 that small industries can have a medical service favorably comparable to that of larger industries and at a cost not out of proportion to that which larger industries have to pay. The Philadelphia Health Council developed a plan for making voluntary health examinations of the employees of small plants. It was hoped that this program would stimulate the industries to institute a permanent medical service. The response to this health examination program was sufficiently encouraging to warrant working out a plan for a medical service which would meet the needs of a plant having from twenty-five to 500 employees, and later an industrial secretary was engaged to explain its value to the executives of small industries.

The principal difference between offering a medical service to small plants and starting it in large ones lies in the matter of a part time schedule for the nurse and doctor as compared to a full time schedule. The original plan was to group two or more plants into a single unit for joint medical service. This was spoken of as an "industrial health unit." Each unit was to consist of almost 1,000 employees. One industrial nurse, if her time was carefully scheduled, could successfully serve that number of employees and do the necessary travel between plants. Half the time of an industrial physician likewise was found to be sufficient for that number of employees. During the demonstration period the industrial nurse was carried at full time on the staff of the health council, doing other types of health work until, as each plant was added, her time was entirely absorbed by industry. Likewise, during the demonstration period, the full time medical secretary of the health council, with previous experience primarily in industry, served as the industrial physician in starting the medical service in each plant.

In 1932 a modified plan was developed. An arrangement with the visiting nurse society was made to supply the necessary scheduled hours for each plant. This newer plan did away with the grouping of a few small plants into health units for the sake of making possible a part time schedule. A plant of any size under the arbitrary number of 500 employees



located in Philadelphia can begin a part time medical service whenever it elects to do so. Where the community enjoys the service of a visiting nurse society, the part time nurse's schedule would be simplified and the responsibility of the physician for details decreased. The original plan was put in operation by regular visits made throughout each week to each plant by the industrial physician and the full time nurse, each of whom gave a definite amount of service to each plant. The modified plan is simply that the private physician gives regular service to a single plant or perhaps to two plants with a different visiting nurse furnishing the nursing service for each plant. Each regular visiting nurse has a well trained substitute who is prepared to step in whenever necessary. The amount of service given was estimated that for every hundred employees the plant should receive three hours of medical service per week, one hour of this being physician's time and two hours nurse's time. There has been no reason to deviate from this allotment of time when trying to interest a plant in the service in the beginning, but experience has shown that this proportion of time per week to the plant population is minimal and that a hazardous industry, or an industry having a need for more health work, may require more service.

The service offered the small plant is the same now as it was in the beginning. It consists of the following items: (a) A typical examination taking an average of seventeen minutes on all present employees, preferably on a tactfully compulsory basis rather than on a voluntary one. (b) A physical examination on all new employees. (c) An annual reexamination of all employees, taking an average of fifteen minutes. (d) The assumption of the responsibility for the care of all plant accidents in the following way: (1) by taking care of the accident personally (physician or nurse) if the accident occurs during the hours of the medical service schedule, (2) by having a well chosen first aid person take charge in their absence and, when advisable, telephone the doctor, (3) arranging with the surgical service of the nearest hospital to take care of serious accidents, (4) assuming charge of redressing all accident cases either when the individual is still on the job or when off the job, if he is ambulatory and can travel back and forth to the plant dispensary, (5) arranging with an ophthalmologist to whom all plant eye accidents may be sent in absence of the physician or nurse. (e) The care of illnesses the individual may have while on the job, referring him to his family physician when he is too sick to work. (f) Attempting to diagnose chronic pathologic conditions and interpret their importance to the employee, referring him to his family doctor or diagnostic clinic. (g) Follow-up visits resulting from the original physical examination. (h) Home or hospital visits to the injured or sick in the capacity of a friend, never professionally, to determine the progress and estimate probable date of return to work for the benefit of the foremen of the department. (i) Health education—talks to groups of employees, posters on health bulletin boards, and pamphlets given to employees by the physician or nurse. (j) Sanitary survey of plant annually and frequent inspection throughout the year with particular reference to occupational hazards. (k) Accident prevention: (1) by cooperating with the safety program, (2) by getting an accurate report of the way each accident happened from the injured employee, (3) by following up the mechanical factor at fault to see that the accident does not happen again.

Experience has shown that in carrying out this program the nurse in the plant tends to become the key to the permanent success of the service even more than does the physician. She must assume not only the nursing duties but the administrative duties as well. This is especially true when she must work with a physician who has a private practice. The physician must rely on her for the first handling of many conditions which he will later review but which at the time may be considered an emergency. And yet without the sustained interest of the physician and his adherence to the hours scheduled much of the success of the program will fall by the wayside. In twelve years I have had yet to find any important executive in the plant who has attempted to influence me in matters involving medical or surgical judgment about an individual employee.

The present cost of a part time medical service is as follows: (a) Physician's time per scheduled hour, \$4. (b) Visiting nurse society's charge per scheduled hour, \$1.25. (c) Other items of cost based on a plant of 100 employees: (1) estimated cost per month of drug and dressing supply, \$15; (2) original cost of dispensary equipment—furniture, instruments, and so on, \$150; (3) original cost of drug and dressing supply, \$75; (4) original cost of constructing a two room dispensary including sink, electrical fixtures and outlets, from \$50 to \$500. If these items covering the original expense of setting up the complete dispensary are excluded, a plant of 100 employees could start a so called minimal service for about \$10 a week. Experience has proved, however, that the single one hour a week visit by the physician and the one hour a week visits by the nurse as a minimal service is inadequate even in the quite small plants.

Interesting an employer in medical service for his employees has been a matter of intensive education and salesmanship. Education by any other than direct interview was not fruitful. Repeated announcements of the availability of such a service were made through the chamber of commerce and the trade associations without a single inquiry being made as to further details. In spite of the fact that this representative was fully informed on industrial health work and skilled in the psychology of salesmanship, it often took several interviews with the most health-minded employer before he felt ready to institute the service. In securing the first nine or ten firms with a total of about 4,000 employees upward of 900 interviews and reinterviews were required. Of course, this included contacts with some forty or fifty firms which were not good prospects.

Six years has elapsed since the health council concluded its demonstration. During that time I have learned of no small plants in Philadelphia which have instituted any sort of a medical service, although probably a few have done so. It is my feeling that a much larger number of small plants would provide a medical service for its employees if the message were carried to the employer on purpose. Whether this should be done by the physician, the local medical society or some organization approved by the local medical society can be a matter for subsequent consideration.

The dispensary, ideally, should be located with reference to accessibility, light and freedom from noise, but in many small plants space is at so great a premium that there is little option as to location. The space when selected must be walled off to create a room, which is subdivided into a larger general treatment room and a smaller examining room as in the letter E. Experience has shown that it pays to draw the plans to scale and in sufficient detail to show the desired location of the dividing partition, the sink, the lights and the electrical outlets. Furthermore, the furniture and large pieces of dispensary equipment should be cut out of cardboard to scale and prearranged in their most effective dispensary location. The resulting layout will then be a precise guide to the workmen in building the dispensary, and a boon to the physician and nurse when beginning the service.

The original list of equipment and supplies has changed a little from time to time according to the efficiency of the newer items introduced to the profession. I have found, however, that the simplicity of the equipment remains essentially unchanged not so much because of the expense or even lack of room to house it as because of the lack of time to make the fullest use of it. I refer particularly to the finer equipment for diagnosis and physical therapy.

The service will get off to a better start if definite attention is paid to certain details of procedure at the time of opening the dispensary and in establishing a few important practices in the early weeks of its inception. The essential considerations are: (a) Talk to foremen and forewomen by physician, explaining purpose of dispensary and its relationship to all the employees. (b) On health bulletin boards, installed as a part of the work of equipping the dispensary, these notices: (1) first notice announcing the opening of the dispensary, (2) second notice to all employees "what to do in case of accidents", (3) third notice, especially to foremen, to notify the dispensary of absences of two days duration. (c) On health bulletin boards: (1) the dispensary schedule at all times, (2)



a monthly change of health posters and accident posters (d) From timekeeper (1) payroll by departments, including clock numbers, (2) names of absentees for any reason twice a week (e) An early trip through the plant by physician and nurse to become somewhat acquainted with the processes, location of departments, and accident and health hazards (f) Selecting and training first aid men or women (g) Location and contents of all first aid boxes (h) With superintendent (1) arrange for preemployment examination of all new employees, (2) arrange for the physical examination of the present employees in this order superintendent, forewomen foremen, and female and then male employees (i) Establishment of working relationship with claim agent of carrier of the plant's compensation insurance

The final step in this promotion of health work in small plants is the transfer of the service to the administration of the plants themselves. Since this work was in the nature of a demonstration on the part of the health council, it was not considered complete until it had been transferred. When, therefore, the work of the dispensary had been integrated into the routine of the plant and well established, it was turned over to the plant for future management. In the modified plan with the flexible hourly service of the visiting nurse society, only one or two plants needed to be considered and the transfer to the management became comparatively simple. With either plan a complete divorcing from the health council of the medical work of the plants was accomplished with no change in the character of the work and but little change in previous routine. The physician and nurse were placed on the payroll of each plant and were thereafter jointly responsible for the continued functioning of the dispensary at the same level of service as previously. The health council continued to manifest an active interest in the future welfare of each plant. Today, six years after the conclusion of its seven year demonstration, it maintains an interest in the progress of the medical services of the plants it was instrumental in starting.

The extent of the demonstration during those seven years can be gaged by these facts: (1) Dispensaries were established in thirty-one plants which represented a total number of employees of 9,721, (2) nineteen physicians and twenty-two nurses were employed for various periods in this work, and (3) the amount paid to those doctors and nurses was a total of \$62,078. The industries were diversified as to both kind and size. Of the thirty-one plants there were eleven confectioners, two cake and cookie bakers, two pork packers, one root beer manufacturer, three lithographers or printers, two woolen yarn or woolen knitting mills, one silk mill, one narrow tape mill, one blue serge suit manufacturer, one elastic goods mill, one iron and steel mill, one lead and alloy foundry, one cigaret factory, one paper bag maker, one paper box maker and one calf skin tannery. The number on the payroll in these plants varied from twenty-five in the yarn mill to 560 in the tannery, with an average of 200 for all plants. Many of the plants have discontinued the service. Of the thirty-one original plants, thirteen still maintain their medical service. Of the eighteen which discontinued the service the reasons, so far as have been learned, are as follows: nineteen apparently financial, four moved out of the city, leaving five the reasons for which are not known but which could be due to some fault of the service itself. I had the gratifying experience of spending from six months to two years in twenty-seven of these plants before they were transferred, and since 1932 I have continued personally to maintain the service in five of them as an increasingly interesting full time work.

I have fallen short of the goal we would all like to achieve. I have formed certain convictions from experience that a health salesman to carry the message personally to the employer is almost a necessity, that some means should be developed to help the average private practitioner learn more about the practice of medicine in industry and help him maintain permanent interest in his small plant work, and that when available the efficient, flexible nursing service of the visiting nurse society should be used. I feel that nothing but good can come from the local medical society, being prepared to point the way toward adequate medical service in small plants,

even though the idea of active promotion at first is not adopted. I suggest (1) that the Council on Industrial Health initiate the preparation of a pamphlet as a detailed guide for establishing a medical service in small plants, to be available to local medical societies, (2) that local medical societies establish a section of industrial health and (3) that a committee of the Council be formed to study the problem of presenting the medical service idea to small plants both by way of announcing its availability and by possible active promotion later on.

### Methods of Appraisal

DR LEVFRETT D BRISTOL, New York. In no field of medicine or public health have more rapid or significant developments recently taken place than in industrial health. The terminology and objectives of today are different from those of yesterday. A short time ago one spoke only of occupational diseases and accidents. Now one speaks of industrial health, including the prevention and control of syphilis as well as of silicosis, of tuberculosis as well as of traumatic neurosis, of pneumonia as well as of plumbism, of the common cold as well as of carbon monoxide poisoning, of heart disease as well as of heat exhaustion, and of off-duty accidents as well as of industrial injuries. The policeman approach to the problems of industrial hygiene is giving way to the medical and public health approach.

Industrial health implies not only that health should be promoted in industry but also that industry should take a leading part in community health. The vast majority of workers are employed by smaller plants and business concerns, most of which have little or no facilities for adequate programs of industrial health, largely because of the financial outlay involved.

A somewhat standardized survey and appraisal form would make it possible for the business executive of a smaller company to know what his company is doing or should be doing for employee health and what measurable progress is being made from year to year in the development toward an ideal program. What is most necessary is to give executives of smaller organizations at least an outline of what they ought to know about the essentials of an industrial health program. To help them evaluate a program of health services, an actual numerical rating scheme also might be valuable. It would not necessarily follow that each executive of a smaller plant or business would have to do all the things suggested or implied in a survey and appraisal form or that he would have to set up his own medical staff to carry on suggested activities. If he does not have the means in the way of adequately trained personnel to "carry on," the best thing for him to do is to find out where he can get it done. A fairly simple, standardized health survey form for smaller companies and business concerns could be used to survey health effort and performance in a very general way and would not attempt to stress the actual quantitative or qualitative services rendered. Such a form would visualize a fairly complete, well-rounded program, which is the first essential.

Since 1932 a Subcommittee on Industrial Health Appraisal of the Committee on Administrative Practice of the American Public Health Association has attempted, with partial success, to promote the health appraisal idea and plan in industry. Each year a growing interest in such a plan has been manifested on the part of various individuals, agencies and industrial organizations. Dejon and Simonds state with regard to the plan:

1 It has provided a list of definite health and accident activities which are essential to a constructive well rounded program of health service. This list of activities prepared and approved by medical authorities constitutes a scientific approach to the establishment of methods of procedure.

2 It has aided us in planning definite health activities for each ensuing year, guiding us in the direction of the ideal without undue experimentation. After the appraisal a definite program of health activities to be pursued for the current year is prepared and definite assignments of administrative responsibility for particular health activities are made to the various departments, units of organization or individuals which insure coordinated effort toward the completion of the program during the year. In this program management concentrates its energies on those particular health activities which are directly related to the immediate needs of its business.

3 It has provided through ratings a comprehensive measurement both to management and to health supervisors of the extent to which the various

planned health activities have been administered and it has also been a measurement of the progress we have made in approaching the ideal of an industrial health program. This method of measurement is far more stable and reliable than the old yardsticks such as the number of sickness days or the cost per case as compared with previous years, because many intangible factors affected such a measuring scheme. One year the influenza incidence may be high the next year low as a result of cyclic epidemics.

4 It has steadily strengthened interest in our health activities not only within the medical department and among the health counselors but also on the part of management at various organization levels.

While for various reasons the health survey and appraisal plan undoubtedly will make slow progress in larger industrial organizations, it may have its greatest usefulness as a stimulus and guide to smaller business concerns.

As an example of the possibilities involved in such an industrial health survey form, reference is made to a form recently adopted by the National Industrial Conference Board and distributed to about 800 industries in the board's present study of industrial health and medical services. Of the 800 industries now being studied by the board, about 450 are those having 500 or more employees and 350 having less than 500 workers. The survey form of the National Industrial Conference Board, through minor changes in arrangement and certain additions, is an improvement on our original health survey form for smaller industries. In contrast to forms used in the past by various agencies in their studies and reports on medical services in industry, this form in agreement with present trends in industrial health, specially emphasizes positive health promotion and general sickness prevention among workers.

Until such surveys, trial appraisals and reports have been compiled over a sufficient period of time, no final attempts can be made to develop an official, standardized appraisal form or method for promoting or measuring individual company performance in respect to industrial health services.

As specialists interested in the broad aspects of industrial health administration we must attempt to produce administrative tools for management and be prepared to interpret them to management in the language of management. No opportunity should be lost to emphasize the fact that industrial health surveys and appraisals are nothing more than important tools to help in planning, organizing and controlling business efficiency.

For smaller business concerns, much of the health service and medical work ultimately must be carried on either (a) by groups of these smaller concerns working together as units through some joint plan of centralization, as for example those in one building or trade group or in a restricted locality on the basis of divided costs for medical, nursing and other assistance required, or (b) by local community agencies, such as official health departments, tuberculosis and other voluntary or unofficial health agencies, university institutes of industrial hygiene, or organized local medical societies or groups of physicians.

#### DISCUSSION ON MEDICAL SERVICE TO SMALL INDUSTRIAL PLANTS

DR ELSTON L. BELKNAP, Milwaukee. The paper of Drs Heiser and Shafer presents an excellent statement of the scope of the problem as well as tangible evidence to show the small employer both the advisability and the feasibility of his inaugurating a real medical service. As chairman of the Committee on Occupational Disease of the Milwaukee County Medical Society, I have for the past four years been faced with the problem of arousing the interest in occupational hazards both in the small employer and of the physician who did his industrial work. In arriving at their annual cost of from \$10 to \$13.50 per man for medical care I wish to inquire as to just what they include under medical care. Is it just occupational illness and injury or does it include also actual treatment of nonoccupational disease or the ordinary disease of the community, which they state causes 90 per cent of absenteeism from industry? Certainly it would seem that Drs Heiser and Shafer do not include more than the diagnosis of nonoccupational disease in arriving at such a relatively low cost. As a part time consultant in occupational disease for eight years to a plant often falling just within the limit of 500 I have had the opportunity of studying men serially who have been exposed to dust of lead, copper, manganese and silica as well as to the volatile

solvents, cyanides and carbon monoxide. Not only the pre-employment but the frequent periodic examinations at two to four week intervals needed for certain of these workers not for treatment but for actual prevention of disability has made a medical cost of at least \$13.50 to \$15 per annum. This includes the cost of surgical treatment of injury. Should the cost of adequate annual protection of his worker run even to \$20, I do not believe the small American employer would be really appalled. Even that amount will still be good business and good humanitarianism. Dr McCord frankly faces the fact of present inadequacies both in the interest and in the specialized training of the private physician. I believe that both of these issues can and will be improved as we raise the level of general practitioner knowledge of industrial health by seminars and field trips sponsored by our medical society groups. Dr McCord has properly emphasized the need of specially trained occupational disease consultants in each community. These physicians should be able too to evaluate from their personal observation of plant processes and from engineering surveys the question of exposure to a toxic substance over against its effect on the human body. In this congress Dr Besley has reported that the worker receives the highest grade of preventive medical service when the same physician who treated him for occupational disease was also charged with the responsibility of inspecting his plant for hazardous conditions. I would add that such medical consultants should have the broad experience of general diagnosis gained in the field of internal medicine in private practice. Dr Everts has given a valuable account of one type of experiment in meeting the needs of medical service for the small industry in a large community. He demonstrates brilliantly the practicability of grouping two or more small plants into a unit for service by one physician and nurse. I approve the part time medical service which he suggests because I believe that the element of private practice provides a stimulus difficult to obtain otherwise. One might question the advisability of rigidly demanding a complete examination in from fifteen to seventeen minutes. A fixed price per hour of medical service—an hour packed with real service—is a good idea. I do not believe, however, that Dr Everts wishes us to take \$4 an hour as a standard for medical service. Varying circumstances of community custom as well as of personal skill and experience will call for corresponding levels of remuneration. Surely, such a key position as the physician holds for maintenance of proper employer-employee trust and human understanding should be adequately compensated. Physicians should no longer underestimate either their responsibilities or their value both to industry and to the worker. Dr Everts suggests the innovation of the local medical societies sponsoring the establishment of these "health units." I suggest another new departure. In certain instances why not allow the traumatic surgeon to attend the accidents of industry and the internist to help prevent the diseases of occupation. From my experience I have found such teamwork beneficial for employer, worker and physician. The appraisal form method of Dr Bristol should be of ever increasing value. We all benefit by such searching periodic self analysis. I have found that a monthly written review is of even more value than the time honored annual report. Dr Bristol stresses that we must learn to deal with business executives in their own language of analysis and inventory. We must never let them forget, moreover, that our prime responsibility is in the doctor patient relationship. To these ends may all interested parties continue to exchange experiences in repeated annual congresses on industrial health. Eventually we physicians of the American Medical Association may come together with a few generally admitted basic principles on effects of occupational disease on the worker and announce our agreement before the lay world on such questions as disability in uncomplicated silicosis or as to the likelihood and evaluation of percentage disability for residuals from specific industrial poisons.

DR A. G. KAMMER, Chicago. I should like to comment on a question or two raised in the paper by Dr Everts. There are certain reasons why an industrial medical examination has to be complete. 1 Men coming in for examination are not sick nor do they look sick. 2 They usually go to their family physician. 3 The purpose of the examination is to discover disease at its earliest stage. 4 Misdiagnosis destroys the confidence of men in the medical department. In the past three years I have made

7 000 examinations and have had an additional 6,000 made under my supervision. To do this work well it has been found necessary to take about twenty minutes per man. It takes enough time besides that to make records and to interview men and give them results of examinations, so that a doctor working very hard can't make more than eight examinations, and do them well, in less than half a day. My objection to the recommendation made by Dr. Everts is that I believe he is getting into our record here a standard which is too low for industry generally to accept.

DR. GLENN S. EVERTS, Philadelphia: Suppose we use the word "inspection" instead of "examination." I fully appreciate the fact that you can't examine a man in twenty minutes. Sometimes we take over a half hour for a thorough examination. But when the plant has had a strike, and they come back in one day and hire 100 new men, what are you going to do about it? You certainly aren't going to take half an hour for an examination. We call it an inspection and let it go at that.

### RADIO BROADCASTS

The fourth series of programs broadcast in dramatic form portraying fictitious but typical incidents of significance in relation to health by the American Medical Association and the National Broadcasting Company, entitled "Your Health," began Wednesday October 19 and will run consecutively for thirty-six weeks. The program is broadcast each Wednesday over the blue network of the National Broadcasting Company at 2 p. m. eastern standard time (1 p. m. central standard time, 12 noon mountain time, 11 a. m. Pacific time).<sup>1</sup>

These programs are broadcast on what is known in radio as a sustaining basis, that is, the time is furnished gratis by the radio network and local stations and no revenue is derived from the programs. Therefore, local stations may or may not take the program, at their discretion, except those stations which are owned and operated by the National Broadcasting Company.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

March 1	Diabetes
March 8	Water Waste and Sanitation
March 15	Guarding Fresh Foods

<sup>1</sup> Owing to program conflicts there will be no Chicago broadcast of the network program. Instead a recording of the program will be broadcast over station WENR at 8 p. m. each Wednesday. This recording will be an identical rebroadcast of the network program broadcast earlier the same day.

### RADIO STATIONS BROADCASTING "YOUR HEALTH"

The following radio stations were reported by the National Broadcasting Company as taking the Your Health program Dec 31, 1938

WTAG	Worcester Mass	WIBM	Jackson Mich
WJZ	New York	WRDO	Augusta Maine
WMAL	Washington D C	WLBZ	Bangor Maine
WXYZ	Detroit	WNBC	New Britain Conn
WCKY	Cincinnati	WMPS	Memphis Tenn
KSO	Des Moines Iowa	WSGN	Birmingham Ala
WREN	Kansas City Mo	WAGA	Atlanta Ga
WABY	Albany N Y	WALA	Mobile Ala
WLEU	Eric Pa	WROL	Knoxville Tenn
WRTD	Richmond Va	WKY	Oklahoma City
WFEA	Manchester N H	KTBS	Shreveport La
WORK	York Pa	KTOK	Oklahoma City
WGAL	Lancaster Pa	KAYZ	Houston Texas
WJAR	Norfolk Va	KGBX	Springfield Mo
WCOL	Columbus Ohio	KFDM	Beaumont Texas
WGI	Fort Wayne Ind	KRIS	Corpus Christi Texas
WOOD	Grand Rapids Mich	KFYR	Bismarck N D
WGBF	Evansville Ind	KUTA	Salt Lake City
WEBC	Duluth Superior	KSEI	Pocatello Idaho
WPTF	Raleigh N C	KGO	San Francisco
WSOC	Charlotte N C	KECA	Los Angeles
WFBC	Greenville S C	KEN	Portland Ore
WWNC	Asheville N C	KJR	Seattle
WIS	Columbia S C	KGA	Spokane
WCSC	Charleston S C	KFBK	Sacramento Calif
WJAX	Jacksonville Fla	KWG	Stockton Calif
WJIA	Tampa Fla	KMJ	Fresno Calif
WEII	Battle Creek Mich	KERN	Bakersfield Calif
WJIM	Lansing Mich	KFSD	San Diego Calif
WJDT	Flint Mich	CFCF	Montreal Que

### THE ST LOUIS SESSION

#### Annual Tournament of the American Medical Golfing Association

The twenty-fifth annual tournament of the American Medical Golfing Association will be held at the Norwood Hills Country Club Monday May 15. Since there are from 250 to 300 contestants and many of the trophies are for thirty-six holes, which must be played on the Monday designated, the association is fortunate to have available two beautiful golf courses at this club. Following the tournament a dinner will be held at the club. There will be nine major events with nine trophies. There are also more than forty prizes to be awarded for various classes. These prizes include golf bags, golf clubs, traveling sets, golf jackets, cocktail sets, doctors' bags and other desirable articles. The president of the association is Dr. E. S. Edgerton, 106 North Main Street, Wichita Kan, and the executive secretary Bill Burns, 2020 Olds Tower, Lansing, Mich.

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

**Change in Status**—H. R. 3537 has been favorably reported to the House, proposing to extend the facilities of the United States Public Health Service to active officers of the Foreign Service of the United States.

**Bills Introduced**—S. 1218, introduced by Senator Sheppard, Texas, and H. R. 4035, introduced by Representative Beckworth, Texas, propose to amend the Social Security Act by adding a new title whereunder to aid the states to provide money payments to needy individuals who are 18 years or more of age and are permanently incapable of self support by reason of a physical disability or defect, not mental. S. 1416 introduced (by request) by Senator Ashurst, Arizona, proposes to make the provisions of the United States Employees Compensation Act applicable to all civil officers of the United States. S. 1428, introduced by Senator Andrews, Florida, proposes to grant service pensions to male contract nurses of the Spanish-American War. S. 1460, introduced by Senator Sheppard, Texas, contemplates that the retired personnel of the Army, Navy, Marine Corps, Coast Guard and Fleet Naval and Fleet Marine Corps reservists requiring hospitalization shall be entitled to enter any Army or Navy hospital on their own personal request, under the same conditions as are now or which hereafter may be, fixed for the active service. Applicants residing within an Army or Navy hospital area, who

require medical attention and who are unable, because of physical disability, to journey to such Army or Navy hospital, are to be accorded outpatient treatment on parity with active service personnel residing within the same hospital area. S. 1461, introduced by Senator Sheppard, Texas, proposes that hereafter the retired enlisted personnel of the Army, Navy, Marine Corps and Coast Guard, when hospitalized or domiciled in any Army or Navy hospital or United States Naval or United States Soldiers' Home, shall be extended such treatment or domiciliary care without cost. S. 1464, introduced by Senator Pittman, Nevada, proposes to extend the facilities of the United States Public Health Service to active officers of the Foreign Service of the United States. H. R. 3602, introduced by Representative Youngdahl, Minnesota, proposes to authorize an appropriation of \$650,000 to construct a United States Veterans Administration domiciliary unit to provide 700 beds at Fort Snelling, Minnesota. H. R. 4091, introduced by Representative Risk, Rhode Island, proposes to authorize an appropriation of \$1,000,000 to construct a veterans' neuropsychiatric hospital and domiciliary facility in Rhode Island with a capacity of at least 400 beds. H. R. 4170, introduced by Representative Mundt, South Dakota, proposes to enact a Navigable Waters Antipollution Act. H. R. 4188 introduced by Representative McCormack, Massachusetts, proposes to authorize an appropriation of \$2,000,000 to construct a veterans' hospital in or near Boston with a capacity of 300 beds.

## STATE MEDICAL LEGISLATION

## Alabama

*Bill Introduced*—H 161 proposes to require each applicant for a marriage license to present a certificate from a licensed physician that the applicant has been examined for venereal disease and, in the opinion of the physician, is either not infected with venereal disease or, if infected with syphilis, is not in a stage of that disease which is communicable. The examination by the physician is to include a physical examination, an approved laboratory test for syphilis and, when indicated, a microscopic test for gonorrhea.

## Arkansas

*Bills Introduced*—H 423 proposes to enact a workmen's compensation law (1) to require employers to pay stated compensation to workmen suffering "accidental injury or death arising out of and in the course of employment, and such occupational disease or occupational infection as arises naturally out of such employment or as naturally or unavoidably results from such accidental injury" and (2) to provide to injured workmen "such medical, surgical or other attendance or treatment, nurse and hospital service, medicine, crutches, and apparatus as may be necessary during sixty days after the injury or for such time in excess thereof as in the judgment of the [Workmen's Compensation] Commission may be required." Apparently the injured workman is to be entitled to select his own physician only in an emergency or if an employer fails or neglects to provide one. H 434 proposes that all actions for malpractice against physicians, dentists and hospitals must be commenced within three years after the accrual of the cause of action. The bill also proposes that a cause of action shall not be deemed to have accrued until the date it is discovered by the patient. S 219, to amend the law providing that no licensed physician shall be compelled to disclose in a civil action any information which he acquired from his patient while attending in a professional capacity, proposes to give a similar privilege to trained nurses.

## California

*Bills Introduced*—S 548 proposes so to amend the Insurance Code as to permit the organization of corporations to operate so called nonprofit health and hospital service plans whereby there may be furnished by those corporations to their subscribers (1) medical care through licensed physicians employed by the corporation, (2) hospitalization, (3) nursing care, (4) dental care (5) and drugs and medicines. S 696 proposes to authorize county boards of education to require school teachers to present certificates from physicians that they have submitted to physical examinations within three years last past and have been found free from tuberculosis. A 1018, to amend the State Food and Drug Act, proposes, among other things (1) to redefine the term "drug" so as to include specifically "all chemicals or substances of whatsoever nature in the treatment of obesity due to whatever cause" and (2) to provide that the standard of purity of drugs shall be that of the United States Pharmacopeia and National Formulary and such further standards of strength, quality or purity as the state board of health may make relating to drugs not in the United States Pharmacopeia or in the National Formulary, and the regulations and definitions adopted for the enforcement of the federal Food and Drugs Act of 1906. A 1019 proposes to make the sale dispensing administering or prescribing of diphenylamine for any purpose a felony. A 1131, A 1147 and A 1177 propose to enact a new law to regulate the sale and distribution of drugs, cosmetics and therapeutic devices. A 1147 and A 1177 propose to regulate also the sale and distribution of food. A 1515, to amend the workmen's compensation act, proposes (1) to give an injured employee the right to select a consulting physician, at the expense of the employer, if the employee is dissatisfied with the medical treatment being received from the physicians retained by the employer or insurance carrier, and (2) to provide that no injured workman shall be required to submit to an examination by an independent expert medical examiner selected by the industrial commission. S 517 S 1208 and S 1215 propose to enact a so called "Consumers Protection Act to regulate the sale distribution and advertising of food, drugs, cosmetics and health devices

S 524 proposes to authorize the director of institutions, with the approval of the State Board of Control, to provide an institutional unit or units for the custodial care and treatment of defective or psychopathic delinquents of both sexes. S 551 proposes to enact a compulsory health insurance act whose so called benefits are to be available to all employees in the state and to such other persons as voluntarily elect to come under the act. The benefits are to consist of all forms of medical, dental, hospital and nursing services, cash payments in the event of disability, and certain cash maternity benefits. These benefits are to be paid for from a payroll tax amounting to 6 per cent of wages paid. S 1128 and A 2172 propose to establish a system of compulsory health insurance applicable to all persons now subject to unemployment insurance. The bill proposes to make available to such individual all forms of medical, dental and hospital services which will be paid for by means of an additional payroll tax. The bill also proposes to permit any other person to elect to come under the act if his annual income is not more than \$3,000. A 1203 proposes to enact an independent naturopathic practice act and to create a so-called "self-sustaining board of naturopathic examiners" to examine and license persons desiring to practice naturopathy. A 1505, to amend the Business and Professions Code, proposes that "All advertising of medical business or the actual practicing of any system or mode of treating the sick or afflicted, which is intended or has a tendency to deceive the public or impose upon credulous or ignorant persons and so be harmful or injurious to public morals or safety constitutes unprofessional conduct within the meaning of this chapter." A 1574 proposes to make it a felony for any person to sell, dispense, administer or prescribe dinitrophenol for any purpose. S 817 proposes to restrict the retail sale and distribution of "any registered, trade-marked or copyrighted preparation or compound registered in the United States patent office" containing barbitol to sale or distribution on the prescription of a licensed physician, dentist or veterinarian. The present law imposes such a restriction on the sale of such a registered, trade-marked, copyrighted preparation only when it contains more than forty grains to the avoirdupois or fluid ounce. S 990 proposes to create the dental corporation of California, which is to consist of all licensed dentists and licensed dental hygienists in the state. The corporation is to be governed by a State Dental Board, whose members are to be selected eventually by members of the corporation. The present members of the Board of State Dental Examiners are to constitute the first State Dental Board, but as their terms expire they are to be replaced by persons selected by the corporation. The State Dental Board is to exercise all the rights and assume all the duties now in the Board of Dental Examiners. The bill also proposes to repeal the existing laws relating to the practice of dentistry and to enact an entirely new dental practice act. This bill, so far as it will integrate the dental profession is quite similar in theory and set up to so called bar integration acts in force now in a number of states. S 1183 proposes to regulate the use of x-rays and x-ray appliances in connection with the examination of the jaws, teeth, alveolar process, gums, and the immediate adjacent structures of living human beings, as an aid to the diagnosis and treatment of diseases and lesions pertaining thereto. The bill proposes to create a dental x-ray qualifying committee to determine the qualification of applicants for permits authorized by the bill and to report the qualifications to the Board of Dental Examiners, which on the recommendation of the committee will issue such permits to qualified applicants. Two permits are proposed by the bill: first an unlimited permit, the holder of which is to be called a dental roentgenologist and is to be authorized to diagnose and treat the diseases and lesions of the jaws, teeth, alveolar process, gums and immediate adjacent tissues by means of x-rays or radiographs and to own, possess, or operate x-ray devices or x-ray laboratories, second a limited permit the holder of which is to be called a dental radiographer and is to be authorized to own, possess or operate a dental x-ray laboratory and to render technical descriptions of the shadows visible in roentgenograms to those licensed by law to diagnose ailments and treat the sick. The bill specifically provides that it is not to be construed to prohibit the ownership, possession or operation of x-ray devices

used for the lawful diagnosis and lawful treatment of persons by licensed physicians, dentists, osteopaths, drugless practitioners or chiropractors A 1307 proposes stated state and county aid to persons convalescing from tuberculosis A person is to be deemed convalescing until he is able to return to the regular employment in which he was engaged prior to contracting tuberculosis A 1712, to amend the law authorizing the organization of corporations to operate nonprofit hospital service plans, proposes in effect to permit such corporations to enter into contracts covering the "indemnification of the beneficiary or subscriber for the costs and expense of professional medical service rendered in connection with hospitalization" A 1796 proposes to prohibit the manufacture, advertising, sale or transportation of adulterated, mislabeled or misbranded cosmetics and to regulate the traffic in cosmetics and complexion soaps A 1874 proposes a system under the supervision of the State Department of Public Health, for providing medical care, including medical, dental, nursing and hospital care and the supplying of pharmaceutical and therapeutic appliances to needy persons, the cost of which is to be apportioned between the state and the counties The bill specifically provides that, subject to the rules and regulations adopted by the department, "medical care shall be provided to any resident of the State who has not sufficient income

to provide himself and his dependents with proper medical, dental, nursing, hospital, pharmaceutical, and therapeutic appliance care, without depriving himself or his dependents of necessary food, clothing, shelter, and similar necessities of life" S 657 proposes to establish a health and safety code, which contains provisions relating to, among other things, (1) the duties and rights of the State Department of Health and local health departments and officers, (2) the regulation of clinics and dispensaries and maternity hospitals, (3) the quarantine laws of the state, (4) the maintenance of tuberculosis hospitals by governmental subdivisions, (5) sanitation and sanitary districts, (6) dead bodies, their burial, removal and disinterment, including the disposal of unclaimed dead bodies, (7) cemeteries, (8) vital statistics, and (9) the regulation of the possession and distribution of narcotic drugs

#### Connecticut

*Bills Introduced*—S 168 proposes to enact a separate practice act for practitioners of physical therapy, physical culture and massage, and to create a board of examiners to examine and license persons desiring to practice in the fields indicated Apparently the maximum educational qualification to be required of applicants for such a license is graduation from a college or school giving a course in physical therapy, physical culture or massage after pursuing courses for at least two years of eight months each S 320 proposes to authorize the judges of the superior courts to appoint in each congressional district a medical consultant to the compensation commission to investigate and determine, when directed by the compensation commissioner, the pertinent facts pertaining to the physical and/or mental status and condition of claimants for workmen's compensation H 294 proposes to require every physician attending a pregnant woman to take or cause to be taken a sample of her blood at the time of first examination and to submit that sample to an approved laboratory for a standard serologic test for syphilis Every other person permitted by law to attend pregnant women but not permitted to take blood tests must cause a sample of blood to be taken by a duly licensed physician and submitted to an approved laboratory H 857 proposes to authorize the state medical society and the county medical societies in Fairfield, Hartford, Litchfield, Middlesex, New Haven, New London, Holland and Windham counties, jointly or severally, to incorporate for the purpose of operating a medical service corporation The bill proposes to define a medical service corporation as "a non profit sharing Corporation without capital stock organized under the laws of the State for the purpose of establishing, maintaining, and operating a plan, whereby medical service may be provided, at the expense of said corporation by members of the medical association or associations to subscribers under contract entitling such subscriber to certain medical services" S 538 proposes to authorize the trustees of the Connecticut State Hospital to establish a school for the training of psychiatric attendants S 875 proposes to require

the State Commissioner of Welfare to provide for the medical care of recipients of old age assistance S 921 proposes to authorize the judges of the superior court to appoint for each county a coroner and a deputy coroner who must be attorneys at law S 931, to amend the osteopathic practice act, proposes that any person who is a graduate of a college of osteopathy the curriculum of which has the written approval of the National Society of Osteopathy of the United States on passing an examination on the subjects taught in the college and prescribed by the Board of Osteopathic Registration and Examination is to be entitled to practice in all subjects contained in the examination H 1495 proposes to require the governor to appoint a commission of five to study and investigate the subject of health insurance S 780 proposes to prohibit the sale of any arch support, braces or other foot or leg appliances except on the prescription of an orthopedic surgeon or of the state health commissioner H 1013, to amend the naturopathic practice act, proposes to permit naturopathic licentiates to prescribe or administer dehydrated foods and concentrations properly labeled as such, tissue salts normally found in the human body and non poisonous herbs H 593, to amend the law prohibiting the employment in a bakeshop of any person "affected with pulmonary tuberculosis or a scrofulous or venereal disease or with a communicable skin affection," proposes to impose a similar restriction on the employment of persons with diphtheria, dysentery, paratyphoid fever, poliomyelitis, scarlet fever, smallpox, streptococcus sore throat or typhoid fever except on the written authorization of the health officer

#### Delaware

*Bills Introduced*—H 46 proposes to establish, under the direction and control of the State Board for Vocational Education, a division for the vocational rehabilitation and placement in remunerative employment of persons whose capacity to earn a living is or has been destroyed or impaired S 26, to amend the medical practice act, proposes, among other things, to authorize the refusal or the suspension or revocation of a license to practice medicine, in addition to the causes now stated in the law, for "chronic drug addiction" or for "violation of rules and regulations adopted [by the Medical Council] for the supervision and control of professional conduct"

*Bill Passed*—H 54, to amend the provisions of the medical practice act relating to osteopathy, was introduced February 6 and passed the house February 9 The bill proposes that osteopathic applicants (1) be examined by the medical council and an osteopath designated by the Delaware State Osteopathic Society, (2) be examined in the subjects now enumerated in the law and, in addition, in "Therapeutics", (3) must present evidence, in addition to the evidence of qualifications now required by law, that they have completed two years of acceptable college work, including English, physics, chemistry and biology, and have served as interns for one year in hospitals recognized by the American Osteopathic Association or by the American Medical Association

#### Illinois

*Bills Introduced*—S 52 proposes to grant to hospitals, physicians and dentists treating persons injured through the negligence of others liens on all claims, rights of action, judgments and compromises accruing to the injured persons because of their injuries H 110 proposes to prohibit the operation of a private hospital, nursing home, resting home or sanatorium unless licensed by the Department of Registration and Education and to impose an annual license fee of \$25 on hospitals so licensed

#### Indiana

*Bills Introduced*—H 114 proposes to require every physician within twenty-four hours after first learning of the existence of an occupational disease to report the facts to the State Board of Health H 225 proposes to increase to 180 days from ninety days the period after an industrial injury during which an employer must furnish, free of charge, to an injured workman necessary medical and hospital services H 276 proposes to enact a separate drugless practitioner's practice act and to create a State Board of Drugless Examiners for drugless practitioners to examine and license applicants for such licenses A license

issued by this board is to designate the school or college of healing to which the practitioner belongs and is to entitle the holder to practice said designated branch of drugless healing and to use natural, physical, manipulative, nutritional, electrical, mechanical and other drugless measures in the treatment of disease but is not to authorize the licentiate to practice operative surgery or obstetrics or to administer or prescribe any drug. The bill proposes to prohibit any licentiate from using the term "doctor" or "physician" unless he indicates that he does not use drugs or surgery in the treatment of disease.

#### Iowa

*Bill Introduced*—H 307 proposes to authorize the organization of nonprofit corporations to contract to furnish hospital service to subscribers and to contract with hospitals to furnish the hospital service to its subscribers when needed. At least a majority of the directors of such corporations must be at all times administrators, or directors, trustees or members of the clinical staff of hospitals which have contracted or may contract with such corporations to render to their subscribers hospital service.

#### Kansas

*Bill Introduced*—H 259, to amend the chiropractic practice act, proposes to require chiropractors to renew their licenses annually and to condition that renewal on the furnishing of satisfactory evidence to the board of chiropractic examiners that they have attended at least two days of the annual educational program as conducted by the Kansas chiropractors association or a postgraduate course equivalent thereto in the year preceding application for renewal.

#### Maine

*Bill Introduced*—H 1195 proposes, as a condition precedent to the issuance of a license to marry, that both parties to the proposed marriage present physicians' certificates that they have been given a standard test, as required by the State Department of Health and Welfare for the discovery of syphilis and gonorrhea, made on a day not more than twenty days prior to the date of application and that, in the opinion of the physicians, neither party is infected with syphilis or gonorrhea or, if so infected, is in a stage whereby the disease may become communicable.

#### Maryland

*Bills Introduced*—H 103 proposes to require a physician attending a pregnant woman to take or cause to be taken a sample of her blood at the time of first examination and to submit that sample to an approved laboratory for a standard serologic test for syphilis. Every other person permitted by law to attend pregnant women but not permitted by law to take blood tests is to cause a sample of the blood of such pregnant woman to be taken by a duly licensed physician and submitted to an approved laboratory. S 85 proposes to enact a separate naturopathic practice act and to create a board of naturopathic examiners to examine and license persons to practice naturopathy.

#### Michigan

*Bills Introduced*—S 93 proposes that, whenever any person charged with an offense punishable by life imprisonment has been bound over to the appropriate court, the clerk of that court is to notify the State Hospital Commission which is to cause the person to be examined by psychiatrists to determine the existence of any mental disease or defect which would affect his criminal responsibility. H 140 proposes to require a physician making a diagnosis of pregnancy to make both a clinical and a laboratory test of the patient for venereal disease and if the test shows a venereal disease, to institute proper treatment. The cost of all tests and treatments, if the patient is unable to pay for them, is to be paid from the appropriation to the Michigan Department of Health. H 145 proposes to authorize the organization of corporations to operate nonprofit hospital service plans whereby hospital service may be provided by any hospital or group of hospitals with which such corporations have contracts to such of the public as become subscribers to the plans entitling each subscriber to stated hospital care.

#### Missouri

*Bill Introduced*—H 182 proposes to prohibit the sale, prescription or fitting of any hearing aid device except on the written prescription of a licensed physician.

#### Montana

*Bills Introduced*—S 51, to amend the chiropody practice act, proposes, among other things, (1) that "Chiropody (sometimes called Podiatry) shall mean the diagnosis, medical, surgical, mechanical, manipulative and electrical treatment of ailments of the human foot", and (2) to provide that the State Board of Chiropody Medical Examiners consist of the secretary of the State Board of Medical Examiners, one physician selected by the Board of Medical Examiners from its membership, and three chiropodists appointed by the governor from a list of names submitted by the Montana Association of Chiropodists. H 180, to supplement the workmen's compensation act, proposes to provide compensation and medical and hospital care for silicosis contracted by a worker in any occupation wherein there is an exposure to silica dust. The bill proposes to define silicosis as "a fibrotic condition of the lungs caused by inhalation of silica dust sufficient to render the workman incapable of following his regular occupation." S 28 proposes to require local and county health officers to make complete physical examinations of public school children within sixty days after their first enrolment in school. If it is found that a child is suffering from a contagious or infectious disease, the health officer must exclude the child from school and such child may not be readmitted until the officer certifies that the contagious or infectious condition has been removed. S 83 proposes to make the possession, sale or distribution of peyote (pellote) or anhalonium unlawful. The bill specifically provides however that it shall not apply to "transporting, possessing or using said peyote for religious sacramental purposes within the boundaries of an Indian reservation." H 177 proposes to create the office of medical referee for each county in the state. The medical referee is to be a licensed physician, whose duties are to determine, with the advice of the county attorney, as to whether it is necessary for the county coroner to hold an inquest on the remains of any deceased person. Apparently, only on the finding of the medical referee as to the necessity of an inquest may a county coroner proceed with an inquest. H 101 proposes to enact a food, drug and cosmetic act and to regulate the manufacture, sale, distribution and advertising of foods, drugs, cosmetics and devices.

#### Nebraska

*Bills Introduced*—Bill 181, to amend the provisions of law setting forth the educational qualifications required of applicants for licenses to practice osteopathy, proposes, in addition to existing educational qualifications, that an applicant beginning the study of osteopathy after Dec 31, 1940, must present proof of having completed, prior to his study of osteopathy, two years' study in a college or university. Bill 444, to amend the laws relating to the practice of chiropractic, proposes among other things (1) to define chiropractic as "the science of locating and removing interference with the transmission of nerve energy" and (2) to permit licentiates to practice chiropractic as taught in an accredited school or college of chiropractic [and] to use light, heat, air, water, food, and exercise, as factors of health, and of chiropractic in the treatment of disease and the right to use electrotherapy to facilitate chiro adjustment."

#### Nevada

*Bill Passed*—A 41 passed the assembly February 6, proposing to repeal the law approved March 22, 1921, entitled "An act to prohibit advertisements or manufacture and sale of cures or medicine relating to venereal disease and certain sexual disorders."

#### New Jersey

*Bills Introduced*—A 48 proposes to require the medical inspector in every school district in the state to make eye and ear tests of public school pupils at least once annually. The bill also proposes to authorize the board of education of each school district to appoint specialists for eyes and ears and to fix their compensation, the specialists to assist the medical



inspector in making the tests required by the bill S 15, to amend the pharmacy practice act, proposes to permit persons other than licensed pharmacists to sell commonly used household and domestic remedies in original unopened packages

### New Mexico

*Bills Introduced*—S 30 proposes to authorize the Department of Public Welfare to enter into a contract with the Holy Cross Sanitarium at Deming to treat state and other governmental employees for the ailments noted. No charge is to be imposed on such employees as are afflicted with tuberculosis, cancer, asthma, bronchitis, rheumatism and skin diseases other than a 25 cent month deduction, which the bill authorizes to be deducted from their salaries. The bill also proposes to authorize the department to obtain an option to purchase Holy Cross Sanitarium within two years at not to exceed \$250,000. S 68 proposes to enact a so-called uniform food, drug and cosmetic act to regulate the sale, distribution and advertising of foods, drugs, cosmetics and therapeutic devices. S 47 proposes to make it unlawful for any child to attend school, or for any teacher to allow a child to attend school, unless the child is immunized against diphtheria. H 102 proposes to direct the Department of Public Health to preserve by proper scientific means such eyes of stillborn infants as it may receive and to distribute them in cases of blindness caused by corneal lesions when in the judgment of an eye specialist attending a particular patient their use would be indicated. The bill proposes to make it the duty of every practicing physician on delivering a still-born child to report, with the consent of the mother, the facts to the department so that no delay may be had in procuring the eyes and preserving them. No such eyes are to be received or accepted except with the full consent of the mother, and its father, if the father is living with the mother, and the department when such consent in writing is obtained may make such examination of the parents and of the child as would determine the feasibility of using such eyes for the purposes indicated above. S 112 proposes to authorize the organization of corporations to operate nonprofit hospital service plans whereby hospital care may be provided by the corporations or by hospitals with whom they have contracted to such of the public as become subscribers to the hospital service plans operated by such corporations. H 123 proposes that, when a person convicted of a crime is found by a jury either to be a habitual drunkard or to have been under the influence of liquor at the time of the commission of the crime of which he is convicted, the trial court, after imposing sentence, may suspend sentence on condition that the defendant take treatment under the supervision of the department of public welfare and that after taking such treatment he does not become intoxicated for five years. The cost of the treatment must be borne by the defendant, if he is financially able to do so, otherwise the necessary expenses will be paid by the state. The bill also provides a procedure whereby any alcoholic who is unable to pay for treatment may be treated at the expense of the state.

### New York

*Bill Introduced*—S 572, to amend the law prohibiting the operation of a motor vehicle without a license to do so, proposes to make it a condition precedent to the issue of such a license that the applicant present a certificate of a licensed physician that the applicant has been examined by him and found to have no physical defect which, in his opinion, would render the applicant unfit to drive a motor vehicle.

### North Carolina

*Bills Introduced*—S 88 proposes to provide a uniform procedure for the suspension or revocation by various North Carolina boards and commissions of licenses to engage in trades, professions and lawful callings. H 258 proposes to forbid the sale of all medicinal preparations, whether proprietary, patented or sold on the prescription of a licensed physician, containing acetanilid or any of the bromides, unless the containers are marked "poison." S 121 proposes, as a condition precedent to the issuance of a license to marry, that each party to the proposed marriage present a physician's certificate executed within seven days from the date of application that by the usual

methods of examination the physician has found no evidence of any venereal disease in the infectious or communicable stage or of tuberculosis. Such certificates must also state that the applicant is not an idiot, an imbecile, a mental defective, of unsound mind or subject to epileptic attacks. S 120 proposes that every woman who becomes pregnant shall have a blood sample taken and submitted to a laboratory approved by the State Board of Health for performing an approved test for syphilis and that any licensed physician shall, on the request of the woman, secure or cause to be secured a sample of her blood and submit it to an approved laboratory for the performance of the test indicated.

### North Dakota

*Bills Introduced*—S 197, to amend the medical practice act, proposes to increase the penalty for practicing medicine without a license or for violating any provision of the medical practice act, by authorizing the imposition of a fine of from \$50 to \$500 and/or imprisonment in the county jail not exceeding one year, or both. Under the present law the fine authorized is from \$50 to \$300 and/or imprisonment from ten to thirty days. The bill also provides that any person convicted for the second time for violating any of the provisions of the medical practice act is to be deemed guilty of a felony. H 287 proposes to enact a separate naturopathic practice act and to create a board of naturopathic examiners to examine and license persons applying for such a license. S 155 and H 350 proposes to repeal existing laws regulating the possession and distribution of narcotic drugs and to enact what appears to be the uniform narcotic drug act.

### Ohio

*Bills Introduced*—H 171 proposes to create a "public health study commission" to study all laws and acts concerning public health, organization of group medical service, compulsory health insurance, cooperation between groups and associations and agencies for the furnishing of medical and hospitalization services, and all other factors concerning and affecting the social problem of the availability of medical care and facilities to the people of the state. This commission is to make a full report of its findings and recommendations to the governor on or before July 1, 1939. H 52 proposes to create a commission to study and investigate the possibilities for the rehabilitation of the visual and the physically handicapped of the state. S 97, to amend the medical practice act, proposes (1) to require an applicant for a license to practice to have a minimum preprofessional education of two years of collegiate work in an approved college of arts and sciences, (2) to permit the State Medical Board to refuse to examine applicants licensed to practice in a foreign country if that country does not extend a like privilege to Ohio licentiates, (3) to require applicants for licenses by reciprocity to possess the minimum educational qualifications required of applicants for licenses after examination, and (4) to provide that fines collected for violations of the medical practice act are to be distributed one half to the board and one half to the county or municipality in which the offenses were committed. S 104 proposes to authorize the organization of corporations not for profit to establish and operate group medical service plans under which such corporations, as intermediaries effect contracts between persons duly licensed to practice medicine and persons, firms or corporations for the furnishing of medical or surgical care, to subscribers for stipulated instalment payments.

### Oregon

*Bills Introduced*—S 311, to amend the workmen's compensation act, proposes, in effect, to permit an injured workman to have his injuries treated at state expense by any person licensed to practice any of the healing arts. H 313, to amend the laws conferring stated powers on the State Board of Health with respect to communicable diseases, proposes that the term "communicable diseases" as used in the act shall include tuberculosis in a communicable stage.

### Pennsylvania

*Bill Introduced*—H 204 proposes to authorize the sexual sterilization of inmates of state institutions who are idiots imbeciles or feebleminded.

## South Dakota

*Bills Introduced*—H 78 proposes to raise the maximum liability of an employer for medical and hospital services rendered an injured workman to \$400 and to extend to twenty weeks the period after an industrial accident during which the employer must provide such services. H 133 proposes to permit any registered pharmacist conducting a pharmacy and having in stock drugs of a value of not less than \$2,000 to sell, on the prescription of a licensed physician, whisky and brandy of the kind and character recognized and defined by the United States Pharmacopeia for medicinal purposes. To avail himself of this right, however, a pharmacist must receive from the Secretary of Agriculture a permit to do so and to pay a fee of \$10 annually. H 92 proposes to enact a so-called "basic science act" which is a basic science act in no reasonable sense of the term. The bill proposes to prohibit the State Medical Examining Board, the Chiropractic Examining Board and the Osteopathic Examining Board from admitting to examination any applicant who has not passed a satisfactory examination in anatomy, physiology, bacteriology, pathology and chemistry. However, instead of such applicants being examined by an impartial board in the subjects enumerated, examinations in those subjects are to be given by the medical, chiropractic or osteopathic boards themselves "to applicants for license in their respective professions."

## Tennessee

*Bill Passed*—H 354 passed the House February 2, proposing extensive amendments to the chiropractic practice act. Among other things it proposes (1) to make eligible for examination for licensure any applicant who is of good moral character, who has a preliminary school education equal to that of a standard accredited high school, and who is a graduate of a school of chiropractic giving adequate courses of anatomy, physiology, symptomatology, spinal analysis, hygiene, sanitation, principles and practice of chiropractic, and requiring actual attendance of three school years of not less than nine months each, or 3600 hours of actual class attendance, (2) to raise the examination fee to \$25 from \$15, (3) to raise to \$50 the fee for issuing a license without examination, and (4) to set out causes for the revocation, suspension or refusal of licenses. A companion bill (S 255) is now pending in the senate.

*Bills Introduced*—H 504, to amend the workmen's compensation act, proposes to increase the liability of an employer for medical aid rendered an injured workman to \$300 from \$100 and for hospital care to \$300 from \$100. S 411 proposes extensive amendments to the existing osteopathic practice act which without doubt will grant to osteopaths now licensed and to be licensed in the future the right to practice medicine and surgery without restriction. Specifically the bill states that a license to practice osteopathy shall entitle the holder thereof "to practice osteopathy in any county in this State, in all its branches, as taught and practiced by the recognized associated colleges of osteopathy, with the right to use such drugs as are necessary in the practice of osteopathy, surgery, and obstetrics, including narcotics, antiseptics, anesthetics, and biologicals. Osteopathic physicians and surgeons licensed hereunder shall have the same general rights as physicians or surgeons of other schools of medicine including the right to register under the Federal Narcotic Act." The bill proposes that after 1944 all applicants for licenses must have "completed two years of college education, of college grade, in a recognized college or university, prior to enrolling in an osteopathic college." As indicative of the scope of osteopathy, applicants are to be subjected to examination in anatomy, chemistry, physiology, pathology, bacteriology, *preventive medicine*, diagnosis, toxicology, *pharmacology*, *therapeutics*, *surgery*, gynecology, obstetrics, *medical jurisprudence*, practice of osteopathic medicine, and such other subjects as the board may require. The bill proposes to permit the board to license without examination applicants (1) duly authorized to practice osteopathy in any other state or (2) holding certificates issued by the National Board of Examiners for Osteopathic Physicians and Surgeons. H 664 and S 499 propose to enact a law to prohibit the manufacture, distribution or advertising of adulterated foods, drugs, cosmetics and devices.

## Texas

*Bills Introduced*—H 246 proposes to designate tuberculosis as a communicable disease and to require every physician to notify in writing the appropriate health officer of every case of any form of tuberculosis which comes under his professional observation. The bill proposes to require the appropriate health officer when he learns that any person afflicted with tuberculosis fails to conduct himself in such a manner as not to expose others to danger of infection to petition the probate court to commit the infected individual to any approved institution established for the care of persons suffering from tuberculosis. H 465, to amend the workmen's compensation act, proposes in effect to permit an injured workman to select, at the expense of the employers' insurance association, a physician of his own choice to treat his industrial injuries. S 101 proposes to appropriate \$150,000 to the State Department of Health to assist in the eradication of venereal diseases in the state.

## Washington

*Bills Introduced*—S 322 proposes to create a "Washington State Chiropractors' Association," which is to operate as an agency of the state and is to be composed of all persons licensed to practice chiropractic in the state. The association apparently is to have the power to fix the qualifications requirements and procedure for admission to the practice of chiropractic and to establish and enforce rules of professional conduct for its members. H 261 proposes to repeal the present laws relating to the possession, distribution and sale of narcotic drugs and to enact what appears to be the uniform narcotic drug act. H 280 proposes that "No person, firm, association or corporation shall either directly or indirectly solicit contract, collect, receive or transmit compensation for services in the exercise of any of the healing arts, nor conspire, agree or attempt to do any of said acts, except for and on behalf of a principal or principals all of whom are duly licensed under the laws of this state to perform such services." H 302 proposes in effect to permit any licensed practitioner of the healing art to render the medical aid called for by the workmen's compensation act.

## West Virginia

*Bill Introduced*—S 21 proposes to enact a so-called uniform food, drug and cosmetic act to prohibit the manufacture, distribution or advertising of adulterated or misbranded drugs, foods, cosmetics and devices.

## Wisconsin

*Bill Introduced*—A 227 to amend the basic science act, proposes in effect that chiropractic applicants submitting to the basic science examination shall be examined by chiropractors designated by the State Board of Examiners of Chiropractic.

## Wyoming

*Bills Introduced*—H 54 proposes to authorize the State Board of Charities and Reform to establish in or near the State Park at Thermopolis an orthopedic hospital for the prevention, treatment and care of infantile paralysis and other like diseases. H 106, to amend the optometry practice act, proposes, among other things, to define optometry as "the employment of any means other than the use of drugs for the measurement of the powers or range of human vision or the determination of the accommodative and refractive status of the human eye or the scope of its functions in general or the adaptation of lenses or frames for the aid thereof." H 125, to amend the chiropody practice act, proposes (1) to amend the definition of minor surgery on the feet, which chiropodists are permitted to perform, so that the term shall mean the surgical treatments of the ailments of the human foot and leg, except amputation of the foot or leg or the use of anesthetics other than local. (2) to require applicants in addition to the educational qualifications now required to have had two years in a recognized college of liberal arts and sciences. (3) to provide that "Any person who shall use objectionable display, advertising in any manner being detrimental to the dignity of the profession, and therefore unprofessional shall be punished by the provisions of this Act" and (4) apparently to make the term "podiatrist" synonymous with chiropodist.

## MEDICAL ECONOMIC ABSTRACTS

THE CHANGING ASPECT OF AGE  
AT DEATH

A somewhat novel arrangement of mortality rates is given in the accompanying table, which was prepared by William C. Welling and published in the *Connecticut Health Bulletin* (52:291 [Nov.] 1938). This shows in a striking manner just how and within what age limits the death rate has been reduced

*Mortality by Age Groups, 1890-1937*  
(Percentage of total deaths in italics)

Ages	1890	1900	1910	1920	1930	1937
Under 1	2 540 <i>18.6</i>	3 521 <i>21.6</i>	3 472 <i>19.9</i>	3 063 <i>16.2</i>	1 529 <i>9.1</i>	907 <i>5.2</i>
1 5	1 162 <i>8.6</i>	1 294 <i>8.0</i>	1 234 <i>7.1</i>	1 349 <i>7.1</i>	431 <i>2.6</i>	213 <i>1.2</i>
5 10	414 <i>3.0</i>	393 <i>2.4</i>	357 <i>2.0</i>	423 <i>2.2</i>	209 <i>1.2</i>	150 <i>0.8</i>
10 20	645 <i>4.7</i>	696 <i>4.3</i>	576 <i>3.3</i>	622 <i>3.3</i>	467 <i>2.8</i>	329 <i>1.9</i>
20 30	1 249 <i>9.2</i>	1 172 <i>7.2</i>	1 037 <i>5.9</i>	1 298 <i>6.9</i>	763 <i>4.5</i>	565 <i>3.2</i>
30 40	1 104 <i>8.2</i>	1 247 <i>7.7</i>	1 447 <i>8.3</i>	1 608 <i>8.5</i>	1 019 <i>6.0</i>	807 <i>4.6</i>
40 50	1 053 <i>7.7</i>	1 214 <i>7.5</i>	1 474 <i>8.4</i>	1 580 <i>8.4</i>	1 615 <i>9.6</i>	1 645 <i>9.4</i>
50 60	1 163 <i>8.5</i>	1 497 <i>9.2</i>	1 709 <i>9.8</i>	2 107 <i>11.0</i>	2 442 <i>14.5</i>	2 670 <i>15.2</i>
60 70	1 528 <i>11.2</i>	1 805 <i>11.0</i>	2 243 <i>12.9</i>	2 574 <i>13.6</i>	3 311 <i>19.6</i>	3 951 <i>22.5</i>
70 80	1 532 <i>11.2</i>	1 954 <i>12.0</i>	2 388 <i>13.7</i>	2 602 <i>13.8</i>	3 189 <i>18.9</i>	3 873 <i>22.0</i>
80 90	988 <i>7.3</i>	1,267 <i>7.8</i>	1 310 <i>7.5</i>	1 450 <i>7.7</i>	1 612 <i>9.5</i>	2 108 <i>12.0</i>
90 100	247 <i>1.8</i>	213 <i>1.3</i>	207 <i>1.2</i>	243 <i>1.3</i>	295 <i>1.7</i>	345 <i>2.0</i>
Unknown age	40	95	46	6	90	11
Total deaths	13 665	16 368	17 500	18 925	16 972	17 574
Av. age at death	38.2	38.1	40.7	42.4	52.8	58.6

It is somewhat significant that some of these rates of change seem to be accelerating during the last decade. Up to and including 1920 the entry of greatest numerical value was the infant mortality. By 1930 this had abruptly changed to the age group 60-70. In 1890 and 1900 the median death rate fell somewhere within the age group 30-40. In 1910 and 1920 the median age at death was between 40-50 years and in 1937 this had increased to the age group 60-70.

MORBIDITY AND PHYSICIANS' INCOMES  
UNDER GERMAN SICKNESS  
INSURANCE

The perennial conflict over the payment of physicians in Germany has brought out some additional and illuminating statistics concerning morbidity among the insured. J. Seifert in an article on "Morbidity, Wage Movements and Income of the Insurance Physicians in the Legal Insurance Societies," which appears in the *Deutsches Arzteblatt* (68:893 [Dec. 24] 1938), replies to charges raised by some of the administrators of sickness insurance that the physicians are receiving increased salaries.

He points out, in the first place, that one of the elements which enter into the calculation of the physician's compensation is the number of sicknesses annually. These have increased steadily and at a quite rapid rate in recent years, so that the work which the physician is required to do has become such that "the practicing physician knows no regular hours of work, day and night and hour after hour he must be ready to serve. He is generally overloaded with work." The increase in morbidity has brought about a condition in which the rate of payment for insurance services is lower from year to year. This is in part due to the demand for more extensive services, for

which no additional payment is provided. The demand for x-ray examinations and other costly and time-consuming services has greatly increased. At the same time the "insurance societies find it impossible to pay any higher rates to physicians because no resources for that purpose are available. It is useless to make demands on the societies to raise the rate of payment, since the societies cannot meet any such demand. It is a very exceptional situation when the societies can raise the dues of their members." This condition is one that is bound to arise in any system of voluntary or compulsory insurance in which premiums are paid in cash and benefits in services.

The situation has been rendered exceptionally critical in Germany by the recent rapid increase in the morbidity of the insured. This increase has been fairly constant for fifty years and the rate of advance has risen since 1933. In 1933 the average number of sicknesses per person insured was 2.32, in 1936 this was 2.79, an increase of 20.3 per cent. (This figure applies to a complete, individual illness, which may require many treatments.) The Committee on the Costs of Medical Care found that the corresponding figure in the United States was "0.84 illnesses per person."<sup>1</sup> In other words, the morbidity among persons able to work and therefore covered by insurance in Germany was more than three times as high as for the entire population in the United States, including infants, the aged and the chronically disabled.

The author of the article from which this material was taken is sharply aware of the use that might be made of these figures by critics of the present totalitarian state in Germany, and he seeks to explain it on the ground that the removal of all restrictions on access to services of insurance physicians has caused the greater use of medical services. He seemingly overlooks the argument which might, even for his purposes, have been equally effective and which has been previously mentioned—that this increase has been cumulative for half a century.

In spite of the increase in illnesses which are treated in the home, the author still complains that the costs of hospitalization "have been rising for many years, for which the insurance physician is mainly responsible, since he sends more and more of the insured and their dependents to the hospital in order not to increase the number of services delivered in the home and thereby reduce the rate of payment for such services."

## HEALTH PERSONNEL IN GERMANY

The results of an annual enumeration of all persons concerned in the care and treatment of disease in Germany are given in the *Deutsches Arzteblatt* (68:903 [Dec. 24] 1938). The following table summarizes the results of this enumeration.

Occupation	Number of Persons			
	1934	1935	1936	1937
Licensed physicians*	47,210	47,419	47,844	48,549
Approved dentists	11,247	12,088	13,037	13,966
Licensed druggists	10,845	10,981	11,461	11,549
Pharmaceutical assistants	5,269	4,791	4,591	4,641
Midwives	25,911	25,737	25,765	25,143
Dental mechanics (dentisten)	19,998	20,009	20,659	21,000
Physical therapists and bath attendants	11,410	11,922	12,140	12,687
Nurses	120,216	126,068	131,249	131,407
Nurses for infants and small children	5,747	6,569	9,302	9,781
Private duty nurses	1,197	1,240	1,333	1,517
Sanatoriums	4,972	5,581	5,700	5,847
Unlicensed healers	14,266	14,023	12,936	12,101
Total	278,353	286,948	296,166	298,540
Male	129,019	130,520	132,322	133,710
Female	149,334	156,428	163,844	164,830

\* This includes only practicing physicians and excludes those who have retired, are engaged in research, hold official positions or are in military service. The total number of physicians included within the official medical organization (Reichsarztzammer) is 50,443.

<sup>1</sup> The Incidence of Illness and the Receipt and Costs of Medical Care Among Representative Families. Publication 26. Committee on the Costs of Medical Care. Chicago: University of Chicago Press, 1933. pages 48 and 79.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST SUCH AS RELATE TO SOCIETY ACTIVITIES NEW HOSPITALS EDUCATION AND PUBLIC HEALTH)

### CALIFORNIA

**Physicians' Art Exhibit**—The San Francisco branch of the American Physicians' Art Association held an art exhibit in the club rooms of the San Francisco Medical Society, Washington and Laguna streets, February 13-17. On the opening night there was a Valentine dinner dance given by the woman's auxiliary at the county medical building.

**Professor Van Dyke to Retire**—Dr Edwin C. Van Dyke, since 1913 member of the faculty of the College of Agriculture of the University of California, Berkeley, will retire at the end of the present college year. He will reach the retirement age April 7. Dr Van Dyke graduated at the Cooper Medical College, now Stanford University School of Medicine, in 1895. He engaged in the private practice of medicine until 1913, when he joined the California faculty as instructor in entomology. He has been professor since 1927. He is a former president of the Pacific Coast Entomological Society and is the honorary curator of the California Academy of Science.

**Society News**—The Los Angeles County Medical Association devoted its meeting February 2 to a discussion of new drugs, the speakers were Drs Barclay E. Noble, Morris H. Nathanson, Clarence W. Olsen, William C. Boeck, Robert W. Lamson, Clinton H. Thienes, Roy E. Thomas and William J. Mitchell Jr.—Dr John Dunlop, Pasadena, among others, discussed "Transcondylar Fractures of the Humerus in Children" before the Los Angeles Surgical Society February 10.—At a meeting of the Pacific Physical Therapy Association January 25 Drs Clinton D. Hubbard, Huntington Park, spoke on "Morbose Effect of Stercorremia" and William W. Worster, San Gabriel, "Advantages of Underwater Treatment in Poliomyelitis."

### DISTRICT OF COLUMBIA

**Personal**—Dr Ross T. McIntire, surgeon general of the U. S. Navy, has been appointed a member of the advisory board of the Society for the Prevention of Asphyxial Death, succeeding Dr Perceval S. Rossiter, recently retired.—Dr Robert B. Hightower, Richmond, Va., has been appointed assistant hygiene director in the public schools of Washington.

**Doctors' Hospital**—Ground was broken for the new \$1,500,000 Doctors' Hospital January 9 by Dr Charles Stanley White, president of the institution. The building will be ten stories high and will provide accommodations for 250 patients. It will connect the two medical buildings, known as the Washington and Columbia Medical Buildings, which have as tenants about 250 physicians and representatives of the allied professions.

**Society News**—Dr James G. Townsend, director of health for the Indian Service, was reelected president of the District Tuberculosis Association recently, and Dr J. Winthrop Peabody, superintendent Tuberculosis Sanatorium was chosen secretary.—Dr Charles F. Geschickter, Baltimore, discussed "Recent Advances in Endocrinology in Relation to Neoplastic Diseases" before a meeting of the medical and dental officers of the navy on duty in the District and vicinity February 6.

### FLORIDA

**Hospital News**—The new Lee Memorial Hospital, Fort Myers, assured by a \$100,000 WPA project will be located in Edison Park, according to the state medical journal.

**Public Health Survey**—The American Public Health Association through its committee on state health studies was to begin a statewide public health survey in Florida January 3. The Commonwealth Fund is supplying the funds. The results of the study will form the basis of a long time program of public health work in the state newspapers reported.

**Society News**—The Duval County Medical Society was addressed in Jacksonville January 3 by Drs Karl B. Hanson, James G. Laverle and Julian E. Gammon on "Fluid Balance" and Carl C. Mendoza, New Technics in Blood Transfusion.—The Suwannee River Medical Association was addressed

in Lake City January 20 by Dr John F. Busey Jr. on the value of electrocardiograms, Dr James F. Pitman presented a case report on complete transposition of viscera. Both speakers are of Lake City.

### GEORGIA

**Dr Newburgh Lectures**—Dr Louis H. Newburgh, professor of clinical investigation and internal medicine, University of Michigan Medical School, Ann Arbor, delivered a series of lectures before the Atlanta Clinical Society February 8-10, on "Methods for Studying Exchange of Water Between the Human Organism and the Environment," "Physiology of Water and Salt Exchange" and "Pathological Shifts in Water and Salts as Exemplified by Quantitative Study of These Conditions in Patients."

**Society News**—At the sixth annual meeting of the Georgia Pediatric Society in Augusta, January 12, Drs Charles Hendee Smith, New York, discussed "The Diet of Infants and Young Children", Alexis F. Hartmann, St. Louis, "Nephritis," and Thomas B. Cooley, Detroit, "Anemias of Infancy." At a joint meeting of the society and the Richmond County Medical Society the same evening Dr Cooley spoke on "The Constitutional Anemias of Childhood", Dr Hartmann, "Some Physiologic Effects of Sulfanilamide," and Dr Smith, "Pneumonia."—Dr Charles M. Mulhern, Augusta, addressed the Dugas Journal Club in Augusta January 16 on "Analysis of 500 Incomplete Abortions: Radical versus Conservative Treatment," and Dr Edward S. Cardwell Jr., Augusta, "Syphilis of the Kidney."

### IDAHO

**Changes in Health Officers**—Dr Max B. McQueen, Pocatello, has been appointed head of the health district which includes Nez Perce, Latah and Clearwater counties with headquarters at Lewiston. He succeeds Dr Marion W. Caskey, who will enter private practice. Dr Herbert L. Newcombe, Boston, has been appointed in charge of the health unit in Kootenai to succeed Dr Lester C. Krotcher, Boise, who has been named to a position with the state department of health. Dr George H. Bischoff, Boise, has been given a temporary appointment as head of the Bannock County health unit, succeeding Dr Glen T. Smith, who resigned to accept a hospital residency in Chicago, according to *Northwest Medicine*.

### ILLINOIS

**Prevalence of Tularemia**—Because of the increased prevalence of tularemia in Illinois during the past season, the state conservation department's plan to move 5,000 rabbits from the southern counties to farm lands and marshes in the northern part has been abandoned. More than thirty-eight deaths from tularemia were reported in the state during the past year and 489 cases of the disease have been recorded since Jan. 1, 1938, newspapers announced January 19.

**Activities for Crippled Children**—There were 1,744 patients seen in the sixty clinics for crippled children held in thirty different sites in Illinois in the fiscal year 1937-1938, according to a recent report of the division for handicapped children, state department of public welfare. Of 783 patients recommended for hospital care, 45.6 per cent were hospitalized during the fiscal year, while the majority of the group had been hospitalized by Dec. 1, 1938. A program of consultation on poliomyelitis was initiated and was in operation during the summer of 1938 in the entire state except within the city limits of Chicago, where other agencies covered the field. All the sporadic cases of poliomyelitis of 1938 that needed hospital care were sent to hospitals. There were but twenty-five bona fide cases during the summer. The field nurses of the division for handicapped children made 10,410 visits during the year and 51,960 days of hospital care were provided to crippled children by the department of public welfare of these children 8,426 were in the wards of the general hospitals of the state where orthopedic surgeons are cooperating in the plan for this care with the division for handicapped children. Appliances were furnished to patients attending the clinics in the following numbers: braces 138, artificial limbs 39, and orthopedic shoes and shoe corrections 184.

### Chicago

**Chevalier Jackson to Give Public Lecture**—The Chicago Medical Society will present a public lecture March 1 at the Chicago Woman's Club by Dr Chevalier Jackson, professor of bronchoscopy, Temple University School of Medicine, Philadelphia, on "Looking Into Your Lungs."

**Society News**—The Chicago Gynecological Society was addressed January 20 by Drs William J Dieckmann and Ira Brown on "The Obstetric Management of Pregnancy Toxemia" and Charles E Galloway and Tom D Paul, Evanston, Ill., "Treatment of Early Abortions"—At a meeting of the Chicago Society of Internal Medicine January 23 the speakers included Dr Frederick T Jung and B L Isaacs on "Measurement of Vitamin A Deficiency in Man" and Dr John Ashworth, C J Farmer M A, and Dr Don C Sutton, "Observations on Vitamin C"—The mortality of appendicitis was discussed in a symposium before the Chicago Medical Society February 1, the speakers were Drs David E W Wenstrand, medical director, Northwestern Mutual Life Insurance Company, Milwaukee, LeRoy H Sloan, professor of medicine, University of Illinois College of Medicine, and Vernon C David, clinical professor of surgery, Rush Medical College Dr Byrl R Kirklin, Rochester, Minn, addressed a joint meeting of the society and the Chicago Roentgen Society January 18 on "The Value of Roentgen Diagnosis as It Pertains to the Physician in General Practice," and Dr Bernard P Widmann, Philadelphia, "X-Ray, Radium and Cancer" The Chicago Medical Society sponsored a public lecture at the Chicago Woman's Club February 8 with Dr Francis E Sencar, professor of dermatology, University of Illinois College of Medicine as the speaker, his subject was "Preserving Your Complexion"

### INDIANA

**County Secretaries Retire**—The Lake County Medical Society held a testimonial dinner meeting January 12 in honor of Dr Eldridge M Shanklin, Hammond, who has retired as secretary of the society Dr Shanklin served from 1912 to 1920, becoming president in the latter year In 1927 he took office as secretary, serving continuously through 1938 He has been succeeded by Dr Harry Brandman, Whiting—Dr Joseph L Allen, Greenfield, who has been secretary of the Hancock County Medical Society since 1928, has retired He is succeeded by Dr James R Woods Jr, Greenfield

**Society News**—At a meeting of the Tippecanoe County Medical Society in Lafayette recently Dr Samuel M Fernberg, Chicago, spoke on "Newer Developments and Common Misconceptions of Allergy"—A symposium on jaundice was presented before the Indianapolis Medical Society recently by Drs Brandt F Steele, Bernard D Rosenak and Ralph U Leser—The Northeastern Indiana Academy of Medicine was addressed in Kendallville recently by Dr Henry F Beckman, Indianapolis, on "Hemorrhage Associated with Labor"

**Personal**—Dr Charles E Holland has been appointed physician at Indiana University, Bloomington, succeeding his father, the late Dr James E P Holland—Dr William F Duncan, Aurora, has been appointed the first honorary life member of the Dearborn-Ohio County Medical Society Dr Duncan is the oldest member of the society and has practiced medicine in Manchester for forty-six years He graduated at Miami Medical College, Cincinnati, in 1892—Mrs Isaac Born, Indianapolis, has been appointed commander of the Indiana division of the Women's Field Army of the American Society for the Control of Cancer, succeeding Mrs George Dillinger, French Lick, resigned

### IOWA

**Itinerant Scissors Grinder with Smallpox**—A warning was issued throughout the state January 19 when an itinerant scissors grinder was found suffering from smallpox, newspapers reported January 20 The patient said that he stopped at barber and beauty shops in Mount Pleasant, Ottumwa, Columbus Junction and Iowa City to sharpen scissors, stayed in hotels, ate in restaurants and rode with motorists between towns, it was reported He was detained at University Hospital, Iowa City

### MASSACHUSETTS

**Alumni Dinner**—The alumni of Boston University School of Medicine met at dinner at the Hotel Somerset, Boston, January 20 The speakers included Drs Nathan H Garrick, president of the alumni association, Samuel N Vose, chairman, Alexander S Begg, dean of the university, Wesley T Lee, alumni chairman of the school of medicine campaign, Morris Fishbein, Chicago, editor of THE JOURNAL, "The Frontiers of Medicine", Lucv J Franklin, L H D, dean of women, Boston University, Frederick W Mansfield, LL D, chairman of the Boston University general alumni committee, Pliny Jewell, trustee of the university, and Walter B Dickinson, campaign manager

**Special Society Meetings**—Dr Elias William Abramowitz, New York, addressed the New England Dermatological Society in Boston February 8 on "Action of Certain Drugs in the Local and General Treatment of Various Dermatoses"—At a meeting of the New England Society of Physical Medicine in Boston, January 18, Dr Edward A Edwards discussed "Organic Arterial Disease"—The New England Heart Association was addressed in Boston January 23, among others, by Drs Blair V Jager on "Thrombosis of the Ductus Arteriosus with Embolic Manifestations" and Paul Kunkel, "Influence of the Peripheral Circulation in the Upper Extremities on the Circulation Time as Measured by the Sodium Cyanide Method"—Dr Paul A Younge discussed "Pre Invasive Carcinoma of the Cervix Uteri" before the New England Pathological Society January 19 in Boston

### MINNESOTA

**Graduate Courses at Center for Continuation Study**—Graduate courses at the Center for Continuation Study of the University of Minnesota, Minneapolis, include the following

Hospital Administration January 23 28  
Medical Record Librarians January 30 February 1  
Hospital Dietetics for Dietitians February 13 15  
Medical Social Work February 22 24  
Orthopedics March 13 18  
Neuropsychiatry March 13 18  
Diagnostic Roentgenology March 20 25

In the spring courses on obstetrics, general surgery, hematology and gastro enterology will be offered, the dates to be announced later One on ophthalmology was presented January 16-21

**Society News**—The East Central Minnesota Medical Society was recently addressed by Drs Erling S Platou, Minneapolis, on "Convalescent Sera as Therapeutic Agents," and Gordon R Kimman, St Paul, "Neurosis"—Dr Moses Barron, Minneapolis, was recently elected president of the Minnesota Society of Internal Medicine, Dr Russell M Wilder, Rochester, vice president, and Dr Max H Hoffman, St Paul, was reelected secretary-treasurer The spring meeting will be in Minneapolis—Dr Hobart C Johnson, North Mankato, who has been a medical missionary for several years, discussed "Practice of Medicine in Africa" before the Nicollet Le Sueur County Medical Society in Le Sueur recently—The Upper Mississippi Medical Society was addressed in Brainerd January 28, among others, by Drs Chester A Stewart, Minneapolis, on "Nutritional Problems in Infancy" and Orwood J Campbell, Minneapolis, "Some Observations on the Care of Fractures"—Dr William J Kerr, San Francisco, gave a Mayo Foundation lecture in Rochester Dec 15 1938, on "The Anxiety States in Practice with Particular Reference to the Physiologic and Biochemical Disturbances"

### MISSOURI

**New County Health Center**—A two story building will be erected at the St Louis County Hospital, Clayton to serve as headquarters for the county health department There will be eight rooms on the first floor and a large waiting room and consultation rooms on the second floor The county court has appropriated \$16 500 toward the \$30,000 cost of the building, while the remainder will be sought from the PWA, according to the state medical journal The U S Public Health Service has promised a grant of \$2,500 The health department, of which Dr Theodore R Meyer is the director, is now housed in four rooms scattered through the hospital

**Society News**—Jackson County Medical Society, Kansas City, recently reported the 100 per cent payment of membership dues—Dr Andrew C Ivy, Chicago addressed the Kansas City Obstetrical and Gynecological Society January 19 on "Physiology of Uterine Muscle in Labor"—The Ray County Medical Society was addressed in Hardin in December by Drs William Byron Black and Ralph R Coffey, Kansas City, on "Relationship of Nasal Allergy and Sinusitis" and "Abdominal Pains" respectively—At a meeting of the Kansas City Surgical Society January 18 Dr Michael J Owens, among others, spoke on "Use of Barbiturates in Surgery"

### NEBRASKA

**District Meeting**—Lincoln physicians addressed a meeting of the Sixth Council District of the Nebraska State Medical Association in Staplehurst recently as follows Drs Harry E Flansburg, on "Pulmonary Infarction", E Burkett Reed "The Mechanism of Anemia," and Clarence C Hickman "Diagnosis and Treatment of Certain Anorectal Conditions"

**Practitioner Honored**—Dr and Mrs Joseph H Downing Rising City, were guests at a dinner given by the Sixth Councilor District and the Butler County Medical Society January 9 at Brannard Dr Charles W M Poynter, dean of the University of Nebraska School of Medicine, Omaha, was the principal speaker, reviewing the history of medical practice in Nebraska Drs Homer Davis, Genoa, president of the Nebraska State Medical Association, and Arthur L Miller Kimball, president-elect, paid tribute to Dr Downing, who has practiced fifty-six years in the state

## NEW YORK

**Foreign Physicians Qualify for Licenses**—Of 1 063 foreign physicians who took the state medical examinations in January, 622 were successful The largest number of candidates (422) came from Germany, of whom 210 failed to pass Austria furnished 112 candidates, of whom thirty-five failed Of 488 graduates of New York medical schools 55 per cent failed and of 285 from schools of other states 249 per cent failed

**Dr Edward R Baldwin Retires**—Dr Edward R Baldwin, Saranac Lake, for many years director of the Trudeau Foundation and the Trudeau School of Tuberculosis has retired and has been succeeded by Dr Leroy U Gardner, director of the Saranac Laboratory Dr Baldwin, now 74 years old, was born in Connecticut and graduated from Yale University School of Medicine in 1890 He went to Saranac Lake in 1893 and was assistant director of the Saranac Laboratory from that year till 1915 when he became director He has been head of the foundation and the school of tuberculosis since 1916 In 1916 Dr Baldwin was president of the National Tuberculosis Association He has also served as president of the American Clinical and Climatological Association In 1936 he received the Kober Medal

## New York City

**Theobald Smith Lecture**—Dr Richard P Strong, professor of tropical medicine emeritus, Harvard University Medical School, Boston, delivered the Theobald Smith Lecture before the New York Society of Tropical Medicine January 20, on "Malarial Diseases in the Western Hemisphere"

**Health Data for 1938**—The number of deaths in New York in 1938 was 73,775, giving a rate of 9.8 per thousand, the lowest in the city's history Last year the rate was 10.4 For the first time infant mortality reached a low rate of 38.3 per thousand live births The maternal death rate was 3.5 per thousand live births In 1933 it was 6.4 Dr John L Rice, health commissioner in presenting the report attributed the reductions in deaths of mothers and infants to the work done by the county medical societies and the New York Academy of Medicine in cooperation with the health department The rate from diphtheria was 17 per hundred thousand children under 15 years old there were 712 cases with twenty-seven deaths Scarlet fever cases and deaths declined, but measles and whooping cough were unusually prevalent An increase in measles was not unexpected, as 1937 was a light year, there were 34,605 cases with forty-two deaths Whooping cough was nearly three times as prevalent as in the previous year with 12,333 cases and 105 deaths Poliomyelitis and meningitis were at a low point, with forty-four and 112 cases, respectively A reduction in mortality from pneumonia was tentatively attributed to new services for distribution of serum to physicians There were 4,732 deaths compared with 6,504 in 1937 The death rate from tuberculosis was 51.1, a decline from 57.4 of the previous year Typhoid fever caused twenty-three deaths compared with an average of 126 during the decade 1920-1929 The death rate from appendicitis was 11.1 and for 1937 was 12.6 In 1930 it was 16 Deaths from accidents have declined in the past year the rate for all accidents being 50 as compared with 56.3 for 1937 Suicides numbered 1,161 in 1938 more than in 1937 when 1,140 were listed There were 303 homicides seventy-three less than in 1937 The birth rate continued to decline being 13.6 per thousand of population compared with 13.7 in 1937 and 17.7 in 1930

## NORTH DAKOTA

**Personal**—Dr Ernst G Sasse Lidgerwood was recently guest of honor at a dinner given by friends in recognition of his forty years service to the community—Dr George H Hiltz Bowhells, has been appointed health officer of Burke County

## PENNSYLVANIA

**Cancer and Diabetes Made Reportable**—The state department of health recently announced new regulations making cancer and diabetes reportable diseases Previously these diseases were registered only when they were fatal

**County Secretaries' Conference**—The thirty-second annual conference of secretaries and editors of county medical societies was held in Harrisburg February 10 After separate meetings of secretaries and editors there was a discussion of group hospitalization insurance Dr Walter F Donaldson Pittsburgh, secretary of the Medical Society of the State of Pennsylvania, spoke on "Federal Health Legislation" and afterwards the group discussed Pennsylvania's new public assistance medical service and state and county plans for voluntary insured medical service

## Philadelphia

**Medicolegal Night**—The Philadelphia County Medical Society presented a "Medicolegal Night" for its program February 8 with a discussion of "The Role of Psychiatry in Criminal Justice" The speakers were Prof Edwin R Keedy, LL.D., University of Pennsylvania, on "Proposals of Legislation Relative to the Presentation of Psychiatric Findings in Criminal Procedure", Hugh D Scott, assistant district attorney, "The Prosecutor and Psychiatry", Thomas E Cogan, public defender's office, "The Public Defender and Psychiatry", and Judge Ralph H Smith, Pittsburgh The Allegheny County Behavior Clinic" Dr Edward A Strecker professor of psychiatry, University of Pennsylvania School of Medicine, and Judge Curtis Bok were the commentators on the addresses

**Society News**—Dr Cyril N H Long, New Haven, Conn., delivered a Nathan Lewis Hatfield Lecture before the College of Physicians of Philadelphia February 1 on "Diabetes Mellitus in the Light of Our Present Knowledge of Metabolism"—Dr Howard C Taylor Jr, New York, addressed the Obstetrical Society of Philadelphia February 2 on "The Endocrine Factor in Neoplastic Disease of the Reproductive Tract"—At a meeting of the Philadelphia Academy of Surgery February 6 the speakers were Drs John C Howell and Harry G McNamee Jr on "Treatment of Breast Cancer" and Drs Lewis K Ferguson and Wesley D Thompson Jr, Internal Derangement of the Knee Joints A Review of 100 Operated Cases with Follow-Ups"—Dr Joseph C Yaskin delivered his presidential address before the Philadelphia Neurological Society January 27 on "Neurological Complications Arising from Infections of the Temporal Bone and Paranasal Sinuses"

## GENERAL

**"Milligrams per Cent" a Vague Term**—Many authors use in their papers the terms 'milligrams per cent' or 'grams per cent' to express the results of some laboratory investigations These terms are vague and unreliable The unit used should be specified such as milligrams per hundred cubic centimeters or milligrams per hundred grams

**Society News**—Dr John Edward Clark, Seattle was recently elected president of the Puget Sound Academy of Ophthalmology and Otolaryngology Dr W Cameron Tacoma, was elected vice president and Dr Purman Dorman Seattle secretary-treasurer—The thirty-first annual meeting of the American Society for Pharmacology and Experimental Therapeutics, will be held in Toronto Ont, at the Royal York Hotel April 26-29 The secretary is Dr Gustave P Grabfield 319 Longwood Avenue Boston

**International Surgeons' Meeting**—The biennial assembly of the International College of Surgeons will be held in New York at the Hotel Roosevelt May 21-24, under the chairmanship of Dr Andre Crotti Columbus, Ohio international president Applications for places on the program should be sent to Dr Fred H Albee 57 West Fifty-Seventh Street New York General information as to scientific and commercial exhibits may be obtained by addressing Dr Edward Frankel Jr, 217 East Seventeenth Street New York

**Fatal Accidents Declined in 1938**—Eleven thousand fewer people were killed in accidents of all kinds in the United States during 1938 than in 1937, a decline of more than 10 per cent according to the *Statistical Bulletin* of the Metropolitan Life Insurance Company The 1938 loss was the lowest since the deep depression years of 1932 and 1933 when the number of deaths totaled 89,000 and 91,000 respectively it was stated Present indications are that the number of deaths resulting from accidental injuries will run around 95,000 in 1939 as compared with approximately 106,000 deaths in 1937 and with 110,000 deaths the all time high figure in 1936 That business conditions clearly have a material effect on the general accident



toll is evidenced by the low totals during the depression years. Motor vehicle fatalities decreased about 8,000, or from about 40,000 in 1937 to between 31,000 and 32,000 deaths in 1938, although data on gasoline consumption indicate little change in the amount of automobile mileage in the last two years. There was little change in accidents in and about the home as compared with 1937, final records probably showing that home accident fatalities during 1938 exceeded in number those resulting from motor vehicle accidents. According to the bulletin, cataclysms and catastrophes claimed large numbers of lives in all sections of the country during the year. Most devastating were the hurricane and flood in the Atlantic Coastal states in September (682 lives) and the floods in southern California during February and March (181 lives). A tornado originating in Oklahoma spread across Kansas, Arkansas, Missouri and Illinois (forty lives). Other disastrous tornadoes occurred in Charleston, S C (twenty-nine lives), in Rodessa, La, (twenty-five lives), in and near Belleville, Ill (twenty-two lives), in Aliceville, Ala (thirteen lives), and in Clyde, Tex (thirteen lives). Flood waters caused thirteen deaths in Whitestone, Ga, and ten in Havre, Mont. Forty-seven persons were killed in the most serious railroad accident in years when a passenger train plunged through a bridge in Montana. This one accident took as many or more lives among passengers as are lost ordinarily in all railroad passenger accidents in an entire year. Accidents causing ten or more deaths included coal mine explosions in Grundy, Va (forty-five lives) in Pittston Township, Pa (ten lives), and in Harwick, near Pittsburgh (ten lives), a fire in a hotel in Atlanta, Ga (thirty-five lives), the collision of a school bus and freight train in Midvale, Utah (twenty-four lives), the collapse of a cafe building in Phenix City, Ala (twenty-one lives), the vanishing of the Hawin Clipper with fifteen persons aboard, the airplane crashes near Bozeman, Mont (ten lives), near Cleveland, Ohio (ten lives), and off San Diego, Calif (eleven lives), the collision of two passenger trains near Niland, Calif (twelve lives), and the premature explosion of dynamite while workers were blasting a tunnel in Baltimore (ten lives). Hundreds of other persons were victims in multiple fatality accidents of from five to ten deaths.

## Government Services

### Recommendations of Advisory Committee on Maternal and Child Health Services of U S Children's Bureau, Dec 3 and 4, 1938

The following members of this Committee, at the meeting in Washington Dec 3-4 1938, made these recommendations in addition to those made in 1936 and 1937

Fred L. Adair MD Chicago  
Horton R. Casparis MD Nashville  
Hazel Corbin RN New York  
Robert L. DeNormandie MD Boston  
Amelia Grant RN New York  
Clifford G. Grulee MD Evanston Ill  
Henry F. Helmholtz MD Rochester Minn  
George W. Kosmak MD New York  
George M. Lyon MD Huntington W Va  
Lyle G. McNeile MD Los Angeles  
Guy S. Millberry DDS San Francisco  
Mary E. Murphy Chicago  
Harry S. Mustard MD New York  
Everett D. Plass MD Iowa City  
Grover F. Powers MD New Haven  
Lydia J. Roberts Chicago  
Viola Russell MD Pierre S D  
Marian W. Sheahan RN Albany N Y  
Clifford D. Sweet MD Oakland Calif  
Felix J. Underwood MD Jackson Miss  
Philip F. Williams MD Philadelphia

Dr Paul A. Teschner, Chicago, represented the American Medical Association at this meeting

#### I Selection, training, and compensation of personnel

1 The advisory committee, recognizing that efficient administration of the maternal and child-health services depends on the employment of fully qualified personnel and that personnel with such qualifications are not always resident within each state, urges that (1) selection of personnel be on the basis of qualifications only and (2) that salaries commensurate with the qualifications required and services performed be paid.

2 It is the sense of this committee that the American Medical Association be asked to use its influence through its various component societies to promote the acceptance and attainment of desirable standards regarding qualifications of all official

personnel in health departments, and to work to the end that merit systems be established in all states and political subdivisions.

3 The committee recommends that physicians and nurses participating in maternity clinics and child-health conferences under the maternal and child-health programs be given special training for this type of service and that continued supervision and consultation by approved specialists in these fields be provided by state health authorities to maintain adequate standards of obstetric and pediatric service.

4 The committee recommends that the qualifications of directors of maternal and child-health divisions be (1) Graduation from medical schools approved by the Council on Medical Education and Hospitals of the American Medical Association, (2) thorough training in pediatrics or obstetrics or both preferably training and experience required for certification by the American Board of Pediatrics or of Obstetrics and Gynecology, (3) eligibility for examination for medical licensure in the state in which service is to be rendered, (4) preferably, training in the fundamentals of public health.

5 The committee recommends that the same fundamental requirements be recommended for assistant directors except that less stress be placed on administrative experience.

6 The committee recommends that local practicing physicians paid from maternal and child-health funds for services in child-health or maternity clinics and conferences (1) shall be licensed to practice in the state, (2) shall be graduates of medical schools approved by the Council on Medical Education and Hospitals of the American Medical Association, (3) should be devoting a considerable proportion of their practice to pediatrics or obstetrics, and (4) should have had or shall receive special training in the conduct of these clinics and should be selected from among the outstanding practitioners of obstetrics or pediatrics in their communities.

7 To qualify as full-time clinical consultants in obstetrics or pediatrics or other specialty, physicians should be certified by their respective American boards or have had the training and experience required for certification by the American boards of their respective specialties and, in addition, have had experience in the practice of medicine.

To qualify as part-time clinical consultants in obstetrics or pediatrics under the maternal and child-health programs practicing physicians should be certified by the respective American boards or have had the training and experience required for certification by the American boards of their respective specialties. If physicians having such qualifications are not available, the state health agency, after consultation with a committee of physicians appointed by the state health officer to advise on the selection of physicians, should designate the physicians best qualified to serve as clinical consultants in obstetrics or pediatrics (or other specialty).

#### II Cooperation with other agencies

Recognizing the need for technical advice in the development of the maternal and child-health programs in the states, the committee recommends that the state health agency administering the maternal and child-health program make use of expert advice available through such professional groups as the state maternal and child-welfare committees, state organizations of public-health nurses, social workers, nutritionists, or other professional groups, and through physicians certified by, or having the training and experience required for certification by, their respective specialty boards, or through other individuals with special interest in and knowledge of the problems of maternal and child health.

#### III Hospital standards

The committee recommends that the Children's Bureau take steps to secure the cooperation of various professional and administrative groups and of the state health departments in formulating standards for hospitals and maternity homes caring for mothers, infants and children and that attempts be made by securing effective state licensure of hospitals and maternity homes and by other means to establish and maintain hospitals which conform to acceptable standards of care for mothers, infants and children.

#### New Veterans' Facilities Opened

A new Veterans Administration Facility and regional office was recently opened at White River Junction, Vt., three stories high with fifty beds for surgical patients and sixty for general medical patients. Dr. Jefferson W. Pafford, transferred from Newington, Conn., is chief medical officer. Construction of another building to provide seventy-seven additional beds has been begun. A new 500 bed hospital at Kecoughtan, Va., was also opened in October to replace an old building.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

Jan 28, 1939

#### The Control of Puerperal Fever

In a lecture at the London School of Tropical Medicine and Hygiene Dr Leonard Colebrook, honorary director of the Research Laboratories, Queen Charlotte's Hospital, said that ten years ago the campaign against maternal mortality was held up by lack of knowledge but today the difficulty was that more facts had been accumulated than could be used. Of 100 cases of puerperal fever, the condition was due in about forty to the hemolytic streptococcus and in the other sixty to different organisms, mostly following injury during labor. He would say little about the second group because until to a large extent injuries during childbirth could be obviated they would persist.

Infection by the hemolytic streptococcus was the more important because it was the most serious and the most easily preventable. There were six or seven different types of the organism which could be distinguished by biochemical and serologic tests, but only one of these was responsible to any extent for puerperal fever. It might be transferred from other patients by the physician or nurse but it certainly came by way of the air in particles of dust or droplets from the throat, which were the most important sources. Dr Dora Colebrook investigated forty-eight cases in which she had been able to identify the organism found in the mother with that from some outside source. In twenty-four the infection came from an attendant contact, physician or nurse, and in all but one it was of the respiratory tract. Of the other cases, the infection came in nine from a member of the mother's household and in six from the mothers themselves.

Were so-called healthy throats dangerous? Research had shown that sometimes they might be a source of infection. It seemed that from 5 to 10 per cent of people were carriers of this type of streptococci. Nasal infections appeared to be less frequent but they were serious. A person suffering from a sinus infection always had a little discharge and only a small degree of lack of care was necessary for the infection to be carried.

#### PREVENTIVE METHODS

With all these possibilities it was difficult to get complete safety in midwifery. The ideal would be to inoculate all women in the last month of pregnancy, but at the moment such a measure was not in sight. However, many other things could be done. It should be possible to erect barriers by the use of masks and strict antiseptic toilet. Some valuable things had been learned with regard to antiseptics in the last few years. The prime importance of soap and water had been established. This was the most valuable antiseptic ritual both in surgical procedures and in midwifery. The old antiseptics did not give a sufficient margin of safety when removing streptococci from the skin. It had been shown that iodine and the halogen derivative of xylenol, known as 'dettol,' were much better. They left a protective film on the skin which lasted a matter of hours and thus should be of value in a prolonged labor. There was danger that with the introduction of sulfanilamide less trouble would be taken with the antiseptic ritual. Whatever the barriers, the fewest possible number of women should be delivered in a dangerous environment. Dr Colebrook favored the maternity hospital. In four years only one patient in 700 had hemolytic streptococcus infection while in domiciliary midwifery the proportion for this period had been one in 115.

#### The Medical Journals and the Royal Society of Medicine

An important part of the weekly medical journals consists of reports of the meetings of the medical societies. Of these much the greatest is the Royal Society of Medicine, which was formed by union of almost all the London societies and which in its twenty-three sections embodies all the specialties. It is a rule of this society that it holds the copyright of all its proceedings, which it publishes monthly, and that no paper can be published in a medical journal in extenso until after publication in the proceedings, and then only by permission of their editors. But the medical journals have been allowed to send reporters to the meetings and to publish abstracts of the papers and discussions. Any request from the chairman or from a speaker that something was confidential was always respected. The society has recently shown a tendency to secrecy which is resented by the medical press. Before a journal can report any meeting it must now ask permission, which is becoming more difficult to obtain. The *British Medical Journal* points out that a number of private medical clubs and associations exist for private discussion and that this should be extremely rare at the Royal Society of Medicine. The society exists to promote the science and art of medicine and has a duty to give as well as to receive information. Its contributions to the common stock of knowledge should be accessible to the whole profession not merely to the members of the society. Few discussions can be so delicate as to require privacy. The *Lancet* makes a similar protest and asks: Do those taking part in the debates want to speak to a restricted audience and to have their remarks recorded only weeks or months later and solely for the benefit of the members of the society? Now that the matter has been ventilated, the result will depend on whether the members of the society actually support the desire for secrecy which has been shown by the officials of the society.

#### The Medical Aspects of "National Service"

The need to organize this country so that no other will be tempted to attack it has been realized. The threat of air raids has rendered necessary the enrolling of the civil population capable of service in defense against them. A new term, "national service," on which the government has issued millions of handbooks, has been introduced to designate this work. In keeping with our traditions of liberty, it is on a purely voluntary basis. Men are being enrolled for air raid precautions, police duties and fire services and women for air raid precautions, ambulance driving and nursing. Physicians have been enrolled for war service by the British Medical Association. The handbook states that in view of the probable casualties in war there would be a great demand for nurses. Those who already have had nursing experience should reserve themselves for that duty and many now without experience should train for it. Women who undertake to do nursing or first aid work in war may offer to serve anywhere in the United Kingdom or abroad, if necessary, or they may make it clear that they would be unable to leave their home district. At the government's request, the College of Nursing has arranged to enroll trained and assistant nurses, whether members of the college or not, pending the formation of a representative committee that will take over the task. The evacuation of children from dangerous areas would make an unprecedented call on the services of women. Householders with spare accommodation in the relatively safe areas could do no more useful service than to assume the care and maintenance of such children. The handbook also gives particulars of national organizations by which men as well as women can be trained in first aid and ambulance work in war.

## PARIS

(From Our Regular Correspondent)

Jan 21, 1939

## Prevention of Diphtheria

At the Dec 20, 1938, meeting of the Académie de médecine de Paris a survey of the results obtained during the past fifteen years in the use of the specific toxoid vaccination against diphtheria was submitted by Prof Gaston Ramon. Over three million adults and children in France, two million children in Canada and, up to 1935, one million in New York have been given the Ramon diphtheria toxoid as a prophylactic. No proof has been offered to show that vaccination, when the properly prepared toxoid is used, is followed by any ill effects. Although the toxoid itself is conceded to be almost universally innocuous, there is no question that in certain persons who are intolerant of such a preparation one has observed more or less severe local and general reactions. According to the majority of those who have reported such reactions they are rarely seen in young children, the incidence increasing between the ages of 8 and 10 years. Local reactions, sufficiently marked to be worthy of mention, have been observed in from 2 to 5 per cent and more severe general reactions in from 5 to 10 per cent of those who have been vaccinated. Such a small incidence of reactions ought not to stop physicians from using the toxoid as a prophylactic. Serious reactions such as anaphylactic purpura or hematuria are extremely rare. Many reactions reported as due to the toxoid were found in reality to be the result of a lack of asepsis or to some associated systemic pathologic condition. Although it cannot be denied that reactions do occur from time to time after vaccination with the diphtheria toxoid, such reactions are far more often observed after other methods of active or passive immunization.

Ever since the first vaccinations with the diphtheria toxoid, investigation has shown that the toxoid is capable of conferring an immunity which is characterized by the presence in the blood of the specific antitoxin. During the early period it was found that from 5 to 10 per cent of the vaccinations were failures, the subjects being immunized either not at all or insufficiently. This explains why cases were reported of diphtheria occurring in those who had been vaccinated. During recent years marked progress has been made in obtaining a toxoid of higher antigen value, in repeating the vaccination and in the use of associated diphtheria and tetanus toxoids. These improvements in the technic of preparation and use of the toxoid have been followed by a greater activity, as shown by the fact that the Schick reaction becomes negative in 100 per cent of cases.

## RESULTS OF OBLIGATORY VACCINATION

Diphtheria tends to disappear in the French army because every soldier must be vaccinated. In city and country collectivities the use of the toxoid is more difficult to carry out, as a rule, yet in certain departments of France more than 50 per cent of the children have been vaccinated, with a striking fall in the mortality. Fifty years ago there were 1 500 deaths a year from diphtheria in Paris, whereas in 1937 there were only eighty-seven deaths, the mortality having dropped from eighty to less than three per hundred thousand inhabitants. The results obtained in foreign countries when the vaccination with the toxoid is correctly carried out are as favorable as those seen in France. Only when from 30 to 50 per cent of children in a given community are properly vaccinated can the effect of this prophylactic method against diphtheria be really evaluated. When the proportion of the

vaccinated rises to 70 or 80 per cent of the children in a community, the real merit of the method becomes very apparent. In order to be effective, vaccination ought to be made obligatory. This has been done in Hungary, Poland, Rumania and the city of Geneva, Switzerland. In France such a law was passed June 28, 1938, but has not yet been enforced, because of some opposition on the part of a few physicians and the public.

In the discussion the Paris pediatrician Dr Jules Renault said that vaccination with the diphtheria toxoid is successful in 96 or 98 per cent of cases. A child who has been vaccinated remains exposed to an infection for several weeks while the immunity is being established, hence he injects both the antitoxin and the serum when children are admitted to a contagious disease service in order to secure a rapid immunity. Then two other injections of the toxoid are given after an interval of fifteen days. This method was employed during the past six years with 6,000 children admitted on account of varicella, scarlatina, pertussis, mumps or measles. Only slight local reactions were noted in from 5 to 10 per cent of the children.

## Pneumonectomy for Cancer of Lung

In only about 10 per cent of the cases of pulmonary cancer observed clinically is the condition amenable to operative intervention, according to Dr Robert Monod, who reported two cases at the Dec 7, 1938, meeting of the Académie de chirurgie de Paris. Dr Monod stated that his first patient is the only one thus far operated on in France who has lived for two and one-half years. The diagnosis of a latent cancer which is primary in a peripheral part of the lung presents a more difficult problem than that of one which is primary in the bronchus, because with the latter type of cancer the cough, so often accompanied by expectoration, leads to an examination of the chest. A persistent pain in the upper part of the abdomen especially if recurrent, should always lead to an x-ray examination of the lower part of the chest. Dr Monod said that from the standpoint of technic a total pneumonectomy is not accompanied by a higher operative mortality than a lobectomy.

In the discussion, Dr Maurer who has had a large experience in pulmonary surgery, said that local anesthesia would suffice in the majority of cases. He preferred the anterior to the posterior method of approach because the ribs need not be removed and, with the aid of appropriate retractors, an ample exposure can be obtained. An additional advantage of the anterior route is that the patient lies on his back and can more easily utilize the other lung. Dr Maurer also advocates the use of an artificial pneumothorax as a preoperative procedure, because it prepares the lung for the ample exposure which is indispensable in such operations. He also preferred ligation of the individual structures of the pedicle to the use of a tourniquet. The results obtained in the treatment of pulmonary cancers, the majority of which are primarily bronchogenic, will continue to be very discouraging until earlier diagnoses are made.

In reply to Dr Maurer's advocacy of the anterior mode of approach, Dr Monod stated that it was applicable only in cases in which a preoperative diagnosis of a malignant condition had been made and was not so suitable in cases in which an exploration of the entire lung with respect to the size of the tumor was necessary. Dr Monod agreed with Dr Maurer as to the advantages of local anesthesia for the exposure of the tumor but said that general anesthesia was preferable for the endothoracic portion of the operation because it eliminated the serious reflexes so often encountered when local anesthesia is employed throughout the operation.

### Physicians with Large Families

The excess of deaths over births is causing anxiety hence every effort is being made to encourage the raising of large families. The government is granting a reduction in income tax and a monthly allowance to heads of families proportionate to the number of children. In addition Mr Cognacq owner of the largest department store in Paris, left money in trust, the interest of which is distributed annually to encourage an increase in the birth rate.

The medical profession is doing its share, as stated in the quarterly bulletin "Doctors and Their Families." There are sixty-one physicians with an average of ten children in each family. One physician heads the list with seventeen and another follows closely with sixteen children. Others worthy of mention are two with fifteen children, one with fourteen, six with thirteen, seven with twelve, eleven with eleven and thirty-one with ten children.

### Personal

The contributions of Dr Thierry de Martel to neurologic surgery are familiar to surgeons all over the world. The French government in recognition of this work has conferred on him the rank of Grand Officer in the Legion of Honor. Dr de Martel is head of the surgical department at the American Hospital of Paris.

### BELGIUM

(From Our Regular Correspondent)

Dec 23, 1938

### Collapse Therapy

Collapse therapy in the surgical treatment of tuberculosis is not based on immobilization of the lung and compression of the lesions but on relaxation of those elastic tissues which continually stretch the parenchyma, the procedure seeks to accomplish an elective remission of the lesions. In an address before the Societe medico-chirurgicale du Brabant, M Wybauw reviewed the various methods of collapse therapy.

Phrenicectomy is interesting but its results are the least predictable. If the phrenic nerve has received a preliminary alcoholization, it is easier to foresee the effect. Whereas intrapleural pneumolysis permits section of the adhesions under visible control, extrapleural pneumolysis frees the covered pulmonary apex from the two pleurae and introduces into the cavity thus formed either the pectoral muscles or paraffin. Wybauw has used paraffin, although he has found the procedure to have many disadvantages.

Extrapleural pneumothorax has been introduced with some notable successes but the postoperative happenings are rather complicated. The value of this procedure will be judged in the future.

Thoracoplasty is assuming an increasingly larger place in the surgical treatment of pulmonary tuberculosis and the technique is becoming more reliable. Its objective is remission of the lesions through progressive modeling. Brilliant results may follow the treatment of unilateral nonevolutive lesions by multiple stage thoracoplasties performed with a local anesthetic.

### A National Foundation for the Youth

In accordance with his traditional generosity and philanthropy, Baron Empain has made a further benefaction of 75 million francs for welfare activities among the youth. The foundation is called Pro Juventute. Its income will be used (1) to organize campaigns for improvement and development, physical, moral and mental of the youth, (2) for the award of prizes or other subsidies to encourage the youth to develop their mental and physical faculties and (3) to promote, protect or subsidize activities which have as their object the

improvement and development of the youth. The activities designated under 3 include (a) child welfare activities which would permit city children the advantage of outdoor life in the country and remove them from pernicious influences, (b) outdoor games and other activities which inculcate a sense of solidarity and fair play among adolescents and young adults and submit them to a rational, physical education based on medically supervised gymnastics, games and sports, including the activities of certain nonprofit athletic organizations which conform to the desired standards, and (c) supervised activities designed to improve the youthful intellect and especially to cultivate scientific or artistic bent among young men.

### A Center for Mental Prophylaxis

At the International Congress of Mental Hygiene, Dr Alexander of Brussels set forth the principles which should govern the organization of a foundation for mental prophylaxis. Such a work must be characterized by flexibility. The general activity must be first of all educational. Different sections would deal with particular phases of mental prophylaxis, for example prophylaxis of domestic difficulties through premarital consultations, child mental hygiene, care of mildly affected neuropaths, former hospital patients, former delinquents, former hoboes and drug addicts. The personnel, in addition to the specializing physicians, should include visiting nurses, social workers, a secretary, psychologists, sociologists and persons trained in vocational guidance. The center should maintain the closest collaboration with other medical specialties. The center would above all render service through its contacts with medical practitioners, medical centers, social centers, charitable institutions, judicial authorities and temperance societies. The center's staff physicians should as much as possible act as liaison officers between the center and the collaborating organizations.

### Diagnosis of Salpingitis and Appendicitis

Drs Schockaert, Rosman and Nolens have published in the *Journées médicales de Bruxelles* the results of their research on globular sedimentation as a factor in the differential diagnosis of acute salpingitis, appendicitis and extra-uterine pregnancy. The sedimentation rate is strongly accelerated in the vast majority of cases of acute salpingitis, and in cases of acute appendicitis the acceleration is much less marked, accordingly the test permits differential diagnosis of these two disorders in 95 per cent of cases.

In the pseudosalpingian forms of ectopic pregnancy the acceleration of the sedimentation rate is inconsiderable and in the majority of cases differential diagnosis between this condition and acute salpingitis is thus possible.

Let us assume the point of view of the surgeon or gynecologist called to attend a woman presenting a painful acute syndrome of the hypogastrium or of the right iliac fossa. Despite a good history and careful examination, doubt persists and no clinical sign sufficiently diagnostic of either salpingitis or appendicitis is present. The sedimentation test is easily done and the result is forthcoming within one hour. According to statistics studied by the authors the test permits solution of the problem and in 95 per cent of cases the indications of the sedimentation rate will be confirmed by clinical development or surgical intervention.

The authors believe that if the clinical picture creates serious doubt as between acute adnexitis and acute appendicitis, one may without undue timidity regard the sedimentation test as the basis of performance or postponement of a laparotomy. They recommend that if at the end of an hour the sedimentation rate has attained or exceeded 20 mm the woman should be put to bed and medical treatment of acute adnexitis begun, the chances are ninety five in a hundred that a useless opera-

tion can thus be avoided, and an operation performed at the acute stage of the disorder involves the risk of postoperative peritonitis

#### Dr Vervaeck Honored

A party was recently held at Forest prison in honor of Dr Louis Vervaeck, director general of the anthropologic-criminologic service, who, having reached the retirement age, is about to relinquish his post. He has been responsible for reforms in prison administration which have placed Belgium in the forefront of progress in this field.

### ITALY

(From Our Regular Correspondent)

Jan 14, 1939

#### Tuberculous Hemoptysis

Professors Sanguigno and Valentini, at a recent meeting of the Federazione per la lotta contro la tubercolosi, reported observations in about 3,000 cases of pulmonary tuberculosis. They concluded that alarming hemoptysis appears early in the development of pulmonary tuberculosis in about 10 per cent of the cases. The condition can be classified in three groups: (1) as the only symptom of early tuberculous infiltration of the lung, (2) as the first symptom of evolution of chronic pulmonary tuberculosis and (3) as a symptom appearing in association with other early symptoms of the disease. The second group is the most common. The frequency of alarming hemoptysis is the same for male and female patients. The symptom is frequent in exudative forms of recent development, especially phthisiogenic infiltration of the lung, and rare in primary, chronic and miliary forms. It originates as a rule in parenchymal ulceration of the lung or else, although rarely, in congestion of the organ. The age in 70 per cent of the patients is from 18 to 25, as the symptom is more frequent in young persons and in early maturity than at any other age. In some cases grave alterations of the lung take place before appearance of the first hemoptysis. A certain diagnosis of pulmonary tuberculosis can be made by clinical examination of patients after alarming hemoptysis in some but not in all cases. The sputum gave positive results for tubercle bacilli in 38 per cent of the cases seen by the speakers. In 50 per cent of their cases an early sanatorium treatment or collapse of the lung after hemoptysis induced improvement or clinical recovery.

#### Successor to Professor Alessandri

Prof Raffaele Paolucci was appointed head of the Clinica chirurgica of Rome to succeed Prof Roberto Alessandri, who retired on reaching the age limit. Professor Paolucci was born in Rome in 1892. He was lieutenant physician in the Italian navy during the World War. He was in the battle in which the Austrian warship *Viribus Unitis* was sunk. He was professor of specialized surgical pathology at the faculties of Modena and Bari and of clinical medicine at the universities of Parma and Bologna. He wrote articles on anaerobic bacteria in the appendix, pathogenesis of traumatic shock, relations between the thyroids and the sympathetic nervous system, innervation and motor functions of the intestine and surgery of the thorax in pulmonary tuberculosis and in nontuberculous suppuration of the lung.

#### Meeting of Surgical Society

The Societa medico chirurgica of Modena recently met with Professor Agazzotti as president. Professor Marogna spoke on ureteral calculosis. When the calculi are located at the pelvis or at the iliac or lumbar ureteral segments, the use of a retention catheter and injections of a hypophyseal preparation give satisfactory results. Surgery is resorted to as the

last resource. In some cases the calculi can be removed by means of pyelotomy performed after the passage of the calculi has been forced to the renal pelvis. Professor da Azzi said that he has observed that patients who are suffering from pneumonia suffer also from a deficiency of vitamin C in the blood and in the urine. Ascorbic acid, however, has no efficacious therapeutic action on pneumonia. Professor Dalla Volta reported three cases of frontoparietal cerebral tumors with symptoms similar to those of cerebral arteriosclerosis. The predominant symptoms were convulsions of the jacksonian type, which developed independently of the cerebral symptoms from twenty to twenty-five minutes after administration of an injection of 0.02 Gm of acetylcholine chloride. However, if the acetylcholine injection was immediately followed by an injection of 0.001 Gm of epinephrine the convulsions were inhibited. According to the speaker the acetylcholine injection caused dilatation of the intratumoral vessels with consequent increase of the size of the tumor and convulsions. The tumors found at necropsy were of the angiomatous type. Professor Mircoli followed the behavior of the electrocardiograms immediately before and after blood transfusion in sixteen cases of various diseases. In eleven cases the heart rhythm became slow and the altitude of the T wave increased after transfusion. There was no relation between the intensity of the electrocardiographic changes and the amount of blood which had been transfused. The speaker believes that the electrocardiographic changes are due to transient disorders of the nutritional metabolism of the myocardium after transfusion. Trabucchi did not accept Mircoli's interpretation. Isotonic liquids introduced into animals induce diminution of the altitude of the T wave. Blood transfusion improves the blood supply of the heart with consequent improvement of the physiologic contraction of the structure and slowing of the heart rhythm. From these factors the T wave in the electrocardiogram increases in altitude. Professor Mircoli and Ferromi measured by the congo red method the amount of transudate or exudate in the abdominal or pleural cavity in twenty-two patients. Stained specimens were withdrawn six, fifteen or thirty minutes after introduction of the stain and then the fluid was removed as completely as possible. The colorimetric calculations were done by the method used in determining the amount of circulating blood. The authors found that the amount of fluid withdrawn is slightly less than the amount calculated by the colorimetric method, however, the method is of value in calculating the amount of fluid in the abdominal and pleural cavities.

## Marriages

JOHN W. CROSKY, Philadelphia, to Mrs. Marie L. Bretschneider, Fort Washington, Pa., in Fort Washington, January 21.

WILLIAM H. CONWAY, Larchmont, N. Y., to Miss Helen M. McGraw, Johnstown, Pa., Nov. 24, 1938, in Johnstown.

SANFORD P. LEHMAN, Olympia, Wash., to Miss Constance Jones, Ann Arbor, Mich., in Seattle, Nov. 25, 1938.

WILLIAM FRANCIS HULSE to Miss Helen Frances Stark, both of Cleveland, in Detroit, January 28.

JOHN M. LEAHY, Tiffin, Ohio, to Miss Dorothy Slattery, Chicago, in Chicago, Oct. 10, 1938.

OLIVER S. ORMSBY to Miss Mary Horton, both of Chicago, in Louisville, Ky., February 4.

MARSHALL F. SHIELDS to Miss Eleanor Frances Collins, both of Chester, Pa., Sept. 14, 1938.

ROBERT T. ODON to Miss Mary S. Medearis, both of Fayetteville, Tenn., Sept. 29, 1938.

## Deaths

**Roy Gillian Werner** \* Akron, Ohio, Johns Hopkins University School of Medicine, Baltimore, 1915, past president of the Summit County Medical Society, served during the World War, on the staffs of the City and St Thomas hospitals, aged 55, died, Nov 12, 1938, of chronic ergotamine tartrate poisoning

**Damaso T Laine**, Bryn Mawr, Pa, University of Pennsylvania Department of Medicine, Philadelphia, 1886, fellow of the American College of Surgeons, veteran of the Spanish-American War, founded the Anglo American Hospital in Habana, Cuba aged 72, died, Nov 8, 1938, of cerebral hemorrhage

**Horace Colton Bliss**, Cleveland, Cleveland College of Physicians and Surgeons, Medical Department Ohio Wesleyan University, 1897, member of the Ohio State Medical Association, aged 81, died, Dec 15, 1938, of arteriosclerosis and coronary thrombosis

**Anna M Braunwarth** \* Chicago, Woman's Medical College, Chicago, 1886 an Affiliate Fellow of the American Medical Association at one time medical superintendent of the Post Graduate Hospital, aged 81 was killed, Dec 19 1938 when struck by a bus

**Eber Leander Annis**, La Porte, Ind, Rush Medical College, Chicago, 1881, member of the Indiana State Medical Association, formerly secretary of the city and county board of health, and deputy coroner, aged 78, died, Dec 4, 1938 of coronary thrombosis

**Randall Burrows Hayes**, Jersey Shore, Pa, Jefferson Medical College of Philadelphia, 1900, member of the Medical Society of the State of Pennsylvania, on the staff of the Community Hospital, aged 60 died, Nov 24, 1938, of coronary occlusion

**William Francis Herron** \* Pittsburgh, University of Pittsburgh School of Medicine 1925 instructor in medicine at his alma mater on the staff of St Francis Hospital aged 37, died, Nov 9, 1938 of cerebral thrombosis and cerebral arteriosclerosis

**Gordon Bostwick Maurer** \* Margaretville, N Y, Yale University School of Medicine New Haven, Conn 1923 medical superintendent of the Margaretville Hospital, aged 39, died, Nov 12, 1938, of an accidental gunshot wound received while hunting

**Boyd Bell Snodgrass** \* Rochester, Pa, Marion-Sims College of Medicine St Louis, 1898, secretary of the Beaver County Medical Society on the staff of the Rochester General Hospital, aged 68, died Nov 8 1938, of coronary thrombosis

**Henry Harrison Smith** \* Johnsonburg, Pa Jefferson Medical College of Philadelphia, 1887 past president of the Elk County Medical Society, past president of the school board, aged 76, died Nov 4, 1938 of cerebral hemorrhage

**Samuel E Jordan**, Highland Home, Ala Tulane University of Louisiana School of Medicine New Orleans, 1905, member of the Medical Association of the State of Alabama, aged 57 died, Nov 27 1938, of carcinoma

**Jesse N Clore**, Madison, Va, Medical College of Virginia, Richmond, 1895, member of the Medical Society of Virginia, formerly secretary of the county board of health, aged 69, died, Dec 1, 1938 of coronary thrombosis

**James Harvey Bradfield**, Monterey, Calif, College of Physicians and Surgeons of Chicago School of Medicine of the University of Illinois, 1901 aged 62, died, Nov 5, 1938, of lobar pneumonia and coronary sclerosis

**James Thomas Strickland**, Roanoke, Va, Jefferson Medical College of Philadelphia, 1882 member of the Medical Society of Virginia, aged 81, died, Nov 25 1938, of myocarditis and adenocarcinoma of the prostate.

**Ralph Vernon Moss** \* Philadelphia, University of Pennsylvania Department of Medicine, Philadelphia, 1923, on the courtesy medical staff of the Frankford Hospital, aged 41 died, Nov 10, 1938 of heart disease.

**Wilhelmina G Bickelmann** \* Brooklyn, New York Medical College and Flower Hospital New York, 1919, on the associate staff of the Prospect Heights Hospital, aged 44 died Nov 10 1938, of heart disease

**William Alexander Stevens**, Okanogan Wash Jefferson Medical College of Philadelphia 1886, member of the Medical Society of the State of Pennsylvania, aged 74, died Nov 10, 1938 of a ruptured appendix

**John Adolph Fischer**, Philadelphia Hahnemann Medical College and Hospital of Philadelphia, 1895, aged 66, died, Nov 15 1938 in the Temple University Hospital of carcinoma of the colon and peritonitis

**Alfred Henry Catterall**, Hawley, Pa Medico-Chirurgical College of Philadelphia, 1896 aged 63, died Nov 1, 1938, in the Moses Taylor Hospital, Scranton, of carcinoma of the pancreas with metastasis

**Bruce H Snodgrass**, Beaver Falls, Pa, Marion-Sims College of Medicine, St Louis, 1896, member of the Medical Society of the State of Pennsylvania, aged 65, died, Nov 1, 1938, of coronary thrombosis

**Bernard Sandfeld**, Miami, Fla, Medical College of Ohio, Cincinnati, 1887, aged 73, died, Nov 15, 1938, in the James M Jackson Memorial Hospital of cholelithiasis, cholangitis and aplastic anemia

**Lewis Gravely Pedigo**, Salem, Va, University of the City of New York Medical Department, 1881, member of the Medical Society of Virginia, aged 80, died, Nov 21, 1938, of pernicious anemia

**James V Munger**, Portland N Y, University of Buffalo School of Medicine, 1891, aged 83 died, Nov 20 1938, in Buffalo of hypostatic pneumonia and carcinoma of the larynx

**Thomas J Allison**, Nocona, Texas, Louisville (Ky) Medical College, 1890, member of the State Medical Association of Texas aged 87, died, Dec 16, 1938 of coronary occlusion

**Frederick William Burkhardt**, Buffalo University of Buffalo School of Medicine, 1907, aged 72 died, Nov 29, 1938, in the Deaconess Hospital of carcinoma of the prostate

**Frederick D Brewster**, Scranton, Pa, New York Homeopathic Medical College, New York, 1879, aged 88, died, Nov 30, 1938 in the Hahnemann Hospital of carcinoma

**William Finley Wagner**, Hartleton Pa, University of Pennsylvania Department of Medicine, Philadelphia, 1890 aged 73, died, Nov 16 1938, of chronic nephritis

**Clarence Eugene Meramble**, Los Angeles, University of the City of New York Medical Department, 1894 aged 70, died, Nov 28, 1938, of coronary thrombosis

**J A S Chambers**, Inman Ga Atlanta Medical College, 1892, member of the Medical Association of Georgia, aged 79 died, Dec 6, 1938, of cardiac hypertrophy

**Robert Edward Oliver**, Forrest City Ark, University of Nashville (Tenn) Medical Department, 1907, aged 56, died, Nov 14 1938, of spinal sclerosis

**Frederick A Stevens**, Lake Elmo Minn Hahnemann Medical College and Hospital Chicago, 1883, aged 78, died Nov 30, 1938, of angina pectoris

**John Marion Williams**, Leecreek, Ark, Vanderbilt University School of Medicine Nashville, Tenn, 1884, aged 79, died, Nov 21, 1938, of senility

**Ladura D Rupert**, Frankford, W Va, University of Louisville (Ky) Medical Department, 1892, aged 69, died, Nov 23, 1938, of heart disease

**Edward Van de Vanter**, Burton Wash, Atlanta Medical College 1882, aged 84, died, Nov 18, 1938, in a sanatorium at Seattle of cerebral softening

**William E Jennings**, Boston, N Y, University of Buffalo School of Medicine, 1882, aged 79, died, Nov 6, 1938, of myocarditis and arteriosclerosis

**Henry A Nichols**, Orland, Ind, Medical College of Indiana Indianapolis, 1891, aged 77, died, Nov 12, 1938, of lobar pneumonia

**William P Henry**, Rock Springs, Ga, Atlanta Medical College, 1894 aged 66, died, Oct 31, 1938, of myocarditis and arteriosclerosis

**William James Fletcher**, Eureka, Ohio, Miami Medical College, Cincinnati, 1880, aged 81, died, Nov 9, 1938, of chronic myocarditis

**Clarence N Mosher**, Santa Ana, Calif, Eclectic Medical Institute, Cincinnati, 1890, aged 72, died Nov 4, 1938, of pneumonia

**Thor Bech Lude**, Mill Valley, Calif, Rush Medical College, Chicago, 1910, aged 56 died Oct 30, 1938, of coronary occlusion

**Robert Chester Dundas** \* Los Angeles, Rush Medical College, Chicago, 1890, aged 69, died, Nov 20, 1938 of heart disease

**Dwight Clark Root**, Pine Bluff, Ark (licensed in Arkansas in 1907), county coroner, aged 64, died, Nov 14, 1938

**Francis M Witten**, Oil Springs, Ky, Barnes Medical College St Louis 1895 aged 72, died Nov 6 1938



## Bureau of Investigation

### WILLIAM HOWARD HAY AND HIS "CORN" DIETETICS

#### Hokum Reaches a New High in the Poconos and a New Low on the Far-Flung Plains of Illinois

Frequently William Howard Hay has been mentioned in *THE JOURNAL*. His original sanatorium, called the "Hav Rest Cure," was located at Youngsville, Pa. In *THE JOURNAL*, Feb 25, 1933, attention was called to his subsequent activities at the East Aurora Sun and Diet Sanatorium at East Aurora N Y, and later at Pocono Hav-ven Mount Pocono, Pa. Evidence in the files indicates that in 1934 he moved to Briarcliff Manor, N Y. Subsequently, however, he returned to Mount Pocono, and now he operates the institution there under the name Pocono Haven.

The Hay System is just some simple and not always scientific advice about diet. No one disagrees with the tenet that none of us should overeat and that every one should eat a nourishing diet of natural foods. Hay goes on, however, to advocate the avoidance of mixtures of proteins and starches at the same meal and is apparently so wrapped up in this tenet that many of his menus are of inadequate caloric content. This theory of the incompatibility of proteins and starches has been broadcast far and wide but apparently on the wrong wavelengths, for as yet Mother Nature has heard nothing of it. Green pers still contain about 7 per cent protein and at least, on the average, an equal amount of starch, potatoes 18 per cent protein and 14 per cent carbohydrate, and the human system still converts 58 per cent of protein into carbohydrate. It is interesting to consider some of the foods which Hay himself advocates. Whole wheat flour is chiefly starch but contains 13.8 per cent of protein; wheat germ contains about equal quantities of protein and starch. Eventually people will realize that most foods contain some protein, some carbohydrate and some fat. Meantime, however, Hay apparently continues to prosper in promoting folderol.

As part of his propaganda Hay tries to discredit established medical science. His ridiculous diatribe entitled "Who Are the Quacks?" was released by the American Medical Liberty League. In this little document Hay developed the thesis that the quacks are not the food faddists, the cultists, the "drugless healers," the chiropractors or the naturopaths but, instead, the members of the regular medical profession.

Spas, scientifically conducted, are deservedly popular with many people. The gullible portion of the public, unable to differentiate between the spas in which ethical medicine is practiced and those in which faddists convene, attends institutions such as that operated by Hay and falls easy prey to the misinformation he perpetrates.

Among Hay's publications is one called "The Hay System News." According to its cover it is "published by the Hay Alumni Association," "to extend the teachings of William Howard Hay, M.D." In a current issue Dr Hay answers medical questions. In reply to an inquirer who states "A member of our family suffers with extremely cold hands and feet during the winter time. Can you tell us the cause of this trouble?" Hay replies:

Cold hands and feet may be objectively cold yet subjectively warm. By this I mean that they may feel cold to others yet not be noticeably so to the owner. The condition of objective coldness may accompany high stages of health while objective warmth may accompany high states of toxemia as I have very often noted. It is not always wise to attach too much importance to this symptom if it is a symptom.

But it is far wiser, Dr Hay, than attaching too little importance to such a symptom "if it is a symptom," as it may be indicative of serious vascular disorders.

The Alumni Association which publishes "The Hay System News" apparently has branches, including one at Champaign-Urbana, Ill., where, according to the December 1938 issue of "The Hay System News," there was a meeting on November 10 of the Hay Health Guild. The meeting began with a banquet—if Hay food can be so designated—and was attended by approximately 500 members. The program included songs by Bruce Foote of the Music Faculty of the University of Illinois and

"a very interesting and helpful address on 'Compatibility'" by Dr William Howard Hay. The final sentence of this report reads: "There is no more enthusiastic group of followers of the Hay System, anywhere, than in these 'Twin Cities'."

These twin cities include within their limits the University of Illinois and the homes, fraternity houses and dormitories which house the students and faculty of this great midwestern university. One might expect that, in a community which is composed approximately one fourth of various members of the university faculty and the student body, such faddism would never be popular. The fact remains, however, that at least one restaurant is cashing in by following the edicts of Hay and serving the foods and food combinations suggested by him. Obviously, such activities are a matter of interest to the home economics and biochemistry departments of the university. Probably both are surprised and chagrined that such activities should ensue in these university cities.

There is not the slightest scientific evidence to back up the Hay theory concerning incompatibility of foods. Dr Martin A. Rehfuess of Philadelphia tested such diets on 200 normal men. He also tried them on a great many sick people. Some were fed mashed potatoes and chopped beef together as foods which represented concentrated starches and proteins. Dr Rehfuess discovered that it took only three minutes longer for sick people to digest the beef and potatoes together than it did to digest the beef itself.

These facts are all well known to the medical profession. They have been discussed in numerous books and publications. Two books which have described bluntly the activities of Hay are "Your Diet and Your Health" by Dr Morris Fishbein and "Diet and Die" by Carl Malmberg. The *Reader's Digest* for May 1933 published an article exposing the fallaciousness of these principles of Hay's.

At the time of the founding of the East Aurora institution by one Oliver Cabana Jr., who a number of years ago put out a preparation called "Kem-O-Zone" and described as "The Aristocrat of Antiseptics" it was claimed by Cabana that he had selected Hay as medical adviser to his institution because he was "nationally known for the past decade as an authority on dietetics." Just exactly who designated Hay as an authority on dietetics is not clear. He is not listed in "American Men of Science" and, as far as this Bureau knows, is not a member of any scientific organization in the field of dietetics or nutrition. Not satisfied with his activities in the "twilight zone" of dietetics, he has issued certain statements concerning well established scientific remedies. He claims, for instance, in his book "Health via Food" that "evidence of the efficiency of serum immunization is still entirely lacking, for we have no way of knowing whether one supposedly immunized against any form of disease would ever take such disease, even under extreme exposure." This total disregard for voluminous scientific evidence would be entirely inexcusable, even if it were a statement by a layman and not a graduate in medicine.

Before Hay commenced his activities in this field, he claimed to have been active in the practice of surgery, and yet his book "Health via Food" includes the following paragraph under the chapter entitled "Everyone His Own Physician":

Until the writer sees at least one case of appendicitis die naturally whether this be a simple catarrhal and uncomplicated case or a perforated case with abdominal abscess he is sure to be excused for not taking this condition as seriously as it is painted by the surgeon who knows nothing but the operative treatment of this really simple condition.

This fallacious piece of philosophy is entirely misleading, since it is obvious that those who die with perforated appendices do not die "naturally," whether in "quotes" or otherwise.

Starting with the treatment of asthma, Hay has referred in glowing terms to his treatment of pernicious anemia and, according to a letter from a former patient, published in this Bureau's column in *THE JOURNAL* for Jan 4, 1936, attempts to control diabetes without employing insulin.

Hay appears to be convinced that much that is wrong with any one can be attributable to his failure to follow the principles laid down in the Hay diets. Extensive scientific evidence in both research and clinical medicines refutes completely and entirely his fantastic theories.

The edition of "The Hay System News" previously mentioned contains an article by William H. Hay II. No title, however, is published after his name. Presumably he is neither

a Doctor of Medicine nor a Doctor of Philosophy in biochemistry or nutrition. His writings on the subject are based, apparently, only on his own cogitations. Under the heading 'Disease,' he says

'One fact should be brought home in vivid fashion to the youth of our nation. Disease does not immediately manifest itself in the form of tuberculosis, cancer, arthritis and the like. Disease is present when the body is not 100% efficient in every way. It is evidenced by obesity, unaccountable fatigue, catarrh, and numerous other innocent appearing signs. These conditions are not generally recognized as disease for the failure of the family doctor to pigeonhole them under the head of some definite ailment automatically crosses them off our list of worries.'

Latest reports indicate, however,\* that the "family doctor" is still the first-line battler against disease. At any rate he is not attempting to confuse the public about disease as is Hay II.

From high in the Poconos comes the call to follow Hay. Most people know enough to recognize it for what it is and to consider the call so much static. In Champaign and Urbana the news has yet to be adequately disseminated. No doubt leaders in the university realize that they have an obligation here to their local community.

## Correspondence

### ERYTHEMA NODOSUM

*To the Editor*—The recent editorial on erythema nodosum (THE JOURNAL, January 14, p. 147) should receive wide attention from the medical profession. There are at least three reasons why this subject has an importance beyond the theoretical implications. First those who regard the condition as essentially tuberculous—Wallgren for example—have intimated, as a logical outcome of their observations that patients afflicted with erythema nodosum may be possible sources of the spread of tubercle bacilli to others, if this is true, then important epidemiologic considerations arise in the care and isolation of these patients. Second, assuming that there is a rheumatic variety of erythema nodosum then the possibility of subsequent serious cardiac disease must inevitably loom large in such cases. Third, if either of these views is correct, then patients with erythema nodosum could not be granted insurance rates on the same basis as ordinary persons.

I am a member of a small minority that still regards erythema nodosum as a disease *in generis*. This letter is intended as a plea that nothing be assumed as established until proved definitely.

I. The epidemiologic observations made by Brandon and his co-workers are interesting but the chief thesis of their communication was not substantiated for the following reasons:

(a) It is stated that there was an 'open' case of tuberculosis in the school (a boy aged 17) but it appears that this diagnosis was based alone on a remarkable history of this disease in the patient's immediate family and on the observation in the boy of a positive tuberculin reaction and of a roentgenogram showing 'thickened linear markings and some slight shadowing in the apex of the left lung'. It seems hazardous to speak of 'open' tuberculosis without offering proof in the form of tubercle bacilli in the sputum or, at least, other confirmatory data. If such evidence had been present it should have been so stated. The term 'open' tuberculosis as used in this report requires clarification before its significance can be assessed properly.

(b) The patient who was believed to be suffering from 'open' tuberculosis lived in cottage J, which was later found to have sheltered but one patient with erythema nodosum whereas the other cottages (N and S particularly) had eight and four patients with this disease respectively. Moreover, the isolated patient with erythema nodosum in cottage J had also been in close contact with the first patient to have this disease in the epidemic (cottage N) having carried meals to him. In other words there were many more cases of erythema nodosum in places apparently less exposed to the influence of the boy with open tuberculosis. In order to explain this discrepancy it was assumed

that there had been other means of intimate contact, such as the swimming pool. It seems fair to conclude on the basis of these data, that the source of this epidemic was not definitely established and that there remain too many lacunae awaiting clarification.

2. Regarding the data on rheumatic erythema nodosum it is true that Wallgren described three cases in his report, but of these three he was willing to accept only one as truly rheumatic. It is my belief that an isolated example in which the evidence of relationship was suggestive but not conclusive, compared with an experience of about 800 cases of erythema nodosum, as stated by Wallgren, can hardly be construed as substantiating the rheumatic nature of this condition, at least the factor of coincidence must surely be taken into account. There is an enormous gap between Mackenzie's view that all instances of the disease are of rheumatic origin and Wallgren's apparent demonstration of a single rheumatic case observed among 800 cases of erythema nodosum.

My interest in erythema nodosum is based on a correlation of the dermatologic and the internal medical aspects of a large number of instances of this disease, including two small endemics, thus far I have attempted only an analysis of the relation of this condition to rheumatic fever (*Ann Int Med* 10:1686 [May] 1937). One cannot but be impressed by the imposing edifice of observations on the tuberculous nature of erythema nodosum, but it appears that there are many gaps in our knowledge; moreover, there is much contradictory evidence on fundamental points, all of which will be discussed in a critique under preparation. It is my belief that erythema nodosum as observed in this country differs in no remarkable way from the disease seen in other parts of the world, including the Scandinavian countries, the clinical picture, the high incidence of positive tuberculin reactions (including the vesicular response), the frequent occurrence of hilar shadows, the occasional finding of a negative tuberculin reaction, the recurrences and the like are identical to those reported from other countries. Moreover, the evidence strongly indicates that this condition in adults is essentially similar to that observed in children. The theory that erythema nodosum is a nonspecific cutaneous reaction to a variety of causes is based, in my opinion, on a mass of doubtful data.

HARRY KEIL, M.D., New York

### HIPPOCRATIC LETTERS ON THE INDEPENDENCE OF THE PROFESSION OF MEDICINE

*To the Editor*—Apropos of the present controversies on state medicine and the hiring of physicians on the same basis as workmen, it seems timely to bring to mind the following little episode. The 'Council and Citizens of Abdera' wrote to Hippocrates to come to their city and treat the ailing Democretus, their most illustrious citizen, promising him 'all the glory, learning and gold' their city could afford. The fact that a whole city should be so greatly concerned over the health of one citizen impressed Hippocrates, and he agreed to come. That the Abderites should think, however, that they could hire the services of a physician for a stipulated sum of money the same as of any other artisan, he considered an insult. So he even asked his 'guest friend' Philopomen for hospitality, during his stay in Abdera, not wanting to trouble a city already so disturbed' with his private physical needs and to the Abderites he remarked: 'For my coming neither nature nor God can contract me for money nor may you citizens of Abdera, do me violence (i.e. insult me with such a suggestion), but let the works of a free art remain likewise free. Those who hiring themselves out for salary, force the sciences into servitude, rob them of their ancient freedom and reduce them to utter slavery. Consequently, they would be as though the disease is serious, or deny it is trivial not coming when promising or

coming without being asked. Indeed the life of men has become miserable, because this unbearable covetousness, like a hurricane, has permeated it throughout." This reminds one of some of the present criticisms of the panel system.

I am, of course, aware of the very serious objections as to the authenticity of these so-called hippocratic letters. However, the time and the spirit is hippocratic and it should matter but little who actually penned them. The excerpt is offered for the consideration of both sides, and a familiarity with the spirit it displays might prove profitable to both physicians and laymen.

SAVAS NITTIS, M D, Ann Arbor, Mich

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### DEATH FROM INSULIN SHOCK OR OTHER CAUSE

*To the Editor*—Kindly criticize the following treatment. A woman aged 52 while eating supper suddenly fell into a deep snoring slumber from which she couldn't be roused. Her daughter gave the following history: Mother was told she was diabetic and she had been on insulin and a special diet for about six months. We covered about 300 miles today and twice during the afternoon mother complained of not feeling well and she took a little nap in the bus. She always took her protamine zinc insulin in the morning before breakfast [quantity unknown]. Out side of the diabetes she apparently was in good health. The patient unfortunately was not seen until after having been in coma for over an hour. Her face was pale, the eyeballs were soft, there was a slight suggestion of acetone on the breath, the skin was sweaty, respirations were labored and apneic in character, the pulse was of good quality (about 80), the blood pressure was 130 systolic, 80 diastolic. There were no heart murmurs, the patient was relaxed and the superficial reflexes were sluggish but no abnormal ones were present. The patient was rushed to the hospital where the bladder was immediately catheterized and a blood specimen taken. Ten per cent dextrose in physiologic solution of sodium chloride was started. Examination of the urine revealed specific gravity 1.010, acetone negative and sugar negative. Following this report stimulants were started such as epinephrine, caffeine and strychnine. The 10 per cent dextrose was stopped and 50 cc of 50 per cent dextrose solution was given slowly. The patient did not respond at all but seemed to sink deeper, her respirations coming about once every two minutes. Just as the blood sugar report came back 52 the patient's pulse became irregular and she died. A urea nitrogen test later revealed a level of 38. 1. The condition resembled insulin shock or hypoglycemia; was proper treatment instituted? 2. What is the terminal picture in hypoglycemia? 3. Could protamine zinc insulin have exerted a peak influence early in the evening to have produced the shock picture? (No severe exercise was taken during the day to deplete the sugar.) 4. How long can one remain in shock before treatment is hopeless? Is it possible to be in diabetic coma (acidosis) with a low blood sugar, urine sugar and acetone free? If kidneys stop excreting waste products?

M D, Oregon

*ANSWER*—Treatment of this case under the circumstances appears sensible, but the diagnosis of the condition remains in doubt. First, it is rare for a patient while eating a meal to develop insulin shock, but it does occur. Second, an argument against insulin shock is the rapidity with which a blood pressure of 130/80 and a pulse of good quality changed and the patient died. Third, a blood sugar of 52 mg is not as low as one ordinarily encounters during insulin shock which has persisted in the stage of unconsciousness over a considerable period. Fourth, the insulin shock came on rapidly and treatment was instituted within an hour, and with such prompt treatment a prompt recovery would be expected. Fifth, extreme pallor, soft eyeballs and a labored respiration, apneic in character, are not characteristic of insulin shock. A necropsy might well have shown cerebral or coronary sclerosis with accompanying lesions.

The terminal picture in hypoglycemia is not well known. In three recent cases supposed to be typical of death in hypoglycemia, coronary occlusion was found in two and a pulmonary embolism subsequent to a fracture in the third. It is perfectly possible for the symptoms to come on suddenly and thus for perspiration and tremor to be absent. The respiration is usually normal, blood pressure certainly normal at first.

Protamine zinc insulin could have exerted a peak influence early in the evening, but one would have expected a lower blood

sugar to produce such an advanced stage of shock. The fact that the shock came on during the meal does not militate against the possibility of insulin shock, because the food might not have been absorbed. Repeatedly dextrose or other forms of carbohydrate are given in the early stages of shock and do not bring about prompt improvement and later this is explained, because the stomach empties itself of all that was administered. In such instances people generally get well of themselves or with the help of repeated feedings or dextrose given intravenously or subcutaneously.

If a patient is unconscious in insulin shock for more than eight hours there is grave danger. No instance is recalled from experience or in the literature in which recovery has occurred after unconsciousness of twelve hours.

It does not appear possible for a patient to be in diabetic coma caused by acidosis with a low blood sugar and to have the urine free from sugar and acetone. If the kidneys were blocked, acetone and diacetic acid might disappear from the urine but would be present in the blood.

### DROWNING AND RESUSCITATION

*To the Editor*—Can you tell me how long a person has been under water and then resuscitated regardless of whether or not death occurred a short time later from complications? The reason I am asking is that I have seen in several books statements to the effect that persons who have been immersed as long as thirty minutes have been resuscitated. Don't give up! Persons who have been under the water as long as thirty minutes have been resuscitated by this simple method (Daiton F E Swimming Scientifically Taught New York Funk & Wagnalls Company 1931 p 246). Persons have been known to have been restored to life after having been under water for a half hour (Sullivan F J Science of Swimming New York American Sports Publishing Company 1932 p 91). There are cases on record of people having been revived after being under water for half an hour and unconscious several hours (Hindley L de B Swimming for Women New York American Sports Publishing Company 1931 p 90).

R D STREETOR M D Moberly, Mo

*ANSWER*—All laboratory tests have agreed in showing that after about four minutes of complete deprivation of oxygen in the brain—as by occlusion of the arteries—irremediable damage has occurred. If instead the trachea is clamped, the oxygen in the air in the lungs postpones this result perhaps a minute or two. Absolutely sudden and complete submersion for six or seven minutes may therefore be expected to render resuscitation impossible. But considering the way in which drownings actually occur, with the possibility that the victim has drawn a partial breath before his traditional "going down the third time," ten or twelve minutes may elapse during the "drowning" and therefore resuscitation may still be attainable. As for such longer periods as half an hour, it may be remembered that no one actually times them, and that in view of many successful resuscitations of persons apparently dead it is well to encourage prolonged efforts.

### DIAGNOSIS OF SYPHILIS

*To the Editor*—A man aged 47 was originally infected with syphilis in 1910. He states that there was no doubt about the original infection since he had gone out on furlough with three other persons and all were infected. He was treated with arsphenamine from 1910 to 1912 and he had malaria from 1912 to 1914 on several occasions while in the tropics. He is married and has two healthy grown children and a grandson. Routine and provocative Wassermann tests at intervals have been negative. There has been no treatment since 1912. Up to September 1938 the spinal fluid had not been examined. In September he suffered a nose bleed. The examining physician stated that the cause was either hypertension or syphilis and concluded that it was the latter as the blood pressure was 130/90. The patient came to my attention about September 15. Examinations revealed no physical or neurologic abnormalities. The nasal mucous membrane was normal. The blood pressure was 130/90. X ray examination of the heart showed nothing suggestive of syphilis. The blood serum reaction was negative. The spinal fluid was normal as to Wassermann and Kahn and colloidal gold tests. The patient is somewhat worried and no doubt a diagnosis made twenty-eight years ago has irretrievably affected his life. Was syphilis present originally? Had the malarial infection of 1912 to 1914 an adverse influence on the course of the supposed syphilitic infection? Does the negative serum reaction rule out a syphilitic infection? How should the case be handled?

M D Michigan

*ANSWER*—The fact that the patient now shows no clinical or serologic evidence of syphilis does not mean that he did not acquire syphilis in 1910. It is known that practically one third of the patients who acquire syphilis will control the disease spontaneously, and this patient may belong in this group. As he manifests no signs of the disease at this time, there is no way in which the original diagnosis made in 1910 can be confirmed or disproved. It is true no doubt, that the psychological effect of this knowledge on the patient has been great, but the only way this can be offset is to reassure him that,

although one cannot say whether or not he had the disease in 1910, the evidence now indicates that the syphilis has apparently been cured. It is likewise impossible to say just what effect the malarial infection of 1912 to 1914 had on the course of the disease, because many patients with a serious type of syphilis are seen who have a malarial infection after they acquired the syphilis. It would seem advisable to reassure the patient to the utmost and to urge him not to take treatment but, if he wishes, to come in once a year for a recheck simply to assure himself that he need have no worry regarding the disease.

#### PRIMARY JEJUNAL ULCER

*To the Editor*—I recently had occasion to examine a white man aged 42 who showed all the signs and symptoms of an acute perforated ulcer. On operation a primary jejunal ulcer was found to have perforated. No other ulcers were found elsewhere in the gastrointestinal tract and there had been no previous abdominal surgery done except an appendectomy seven years before. In going back over the literature I am unable to find mention of a case of perforation of a primary jejunal ulcer in which the jejunal ulcer is of the peptic type and no previous abdominal surgery had been done. If you know of such a case I should appreciate the references.

M D Pennsylvania

*ANSWER*—Primary jejunal ulcer must be an extreme rarity, as many large necropsy series fail to record a single case. W W Ebeling (Primary Jejunal Ulcer *Ann Surg* 97 857 [June] 1933) of Philadelphia, in a comprehensive article states that only forty-seven cases including one of his own had been reported in the literature between 1827 and 1932. Only seven of these ulcers had been operated on in the absence of perforation. While tuberculous ulceration and syphilis produce changes in the jejunum, the pathologic change of a primary jejunal ulcer is different in that it is similar to that of chronic peptic ulcer as found in the duodenum. Most of these ulcers occur in the upper part of the jejunum and are situated opposite the mesenteric border. The symptomatology is not unlike that of duodenal ulcer, although the pain may be located in the upper left quadrant, especially in the occasional case in which upper jejunal obstruction has occurred. X-ray examination may be of some aid in diagnosis. The diagnosis, however, has not been made in most cases until after perforation has occurred. Perforation has followed trauma in one or two instances. Resection of the ulcer is naturally the treatment of choice.

#### Additional references

- Coletti D A Primary Ulcer of the Jejunum Two Cases *Polichin (sez chir)* 43 243 (June) 1936  
Hall D P Perforation of Primary Jejunal Ulcer *South Surgeon* 5 309 (Aug) 1936

#### TREATMENT OF HEMOPTYSIS IN PULMONARY TUBERCULOSIS

*To the Editor*—Should small doses of morphine sulfate (from one eighth to one fourth grain (0.008 to 0.016 Gm)) be used in hemoptysis in cases of pulmonary tuberculosis? Is the value of this drug in quieting the patient and controlling the cough overshadowed by the danger of producing spread of disease by permitting blood and sputum to collect in the bronchi? Is there risk of producing pneumonia by placing an icebag on the patient's chest to keep him quiet? Would you outline a routine to be followed in treating a tuberculous patient with hemoptysis?

M D Connecticut

*ANSWER*—Morphine in ordinary doses does not stop cough completely, therefore there is not much increase in danger from the blood collecting in the bronchi. The greatest danger in this respect comes from slow internal bleeding. As a rule the doses specified can be used with safety.

An ice bag placed over the precordium has a tendency to slow the heart rate. It does not tend to cause pneumonia. Absolute quiet of the patient gives the best chance of stopping bleeding. This includes also the assurance given the patient by the physician himself.

The treatment of pulmonary hemorrhage may be divided into prophylactic and active. The former depends on the early diagnosis of ulcerations and prompt collapse therapy or other forms of treatment supplemented always with the sine qua non of tuberculosis therapy—rest.

Active treatment in actual bleeding differs depending on the amount of hemorrhage. In ordinary bleeding blood spitting, oozing or seeping hemorrhages the patient should have absolute rest, small doses of morphine or barbiturates. Phenobarbital is good and is preferred by some to morphine. Coagulants such as calcium gluconate or lactate have been recommended but their actual efficacy has not been demonstrated. They inspire the patient however so that the fear of death or great hemorrhage is removed somewhat. Chipped ice by mouth, ice cream for food and an ice pack to the chest are useful and may be used profitably.

As soon as any danger of bronchopneumonia has passed, collapse therapy should be done.

In massive hemorrhage the patient should have collapse of the bleeding lung as soon as possible until bleeding stops and be put to bed in a horizontal position with the head elevated enough to keep him from strangling in the sputum or blood that may come up. Then all the other measures mentioned before may be used, as necessity dictates.

#### ILL EFFECTS OF PROLONGED STANDING ON WOMEN

*To the Editor*—As medical inspector of our department of labor I happened to inspect a canning industry in which women in its trimming department have been working in the standing position all the time. Please explain to me what ill effects this working in the standing position for at least eight hours a day will be likely to bring to these women.

JOSE SANTILLAN MD Manila P I

*ANSWER*—Most disorders attributed to prolonged standing are associated with the lower extremities, such as varicosities with eczema or ulcers, flat foot, and knock knee. Bone and joint changes have been reported in young women and children in whom the osseous system is imperfectly developed especially when unnatural posture or repetitive movements are added considerations. Also in the case of women greater incidence of dysmenorrhea with or without associated uterine displacement is stated to occur. Similar functional disturbances may take place in the case of abdominal organs in persons with viscerotonic tendencies. Bulletin 136 of the Women's Bureau of the U S Department of Labor contains a section on seating equipment for women workers and the regulations which have been adopted in certain jurisdictions. Various commentators have pointed out that due care must be taken that the facilities provided are not as injurious as standing itself, that seats or benches are readily accessible and adjustable to the working place, with backs, arm and foot rests if needed and the number of seats supplied in proper relation to the number of employees.

#### PAINFUL AND STIFF FINGERS AND TOES AFTER CEREBRAL HEMORRHAGE

*To the Editor*—A white man aged 62 suffered a cerebral hemorrhage last January resulting in a paralysis of the left side. He gradually improved until now he can walk again and do light work. His Wassermann reaction is negative, blood count normal and blood pressure around 170 systolic, 90 diastolic. His reflexes are all hyperactive. He also has several carious teeth. His chief complaint is pain and tenderness in the ends of his fingers and toes; another complaint is a progressive stiffness of the joints of his hands. I gave him six injections, one every three days of sodium iodide 1 Gm without any relief. I should like to know the cause of the pains and tenderness in his fingers and toes and the treatment.

M D Ill

*ANSWER*—It is assumed that the pain and tenderness in the fingers and toes is bilateral. If this is the case it is extremely unlikely that the cerebral hemorrhage is directly responsible. Occasionally a hyperesthesia accompanies cerebral hemorrhage but only on the affected side.

There are a number of conditions that might produce the complaint mentioned. Circulatory disturbances must be ruled out. Buerger's disease (thrombo angustis obliterans) is a possibility. This disorder is not symmetrical in its distribution and rarely affects the upper extremity to the same extent that it affects the lower. Raynaud's syndrome is symmetrical in its distribution but it is not continuous and is associated with blanching of the skin. Weir Mitchell's disease (erythromelalgia) produces discomfort of this sort. This condition is aggravated by a dependent position and by heat or is relieved by elevation of the part and by cold. Scleroderma may be painful even before thickening of the skin occurs. In subacute bacterial endocarditis Osler's nodes, small painful elevations on the finger tips and toe tips occur as a result of embolism of the end arteries. This appears unlikely in this case. The pain of arteriosclerosis is rarely symmetrical and is made worse by exercise.

Nerve disorders must be considered. An avitaminosis may produce a peripheral neuritis. Certain drugs, notably arsenic produce a like effect.

The progressive stiffness of the hands in patients of this age is usually the result of an osteoarthritis. This condition often progresses rapidly when customary exercise is abandoned for any reason.

Correct therapeutic procedures will depend on a more accurate diagnosis. The effect of heat and cold should be tried both for therapeutic and for diagnostic reasons. The effect of vaso dilators should be investigated. For this purpose one of the compounds of thiochrome or theophylline may be used.

### ABSENT TEETH AND DELAYED DENTITION IN BABY

*To the Editor*—A white baby an only child aged 16 months has a complete absence of teeth. The baby held its head up at 2 months sat up at 6 months walked at 11 months and says several two syllable words now. Physical examination is normal except for a tendency to dry hair dry skin and absence of all teeth. There is no evidence of rickets. The baby has been spoiled and no regular dietary regimen has been followed because of unwillingness of the parents to cooperate. The Wassermann reaction is negative and there is no family history of syphilis or delayed dentition. X-ray examination of the skull shows unerupted teeth present. The film was not a good one. X-ray examination of the wrist bones shows only two carpal bones present. According to the roentgenologist this shows the development of a 6 months infant. Oct. 15, 1938 I started the baby on one-half grain (0.03 Gm.) of thyroid extract (Armour's) orally daily. I know that infants who have manifestations of thyroid deficiency often have delayed dentition. However this child's mental development has been normal. Are there any other causes of delayed calcification of the carpal bones other than thyroid deficiency? How long should I keep giving thyroid extract if the child shows no physical improvement but continues to do well mentally?  
M D Virginia

*ANSWER*—It is doubtful whether the infant discussed is suffering from a lack of thyroid secretion. Thyroid deficiency in infancy is manifested by slow growth in height, thick, dry, wrinkled skin, pasty complexion, dull expression, thick tongue, protuberant abdomen and short, thick hands. There is a delayed closure of the fontanel.

It is true that delayed dentition and tardy ossification of the carpal centers accompany thyroid deficiency. However, physical and mental development are retarded also.

In certain nutritional disorders, especially rickets, there is a delay in the calcification of the carpal bones. It should be pointed out, however, that there may be considerable individual variation in the time at which the carpal bones become calcified. The infant mentioned in the query may well be within the range of normal.

If there is no response to the treatment within one or two months, the administration of the thyroid gland extract should be discontinued.

### OPHTHALMOGRAPH AND METRONOSCOPE

*To the Editor*—As president of the board of education I am interested in knowing whether or not there is any scientific basis for the use of metronoscopes and ophthalmographs in the public school system for the purpose of detecting visual defects and their correction. Worlds of literature emanate from educational institutes where reading laboratories are maintained which set forth the great value of these instruments. I have been unable to find any medical literature on the subject and would appreciate any information you may be able to give me.

E J CUMMINS M D El Paso Texas

*ANSWER*—No strictly medical literature on the metronoscope or ophthalmograph has been found. The ophthalmograph has been used for photographing the movements of the eyes in reading and it does give a record of ocular imbalance in reading and of faulty reading habits. A certain amount of skill and experience is required to obtain good records with it. Unless such records are obtained the use of the metronoscope does not seem scientific, since it should be used only for children whose reading rhythm is proved to be defective by such a record. Probably no one knows what proportion of cases showing reading disability is due to poor reading rhythm which could be detected and might be corrected by the two instruments. The problem is rather one for educators than for ophthalmologists.

### INTRAVAGINAL TAMPONS AND OBSTRUCTION OF MENSTRUAL FLOW

*To the Editor*—I have had a few cases of severe pain in the right lower quadrant which followed a normal menstrual period during which time the patient had used intravaginal tampons to absorb the menses. Two cases of severe pain showed signs of peritoneal irritation. Rigidity, tenderness below McBurney's point and rebound tenderness were present in both cases. There was marked tenderness in the right fornix. However there was no vomiting, nausea, fever or increased white count. All symptoms subsided in forty-eight hours and did not recur when the use of intravaginal tampons were forbidden. I believe that the entire syndrome was due to back pressure by a snug tampon. I should like to know your opinion.  
M D New York

*ANSWER*—It is entirely possible that the symptoms enumerated may have been due to the escape of blood from the uterus through one or both fallopian tubes into the pelvic cavity. Good evidence in favor of this is the fact that the attacks failed to appear when the intravaginal tampons were not used. Most likely the tampons were inserted high enough into the vagina to obstruct the external os. Ordinarily if there is no obstruction

at the external os the blood which escapes from the uterus remains in the vagina until the tampon is removed. If the external os is not blocked, a back flow of blood through the tubes can occur only if a large amount of blood is dammed back in the vagina. Of course in some cases blood may escape into the peritoneal cavity without any obstruction, an occurrence which in the opinion of Sampson and others is responsible for most cases of external endometriosis.

### PERMANENT WAVE AND CONSTITUTIONAL DISEASE

*To the Editor*—Every now and then a patient states that hairdressers claim that there must be some constitutional disease present as they are unable to get a permanent curl in the customer's hair. Thus far I have never seen literature that would enable me to solve this problem. Has anything been written regarding this matter?

W L CASLER M D Marquette, Mich

*ANSWER*—So called permanent waves are produced by wetting the hair with an alkaline solution to soften it and then heating it while on the curlers long enough to produce steam. This fixes the curl for a longer time than any other method yet discovered. It works well with most hair, but even the most expert hairdressers have difficulty with some kinds of white, overbleached, stringy or dyed hair.

"Constitutional disease" is a common excuse used by hairdressers whose failure to accomplish a good curl is not uncommonly due to poor technique or poor preparations. A test curl made on one lock of hair preliminary to the operation will sometimes spare both operator and subject the distress of failure. It is not an uncommon experience for the woman who has been told that some mysterious constitutional disease or condition prevents her hair from taking the curl to get a perfect result by employing another more expert hairdresser.

### TRAUMA AND REGIONAL ILEITIS

*To the Editor*—Will you discuss the possible relationship between so called terminal ileitis and trauma? References to the ileitis syndrome would be appreciated.  
M D New York

*ANSWER*—Although most of the many articles which are now appearing on so called terminal or regional ileitis make no mention of trauma as an etiologic factor, Mock (*Infective Granulomata, Surg Gynec & Obst* 52:672 [March] 1931) mentions trauma as one of the factors in production of infective granulomas. He refers more particularly, however, to inflammations following the presence of foreign material such as mass ligation with silk, sponges left in the intra-abdominal cavity, and similar conditions. While all authors regard the etiology of regional ileitis as obscure, it is generally agreed that the process is of some unknown bacterial or virus origin. An excellent bibliography including over 100 articles is to be found at the end of a paper by Maxwell Lick on "Regional Ileitis" (*Surg Gynec & Obst* 66:340 [April] 1938).

### ONSET AND DURATION OF SYMPTOMS FROM FOOD ALLERGY

*To the Editor*—In a case of vasomotor rhinitis in which certain foods are the proved cause (such as potato and wheat) approximately how long might the interval be between eating the food and the onset of the attack? Approximately how long might symptoms continue to appear or be present from a single attack producing amount of the allergen?

M D Washington D C

*ANSWER*—Foods such as potatoes and wheat which cause vasomotor rhinitis usually act within a period of time varying from one-half hour to three or four hours. In extremely sensitive persons symptoms may occur almost immediately after ingestion, on the other hand, in less sensitive persons the symptoms may not occur until twenty-four hours after eating. Certainly twenty-four hours would be the late limit in almost every case. The duration of symptoms will vary from a few minutes to perhaps as long as three or four days or even longer in occasional instances.

### REDUCED FECUNDITY IN RADIO WORKERS

*To the Editor*—A 33 year old radio engineer whose work keeps him in close contact with radio transformers complains of sterility. His sperm count is found diminished with a large preponderance of dead sperm. He states that those in this work are of a reduced fecundity which factor is common knowledge to them. Is this true? Can you refer me to articles on this subject?  
M D Alabama

*ANSWER*—Although the X-rays will at times cause sterility, there is no evidence that workers in radio machines are ever affected in this fashion. There are no cases on record and no articles on the subject.

Medical Examinations and Licensure

COMING EXAMINATIONS  
STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL February 18 page 664

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II Medical centers having five or more candidates desiring to take the examination May 1 2 (Part II only—limited to a few centers) June 19 21 and Sept 11 13 Ex Sec Mr Everett S Elwood 225 S 15th Street Philadelphia

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY An Affiliate of the American Board of Surgery Written examination will be held at various places throughout the United States Sept 9 Oral examinations for all candidates St Louis May 13 14 Applications must be filed not later than sixty days prior to the date of the examinations Sec Dr Paul M Wood 745 Fifth Ave New York

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY Philadelphia Oct 30 Nov 1 Sec Dr C Guy Lane 416 Marlboro St Boston

AMERICAN BOARD OF INTERNAL MEDICINE Written Various parts of the United States Oct 16 Applications must be received by Aug 20 Oral New Orleans March and St Louis May Sec Dr William S Middleton 1301 University Ave Madison Wis

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY General oral clinical and pathological examinations for all candidates Part II examinations (Groups A and B) will be held in St Louis May 15 16 Application for admission to Group A examinations must be on file in the Secretary's office by March 15 Sec Dr Paul Titus 1015 Highland Bldg Pittsburgh (6)

AMERICAN BOARD OF OPHTHALMOLOGY Written Various cities throughout the country March 15 and Aug 5 Oral St Louis May 15 and Chicago Oct 7 Sec Dr John Green 6830 Waterman Ave St Louis

AMERICAN BOARD OF ORTHOPAEDIC SURGERY St Louis May Applications must be filed with the Secretary on or before April 1 Sec Dr Fremont A Chandler 6 N Michigan Ave Chicago

AMERICAN BOARD OF OTOLARYNGOLOGY St Louis May 12 13 and Chicago Oct 6 7 Sec Dr W P Wherry 1500 Medical Arts Bldg Omaha

AMERICAN BOARD OF PATHOLOGY Richmond Va April 3 4 Sec Dr F W Hartman Henry Ford Hospital Detroit

AMERICAN BOARD OF PEDIATRICS Cincinnati Nov 15 Appointments must be made before July 15 Sec Dr C A Aldrich 723 Elm St Winnetka Ill

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY Chicago May 13 Sec Dr Walter Freeman 1028 Connecticut Ave N W Washington D C

AMERICAN BOARD OF RADIOLOGY St Louis May 11 14 Sec Dr Byrl R Kirkin 102 110 Second Ave S W Rochester Minn

AMERICAN BOARD OF SURGERY Part I Simultaneously in various centers throughout the United States April 3 Part II New York May 8 and May 9 Sec Dr J Stewart Rodman 225 S 15th St Philadelphia

AMERICAN BOARD OF UROLOGY White Sulphur Springs W Va May 26 28 Sec Dr Gilbert J Thomas 1009 Nicollet Ave Minneapolis

Georgia Reciprocity and Endorsement Report

Mr R C Coleman joint secretary, State Examining Boards, reports six physicians licensed by reciprocity and one physician licensed by endorsement from Oct 19 through Dec 5, 1938 The following schools were represented

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Emory University School of Medicine		(1935)	Mississippi
Rush Medical College		(1935)	California
University of Minnesota Medical School		(1932)	Minnesota
University of Tennessee College of Medicine		(1931)	Tennessee
Vanderbilt University School of Medicine		(1937)	Tennessee
University of Texas School of Medicine		(1935)	Texas

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Tufts College Medical School		(1934)	N B M Ex

Minnesota October Report

Dr Julian F Du Bois, secretary, Minnesota State Board of Medical Examiners, reports the oral written and practical examination held at Minneapolis, Oct 18 20 1938 The examination covered twelve subjects and included sixty questions An average of 75 per cent was required to pass Fifty candidates were examined forty-nine of whom passed and one failed Five physicians were licensed by reciprocity and four physicians were licensed by endorsement The following schools were represented

School	PASSED	Year Grad	Per Cent
Stanford University School of Medicine		(1937)	91 3
Loyola University School of Medicine		(1938)	85 4
Northwestern Univ Medical School	(1937) 89 2	(1938) 88 1	88 1
Rush Medical College	(1937) 84 1	86 3	89 3
School of Medicine of the Division of Biological Sciences	(1938)		88 5
Indiana University School of Medicine	(1932)		86 3
State Univ of Iowa College of Medicine	(1932) 90 6	(1937)	86 2

Harvard University Medical School	(1935)	89 4
University of Minnesota Medical School	(1934)	87 3
(1937) 88 88 1 * (1938) 82 2 83 1 * 86 86 * 86 2 86 3 86 3 * 86 5 * 87 1 * 87 4 87 6 90 90 6		
University of Nebraska College of Medicine	(1935) 87 3	(1937) 89 6
Cornell University Medical College	(1936)	87 5
University of Cincinnati College of Medicine	(1938)	83 4 *
University of Oklahoma School of Medicine	(1936)	87 4
University of Oregon Medical School	(1936)	89 1
Jefferson Medical College of Philadelphia	(1933)	93
University of Pennsylvania School of Medicine	(1936) 84 4	88 5
Baylor University College of Medicine	(1928) 84	(1936) 88 5
University of Texas School of Medicine	(1937)	85 2
Marquette University School of Medicine	(1938)	88 4
University of Manitoba Faculty of Medicine	(1937)	86
Queen's University Faculty of Medicine	(1926)	88 4
University of Toronto Faculty of Medicine	(1937)	90 6
McGill University Faculty of Medicine	(1936) 87 2	88
University of Montreal Faculty of Medicine	(1936)	89 2

School	FAILED	Year Grad
University of Minnesota Medical School		(1938)

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
State University of Iowa College of Medicine		(1933)	Iowa
Harvard University Medical School		(1933)	Maryland
Long Island College of Medicine		(1933)	New York
Marquette University School of Medicine		(1937)	Wisconsin
University of Wisconsin Medical School		(1937)	Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad	Endorsement of
Northwestern University Medical School		(1936)	N B M Ex
University of Minnesota Medical School	(1937)	(1938)	N B M Ex
Cornell University Medical College		(1935)	N B M Ex

\* This applicant has received the M B degree and will receive the M D degree on completion of internship

Nevada November Report

Dr John E Worden, secretary, Nevada State Board of Medical Examiners, reports the written examination held at Carson City, Nov 7, 1938 The examination covered twelve subjects and included ninety-seven questions An average of 75 per cent was required to pass Two candidates were examined, both of whom passed Three physicians were licensed by reciprocity The following schools were represented

School	PASSED	Year Grad	Per Cent
College of Medical Evangelists		(1938)	85 7
Northwestern University Medical School		(1937)	86 8

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
Keokuk Medical College Iowa		(1903)	Iowa
Creighton University School of Medicine		(1936)	Kansas
University of Nebraska College of Medicine		(1932)	Nebraska

Kansas December Report

Dr J F Hassig, secretary Kansas State Board of Medical Registration and Examination reports the written examination held at Topeka Dec 13-14 1938 The examination covered ten subjects and included 100 questions An average of 75 per cent was required to pass Eleven candidates were examined, ten of whom passed and one failed Fifteen physicians were licensed by reciprocity The following schools were represented

School	PASSED	Year Grad	Per Cent
College of Medical Evangelists		(1938)	84 5
Harvard University Medical School		(1937)	88 7
University of Minnesota Medical School		(1935)	80
(1937) 78 9 (1938) 83 84 2			
Univ of Oklahoma School of Medicine	(1937) 81 6	(1938)	80 8
Columbia Univ College of Physicians and Surgeons	(1936)		82 6
University of Oregon Medical School	(1936)		84 4

School	FAILED	Year Grad	Per Cent
Creighton University School of Medicine		(1937)	72 4

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Georgia School of Medicine		(1936)	Georgia
Loyola University School of Medicine		(1916)	Illinois
University of Illinois College of Medicine		(1937)	Illinois
University of Kansas School of Medicine		(1932)	Missouri
University of Michigan Medical School		(1929)	Missouri
University of Minnesota Medical School		(1936)	California
St Louis University School of Medicine	(1934)	(1937)	Missouri
Washington University School of Medicine	(1937) 2	(1937) 2	Missouri
University of Nebraska College of Medicine	(1936) (1937) Nebraska		Tennessee
Long Island College Hospital		(1928)	Nebraska
University of Oklahoma School of Medicine		(1936)	Oklahoma



## Book Notices

**Human Pathology A Textbook** By Howard T. Karsner M.D. Professor of Pathology Western Reserve University Cleveland Ohio. With an introduction by Simon Flexner M.D. Fifth edition. Cloth. Price \$10. Pp. 1013 with 461 illustrations. Philadelphia & London J. B. Lippincott Company 1938.

The object of a textbook of any scientific subject is to provide for the initiate a logical and understandable guide which will enable him (1) to acquire the fundamental principles, (2) to orient the different yet related phases of the subject material, (3) to incorporate all such information into the sum total of a fruitful knowledge and (4) to instill the spirit of response to the challenge in the search for new and as yet unknown truths. Such a concept of purpose is especially applicable to the comprehensive subject of pathology.

Textbooks in pathology are written from the point of view of the generalizations of disease as applied to the various systems and organs (general pathology), from the point of view of the specific considerations of the morbid anatomy of the various organs and systems (organ or system pathology), or with a combination of these two considerations. The latter is the arrangement in this textbook.

The average writer of the modern textbook in pathology is undoubtedly motivated by a desire to present the subject clearly, logically and comprehensively, yet sufficiently concise to enable the struggling student sufficient time to meet the exacting demands of other instructors in a rapidly advancing "curricular" curriculum conspiracy. To meet this situation certain textbooks abound in attractive, often dogmatic, brevity. The author levels off his competency to a stratum of knowledge too incomplete to be beneficial to either the student, author or subject. In his preface Dr. Karsner admirably points out that "the doctrine of purpose should not be permitted to smooth too easily the paths of learning, especially if it entails a critical analysis of cause and effect."

There are three preeminent qualities in Karsner's textbook: (1) pertinent outlines of each subject, (2) vivid and scholarly discussions and (3) excellent and often inclusive bibliographies following the exposition of each major dissertation. To the teacher it affords a stimulus to a better pedagogy, for the student it provides a *modus operandi* for the epitomizing, orienting and retaining of the maze of facts and theories of the continuously growing science of disease. One cannot emphasize too much the helpful assistance that such a textbook in pathology gives to the student not only while he is taking the course but later when he begins to apply his knowledge of pathology to the recognition of disease in his patients and the alleviation of human suffering. Such practical application is made possible on the basis of a better understanding of the altered anatomy and physiology induced by the various etiologic agents of disease.

The book is amply illustrated if supported by the usual demonstrations available in the lecture room and laboratory. More complete illustrations would undoubtedly enhance its value in keeping alive for the physician the impressions of disease he acquired as a student. Realizing that illustrations are costly and that students are usually poor, the writer is nevertheless impressed with the soundness of the economic principle of paying well for a complete portrayal in words and illustration afforded by a good textbook of pathology or any other science, especially when such books may be made to serve as the personal and "cherished guides" of scientific knowledge throughout the life of the student and physician.

Karsner's *Human Pathology* continues to maintain an enviable position among the excellent American textbooks on this subject.

**The Practice of Medicine** By Jonathan Campbell Meakins M.D. LL.D. Professor of Medicine and Director of the Department of Medicine, McGill University, Montreal, Quebec. Second edition. Cloth. Price \$12.50. Pp. 1413 with 521 illustrations. St. Louis: C. V. Mosby Company 1938.

The first edition of this work appeared in 1936. In his preface the author emphasizes the necessity for individualization of patients, particularly in the control of infectious diseases, indicating that every patient is an *experimental problem* to the scientific physician. The feature of the Meakins work is the extensive illustration. Whereas some may criticize the medical student

will find this feature most commendable. It may be said of the illustrations that they have been most carefully chosen and all of them actually illustrate.

In the preparation of the new edition there have been extensive revisions of many of the sections in which new information has been developed. The opening chapters are for the average student a fine philosophic approach to the practice of medicine. This volume, which is in outline form, is ideal for the medical student.

The section on vitamins unfortunately is altogether inadequate. Thus it is stated that there are now recognized five vitamins, which hardly gives an adequate picture of the situation. The consideration of migraine occupies some thirty lines. This is inadequate, since it fails to reveal many of the etiologic factors commonly discussed in other works. The treatment offered is apparently wholly empirical. Obviously, this great work suffers from the same difficulties of other works of similar scope, namely the unevenness of the treatment of various subjects. However, on the whole the volume compares quite favorably with other works in this field.

If there is any single criticism which should be made against this volume, it is of carelessness in editing, which might easily be controlled by more meticulous attention. For example:

This Utopia has not yet arrived but in the meantime we must do the best we may.

The generally accepted facies of mitral disease are characterized by a deep reddish color.

Pneumothorax is not the result of trauma; it is most frequently due to pulmonary tuberculosis and spontaneous pneumothorax due to such may occur without any obvious parenchymatous pulmonary lesion.

It has already been described how the internal carotid and the vertebral arteries form the circle of Willis.

In treatment, the author refers frequently to pharmaceutical preparations that are little used in the United States but which have sale in Canada.

**Abortive Poliomyelitis.** Rein abortive und nicht pareitische Formen der Heine Medin'schen Krankheit. Von Dr. med. Otto Gsell, Chefarzt der medizinischen Abteilung am Kantonsspital St. Gallen (Schweiz). Boards. Price 6.70 marks. Pp. 94 with 13 illustrations. Leipzig: Georg Thieme 1938.

This short monograph on abortive poliomyelitis is a valuable contribution to the subject. Although the author presents a brief review, his remarks are quite pertinent. He begins with a short historical outline of the subject and discusses in a systematic manner the epidemiology, the clinical appearances in the various types of abortive poliomyelitis, the pathologic changes, the differential diagnosis, prognosis and prophylaxis, and the therapy of this disease. It is of interest to note the many references to American contributions to this subject. The author states that the first report on the abortive type of poliomyelitis was made in 1894 by Caverly, who discussed the epidemic in the Otter Creek Valley in Vermont. Subsequent contributions were made by writers from Norway, Sweden, Germany and Switzerland. In the epidemiology of this disease the author discusses local epidemics in various countries, particularly Germany and Switzerland. Later the larger epidemics are reviewed and toward the end of this chapter a detailed discussion of epidemics of abortive poliomyelitis that occurred in the Jungfrau district in Switzerland. In this section the larger epidemics in Denmark and California in 1934 and in Sweden in 1936 are discussed in some detail. In the discussion of experimental and immunobiologic observations in abortive poliomyelitis the author refers to the work of Flexner and his associates among others. The clinical forms of this test are classified by the author as: (a) The nonparalytic form of poliomyelitis, which includes the poliomyelitic form of serous meningitis, the neuritic form and the encephalitis form. In this group the author emphasizes particularly the "spine" sign, which is pain over the region of the vertebrae and stiffness of the neck, the Lasague sign, which is similar to the Brudzinski, headache, characteristic facies of poliomyelitis, obstipation, fever and lastly spinal fluid changes, which may vary from an increase in neutrophils in the spinal fluid the first few days of the disease and later present a predominance of mononuclear cells. The spinal fluid is not very characteristic in the abortive type of poliomyelitis. (b) The pure abortive type of poliomyelitis. The author discusses the similarity to various other diseases, such as bacterial endocarditis, typhus and meningismus. As to the pathol-

ogy of this condition, there is grossly a cloudy swelling of the heart, liver and kidneys, and the blood vessels of the brain are engorged. Under differential diagnosis the author discusses such conditions as meningococcic meningitis, tuberculous meningitis, the meningitis associated in croupous pneumonia, Weil's disease, acute syphilitic meningitis, and meningitis due to virus diseases. Although the book is brief, it is highly recommended to all physicians.

**Medical Information for Social Workers** Edited by William Matthew Champion A.B. M.D. With the assistance of the contributors from the Faculty of Western Reserve University School of Medicine Cleveland Ohio. Cloth Price \$4. Pp 520 with 26 illustrations. Baltimore: William Wood & Company 1938.

Nine physicians from the faculty of the Western Reserve University School of Medicine have aided the author in preparing an outline of medical information for the use of social workers. The book is not expected to teach social workers how to recognize diseases, how to estimate the physical capacity of the patient to work or how to apply remedies. It is hoped merely by its use to aid the social worker in serving more efficiently as a liaison officer between doctor and patient. Since statistics seem to show that the majority of failure to secure adequate medical care seems to arise in our present times not so much from poverty as from ignorance, the social worker has a vital place in bringing the patient into contact with the available medical care. The social worker may be called on to make the decision for the patient as to when the home shall be left for the hospital or the sanatorium. The chapters on the selection of a physician and on the history of medicine are followed by individual chapters giving fundamental facts regarding various forms of disease. The book concludes with outlines for examinations and with an excellent bibliographic supplement.

**Histological Technique for Normal Tissues Morbid Changes and the Identification of Parasites** By H. V. Carleton M.A. B.Sc. D.Phil. University Lecturer in Histology Oxford and E. H. Leach M.A. B.Sc. Demonstrator in Histology Oxford. Chapters VI and VII in collaboration with Frederic Haynes M.A. Second edition. Cloth Price \$7.25. Pp 383 with 18 illustrations. London New York & Toronto: Oxford University Press 1938.

"The worker in biology or medicine must be an Aphrodite, quick to transform the cold ivory of Pygmalion's technical result into the glow of the living cell." So enlightened an attitude leads the reader to expect much and he is not disappointed. The point of view and the consistent effort to rationalize the histologic procedures is a unique character of the book. It is written primarily for students and technicians and does not aim to be encyclopedic. The authors and their associates have had personal experience with all the methods described and as a result many details are included which often spell the difference between success and failure. The fundamental differences between histologic and cytologic procedure are stressed but there is not much intimation of the gulf that lies between a microtome knife that will cut satisfactory 10 micron sections and one that will give good 4 micron sections. This is especially true of celloidin work. One would hardly suspect from the rather summary treatment of this procedure that many histologists insist it is vastly superior to all others, even for serial sections. The work is divided into five parts. Parts I and II deal with general principles and type methods. The general discussion of the cell and the chapter on the theory of staining are perforce brief and simple but unnecessarily dogmatic in view of the many controversial issues involved. Part III describes the principles and practice of dark field study, certain microchemical and injection methods and the staining of fresh tissue. Attention may be called to an error on page 191. R. R. Bensley was the first to show that the "mitochondria" of Benda are specifically stained supravitaly by Janus green. Part IV gives special histologic and cytologic methods for various cells, organs and tissues and comprises the bulk of the book. Numerous changes have been made in this edition. Important new methods that have been added are the Feulgen nuclear reaction, which replaces all staining methods for chromatin, the brilliant differential staining methods of Masson, the galloxyanin technic for Nissl substance, and the newer diovan and double embedding procedures. Part V details various special methods used in pathology, bacteriology and parasitology. Chiefly by economizing on ems, considerable new material has been added and the total number of pages has been reduced as compared to the first edition.

**Medicine in Modern Society** By David Riesman. Cloth Price \$2.50. Pp 226. Princeton New Jersey: Princeton University Press, London: Oxford University Press 1938.

The author has collected a number of essays in a volume published under a grant from the Louis Clark Vanuxem Foundation. The book includes a brief account of medical progress with philosophic reflections. Especially interesting are the chapters on medical education, those on the neuroses and the concluding chapters, in which the author expresses his concept of the future of medicine. If one wished to be hypercritical, one could easily point out the discrepancies in thought between the chapters on medical education, on medicine as a career and on medical ethics with the conclusions presented in the chapters on the social outlook in medicine. Yet one does not wish the author to be scientific in his leisurely contemplation of medical sociology and medical economics. He approaches the field as an amateur and it is interesting to have him present his own point of view, which does not seem to be very distinct or concrete. If there is any one point which Dr. Riesman's essays reveal, it is the fact that his personality is of the compassionate, reflective, humanitarian type that makes good physicians but sometimes exceedingly inefficient businessmen, organizers or politicians.

**Manual of Veterinary Bacteriology** By Raymond A. Kelsner D.V.M. A.M. Ph.D. Lieut. Colonel Veterinary Corps United States Army. Third edition. Cloth Price \$6. Pp 640 with 93 illustrations. Baltimore: Williams & Wilkins Company 1938.

The first edition was published in 1927 and contained 525 pages and eighty-seven illustrations, a second edition appeared in 1933 and contained 552 pages and ninety-three illustrations. The author states in his preface that the need for a third edition at this time is due to the place the work has found in the libraries and laboratories of those interested in the bacteriology of diseases of the lower animals and especially to its adoption by numerous colleges and universities as a textbook for use in the teaching of veterinary bacteriology. Much new material is introduced in the various sections, and the chapters and subject material have the same orderly and systematic arrangement as in previous editions. The classification of bacteria as developed by Bergey has been continued. Chapters on protozoa and hematology are again included. Kelsner's Manual of Veterinary Bacteriology is the foremost work in the field of veterinary bacteriology and no doubt will maintain its prestige as an authoritative and comprehensive reference work of value. It should also continue its popularity as a textbook among veterinary students and others interested in animal diseases. The book should likewise prove a valuable help to medical men and general laboratory investigators, as many animal diseases also affect man. In the latter group may be mentioned actinomycosis, anthrax, botulism, avian and bovine tuberculosis, tetanus, rabies, tularemia, psittacosis of parrots, various pathogenic fungi, influenza, brucella infections causing undulant fever in man, and equine encephalomyelitis. The subject of equine encephalomyelitis is of special significance now that this disease has been definitely linked with human encephalitis. The chapters on bacterial variation and filtrable viruses are entirely new and contain much of the new knowledge that has come to light in the five years since the publication of the previous edition.

**Refraction of the Eye** By Alfred Cowan M.D. Associate Professor of Ophthalmology Graduate School of Medicine University of Pennsylvania Philadelphia. Cloth Price \$4.75. Pp 319 with 175 illustrations including 3 colored plates. Philadelphia: Lea & Febiger 1938.

The first thirteen chapters, 167 pages, are devoted to physiologic optics, given in somewhat less detail than the author's book on Ophthalmic Optics published by the F. A. Davis Company in 1927. Chapter 14 is on the lens changes in accommodation, method of determining the accommodative power of the eye, presbyopia and its symptoms and cycloplegics and their uses. He states on pages 181-182 that atropine used in the conjunctival sac reaches its maximum cycloplegic effect in two hours. If this were true why should it be used for "a day or two before refractions"? He also states on page 183 that homatropine hydrobromide is "an efficient and adequate cycloplegic." Two sentences later he says "It is unsatisfactory in children." He further states on page 184 of cycloplegics that "they are unnecessary in older presbyopes." With this dogmatic state-

ment we must take issue. On page 185 he states of ametropia that "the tendency is usually toward a too great growth of the eyeball—hypermetropia toward emmetropia, emmetropia toward myopia and myopia increasing." This is an old belief based on studies with incomplete cycloplegia. Recent investigations showed that hyperopia increases and myopia may remain stationary. On page 199 the author states that "axial hypermetropia never reaches to such high degrees as myopia, even 5 D is uncommon and 8 to 9 D is rare." With complete cycloplegia, from 8 to 9 diopters is common and even 10 to 12 diopters is not rare. On page 200, "Hypermetropia is said to develop sometimes in diabetes." This is merely a latent hyperopia become manifest. In chapter 17 are given a brief description of instruments and lenses used in refraction, the theory of retinoscopy and the various methods for objective and subjective refraction. Chapter 18 is devoted to routine procedure in the conduct of the examination and writing the prescription for glasses as well as remarks on bifocal lenses. The final chapter deals with contact glasses and telescopic spectacles. The book is well illustrated and will be useful to beginners in refraction but would be vastly more useful if greater space were used to cite case histories and examples of the various types of refractive errors and what to prescribe for each.

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Hospitals Liability for Negligence of Physician Whose Services Are Provided by the Hospital**—The defendant was a charitable institution maintaining a school and a hospital. In 1928, the plaintiff underwent a tonsillectomy at the defendant's free clinic, the operation being performed by a physician assigned to the case by the defendant. Alleging that the hospital was negligent because, without knowledge of the physician's fitness or ability to perform the operation, and without making a proper and adequate examination to determine his competency, it permitted him to operate and to subject the plaintiff to careless and unprofessional treatment, the plaintiff sued the hospital. The action was commenced in 1931, more than two and less than three years after the operation. The trial court dismissed the complaint on the ground that the acts which were the foundation of the action constituted malpractice and that therefore the two year statute of limitation applicable to malpractice actions barred the action. The plaintiff appealed to the supreme court of New York, appellate division, second department.

In the opinion of the appellate court, the act which formed the basis of the action was not the malpractice of the physician but the defendant's negligence in selecting him when it knew or should have known that he was not qualified to perform the operation. That was the charge made against the hospital both by the allegations of the complaint and by the terms of the stipulation entered into between the parties. The defendant may be held liable only for its negligence in selecting the physician, the court pointed out, not for the latter's negligence or malpractice in performing the operation. In other words, a charitable institution which makes a physician available for the patient's use is not liable for malpractice. It is in no sense an employer or principal.

If the allegations of the complaint be established, the court said, the negligence of the hospital in selecting the physician and the malpractice of the physician in performing the operation were concurrent causes in producing a single wrong or injury to the plaintiff, for which she may recover against the hospital. The fact that the plaintiff suffered a single wrong or injury to her person, while it may authorize only one recovery, does not necessarily give rise to a single cause of action. It may give rise to several causes of action. Here the origin and nature of the wrong alleged gave rise to two causes of action—one against the physician for malpractice and one against the hospital for

its negligence in selecting him. The former is governed by the two-year statute of limitation and the latter by the three year statute.

The order of the trial court in dismissing the complaint was therefore reversed and the case remitted for further proceedings.—*Roczekamp v New York Post Graduate Medical School and Hospital (N Y)*, 4 N Y S (2d) 751

**Medical Practice Acts Proof that Person Treated Has a Disease Unnecessary**—The appellant was convicted of practicing medicine without a license and appealed to the court of appeals of Alabama.

The appellant had no license to practice medicine. A witness for the state testified that in April 1937 she was sick and under the care of a physician. The appellant came to her home and told the witness that she was just throwing away money by continuing treatment under the physician and that he, the appellant, could take the case. He gave her medicine and wrote several prescriptions for her, which the witness' husband had filled at a drugstore. The appellant was paid a fee of \$25 for his services which apparently extended over a period of a week. All this testimony was corroborated by the patient's husband. The appellant categorically denied the evidence presented by the state.

The medical practice act of Alabama declares it to be unlawful for any person to treat or offer to treat "diseases of human beings" without having obtained a certificate of qualification from the state board of medical examiners. On appeal, the principal contention urged by the appellant was that the state had failed to prove that the person alleged to have been treated was suffering from a disease, citing the case of *Frazier v State*, 19 Ala App 322, 97 So 251. But, said the court, the case cited was no authority for the appellant's contention, for in it the court said:

We are not however of the opinion that in a prosecution under this statute [the medical practice act] the state must either allege or prove that the person treated in fact had a disease. The statute reads:

Any person who treats or offers to treat diseases of human beings in this state by any system of treatment whatsoever etc. Acts 1915 p 661. Whether the person receiving the treatment or offered to be treated has a disease or not does not relieve one treating or offering to treat, from criminality. The fact that one claiming to be able to treat diseases of the human body offers to treat a person for a disease which that person did not have would be the worst kind of 'quackery' and was one of the things aimed at by the statute. Again if it should be held that the person offered to be treated must in fact be affected by the disease offered to be treated each case would present a case for the highest and most technical investigation involving diagnoses and other questions of pathology and scientific medicine. Such certainly, was never in the minds of the Legislature.

Furthermore, the person alleged to have been treated testified that she was sick when the appellant came to her home and the terms sick, sickness or disease, the court pointed out, are used interchangeably, and are of practically the same import.

The court could find no reversible error in the record and therefore affirmed the judgment of conviction.—*McAllister v State (Ala)* 181 So 511

## Society Proceedings

### COMING MEETINGS

Alabama Medical Association of the State of Montgomery April 18 20  
Dr D L Cannon 519 Dexter Ave., Montgomery Secretary  
American Association of Anatomists Boston Apr 68 Dr E R Clark  
University of Pennsylvania School of Medicine Philadelphia Secretary  
American Association of Pathologists and Bacteriologists Richmond Va  
Apr 67 Dr Howard T Karsner 2085 Adelbert Rd Cleveland  
Secretary  
American College of Physicians New Orleans March 27 31 Mr E R  
Loveland 4200 Pine St Philadelphia Executive Secretary  
American Society of Anesthetists New York Apr 14 Dr Paul M  
Wood 131 Riverside Drive New York Secretary  
Arizona State Medical Association Phoenix Apr 13 15 Dr D F  
Harbridge 15 East Monroe St Phoenix Secretary  
Missouri State Medical Association Excelsior Springs Apr 10 12 Dr  
E J Goodwin 634 North Grand Blvd St Louis Secretary  
Pacific Coast Surgical Association San Francisco Oakland Del Monte  
March 28 31 Dr H Glenn Bell University of California Hospital  
San Francisco Secretary  
Southeastern Surgical Congress Atlanta Ga Mar 68 Dr B T  
Beasley 701 Hurt Bldg Atlanta Ga Secretary  
Tennessee State Medical Association Jackson Apr 11 13 Dr H H  
Shoulders 706 Church St Nashville Secretary

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### American Journal of Cancer, New York

34 333 500 (Nov.) 1938

- Structural Development in Gliomas H J Scherer Antwerp Belgium —p 333
- Histologic Observations on Anterior Pituitaries of Old Rats with Particular Reference to the Spontaneous Appearance of Pituitary Adenomas J M Wolfe W R Bryan and A W Wright Albany N Y—p 352
- The Mode of Action of Methylcholanthrene on Cultures of Normal Tissues W R Earle and C Voegtlin Washington D C—p 373
- Lung Tumor Development in a Resistant Strain of Mice Subjected to Inhalation of Soot M G Seelig and E L Benignus St Louis—p 391
- Transplantable Lymphosarcoma in Mice Margaret Reed Lewis—p 399
- Increased Susceptibility of Rabbits to Brown Pearce Epithelioma Induced by Estrogens in Human Pregnancy Urine J W Mu Peiping China—p 407
- Growth Processes Induced by Estrogenic Hormones in the Uterus of the Mouse L Loeb V Sunitzef and E L Burns St Louis—p 413
- Some Experiments with Cysteine Hydrochloride in Treatments of Animal Tumors J L Carr C L Connor and L L Ginzton Berkeley Calif—p 428
- Inertness of Sulfanilamide in Relation to Tumors in Mice Margaret Reed Lewis—p 431
- Genetic Segregation Mammary Cancer to No Mammary Cancer in the Mouse W S Murray New York—p 434
- Biologic Method for Freeing Walker Tumor No 256 from Contaminating Bacteria R E Gardner and R R Hyde Baltimore—p 442
- Biology of Carcinoma in the Cervix Uteri J E Davis Detroit—p 446

### American Journal of Diseases of Children, Chicago

57 1 244 (Jan.) 1939

- \*Gonorrheal Vaginitis in Girls Treated with Estrone (Theelin) Fever and Sulfanilamide. C M Burpee M Robinow and J T Leslie Augusta Ga—p 1
- Circulatory Function in the Anemias of Children I Effect of Anemia on Exercise Tolerance and Vital Capacity C G Parsons Birmingham England and F H Wright New York—p 15
- Basal Metabolic Rate in Children with Abnormal Bodily Dimensions M de Bruin Amsterdam Netherlands—p 29
- Dental Defects in Congenital Syphilis B G Anderson New Haven Conn—p 52
- Arterial Oxygen Saturation and Effect of Oxygen Therapy in Pulmonary Diseases J H P Jonxis Groningen Netherlands—p 58
- \*Time and Stage in Development at Which Factors Operate to Produce Mongolism W E Southwick Theills N Y—p 68
- Disturbances of Rotation of the Intestinal Tract Clinical Picture Based on Observations in Twenty Cases R McIntosh and E J Donovan New York—p 116

**Theelin, Fever and Sulfanilamide for Gonorrheal Vaginitis**—During the last three years Burpee and his co-workers have had under their observation 112 cases of gonorrheal vaginitis in young girls. In the majority of the girls the infection was probably acquired from an adult in their homes. Complications were common. Apparent cures following the intramuscular injection of theelin in oil as the only form of treatment were obtained in forty-one of forty-seven cases. In five of these there were recurrences. Five patients treated with theelin and 1 per cent silver nitrate jelly were cured and did not have recurrences. Apparent cures following fever as the only method of treatment were obtained in eight of nineteen cases. There were no recurrences. In six of the seven patients treated with fever during theelin therapy apparent cures could be attributed to the fever. The fever was produced by the intravenous injection of typhoid vaccine and in five cases by the Kettering hypertherm. Apparent cures followed the oral administration of sulfanilamide as the only method of treatment in eleven of twenty-two cases. One patient had a recurrence. Two patients were cured by

the combined treatment of fever and sulfanilamide. There was a recurrence in one. All cures due to sulfanilamide were obtained in less than two weeks. Increase of the dose, prolongation of the treatment and combination with fever therapy did not improve the results. Fever therapy and sulfanilamide are recommended for further investigation.

**Development of Mongolism**—Although the available data are not sufficient to allow one to make a definite and final conclusion as to the exact time of the operation of the factor or factors which lead to the production of mongolism, Southwick believes that it can be stated, on the data that he found in fifty-eight cases of mongolism in dizygotic twins, that the causes of mongolism must reside in some factor or factors that cannot at any stage of development act directly on more than one ovum, zygote or embryo. Since at all stages of the development two or more ova, zygotes or embryos may occur in exactly the same external environment, one can conclude that the condition can develop only from within the gametes and so must be either chromosomal or cytoplasmic. The extreme infrequency with which two or more persons with the condition appear in one family makes it justifiable to conclude that mongolism is not produced by hereditary factors. The factors therefore are not considered to act at the time of the formation of the gametic chromosomes. It is suggested that the production of mongolism may be definitely associated with substances liberated from the ovum and from the spermatozoon and that mongolism may be the result of fertilization in which one or the other gamete was in an aged condition transitional to the nonfunctional or inactive state. That the spermatozoa may thus be effective is shown by the abnormal sex ratio that occurs among those with mongolism, and that the ovum may be similarly effective is shown by the definite relation between the age of the mother and the frequency of production of mongolism. This study is based on the records of 259 persons with mongolism.

### American Review of Tuberculosis, New York

39 1 144 (Jan.) 1939

- \*The Effect of Tuberculosis on the Serologic Reactions for Syphilis T Parran Washington D C and K Emerson New York—p 1
- \*Pulmonary Tuberculosis in Young Adults Particularly Among Medical Students and Nurses W B Soper, New Haven Conn and J B Amberson Jr New York—p 9
- Collapse Therapy in Pulmonary Tuberculosis Follow Up Study H W Bosworth and C R Smith Los Angeles—p 33
- Tuberculous Tracheobronchitis J L H Hawkins Jr Olive View Calif—p 46
- Pleural Effusion Its Prognosis in Patients Showing Little or No Parenchymal Involvement F B Trudeau, Saranac Lake N Y—p 57
- Tuberculin Anergy in Cases with Pulmonary Calcifications P D Crimm and D M Short Evansville Ind—p 64
- Variations in Leukocytes Studies on Tuberculous Patients Under Basal and Active Conditions M H Adelman New York—p 70
- Results of Intensive Study of Sputum in Pulmonary Tuberculosis H S Willis and Ruby G Kelly Northville Mich—p 81
- Tubercle Bacilli in Sputum Criteria for Negativity and the Significance of the Number of Bacilli Found E Bogen and E S Bennett Olive View, Calif—p 89
- Pathology and Pathogenesis of Pulmonary Arterial Aneurysm in Tuberculous Cavities O Auerbach Staten Island N Y—p 99
- Virulence of Tubercle Bacilli Its Variations Attendant on Animal Passage K C Smithburn New York—p 116
- The Multiple Puncture Method of BCG Vaccination S R Rosenthal Chicago—p 128

**Effect of Tuberculosis on Serologic Reactions for Syphilis**—Parran and Emerson discuss the general field of tuberculosis with regard to the possibility that this toxemia adversely influences the specificity of carefully conducted serologic tests for syphilis. The study was participated in by five serologists. From 458 supposedly nonsyphilitic tuberculous donors of blood obtained from nine sanatoriums, the serums of eight were found to be positive to many laboratory tests. A minute review of the histories of four patients revealed evidence which supported the probable presence of syphilitic infection. Three of the remainder were not available for reexamination, while follow-up of the remaining one failed to reveal a history or clinical evidence indicative of syphilis. As the blood from this patient was strongly positive to all tests on both original and follow-up examination and as the eight instances of unrecognized and unsuspected syphilitic infections in the 458 cases are within the normal expectancy, it seems

justifiable to omit the entire group of eight cases from the final tabulation. Communications from some of the serologists called attention to the atypical nature of many of these adverse results. The authors' conclusion is that, since with the present serologic tests for syphilis both typical and atypical false-doubtful and false-positive results are found in serums from tuberculous donors, it is evident that tuberculous toxemia may contribute a confusing factor to the serologic study of syphilis. It should not, however, present a major problem in the clinical interpretation of results obtained with carefully conducted sero-diagnostic procedures.

**Pulmonary Tuberculosis in Young Adults**—Soper and Amberson find that tuberculous infection in young adults in this country and abroad is by no means universal. Roughly speaking, in this country 50 per cent of the white population less than 20 years of age does not react to tuberculin. In some sections, as the Middle West, the percentage of positive reactors is considerably lower. The medical student and the student nurse are more intimately exposed to tuberculous infection during their training than are those in other professions and occupations. This is attested by the disproportionate increase of positive reactions to tuberculin during their training. Infection in them may produce a primary type of lesion in the nonallergic individual or the superinfection type in the allergic. Recognizable lesions appear to occur more frequently in the nonallergic than in the allergic. Allergy may be said to be associated with a definite protective influence within certain limits. The severity of infection of nurses and medical students appears to be decreasing owing to the greater application of methods to prevent exposure, improved diagnosis of the acquired disease in its earliest stage and better living standards. A greater and more widespread emphasis on prevention of infection and on early diagnosis, particularly by tuberculin and the x-rays, should reduce the hazard in students to that of the general population or even lower. Its accomplishment is a direct obligation of the institutions concerned.

### Annals of Otol, Rhinol and Laryngology, St. Louis

47 865 1150 (Dec.) 1938 Partial Index

- Carcinoma of Larynx and Total Laryngectomy S. J. Crowe and E. N. Broyles Baltimore—p. 875  
Treatment of Chronic Stenosis of the Larynx with Special Reference to Skin Grafting V. E. Negus London, England—p. 891  
Treatment of Acute Nasal Accessory Sinus Disease A. C. Furstenberg Ann Arbor, Mich.—p. 902  
Manifestations of Allergy in the Ear M. F. Jones New York—p. 910  
\*Deficiency Reaction in the Nose E. R. Hargett Springfield, Ohio—p. 917  
IV Pathogenesis of Meniere's Disease and of Kindred Conditions in the Ear and the Rest of the Body S. H. Mygind and Didri Dederding Copenhagen, Denmark—p. 938  
Histopathology of Apicitis in Suppurations of Petrous Pyramid E. A. Friedman Chicago—p. 954  
Optic Nerve Complications of Accessory Nasal Sinus Disease I. Strauss and W. Needles New York—p. 989  
Prolonged Analgesia After Tonsillectomy by Nerve Blocking Anesthesia C. Hirsch New York—p. 1035  
Advantages of a Split Skin Graft Following Tonsillectomy H. I. Harris Hollywood, Calif.—p. 1045  
Broncho Esophagology Postulated Semisologic Observations C. Jackson Philadelphia—p. 1049  
\*Role of Inflammatory Bronchial Stenosis in the Etiology of Bronchiectasis P. H. Holinger Chicago—p. 1070

**Deficiency Reaction in the Nose**—Hargett believes that atrophic rhinitis is a deficiency of the mucous glands of the nasal epithelium, either because there is an inadequate number of them or because the function of those present, if their number is normal, is abnormal, or a combination of the two. When the stratum corneum is removed from the skin, the moist layers beneath refuse to submit to drying and exude lymph and fibrin, which coagulates and dries, forming a protective coating, so that the cells below continue their function in a moist state. The author points out that the same reaction occurs in the mucous membrane of the nose. The microorganisms normally inhabiting the nose invade these scabs and produce the typical ozena. As this condition persists over a long period, a secondary defensive measure begins on the part of the mucous membrane to form a stratum corneum for itself. This process begins at the junction of the skin and mucous membrane at the opening of the nares and gradually extends

backward. This, the author believes, explains why atrophic rhinitis is most severe and is most often seen in the posterior half of the nasal cavity and why the condition never extends into the mouth and seldom into the pharynx, with the large and copious salivary glands to keep these parts moist. The author knows of nothing that will help the condition after cornification has taken place. But before cornification takes place treatment should resolve itself into trying to lighten the load of the glands present, to restore them to normal function and perhaps to stimulate their proliferation. If one side of the nose is closed through a deviation, the amount of air going through the other side is equalized, and thus the work of the glands, by a straightening of the septum. Operations which reduce the amount of air going through the nose by moving the lateral walls inward ease the burden of the glands, and some cures are effected. Paranasal sinusitis preceding the atrophic rhinitis coincides with the theory of deficiency. As with the other organs of the body, it seemed reasonable that the condition of the glands might be improved by periods of rest. This was accomplished by placing cotton plugs in one or both nostrils. It was found convenient to have the patient place these plugs in the nose at bedtime and remove them the next morning, giving the membrane eight or more hours of rest. Patients soon become accustomed to the mouth breathing necessitated and make no complaints. If the plugs are used while there is active sinus infection the patient immediately feels worse, and this is an indication to begin simultaneous treatment of the sinus, always being conservative at first. As soon as the sinusitis begins to improve, the plug treatment may be begun, and at this stage the patient will usually remark on the improvement. If the adenoids are infected they should be removed, but it is well to give preoperative douches daily for about a week.

**Inflammatory Bronchial Stenosis and Bronchiectasis**—The specific reaction which Holinger discusses is the inflammatory bronchial stenosis which produces complete or partial bronchial obstruction leading eventually to atelectasis and then to bronchiectasis. He correlates this sequence of bronchial inflammation, bronchial obstruction, atelectasis and, eventually, bronchiectasis as it has been observed in a series of children. He compares a previously reported series of bronchiectatic children who were observed from the onset of the pulmonary disease and followed to fully developed bronchiectasis with similar cases observed early and treated bronchoscopically in which the process was aborted, thus reemphasizing the effect of breaking this sequence by prompt recognition and clearing of the original lesion. Inflammatory bronchial stenosis was found to be responsible for the production of the original pulmonary lesion, atelectasis. "Atelectasis precedes and plays a prominent and most constant role in the development of a common form of bronchiectasis of the lower lobes" (Anspach, 1934). Persistent pulmonary changes simulating pneumonia are frequently due to atelectasis. If the lung does not clear spontaneously, early and frequent bronchoscopic drainage of the involved bronchi will prevent permanent dilatation and destruction of the bronchial walls, which follow if the atelectasis is left untreated.

### Canadian Public Health Journal, Toronto

29 575 614 (Dec.) 1938

- \*Typhoid Fever Carriers in Nova Scotia J. J. MacRitchie Halifax N. S.—p. 575  
Diphtheria Toxoid Week in Toronto G. Bates, Toronto—p. 578  
Scarlet Fever in Everyday Practice P. Belliveau Meteghan N. S.—p. 583  
Canadian Life Tables, 1931 N. Kevitz Ottawa Ont.—p. 587  
Bacteriologic Study of Eating and Drinking Utensils A. L. MacNabb F. White and O. W. Owen Toronto—p. 591

**Typhoid Carriers in Nova Scotia**—MacRitchie states that in Nova Scotia the average annual death rate from typhoid for the ten years previous to 1932 was 17.9 per hundred thousand of population. For the five years from 1932 to 1936 the average rate was 4.2, the lowest of any province in Canada and slightly less than that of British Columbia, a province which has always had a low rate. From April 1936 to April 1938 the department of public health of Nova Scotia has been able to detect and place under a degree of control eight residual carriers, making a total of twenty now listed. The histories

of three of these carriers are reported. The three lived at different points within a radius of ten miles and during the preceding years 75 per cent of the cases reported in the province were from this section. A cholecystectomy was performed in all three cases.

### Connecticut State Medical Society Journal, Hartford

3 150 (Jan) 1939

- Carcinogenic Substances. A White New Haven—p 4  
Behavior Problems in Children. E Kahn New Haven—p 6  
Early Diagnosis of Behavior Defects and Deviations. A L Gesell New Haven—p 6  
Practitioner's Role in Advising About Developmental Problems of the Preschool Child. F L Ilg New Haven—p 9  
Behavior Disorders Associated with Developmental Disorders in Language Acquisition. S T Orton New York—p 12  
Problems of Older Children as Seen in General Practice. J M Cunningham Hartford—p 14  
Emotional Reactions at Large as the Pediatrician Sees Them. R Salinger New Haven—p 17  
Gonorrhea in the Female. R W Mohler Philadelphia—p 22  
Immunization with Scarlet Fever Toxin. G A Wulp Hartford—p 28  
The Eight Point Program of American Social Hygiene Association. W Clarke New York—p 30

### Indiana State Medical Assn Journal, Indianapolis

32 150 (Jan) 1939

- Role of Serum and Oxygen in Pneumonia. M H Barker Chicago—p 1  
Pneumonia a Public Health Problem. W J McConnell New York—p 4  
Pneumococcus Typing. W Dodds Crawfordsville—p 5  
Hospital Anesthetic Organizations. Consideration of Various Available Types. H S Ruth Philadelphia—p 7  
Cystitis in Women and Children. H L Kretschmer Chicago—p 11  
The Normal Infant. Indiana Pediatric Society—p 15  
Antistreptococcus Serotherapy in Agranulocytosis. Recovery of Two Cases. J L Emenhiser Hammond—p 17  
Clinical Experiences with Sulfanilamide. W N Wishard Jr. H G Hamer H O Mertz and R C Rauscher Indianapolis—p 19  
The General Practitioner Remembers That the Child Has Emotions. S R Smith Indianapolis—p 21  
Marijuana. J W Jackson Indianapolis—p 24  
Perforations in the Abdomen. J F Habermel New Albany—p 25

### Journal of Bone and Joint Surgery, Boston

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- \*Pathogenesis of the Limp Due to Coxalgia. The Antalgic Gait. J Calve M Galland and R de Cigny Berck Plage France—p 12  
\*The Use of Hydrochloric Acid in Certain Cases of Atrophy and Delayed Calcification in Fractured Bones. N W Cornell Alice R Bernheim and E C Person New York—p 40  
Compensation Derotation Treatment of Scoliosis. A Steindler Iowa City in collaboration with W R Hamsa Omaha and W Cooper Iowa City—p 51  
Transcondylar Fractures of the Humerus in Childhood. J Dunlop Pasadena Calif—p 59  
Metastasis to Bone from Carcinoma of Gastrointestinal Tract. R K Ghormley and J E Valls Rochester Minn—p 74  
Aseptic Necrosis of Head of Femur Following Traumatic Dislocation. F N Potts and B E Obletz Buffalo—p 101  
Dropfoot. End Results of a Series of Bone Block Operations. H E Branch Detroit—p 141  
Tuberculosis of the Long Bones. Report of Six Cases. F C Hodges Abilene Texas—p 148  
Volkmann's Contracture as Complication of Fractures of the Forearm and Elbow. J N Garber Gastonia N C—p 154  
Method for Treating Displaced Fractures of the Pelvis. E L Jewett Orlando Fla—p 177  
Objections to Use of Kirschner Wire for Fixation of Femoral Neck Fractures. S Selig New York—p 182  
Ankle Dislocations Without Fracture. M J Wilson A A Michele and E W Jacobson New York—p 198  
Compound Dislocation of the Tibiotalar Joint Without Fracture and Without Separation. C Haines New York—p 205  
Sleeved Wire Method of Fixation of Fractures. T Wheelton Richmond Va—p 210

**Limp Due to Coxalgia.**—Calve and his associates believe that the limp of coxalgia is a limp of escape, a limp of defense by antalgic reflex. The antalgic gait is not associated exclusively with coxalgia. It is seen in all conditions causing instability of the hip. It is frequent in congenital dislocations of the hip particularly in those cases of subluxation in which the phenomena of arthritis predominate over those due to interference with the static equilibrium. The authors have frequently seen patients with bilateral congenital dislocation of the hip present the Trendelenburg sign on one side and the antalgic limp on the other or show the antalgic limp only periodically. The antalgic limp is an indication of the degree

of irritability of the fibrous neocapsule in coxalgia, or of the deformed capsule of congenital dislocation of the hip. It is for the same reason that the antalgic gait characterizes the limp of those with arthritis deformans of the hip. Here again the antalgic movement makes possible the avoidance of pain. Theoretically it is impossible to have an antalgic gait when the hip is firm and capable of transmitting the weight of the body to the lower extremity. There is no antalgic gait when coxalgic conditions terminate in a true bony ankylosis, either spontaneous or operative (arthrodesis). The antalgic gait is slight in certain cases when, contrary to the rule, the *gluteus medius* has conserved an important functional value and especially in the cases in which the neocapsule is formed of tissue so tight that the ankylosis seems complete and comparable to a bony ankylosis. The antalgic gait may vary in a given case. For example, fatigue markedly aggravates the antalgic gait, which may appear after a long walk in patients who usually do not show it. Also, like rheumatic manifestations, the antalgic gait undergoes variations in relation to meteorological conditions.

**Hydrochloric Acid for Enhancing Calcification.**—Cornell and his colleagues observed reduced gastric acidity and decrease in the volume of gastric contents in eight cases of fractured bones with excessive osseous atrophy and delayed calcification at the sites of fracture. Five of these cases were treated with hydrochloric acid. The addition of hydrochloric acid (from 4 to 8 cc of a 10 per cent solution three times a day) to a diet high in calcium and vitamins increased the absorption of calcium and furthered the calcification of bone.

### Journal of Clinical Investigation, New York

18 1170 (Jan) 1939 Partial Index

- \*Gastric Secretion in Chronic Alcoholic Addiction. W B Seymour T D Spies and W Payne Cleveland—p 15  
Effect of High Intracranial Venous Pressure on Cerebral Circulation and Its Relation to Cerebral Symptoms. E B Ferris Jr Cincinnati—p 19  
Long Term Study of Variation of Serum Cholesterol in Man. K B Turner and A Steiner New York—p 45  
Proteinuria Following Momentary Vascular Constriction. L C Chesley I Markowitz and B B Wetclier Jersey City N J—p 51  
Clinical Studies of the Blood Volume. V Hyperthyroidism and Myxedema. J G Gibson 2d and A W Harris Boston—p 59  
\*Urinary Excretion of Androgenic Substances After Intramuscular and Oral Administration of Testosterone Propionate to Humans. R I Dorfman and J B Hamilton New Haven Conn—p 67  
The Lipid Distribution of Human Platelets in Health and Disease. Betty N Erickson H H Williams I Avrin and Pearl Lee Detroit—p 81  
The Nature of the Human Factor in Infantile Paralysis. I Peculiarities of Growth and Development. G Draper and C W Dupertuis New York—p 87  
Metabolism in Idiopathic Steatorrhea. I Influence of Dietary and Other Factors on Lipid and Mineral Balance. S H Bassett E H Keutmann H van Zile Hyde Helen E Van Alstine and Ella Russ Rochester N Y—p 101  
Renal Function as a Factor in the Urinary Excretion of Ascorbic Acid. J Sendroy Jr and B F Miller New York—p 135  
Significance of Prolonged Streptococcus Antibody Development in Rheumatic Fever. A F Coburn and Ruth H Pauli New York—p 141  
\*The Prophylactic Use of Sulfanilamide in Streptococcal Respiratory Infections with Especial Reference to Rheumatic Fever. A F Coburn and Lucile V Moore New York—p 147  
Comparison of Effects of Vitamin D Dihydrocholesterol (A T 10) and Parathyroid Extract on the Disordered Metabolism of Rickets. F Albright H W Sulkowitch and Esther Bloomberg Boston—p 165

**Gastric Secretion in Chronic Alcoholic Addiction.**—Seymour and his colleagues studied the gastric secretion of forty chronic alcoholic addicts (from seven to forty years). Histamine was used as a secretory stimulant. The fasting volume of their gastric juice on repeated intubation was scanty and in the majority of cases was rather thick and ropy. A volume of 20 cc or less was found in 71 per cent of the men. Twenty minutes after the injection of histamine the gastric juice was considerably more limpid and had increased in volume 50 per cent of the men showing 20 cc or more. Only two of the forty subjects had free acid in the fasting specimen. In the first analysis after histamine eighteen had free hydrochloric acid and twenty-two had none. Reintubation of all the latter was done after from one to three weeks had elapsed and seven of these showed free acid in the gastric juice after this period. Only three of the men showed no evidence of pepsin in the gastric juice after repeated analyses, and seven showed an absence of rennin. The mean digestion of albumin in the



thirty-seven cases was 35 mm. The patients were singularly free from gastrointestinal complaints. Thirty-two claimed to have good appetites, twelve complained of gas and eight complained of sour eructations. Intermittent nausea and vomiting were experienced by six. In none was there a history of sore tongue, cutaneous lesions or diarrhea nor was there any objective evidence of glossitis. Six patients complained of occasional numbness and burning sensations of the extremities, and none had any objective evidence of involvement of the peripheral nerves. The erythrocyte counts and hemoglobin determinations were normal in all. After repeated analyses on all subjects with achlorhydria after histamine in the initial analysis, seven yielded free hydrochloric acid after histamine following enforced abstinence from alcohol. This point suggests the relationship of the ingestion of large quantities of alcohol to the secretion of acid in the gastric juice. It is apparent from the authors' studies and those of other observers that the incidence of achlorhydria is far higher in addicts to alcohol with polyneuritis than in those with uncomplicated alcoholism.

**Urinary Excretion of Androgen After Testosterone Propionate**—Dorfman and Hamilton determined the excretion of urinary androgens following the treatment with testosterone propionate of two men having organic and functional evidence of deficient testicular secretion. The rapidity of the appearance and comparative levels of excretion after oral and intramuscular treatment, the percentage of recovery in the urine of the administered material and the urinary levels of androgens were studied. The first patient was a man aged 35 who had lived until this time with a single descended testis. Following surgical removal of the testis at the age of 35, castration phenomena appeared. The second patient was a sexually underdeveloped man aged 27 whose genitalia instead of undergoing atrophy had never developed. The testes did not respond to injections of 100 rat units of gonadotropic substance given three times a week for nine weeks. With intramuscular injections of 20 mg. of testosterone propionate daily, the first patient showed an increase in androgenic output to normal levels and clinical disappearance of castration phenomena. A twenty-four hour titer of 50 international units was obtained on the third day of administration. The average of six assays covering twelve of the thirty days of injection was 68.9 international units, with a range from 47 to 94 international units. Tablets containing from 60 to 120 mg. of testosterone propionate were given daily. Twenty-four hour urine readings gave as high as 500 international units of androgen in case 1 and 264 international units in case 2. These large excretions were not accompanied after oral intake by as good clinical relief as was obtained with one-sixth or one-seventh the amount taken intramuscularly and with lesser androgenic activity of the urine. Absorption of the large amounts of androgen can take place through the gastrointestinal tract with what appears to be rapid elimination through the kidneys. It is suggested that there may be a threshold for the substance in the body and that rapid disposition is made of an excess. Oral means of administration should be considered from the standpoint of material lost not only through the feces but also excreted in the urine. Urine assays as an indication of the presence of hormone in the body may be misleading if the hormone in the body is present only irregularly. A rough estimation of the percentage of the androgenic material recovered in the urine is 62 per cent if it is in the form of testosterone, 41.4 per cent if androsterone, and 62.4 per cent if the material given contains an equal amount of androsterone and dehydroisoandrosterone.

**Sulfanilamide in Respiratory Infections and Rheumatic Fever**—The experience of Coburn and Moore over the last ten years has shown that rheumatic subjects who escaped hemolytic streptococcus infections also escaped rheumatic fever. With this objective in mind they conducted studies in the prophylaxis of hemolytic streptococcus infections during the last two years. The data reported comprise experiments on guinea pigs and observations on eighty rheumatic subjects. The authors found that sulfanilamide administered to guinea pigs before or after the induction of streptococcal abscesses failed to sterilize the lesions. Sulfanilamide used prophylactically prevented spontaneous infections and either prevented or modified the development of induced hemolytic streptococcus

cervical adenitis in guinea pigs. Sulfanilamide administered to rheumatic subjects after the onset of streptococcal infections of the throat did not prevent rheumatic recrudescences. The possible prophylactic use of sulfanilamide was tested in eighty rheumatic children. Seventy-nine escaped hemolytic streptococcus infection and signs of rheumatic activity.

### Kentucky Medical Journal, Bowling Green

37 142 (Jan) 1939

- Gas Gangrene: General Discussion and Present Day Treatment J D Hancock Louisville—p 1  
Eclampsia and Its Treatment B W Smock Louisville—p 4  
Present Day Treatment of Peptic Ulcer H S Frazier Louisville—p 7  
Acute Infection of Middle Ear J F Dunn, Arlington—p 9  
Detached Retina C D Townes Louisville—p 12  
Acute Polymyelitis J L Tanner Henderson—p 15  
My Obstetric Experience C V Stark Maysville—p 19  
Achlorhydria W S Wyatt Lexington—p 20  
County Health Department in Tuberculosis Control C D Cawood Lexington—p 24  
Uterine Bleeding J Abell Jr Louisville—p 28  
Eclampsia F B Zimmerman Greenup—p 32  
Metabolism of Cardiac Muscle H Lawson Louisville—p 36  
Tuberculosis I H South Louisville—p 38

### Tennessee State Medical Assn Journal, Nashville

31 467 526 (Dec) 1938

- Two Years of Postgraduate Teaching in Tennessee F E Whitacre Memphis—p 494  
The Doctor at the Crossroads N B Van Etten New York—p 499

### West Virginia Medical Journal, Charleston

35 156 (Jan) 1939

- \*Pyelitis in Pregnancy N J Eastman Baltimore—p 1  
Critical Analysis Regarding Periodic Physical Examinations J J Brandabur Huntington—p 9  
Nonspecific Lung Infections in Childhood J C Gittings Philadelphia and R C Tredean Kansas City Kan—p 16  
Leiomyosarcoma of the Ileum R S Widmeyer and A R K Mathews Parkersburg—p 34

**Pyelitis in Pregnancy**—Eastman states that the symptoms produced by infections of the urinary tract in pregnancy may vary considerably from those of the same disease in the non-pregnant state. Hectic fever with chills, tenderness at the costovertebral angle, clumped white cells in the urine and colon bacillus bacteriuria are the main diagnostic signs. To be of diagnostic significance the pyuria should exceed fifty white cells per high power field and these should be in clumps. From a diagnostic point of view the only difficulty that arises occasionally is in differentiating pyelitis, which is usually on the right side from acute appendicitis. Appendicitis rarely strikes for the first time during pregnancy. If appendicitis does exist usually there is a history of previous attacks. In pyelitis the "spiking" temperature curve, the common occurrence of chills and the tenderness at the costovertebral angle are usually characteristic and the diagnosis ordinarily presents no great problem. In women suffering from pyelitis the fetal mortality is at least twice that usually encountered. Abortion and premature birth account for most of these deaths. When therapeutic abortion is considered in refractory cases this unfavorable outlook for the fetus must enter into the decision. The variety of therapeutic methods which have been advocated for the treatment of pyelitis in pregnancy is evidence in itself that an established and successful form of therapy is lacking. Actual cure of pyelitis during pregnancy is rarely possible since the atonic ureters with their content of static urine prove usually an insuperable handicap, and during this period only relief of the disease is possible. Treatment has two objectives: relief of stasis and urinary antisepsis. Forced drinking of water serves both these ends and is the most important single measure, both in the prophylaxis and in the treatment of the disease. Two glasses of water with each meal and the same at bedtime should be routine for every pregnant woman and during warm weather a larger intake is desirable. In the treatment of pyelitis the intake of fluid should exceed 4,500 cc daily (except when certain of the newer urinary antiseptics are used). The more important drugs and therapeutic measures used in the treatment of pyelitis are methenamine, alkalis, mandelic acid, sulfanilamide, solution of posterior pituitary, termination of pregnancy and drainage and lavage of the renal pelvis. Of these, sulfanilamide appears to be the best.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Archives of Disease in Childhood, London

13 289 378 (Dec) 1938

- Determination of Glucose Tolerance C W Ross with technical assistance of Eva L Tonks—p 289  
Peripheral Brachial Paralysis in Infants and Children J E Morison—p 310  
Causative Organisms of Bronchopneumonia in Infants in Egypt A K Abdel Khalik A M Askar and M Ali—p 333  
Chinese Methods of Infant Feeding and Nursing B S Platt and S Y Gin—p 343  
\*Nutritional Anemia in an Industrial District J H Hutchison—p 355

**Nutritional Anemia in an Industrial District**—In order to determine the incidence of iron deficiency anemia of infancy in a large industrial area of Glasgow, Hutchison studied the hemoglobin levels of 300 infants up to 1 year of age. The diets of these infants were not supplemented by iron and they were regarded by their mothers as healthy. The author's data show that 26 per cent of the breast-fed and 35 per cent of the bottle fed infants had hemoglobin values of at least 10 per cent below normal (Mackay) values for their respective ages. These percentages become much greater if infants less than 6 months old are excluded. The principal factors influencing the development of this type of anemia were undue prolongation of exclusive milk diet, low birth weight and infections. The importance of prophylaxis is stressed and a mixed diet (including broth, vegetable puree and egg yolk at 4 or 5 months), preceded by the administration of iron, is suggested as a method of preventing this type of anemia.

## British Journal of Experimental Pathology, London

19 367 442 (Dec) 1938

- Lethal Toxins of Hemolytic Streptococci and Their Antibodies E W Todd—p 367  
Studies on Antirabic Immunization with Formolized Culture Virus I J Kligler and H Bernkopf—p 378  
Spontaneous Variation in the Neurotropic Strain of Yellow Fever Virus G M Findlay and F O MacCallum—p 384  
The Specificity of Active Immunity in Mice Against Influenza Virus F M Burnet—p 388  
Surface Films of Antibodies and Antigens I Effect of Spreading on a Water Surface on the Specific Properties of Pneumococcus (Type II) Antibody and Horse Serum Globulin J F Danielli Mary Danielli and J R Marrack—p 393  
Photo Electric Study of Reactions Between Diphtheria Toxin and Anti-toxin C G Pope and M Healey—p 397  
Effect of Agar on Production of Staphylococcus  $\alpha$  Hemolysin H McIlwain—p 411  
\*Nonhemoglobin Cellular Iron in Anemia C E Jenkins and M L Thomson—p 417  
Note on the Isolation of Clostridium Tetani from the Intestines of Normal Sheep in Cambridgeshire P S Watts—p 422  
Effect of Increased Salt Concentration on the Amount of Precipitate Formed by Antisera with Specific Precipitants J Marrack and Helga Franziska Hollering—p 424  
The Influence of Intravenous Injections of 3,4-Benzpyrene Colloid on Growth of Transplanted Mouse Squamous Carcinoma 2146 P R Peacock and S Beck—p 434

**Nonhemoglobin Cellular Iron in Anemia**—In a previous paper on the distribution of iron in blood Jenkins and Thomson suggested that the excess iron was a breakdown product derived from aging hemoglobin and that the rise of the nonhemoglobin cellular iron percentage found in most forms of anemia was due to a compensatory retention in the circulation of cells which had passed the normal life span of an erythrocyte. In this investigation the authors performed 110 blood examinations in twenty-four cases of anemia or hemorrhage. The results show that the nonhemoglobin cellular iron increases as the hemoglobin concentration falls and decreases as the latter rises. If the fluctuations of the nonhemoglobin cellular iron are expressions of a compensatory mechanism they should usually be independent of the cause of the anemia. A study of the results makes it clear that this is so, as a corollary the nonhemoglobin cellular iron is of no value as a means of differential diagnosis. The erythrocytic population is made up of cells of varying age and if in the course of recovery from an anemia there is at one stage an intense hematopoietic activity one would expect that the new cells, having no appreciable nonhemoglobin cellular iron would

depress the percentage to a point below the normal for a brief period a number of such instances are present (six cases). The result is due to the combined effects of an increased removal of aged cells, in itself causing a reduction in the nonhemoglobin cellular iron percentage, and the influx of a large number of new cells. A further expectation would be that the total cellular iron might actually fall if the hemoglobin rises sharply enough. Several such instances have been encountered. The fallacy of assuming that the hemoglobin concentration can be calculated from the total cellular iron is evident. The authors do not claim that the facts presented furnish formal experimental proof of the accuracy of the hypothesis, but they submit that all the data obtained so far can be explained rationally on that basis.

## British Journal of Ophthalmology, London

23 180 (Jan) 1939

- Standardized Lantern for Testing Color Vision L C Martin—p 1  
Vital Staining of the Retina Preliminary Clinical Note A Sorsby—p 20  
Studies on Bacteriology of Hypopyon Ulcer I Conjunctival Flora of Healthy Coal Mine Workers A J Rhodes—p 25  
Id II Conjunctival Flora of Shale Mine Workers A J Rhodes—p 38  
\*Note on the Use of Horsehair Sutures for the Conjunctiva P J Hay—p 43  
Pathology of Scleral Plaques Report of Five Cases of Degenerative Plaques in the Sclera Mesially, One Studied Histologically A M Culler—p 44  
Light Adaptation at the Fovea for Normal Eyes W D Wright—p 51

**Horsehair Sutures for Closure of Conjunctiva**—Hay has found horsehair extremely useful for closing the wound after inserting the glass globe in a Frost-Lang operation. No knots are required. Horsehair keeps the wound firmly closed in virtue of its rigidity, while it does not bunch up the conjunctiva like a silk purse-string suture. The same suture may be used with advantage for closing the wound in the conjunctiva after trephining.

## Clinical Science, London

3 357 418 (Dec) 1938

- Experimental Hypertension of Renal Origin in the Rabbit G W Pickering and M Prinzmetal—p 357  
Observations on Pituitary Control of Creatine and Creatinine Excretion I Schrire and E P Sharpey Schafer—p 369  
\*Experiments Relating to the Itch Sensation Its Peripheral Mechanism and Central Pathways R G Bickford—p 377  
Some Observations on Clubbed Fingers M Mendlowitz—p 387  
Rate of Blood Flow in Normal Fingers R W Wilkins J Doupe and H W Newman—p 403  
The Inhibition of Pituitary Activity in Acromegaly by Estradiol Benzoate and Testosterone Propionate I Schrire and E P Sharpey Schafer—p 413

**The Itch Sensation**—Bickford states that, when histamine enters the skin through a puncture, itching begins at the point of the puncture. The skin widely surrounding the puncture also undergoes a change, so that when gently rubbed it gives an abnormal itchy sensation. The former sensation is called spontaneous itching and the latter itchy skin. Itchy skin arises through a local nervous (axonic) pathway. This pathway is separate from that of hyperalgesia and the vascular flare. The nerves do not belong to the sympathetic system. Itchy skin has been found round all itching lesions examined, whether occurring naturally or produced deliberately. It is, therefore, considered to be an essential part of the sensation of itching. Itchy skin may be abolished by a degree of asphyxia which leaves spontaneous itching unaffected, a similar dissociation may be produced by cooling a nerve trunk. This indicates that the nerves carrying the two sensations are separate. The sensation of tickling shows a close association with itchy skin in these experiments. In clinical cases of sensory dissociation itchy skin is not detected in areas in which the sensation of tickling is lost, even though the sensation of touch may be retained. Spontaneous itching is not felt at a point at which pain to the prick of a pin is defective. The pain of tickling, spontaneous itching and itchy skin are all conveyed in the anterolateral tracts, since they all disappear when this is divided. A condition of the skin in which itching is inhibited is described. The inhibition is central in origin and is probably produced through the pain nerves.

## Journal of Tropical Medicine and Hygiene, London

41 377 392 (Dec 1) 1938

- Mycotic Pruritus Anus Short General Account A Castellani—p 377  
 \*Observations on Some Cases of Food Poisoning in Egypt R Fahmy, S El Kholi and M A Gohar—p 380

41 393 408 (Dec 15) 1938

- Scorpionism O de Magalhães—p 393  
 Note on Some Little Known Conditions of the Lanugo Hair A Castellani—p 400

**Food Poisoning in Egypt**—From a total of 117 cases of food poisoning observed during three months, Fahmy and his associates isolated fifteen organisms seven *Bacillus pyocyaneus*, six *Bacillus morganii*, one *Bacillus aertrycke* and one *Bacillus metadysenteriae*. Of fifty rats, three were found to be infected and five strains were isolated four *Bacillus aertrycke* and one *Bacillus morganii*. There is apparently no difference between the organisms isolated from rats in Egypt and those isolated elsewhere. Strains of Castellani's metadysentery group were found responsible for two fatal cases.

## Lancet, London

2 1449 1502 (Dec 24) 1938

- Congenital Disease J B S Haldane—p 1449  
 \*Significance of the van den Bergh Reaction in Diagnosis of Pernicious Anemia J Mills and C A Mawson—p 1455  
 Control of Urinary Secretion by the Anterior Pituitary B G Shapiro—p 1457  
 \*Treatment of Pellagra with Nicotinamide A C Alport, P Ghahoungui and G Hanna—p 1460  
 Acute Gonorrhea Treated with Sulfapyridine Report on 100 Cases J G McGregor Robertson—p 1463  
 Possible Failures in Chest Lead Electrocardiograms G Schoenewald—p 1465  
 Extrapleural Pneumothorax A Maurer and E de Switsch—p 1468

**Bilirubin Level and Pernicious Anemia**—Mills and Mawson found that the bilirubin content of the serum of pernicious anemia patients is considerably greater than that of normal persons. Of eighty-five patients with pernicious anemia 93 per cent had serum bilirubin greater than 0.4 mg per hundred cubic centimeters, whereas of eighty-five normal patients 91 per cent had less than 0.4 mg per hundred cubic centimeters. The serum bilirubin was  $0.31 \pm 0.02$  mg in normal persons and  $0.98 \pm 0.06$  mg in patients having pernicious anemia. In fifty-three cases of pernicious anemia controlled by liver therapy the serum bilirubin was  $0.31 \pm 0.03$  mg per hundred cubic centimeters. The most striking proof that a significant difference between the two groups of persons does exist is shown not by statistical analysis but by the fact that specific treatment of pernicious anemia causes a return of a previously raised serum bilirubin to a normal level. That such a return to normal does take place can only mean that a raised serum bilirubin is a true symptom of pernicious anemia.

**Treatment of Pellagra with Nicotinamide**—Alport and his associates treated fifteen patients with pellagra and dermatitis, and two with, presumably, pellagrous stomatitis with 1 Gm orally or 0.5 Gm by injection of nicotinamide. The acute lesions of the mucous membranes were promptly and rapidly improved. Improvement in the acute cutaneous lesions was slower. Chronic cutaneous lesions in friction areas and chronic atrophic changes in the tongue were only slightly affected. The appetite, mental condition and general physical health of all the patients were improved by the treatment. Headache, itching and warmth of the skin followed treatment of four patients and one patient had colic after the administration of 1 Gm of nicotinic acid, but the same dose of nicotinamide given two patients led only to transient headache.

## Medical Journal of Australia, Sydney

2 1017 1060 (Dec 17) 1938

- What Is the Outlook for the Medical Profession? B Kilvington—p 1017  
 Cardiac Irregularities Other Than Auricular Fibrillation W Evans—p 1023  
 Statistical Tabulation of the Results of Treatment of Carcinoma of the Uterus H E Downes—p 1030  
 Preliminary Note on the M<sup>N</sup> and MN Blood Groupings B Bradley—p 1036

## Journal de Medecine de Lyon, Lyons

19 715 740 (Dec 20) 1938

- \*Infarct of Liver J F Martin, P F Girard and M Planchu—p 715  
 Primary Hematoma of Aortic Wall I Bouchut A Guichard and J Bourret—p 727

**Infarct of Liver**—Martin and his associates point out that infarcts of the liver are extremely rare. As they were able to find reports of only seven cases, they describe two new cases that were observed in 1938. They give detailed clinical histories of the two cases and describe the postmortem aspects. The two hepatic infarcts were as different as could be one was red, circumscribed and triangular and its aspects corresponded well to the classic description. The other was white, diffuse and of irregular outline. It differed in all points from the cases reported heretofore, for the red infarct is the most frequent type. After describing the microscopic aspects of the two types of infarcts the authors give their attention to the etiology and pathogenesis, pointing out that they are difficult to explain. The double circulation of the liver, the arterial and the portal systems, create peculiar anatomic conditions, which however render the study of hepatic infarcts useful for a knowledge of the causes of infarcts in general. The authors regard as important the frequency of infectious endocarditis which they observed in two of four cases. Moreover, the large white infarct seemed to be connected with a dissecting aneurysm of the thoraco abdominal aorta in a patient with hypertension. It is by an arteritic process that hepatic infarct is most frequently brought about. However, it remains difficult to explain the extreme rarity of infarct of the liver. At first it seems justified to explain this rarity by the double circulation in the liver, for theoretically it seems necessary that obliteration of an arterial branch and of a portal branch would have to concur. After citing some experimental studies on the functions of the double circulation of the liver, the authors show that the results of these experiments are discordant and that it is difficult to explain the hepatic infarct by a simple mechanism. They regard as of primary importance the role assumed by the nervous element. They call attention to the rich nervous plexus which surrounds the hepatic artery and show that the anatomoclinical observations indicate the primary role of the periarterial nervous system. Among other factors they point out that whereas in the red infarct arterial obliteration was evident, in the case of the white infarct it was disputable. In the latter case the dissecting aneurysm was the most important vascular lesion and this produced a dislocation of the periaortic nervous plexus.

## Presse Medicale, Paris

16 1913 1928 (Dec 28) 1938

- Insulin Storage of Sugar L Bugnard and C Soula—p 1913  
 \*Role of B<sub>1</sub> Hypovitaminosis in Cardiovascular Pathology G Bickel—p 1916  
 Painful Syndrome of Right Hypochondrium in Course of Gonococcal Adnexitis E Mauro—p 1919

**B<sub>1</sub> Hypovitaminosis in Cardiovascular Pathology**—Bickel observed the disappearance of severe cardiac dilatation accompanied by cantering rhythm, simultaneously with the alcoholic polyneuritis, after the cardiotonic treatment had been interrupted and the patient was treated only with vitamin. The author shows further that the great importance of circulatory symptoms in the symptomatology of classic B<sub>1</sub> avitaminosis, beriberi, justifies a search for cardiovascular involvement in numerous disorders due to a partial deficit of vitamin B<sub>1</sub>. He made studies on patients with polyneuritis of alcoholic and gravidic origin and discovered that cardiac disturbances may become manifest in alcoholic addicts and in pregnant women in the absence of nervous symptoms other than diminution in the tendon reflexes and a slight weakness in the legs. On the other hand, these patients almost always present a certain degree of anorexia or of other gastrointestinal disturbances, which are early symptoms of a B<sub>1</sub> hypovitaminosis. After discussing the cardiovascular disorders of chronic alcoholism, the author takes up the cardiac disturbances of pregnancy, which, when they appear independent of valvular, arterial or renal disorders, should always suggest a deficit in the intake or utilization of vitamin B<sub>1</sub>. To be sure, the cardiovascular

disturbances of purely gravidic origin, that is, independent of all preexisting cardiac disorders, are usually less severe than those which appear in alcoholism. Nevertheless the author observed a favorable effect of the administration of vitamin B<sub>1</sub> in several women who, during the fourth or fifth month of pregnancy, developed tachycardia, cardiac erethism and slight dilatation of the heart, symptoms which generally are attributed merely to mechanical or toxic causes. After pointing out that cardiac disorders of hypovitaminotic origin occasionally are observed also in diabetes, in hyperthyroidism, in febrile diseases with grave denutrition, in certain gastrointestinal disturbances and so on, the author makes remarks about the mechanism by which the B<sub>1</sub> hypovitaminosis might give rise to the circulatory disorders and then discusses the therapy. He says that the rapid and complete cure of the cardiovascular disturbances requires comparatively large doses of vitamin B<sub>1</sub>, at first from 10 to 20 mg should be administered daily by injection. Beginning with the third week, that is, after a sufficient amelioration has been obtained, vitamin B<sub>1</sub> is given by mouth in combination with a suitable diet.

47 116 (Jan 4) 1939

Postoperative Deficit in Weight Eventual Sequel of Gastrectomy for Ulcer. P. Santy and P. Mallet-Guy —p 1

\*Value of Cutaneous Reaction in Tuberculous Milieu. P. Foucaud —p 5

**Cutaneous Reaction in Tuberculosis**—Foucaud says that the cutaneous reaction for tuberculosis has been in use for about twelve years and that most pediatricians agree that the percentages of positive or negative reactions depend on factors such as (1) the housing conditions, the proportion of positive cutaneous reactions being much lower in rural sections than in urban and densely populated sections, (2) the mode of life, in that among the well-to-do, even in the cities, the percentage of positivity is much lower than among the poorer classes, (3) the type of material in which the tests are made in presumably healthy subjects (schools, group of students or of workers) positive results are detected in a much smaller percentage than in subjects from an infected milieu such as in those who come to medical services and dispensaries. The author's studies, which were begun in 1934, were made on the one hand on children who came from surroundings in which infection was suspected and who were referred to his dispensary by physicians for completion of the diagnosis and, on the other hand, on school children. The majority of children were from rural regions. Tests were made on 1,020 children ranging in age from several months to 18 years. The antecedents and the living conditions were known. The cutaneous tests were made at the time of the first examination. If negative they were repeated after three months if it was supposed that the infection was masked by a transitory state of anergy or was made the first time during a preallergic period when, for instance, the tuberculous contact had been removed. The results of the tests are recorded in tables. In the conclusion the author stresses the points which he was able to verify with maximum exactitude. 1 A positive cutaneous reaction indicates a tuberculous infection in the environment, the more so if the child is quite young. 2 The child represents the biologic evidence of familial tuberculosis in that the positive cutaneous reaction in a child permits the detection of tuberculosis in its familial surroundings. 3 The onset of school age and the age of puberty seem to be the periods during which the child is most exposed to tuberculous infection and to tuberculous disease. 4 A considerable number of children living in the surroundings of persons who excrete tubercle bacilli retain a negative cutaneous reaction. A table compares the incidence of positive reactions according to the type of tuberculous contact the children were exposed to: (a) persons with pulmonary tuberculosis who excrete bacilli, (b) persons with pulmonary tuberculosis who do not and (c) persons with visceral and osseous tuberculosis. 5 A considerable quantity of bacilli are necessary to provoke a positive cutaneous reaction in certain children. 6 The change of the cutaneous reaction is produced only in an infected milieu, it is produced rarely and slowly, this fact can be explained by a natural resistance to the bacillus without manifestation. The immunity thus conferred is slow but lasting.

**Revue Belge des Sciences Medicales, Louvain**

10 533 580 (Nov.) 1938

\*Comparative Study of 350 Benign and Malignant Tumors of Mammary Gland. P. Desaise —p 533  
Septicopyemia of the Newborn and of Nurslings. J. Bottin —p 573

**Tumors of Mammary Gland**—Desaise presents a comparative study of 350 cases of benign and malignant tumors of the mammary gland. In the course of this report he advances a certain number of facts which now militate for a correlation between the two types and then again for their absolute independence. Among the first he cites the fact that fibro adenomas usually precede the development of cancer, for, whereas the average age of women with fibro-adenoma of the breast is 37 years, that of the women with cancer of the breast is 52 years. This fact makes probable the transformation of the first into the second type. The coincidence of the preferential site of the two forms of tumors in the superior external quadrant of the left breast and the observation of a direct transformation of a fibro-adenoma into cancer are additional factors indicating a correlation. Factors which militate against a correlation are the anatomopathologic independence of the fibro-adenoma, which is transplantable and is not dependent on a simple process of involution of the gland, the extremely different behavior of the two neoplasms as regards the time factor, the one being benign and of indefinite duration, the other one malignant and of limited duration, the noticeable divergences between the hormonal influences exerted on the two types of tumors, the fibro-adenoma developing chiefly during the period of ovarian activity and the cancer during or after the menopause, finally the possibility of interpreting as simply accidental the cases of association of fibro-adenoma and cancer. The author is inclined to consider as problematic the existence of the etiologic complex fibro-adenoma cancer, he thinks that the two tumorous processes have different if not opposite causes. He then raises the question whether, on the basis of this opinion, it would be justified to advise abstinence from surgical treatment in mammary fibro-adenoma and try in such cases medical treatment, based on glandular therapy and especially on the search of a perfect equilibrium between the ovary and the anterior hypophysis. Taking this position seems premature to the author for three reasons. 1 The exact mode of endocrine action on the genesis of benign mammary tumors is still unknown. 2 At the onset, the differentiation between benign and malignant tumors is impossible without recourse to biopsy. 3 The chances of atypical transformation constitute a danger for the patient with fibro-adenoma, because a more mutilating treatment may become necessary than the simple ablation of the small initial tumor. The author concludes that at the present state of knowledge the systematic ablation remains the best treatment in the presence of an apparently benign tumor of the mammary gland.

**Monatsschrift für Psychiatrie und Neurologie, Basel**

100 129 240 (Oct.) 1938 Partial Index

Sympathetic Systems and Their Relations to Psychic Disturbances. M. Rosenfeld —p 137

Clinical and Experimental Investigations on Problems of Tabes. H. Bertha —p 174

\*Behavior of Sugar Content of Cerebrospinal Fluid and Its Relation to Blood Sugar in Course of Insulin Coma in Schizophrenic Patients. M. Fischer —p 221

Psychology of Process of Suggestion. B. Stokvis —p 237

**Cerebrospinal and Blood Sugar During Insulin Coma**—Fischer says that, whereas the behavior of the sugar content of the blood during insulin shock therapy has been repeatedly investigated, little is as yet known about the behavior of the sugar content of the cerebrospinal fluid. He reports studies in fourteen cases and he arrives at the following conclusions. 1 In the course of insulin shock therapy there often develop considerable fluctuations in the fasting sugar values of the cerebrospinal fluid. A regular decrease in the fasting values was not proved by the author's investigations. 2 Like the blood sugar values the cerebrospinal fluid values decrease rapidly during the first hour, to be sure, the decrease in the cerebrospinal fluid is not quite as extensive and so the two curves either approach or cross each other during the second or third hour. 3 The glycochorrhachia shows a renewed decrease after two and one half hours, that is, at a time when the blood

sugar curve commences to increase again. 4 At the end of the coma the glycorrhachia is usually considerably lower than the blood sugar value and it rises much more slowly. 5 After the administration of sugar, the sugar content of the blood increases more rapidly than that of the cerebrospinal fluid. Although the blood may show a temporary hyperglycemia, the sugar content of the cerebrospinal fluid is more constant and in the author's cases it never exceeded normal values. Frequently the glycorrhachia was still quite low after the patient had wakened from the coma, this was the case even in the presence of hyperglycemia. Regaining consciousness is dependent not on the restoration of normal sugar values in the cerebrospinal fluid but probably on the reestablishment of normal endocrine conditions in the tissues, including the ganglion cell. Under certain conditions the sugar may reach abnormally high values also in the cerebrospinal fluid. In this connection the author cites a case observed by Molony and Honan, but even in this case it was observed that the sugar values of the cerebrospinal fluid do not fall and rise as quickly as do the sugar values of the blood, that is, they have a greater stability than do the sugar values of the blood. The author further cites results of punctures after spontaneous epileptic attacks and after attacks induced by metrazol. In the concluding summary he stresses once more that the sugar contents of the cerebrospinal fluid and of the blood do not determine the depth of the coma, as has been assumed by some investigators.

### Archivio Italiano di Chirurgia, Bologna

49 429 556 (Sept.) 1938

\*Arterial Symptoms from Phlebitis of Limbs C Uggeri and A Massone —p 429

Suture of Inguinal Ligament to Pubic Ligament as Done in Radical Treatment of Femoral Hernia According to Bassini's Technic. Experimental Results G Austoni —p 480

Technic for External Cholecystostomy P Cazzamali and R Pecco —p 501

**Arterial Symptoms in Phlebitis of Extremities**—Uggeri and Massone report three cases of arterial vasomotor reactions from thrombophlebitis of the legs and review the literature on the subject. They conclude that arterial reactions with ischemia may develop from thrombophlebitis of the extremities. They can be classified into three different groups: (1) in the course of phlebitis of long duration or during amelioration of the condition; (2) as sudden grave early symptoms of extensive thrombophlebitis of the main vein of the limb; and (3) in the course of aggravation of benign thrombophlebitis. Ischemia of the first type may be caused by arteritis (from dissemination of phlebitis), by arterial spasm (also induced by phlebitis) or by both arteritis and arterial spasm. It develops slowly. The arterial pulsation at the foot and at the posterior tibial and popliteal arteries generally cannot be felt and that of the femoral artery is weak, the oscillometric waves (Pachon) at the thigh and leg are absent. Both the arterial pulsations and the oscillometric waves improve by rest and proper treatment. Gangrene develops only in rare cases. Ischemia of the second type develops suddenly with symptoms of arterial embolism. It is due to reflex arterial spasm from venous occlusion. The arterial pulsations at the foot and at the posterior tibial and popliteal arteries and the oscillometric waves are absent from the beginning of the acute attack. The pulsation of the femoral artery may be felt weakly at the beginning of the attack and disappears as the condition is aggravated. The arteries in this type of ischemia show no pathologic changes. Ischemia of the third type is a benign arterial reaction to the venous condition. The diagnosis of the arterial reaction is simple in cases of the first and third groups. In cases of the second group (those which simulate arterial embolism) the diagnosis is made by the early appearance of cyanosis of the limb with blue and violet hues, which is different from the waxy pallor of the limb in arterial embolism. The treatment consists in administration of drugs aimed to control the arterial spasm. It is advisable to administer a daily dose of 0.5 or 0.6 Gm of acetylcholine in association with warm bathing of the limb or application of short wave irradiations or a morphine derivative. If this treatment fails, sympathetic treatment with procaine hydrochloride, peri-

arterial sympathectomy or resection of the occluded segment of the vein are indicated. Removal of the venous thrombus seems to be the ideal treatment in acute cases. However, further experiments are indicated in order to establish the probabilities of success of the procedure.

### Deutsches Archiv für klinische Medizin, Berlin

183 211 362 (Dec 21) 1938 Partial Index

Pneumomediastinum Anterior as Diagnostic and Therapeutic Method R Pannhorst —p 211

Insulin Requirements and Type of Diabetes S Donhoff and E. Liposits —p 218

Electrocardiographic Aspects of Typical Form of Hypertrophy of Left Side of Heart Under Influence of Inhalation of Amyl Nitrite and of Air with Reduced Oxygen Content E Duns and C Korth —p 230

Disturbances in Central Regulation of Sodium Chloride Metabolism H Gltzel and H J Wolf —p 243

\*Calcifying Tuberculosis of Spleen A von Orelli —p 264

Aspects and Intensity of Saturation During Nutrition with Diet of High Vitamin C Content G Lemmel —p 277

Erythropoietic Function of Bone Marrow in Hepatic Cirrhosis and Hemochromatosis N Markoff —p 289

**Calcifying Tuberculosis of Spleen**—Von Orelli says that although splenic tuberculosis is occasionally discovered in the course of necropsies it is rarely diagnosed during life, because it is lacking in symptoms. He thinks that a diagnosis during life is possible only if the patient survives the splenic tuberculosis long enough, so that the tuberculous foci in the spleen undergo calcification and thus become detectable by x-rays. Since such cases are rare, he feels justified in reporting several in which clinical and x-ray examinations and in some also microscopic examinations justified the diagnosis of a calcified tuberculosis of the spleen. In four cases x-ray examination of the spleen revealed multiple calcified nodules in the spleen. To be sure, such shadows in the spleen have four possible explanations: they may be caused by calcified animal parasites, by phleboliths, by nonspecific calcified granulomas and by calcified tubercles. The author evaluates these possibilities in the reported cases. In three of his cases it became possible later to subject the calcified splenic nodules to microscopic studies. He found that neither the x-ray nor the microscopic examination permits a definite diagnosis. To be sure, in three cases general pathologic considerations made a calcifying splenic tuberculosis highly probable, however, in a fourth it proved difficult to render an exact differentiation from phleboliths and nonspecific calcified foci. Discussing the pathogenesis of calcifying splenic tuberculosis the author cites a fifth case which, strictly considered, does not belong to the aforementioned group of cases because there were no calcified splenic foci. However, observations in this case indicate that a general tuberculosis of the lymphatic apparatus plays a decisive part in the pathogenesis of splenic tuberculosis.

### Nederlandsch Tijdschrift v Geneeskunde, Amsterdam

82 5997 6092 (Dec 17) 1938 Partial Index

Future of Children with Congenital Myxedema L F Schaeffer —p 6008

\*Risk and Advantages of Energetic Treatment with Neoarsphenamine and Bismuth Compounds C W Bottema —p 6014

Sodium Content of Blood Serum in Thyrogenic Degeneration of Liver J C M D Verschure —p 6021

**Combined Neoarsphenamine and Bismuth Therapy**—Bottema compares the risk involved in the energetic neoarsphenamine-bismuth treatment with the advantages of this method. He describes the disturbances which he observed in 1140 men of the navy who were subjected to energetic therapy with neoarsphenamine and bismuth compounds. The mortality of this treatment was found to be 0.087 per cent, the total morbidity was 4.6 per cent. The neoarsphenamine was chiefly responsible for the toxic complications, that is it caused all the deaths (0.087 per cent) and its morbidity rate was 3.9 per cent, bismuth compounds having a morbidity rate of 0.7 per cent. Of 647 patients observed for from five to seventeen years the mortality from syphilis was found to have decreased by 2.8 per cent and the morbidity (calculated on the basis of the patients with clinical signs, the cases only serologically positive being excluded) by 4.9 per cent. The advantages thus far outweigh the risks involved.

# THE STUDENT SECTION

of the

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*Devoted to the Educational Interests and Welfare of Medical Students, Interns and Residents in Hospitals*

SATURDAY, FEBRUARY 25, 1939

## The University of Michigan Medical Student

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Student in Class of 1940 University of Michigan  
Medical School

ANN ARBOR, MICH

During the one hour out of twenty-four (between 5 and 6 o'clock any evening) when even medical students become human beings, if an inquiring reporter were to drop in at one of Ann Arbor's eight medical fraternity houses he would be apt to find most of its members relaxing lazily on the davenports, grouped around the piano or, more probably, overbidding a weak bridge hand. By engaging in conversation the "dummy" at the sunporch bridge game, the interviewer would probably learn the following:

The student is a freshman in medical school, 21 years old but soon to celebrate his twenty-second birthday anniversary. He may or may not be helping his family in financing his schooling by outside work. He is almost sure to be unmarried, is very apt to be a Michigan resident and there is a 50-50 chance that he has a college degree. There is also an even chance that he will be seen in church on the following Sunday. He will probably state that he spends from \$2 to \$5 each month on social activities, most of which will find its way to the till of one of Ann Arbor's five modest cinema palaces. The remainder probably goes for occasional university or fraternity dances. Probably he does not "go for" the concerts and lectures sponsored by the university. The entire cost of his first year he estimates at from \$600 to \$1,000, with emphasis on the higher figure. Out of this he would probably budget his room cost at from \$150 to \$200 and his board at from \$250 to \$300. He is not sure how much his clothes will cost him during this first year but guesses at anywhere from \$50 to \$150. He is very apt to choose gross anatomy as his favorite subject thus far in his career. His premedical grade average is approximately B.

Over at the grand piano, a young man pauses a few moments to offer this information:

As an "average" sophomore, he is between 22 and 23 years old and the chances are good that he is doing some outside work along with his studies, although he is also leaning pretty heavily on the family for aid. He too is apt to be single and a Michigan resident. While he is more apt to have a college degree, there is less chance that he will be seen with his freshman brother in church. He spends about the same on social activities as his beginning classmate, with emphasis on movies and dances, but he is "discovering" the concerts and lectures and may be attending one or both series. As for the total cost of his first year, he has already found out that his budget had been rather slim and that \$700 was about the lowest figure he could spend, with \$1,000 a more workable figure. However, he has learned to make his room money go further but the board figure remains about the same. His freshman extravagance at the Ann Arbor haberdasheries is standing him in good stead, so that his clothes cost will average about \$50 less this year. He is even more likely to choose anatomy as his favorite subject now, although there is a definite leaning toward such new studies as pathology and biochemistry. His premedical average too was about B, and he probably finished his first year in the middle third of the class.

In another corner a young man is smiling over the Tonics and Sedatives in THE JOURNAL. He lays the magazine aside to give these facts:

Nearly 24 years old, he is a junior in medical school and probably just got back from several hours of extracurricular work. By this work he is able to lean less on his family for financial support than he had the year before. Although nearly a fourth of his classmates have been married during the previous summer, he is still single and probably claims Michigan as his home. He is almost sure to have a college degree and, more than any of his brothers from the other classes, is probably a regular church

The author received help and cooperation from Miss Vera Cummings and (Mrs.) Joyce Stanchfield of the Medical Office and Dr. Bradley M. Patten of the Anatomy Department in the preparation and distribution of the questionnaires. Dean Albert C. Lurstenberg and Dr. H. Marvin Pollard gave encouragement and suggestions.



attendant. He too spends on the average from \$2 to \$5 for his social activities, although not infrequently this figure may be around \$10. He is like as not to spend much of this on movies and dances but, with his future place in community life constantly in mind, he finds it stimulating to be a rather regular attendant at the concerts and lectures. Legitimate stage plays in Detroit not infrequently cut into his social fund. Although he still finds that \$1,000 is about the average yearly cost of schooling, he has learned in his two previous years how to "cut corners" and may be able to shave this figure down to as low as \$500. His room cost is about the same as during his sophomore year but his board is apt to have risen slightly, since he must occasionally eat at the hospital instead of getting back to "the house" for his paid-for meals. His clothes cost is still less this year, probably being no more than \$25 to \$50. Although he is now spending his entire time in the hospital, he has not yet had enough of any one course to pick an outstanding clinical favorite and he probably will choose pathology as his favorite subject, but he still remembers his anatomy dissections with fondness, internal medicine courses are beginning to strike his fancy. His premedical grades were probably mostly A's and B's and he seems to have had a few more of the former than his underclassman brothers.

Just as the first dinner chimes are sounded a rather earnest young man hurries in from the hospital. As he climbs to his room, doffs his white coat and prepares for supper, he tells his story.

Having just learned of his acceptance as an intern for the following year, this senior feels far more mature than his 24 years. The chances are even that he is doing some outside work and he finds that more than at any other time, except during his sophomore year, he is having to depend on his family for financial aid, he has probably borrowed some money to complete his last year. Nearly a third of his classmates are married but he is still a bachelor and, probably, a native of Michigan. He probably boasts a college degree but attends church less than any of his less advanced classmates. He is less apt to overstep a \$2 to \$5 monthly budget for social activities than his junior friends and so attends movies and dances more and the concerts, lectures and plays less. One thousand dollars is still his annual average cost of school, although he finds that this figure sometimes goes a little higher during his final year. His benedick friends are finding that their housing costs are mounting to such figures as \$250 and \$300, but he is still paying about the same as in previous years, his meals too are about the same as before. He is spending less for clothes (from \$25 to \$50 yearly, with emphasis on the smaller

figure) than at any other time during his medical school career. Having sampled the entire curriculum, the odds are that he will favor his medicine courses, especially those entailing clinical work, but surgery is a close second in his choice, just nosing out obstetrics and gynecology. Pathology still ranks high in his favor and he has still fond recollections of his gross anatomy days. He too probably entered medical school with a previous average of B.

Statistics leading to the foregoing information were obtained by circulating nearly 500 questionnaires among the four classes of the University of Michigan Medical School during November and December 1938. While the distribution and collection of these questionnaires had the approval and cooperation of the medical office, they are in no way official, having been circulated by me to obtain information which I believe is both interesting and informational to both students and faculty. Any inaccuracies must therefore be placed on my doorstep. Information that I gleaned from the questionnaires was supplemented through personal interview among students taken at random from the several classes. Verbal information closely coincided with that obtained in the written forms and apparently serves to authenticate the latter. While slightly less than half the entire student body returned completely filled in questionnaires, the number who furnished partial information and the additional personal interviews represents a majority of the medical students. The fact that of the total number who filled in questionnaires there was approximately one third in each of the three "grade divisions" of each class also serves to verify the belief that the information is a true cross-sectional picture of this medical school.

Official figures show the total enrolment of the University of Michigan Medical School to be 475, of which forty are women. Class enrolment figures are 121 freshmen, 125 sophomores, 127 juniors and 102 seniors. Of these 40 per cent returned completed questionnaires. With additional personal interviews, the total answering was about 60 per cent.

While the foregoing word pictures of "average" Michigan medical students may be regarded as typical, the extremes in each category varied widely. The questionnaire, entitled "University of Michigan Medical School Census," was marked confidential. It was explained that while answers were not obligatory they would be appreciated, and that additional details might be written on the back of the sheet. The questions covered the following points:

General Information—Class Entrance date Age  
Sex Married or single Children Nationality City-  
zen? Home city and state Other medical schools  
Premedical school Degree Full-time student? Local

address fraternity, own home, apartment, rooming house, elsewhere Church Member? Attend? Fraternity, social and/or medical Member Pledge Date

**Social Activities**—Approximate cost per month Principally movies, dances, plays or what? Attending concert series, lectures, Detroit legitimate plays, other events? Approximate annual cost of clothes, room, board Other hobbies with approximate cost

**Scholarship**—Approximate grade average in pre-medical school Class standing First year, second year and third year in class of how many? Honor point average of all work Favorite subjects in medical school Grades

**Outside Work**—Percentage of self support Type of work and hours per week, with salary, for each year and summer school Summer work Approximate annual cost of school attendance each year Method of financing medical education Whether willing to give more details on personal interview

Information on these points is presented under the separate headings as they appeared on the questionnaire

#### GENERAL INFORMATION

**Age**—Freshmen range, 20 to 29, 37 per cent 21, 28 per cent 22 Sophomores range, 20 to 33, 33 per cent 22, 22 per cent 23 Juniors range, 21 to 31, 29 per cent 23, 29 per cent 24 Seniors range, 21 to 37, 38 per cent 24, 29 per cent 25

**Married Students**—Freshmen 7 per cent, sophomores 11 per cent, juniors 27 per cent, seniors 32 per cent

**Residents of Michigan**—Freshmen 82 per cent, sophomores 70 per cent, juniors 79 per cent, seniors 76 per cent

**Literary School Degrees**—Freshmen 56 per cent, sophomores 70 per cent, juniors 86 per cent, seniors 82 per cent

**Medical Fraternity Membership**—Freshmen 78 per cent, sophomores 78 per cent, juniors 74 per cent, seniors 69 per cent

**Church Attendance**—Freshmen 49 per cent, sophomores 44 per cent, juniors 56 per cent, seniors 41 per cent

#### SOCIAL ACTIVITIES

**Monthly Cost** Freshmen range, 0 to \$20, 40 per cent \$2-\$5, 24 per cent \$6-\$10 Sophomores range, 0 to \$30, 52 per cent \$2-\$5, 19 per cent \$6-\$10 Juniors range, 0 to \$50, 42 per cent \$2-\$5, 33 per cent \$6-\$10 Seniors range, \$2 to \$25, 51 per cent \$2-\$5 33 per cent \$6-\$20

**Type** Freshmen movies 71 per cent, dances 38 per cent, concerts 7 per cent, lectures 5 per cent, plays 1 per cent, various 19 per cent Sophomores movies 60 per cent, dances 33 per cent, lectures 11 per cent, concerts 15 per cent, plays 11 per cent, various 22 per cent Juniors movies 52 per cent, dances 29 per cent, concerts 37 per cent, lectures 33 per cent, plays 23 per cent, various 2 per cent Seniors movies 54 per cent, dances 38 per cent, concerts 30 per cent, lectures 30 per cent, plays 35 per cent, various 2 per cent

#### SCHOLARSHIP

**Premedical Grade Average** (students' own estimate) —Freshmen A, 11+ per cent, B, 79 per cent, C, 8+ per cent Sophomores A, 11 per cent, B, 78 per cent, C, 11 per cent Juniors A, 15 per cent, B, 63 per cent, C, 19 per cent Seniors A, 11 per cent, B, 78 per cent, C, 11 per cent

**Class Standing**—As was expected, approximately one third of each class fell into each of the hypothetical grade divisions the upper, middle and lower third The majority of the students remained in the

same division throughout their four years It was hoped that the questionnaires might bring out a relationship between class standing and age of the student, but careful survey of the data shows about the same distribution in each of the three grade divisions as in the class as a whole

**Favorite Subject** (only those chosen by 5 per cent or more) —Freshmen anatomy 41 per cent, biochemistry 19 per cent, embryology 10 per cent, histology 5 per cent Sophomores anatomy 52 per cent, pathology 26 per cent, biochemistry 22 per cent, physiology 19 per cent, bacteriology 7 per cent Juniors pathology 31 per cent, medicine 23 per cent, anatomy 17 per cent, obstetrics 12 per cent, physiology 10 per cent, surgery 10 per cent, biochemistry 8 per cent, physical diagnosis 6 per cent Seniors medicine 54 per cent, surgery 30 per cent, obstetrics and gynecology 24 per cent, pathology 11 per cent, anatomy 8 per cent, pediatrics 8 per cent, biochemistry 5 per cent physiology 5 per cent, psychiatry 5 per cent All classes medicine 36 per cent, anatomy 30 per cent, pathology 24 per cent, surgery 19 per cent, obstetrics and gynecology 18 per cent, biochemistry 14 per cent (These percentages include only those classes which have already studied the courses voted on) Other subjects voted for by 3 per cent or more of any one class included clinical microscopy, public health, neuroanatomy and ophthalmology

#### EXPENSES

**First Year**—Freshmen range, \$250 to \$1,300, 35 per cent \$600 to \$1,000 Sophomores range, \$300 to \$1,300, 59 per cent \$700 to \$1,000 Juniors range, \$500 to \$2,500, 60 per cent \$800 to \$1,200 Seniors range, \$260 to \$1,250, 68 per cent \$600 to \$1,000

**Second Year**—Sophomores Too few estimated to make figures reliable Juniors range, \$400 to \$2,500, 62 per cent \$500 to \$1,000 Seniors range, \$260 to \$1,400, 62 per cent \$600 to 1,000

**Third Year**—Juniors Too few estimated to make figures reliable Seniors range, \$260 to \$1,200, 70 per cent \$600 to \$1,100

**Fourth Year**—Seniors (estimates) range, \$260 to \$1,200, 46 per cent \$600 to \$1,000

**Room**—Freshmen range, 0 to \$450, 48 per cent \$150 to \$200 Three per cent worked for their room Sophomores range, 0 to \$400, 60 per cent \$150 to \$175, 4 per cent worked for their room Juniors range, 0 to \$684, 50 per cent \$150 to \$175, 8 per cent worked for their room Seniors range, 0 to \$400, 54 per cent \$250 to \$350, 19 per cent worked for their room (Those living at home listed their room expenses as zero)

**Board**—Freshmen range, 0 to \$400, 45 per cent \$250 to \$300, 11 per cent worked for their meals Sophomores range, 0 to \$400, 63 per cent \$175 to \$300, 15 per cent worked for their meals Juniors range, 0 to \$1,140, 52 per cent \$200 to \$300, 19 per cent worked for their meals Seniors range, 0 to \$400, 62 per cent \$200 to \$300, 24 per cent worked for their meals

**Clothes**—Freshmen range, 0 to \$300, 31 per cent \$25-\$50, 27 per cent \$75-\$100, 35 per cent \$100-\$150 Sophomores range, 0 to \$150, 41 per cent \$25-\$50, 48 per cent \$75-\$100 Juniors range, 0 to \$300, 33 per cent \$25-\$50, 66 per cent varied widely Seniors range, \$10 to \$300, 53 per cent \$25-\$50, 47 per cent varied widely

**Method of Financing Medical School**—Freshmen family aid 58 per cent, borrowing 15 per cent, inheritance, bonds or trust fund 8 per cent, outside work 51 per cent Sophomores family aid 85 per cent, borrowing 7 per cent, inheritance, bonds or trust fund 7 per cent, outside work 52 per cent Juniors family aid 68 per cent, borrowing 29 per cent, inheritance, bonds or trust fund 8 per cent, outside work 40 per cent

cent Seniors family aid 74 per cent, borrowing 38 per cent, outside work 44 per cent, about 3 per cent partially financed themselves as blood donors

#### OUTSIDE WORK (DURING SCHOOL YEAR)

*Working*—Freshmen 51 per cent, sophomores 59 per cent, juniors 60 per cent, seniors 54 per cent

*One Hundred Per Cent Self Supporting*—Freshmen 14 per cent, sophomores 11 per cent, juniors 23 per cent, seniors 11 per cent

*Seventy-Five Per Cent Self Supporting*—Freshmen 11 per cent, sophomores 11 per cent, juniors 12 per cent, seniors 16 per cent

*Fifty Per Cent Self Supporting*—Freshmen 4 per cent, sophomores 11 per cent, juniors 2 per cent, seniors 16 per cent

*Twenty-Five Per Cent Self Supporting*—Freshmen 25 per cent, sophomores 26 per cent, juniors 23 per cent, seniors 11 per cent

*Type of Work*—Waiting table and washing dishes is the most common Other common jobs externship, assistant in university laboratories, laboratory work in hospital and/or doctor's office, NIA, assistant diener, selling medical books and instruments, orderly in hospital, fraternity house manager, fraternity "store," donor for transfusions, instructor, janitor, caretaker, life insurance work, practice of dentistry, subject for medical experiments, usher at university affairs, store clerk, music teacher, carrying paper route

*Relation of Outside Work (during school attendance) and Grades*—Freshmen Premedical average of A 7 per cent worked outside Premedical average of B, 42 per cent worked Premedical average of C, none worked

Sophomores Premedical average A, 5 per cent worked, B, 59 per cent worked, C, 11 per cent worked

Freshman average Upper third of class, 80 per cent worked Middle third, 40 per cent worked Lower third, 50 per cent worked

Juniors Premedical average A, 19 per cent worked, B, 62 per cent worked, C, 21 per cent worked

Freshman average Upper third, 66 per cent worked Middle third, 40 per cent worked Lower third 80 per cent worked

Sophomore average Upper third, 80 per cent worked Middle third, 60 per cent worked Lower third, 65 per cent worked

Seniors Premedical average A, 50 per cent worked, B, 80 per cent worked, C, 8 per cent worked

Freshman average Upper third, 85 per cent worked Middle third, 75 per cent worked Lower third, 1 per cent worked

Sophomore average Upper third, 92 per cent worked Middle third, 37 per cent worked Lower third, 25 per cent worked

Junior average Upper third, 99 per cent worked Middle third, 37 per cent worked Lower third, 25 per cent worked

Although analysis of these figures is somewhat difficult, the tendency appears to be toward higher grades for those students who are working their way through school, in whole or in part

#### COMMENT

Surveys and questionnaires of this kind suggest infinite possibilities which might be revealing as well as interesting I had originally intended only to find the percentage of working students, but the frequent discussions by groups of students have convinced me that medical students are keenly interested in how their fellow students live In my opinion it would be of great interest if a similar census would be taken in other medical schools Fair warning should be given any student, however, who anticipates such an undertaking that the preparation, distribution and collection of the questionnaires, together with the problem of shaping the data into presentable form, entail many hours of tedious work and that the project is hardly one to be undertaken during the busy school year

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## Comments and Reviews

### TEACHING THE MEDICOSOCIAL ASPECTS OF CASES

*Abridgment of an article by Dr George P Reynolds, instructor in medicine at Harvard University Medical School, Boston published in the New England Journal of Medicine, Jan 5, 1939*

Medicine is not a science which can be practiced by the precise methods of reasoning and deduction of the mathematician, the chemist or the physicist The human reaction to external or internal factors is a variable which prevents the accurate relation between cause and effect that characterizes the work of the true scientist The innumerable social, economic, psychiatric and physical elements of each situation make ever changing the reaction of the human being even during the course of a brief illness

Emphasis in the teaching of medicine on the physical and laboratory approach to disease obscures the importance of methods and quali-

ties which enabled the old fashioned family doctor to bring solace and tranquility to patients and to discover factors in their illness which would not have been revealed by the most complete modern laboratory studies

Clinical medicine is taught principally in the wards and outpatient departments From the point of view of the study of disease the public hospital is the best place for such teaching The difficulty is that in these surroundings the patient is likely to be stripped of his personality, his human relationships and the complexities of his own particular life and environment The student and even the instructor tend to speak of him, for example, as a "case of gastric ulcer" They fail properly to investigate the economic, occupational, social and psychological problems that he is facing and that may bear on the etiology and treatment of his illness

There is a tendency to speak of all symptoms as either functional or organic and to base their

treatment on this arbitrary method of classification. Few physicians seem to realize that environmental factors often cause dysfunction of an organ and that dysfunction may result in a lesion. There is much evidence that anxiety may lead to gastric hyperacidity and eventually to gastric ulcer, that exacerbations of arthritis frequently follow prolonged periods of mental or physical overactivity and that arterial hypertension is frequently found in the high pressure type of individual. A summary of the social service investigation and the recommendations resulting from it should be incorporated in the patient's record in as routine a manner as are consultations from medical specialists.

The lack of a proper liaison between the physician and the social worker hides from the student and house officer the importance of considering the social aspects of each case before drawing conclusions as to diagnosis and management. The physician whose experience has been confined to patients within a hospital is prone to look on the social service department as a charitable endeavor to better the lot of poor patients. This is erroneous, as similar social problems arise among well-to-do patients.

This criticism does not imply that attempts to teach the medicosocial approach to medical problems have not been made. Instructors at various schools have given lectures in recent years on this aspect of medicine. But the social approach to the study of cases has received insufficient emphasis in the education of medical students and has been totally neglected by many instructors. The need is to permeate the entire curriculum with such teaching rather than to confine it to any one department. We should adopt a more humane rather than a purely material attitude toward the problem of the individual. We should return to greater emphasis on the health and happiness of the patient as the primary aim of medical practice, but not at the expense of minimizing the importance of the control or cure of disease. We should develop in students a consciousness of the importance of the social aspects of medicine, bring them to realize their responsibilities as physicians not only to the patient but to his family, the community and humanity, and teach them how to elicit and evaluate scientifically the social factors of the individual case and to demonstrate how to construct a plan of treatment that is socially and medically adequate to the individual patient.

#### IMPORTANCE OF SOCIAL ASPECTS

The value of social study in diagnosis, the part it plays in determining the exact treatment of the case and its role in the prevention of disease and psychologic maladjustments must be demonstrated to students so that they may see clearly that this is an integral part of medicine, not merely an allied field of social endeavor.

Students must learn that social service departments were created because this aspect of the cases of indigent patients was being neglected by busy physicians and that social service departments represent merely a dissemination of the function of the physician. The study and evaluation of the social component of each medical problem is, moreover, a duty which the physician has to assume unaided in dealing with his private patients.

#### REALIZATION OF RESPONSIBILITIES

Students frequently ask: Is it the physician's duty to go into family affairs so remotely connected with the patient's disease? Doesn't his responsibility end with the treatment of that disease? Doesn't this belong to the field of preventive medicine, psychiatry or a social welfare agency? To answer them it is necessary to give students a view of the whole field of medicine, at one end of which is the chemist, the bacteriologist and the physiologist, next comes the trained clinical investigator, and near him stands the public health officer striving to prevent disease in the community. In the middle are the more limited aspects of practice, the specialist who attacks patients' problems from one point of view. At the other end of the picture is the psychoanalyst, who deals with the abnormalities of intellect and the emotions—the field so stupidly described as functional disorders. The work of each touches that of all the others. Every human being has his own psychologic peculiarities. Throughout the whole panorama we have the internist or the general practitioner, who serves as liaison between all the other groups and who must occasionally take an active role in the work of each group. The cardiologist has not helped his patient when he advises a sedentary life or "light work" to an individual who has a family to support and whose only means of livelihood is moving furniture. If, through his knowledge of the patient, through social agencies or by any other means a cardiologist finds some employment for the patient compatible with his physical limitations, he has more fully performed his function as a physician. Thus he would aid not only the patient but also his family and the community, which would otherwise have been obliged to care for them all. Such considerations as these, illustrated by actual cases, should convince the student of his responsibility as a physician and his duty to society as well as to the individual. Then he will see that it is part of the duty of physicians to act at times as public health officers, at others as psychiatrists, and to try to prevent disease as well as to cure it. Then the student will realize that he must often become involved in social situations apparently remote from his patient's disease.

Evaluation of the social data in relation to the patient's ailment depends first on the physi-

cian's ability to elicit the story. The student must realize that the usual brief summary of the social, marital, economic and occupational history found in hospital records is inadequate. Knowledge of the patient's ambitions, hobbies, interests, contacts, moods, thinking processes and his ability to adjust himself to the handicaps which his illness imposes should be evaluated. The physician or social worker seldom expects to gain all this information at the first visit, and if the patient is acutely ill perhaps little or none can be learned from members of the family. Brief conversations with his companions may reveal factors deeply affecting the patient's psychologic environment.

One is handicapped if the patient is seen only in the physician's office or the hospital. In private practice it may be desirable to seek an excuse to see the patient in his home or in his business environment. Although this is seldom possible to arrange for the student, its significance should be impressed on him.

The value of these factors in the treatment of the sick cannot be overemphasized. I mentioned their importance a few years ago, and further thought on the subject has strengthened my convictions. Today with an ever increasing number of tests and diagnostic procedures we are too prone to forget the importance of treating the patient as a whole man and to see his problems from his point of view. An illness which to us is trivial may fill him with terror. On the other hand his apparent success in any field may be far short of his aim, or his ambition may lie in an entirely different direction. Eliciting the social history demands tact, patience and keen perception. Its evaluation requires imagination, experience and the ability to see the problems through the patient's eyes.

#### DEVELOPMENT OF AN ADEQUATE PLAN OF TREATMENT

The weakest point in treatment in a public hospital usually develops at the time of the patient's discharge. The planning of after-care is usually left to a house officer whose medical experience has been limited to hospital work. The first step in planning the after-care is to give the patient or his family a thorough understanding of his illness, its resulting limitations, their probable duration and their implications with regard to his future. It is frequently advisable to pass much of this information on to relatives rather than to the patient. However, it is the patient who must make the adjustment and carry out the instructions, and he must be given as complete an understanding of his situation and the reasons for each limitation as is consistent with his welfare.

An intelligent police officer who had been recuperating from a coronary thrombosis was about to be discharged. The intern reported that the patient had been given a thorough

understanding of the nature of his condition and its limitations, that he had arranged to retire from police work and that his future convalescence had been carefully planned for him. Partly to demonstrate to the students the details of such planning and partly to elicit the patient's reaction to his limitations, the visiting physician asked him what he was going to do when he went home that afternoon. "Put the wife and kids in the car and start for California. We ought to make 200 miles before dark" was the surprising answer. Further questioning revealed no understanding of the situation by the patient or by the intern. The intern apparently assumed that all policemen are patrolmen and had informed the patient that his work was not compatible with the degree of cardiac damage he had suffered, and that he should resign and spend the next few months "sitting around outdoors." The patient had been attached to police headquarters, where his duties were almost entirely clerical, and this sedentary life he thought had been the cause of his illness. To him driving eight hours a day was a pleasant way of "sitting around outdoors." With proper planning, his retirement was changed to a leave of absence, his convalescence was completed at home, and he was then able to return to his previous work with slight modifications. The intern had entirely failed to acquire or to give the patient an understanding of the medicosocial situation and had allowed the patient to develop for himself a most undesirable program of after-care.

It is often more important for the plan of treatment to be practical for the patient and his family, and compatible with his financial and occupational resources, than for it to be the ideal therapy for his disease. The office worker may be unable to take milk and cream every hour but can arrange for a bland diet, regular meals and repeated periods of relaxation, which are often as effective in the treatment of peptic ulcer. A wage earner with diabetes may not be able to enter a hospital for regulation of his disease or be able to weigh his food, but such individuals can frequently be treated successfully while at work and can learn to estimate the composition of food intake with sufficient accuracy to permit insulin therapy.

#### METHODS

The methods of teaching the social component of medicine vary widely. The instruction is given by many different departments of some medical schools and by social workers without the aid of physicians in others. It is attempted variously by lectures, medicosocial ward rounds, case studies, case presentations, conferences and in some instances visits to the home. Each has its own advantages. The method of teaching will depend on the peculiar abilities of the indi-

vidual and the situation at a particular medical center. The essential is to present to the student the approach to his cases in the most effective way.

Deliberation on the methods employed in other clinics, together with experiences at the Harvard unit of the Boston City Hospital, has led to certain general conclusions.

The teaching of the medicosocial aspects of cases is most effective if conducted by a physician rather than by a social worker alone.

The function of the social worker in such teaching should be subsidiary to, though in close association with, that of the clinician.

The case method of presentation, whether on ward rounds, in outpatient departments or in conference, is more suited to this teaching than didactic lectures alone.

The subject should not be introduced as a separate entity but in close correlation with the purely medical aspects of a disease or a case.

The ultimate aim is to have such teaching permeate the whole medical curriculum in all discussions that deal with diagnosis, prognosis, treatment and the prevention of illness.

## WELCOME TO THE FRESHMAN CLASS

*Abridgment of an address by Dr Everts A. Graham, Babby Professor of Surgery, to the Freshman Class of Washington University School of Medicine, St. Louis, Sept. 21, 1938*

Each one of you holds a place that was sought by eight others. Some have been actuated by the humanitarian ideal of relieving an individual of the handicaps of illness, others are inspired by the scientific aspects of medicine and a desire to gain the satisfaction that goes with making some discovery. Perhaps some have been led to make this choice because of family traditions.

As one who has watched the careers of many students I offer some advice. Medicine is a full time career from the moment one enters on it. It is a jealous god expecting to receive from its votaries all their talent and energy, and lavishing no rewards on those who are not fully consecrated to its service. Unless one feels that one is led into this profession by an enthusiasm and a zeal which will not be satisfied with any other kind of work, it would be better to select another career. Those who have undertaken the study of medicine in a spirit of indifference and without the zeal demanded usually become tragic figures in later life. The faculty recognizes this principle and believes it is acting in a spirit of kindness when, after it is apparent that an individual is unsuited for a medical career, it advises him to withdraw and to enter some other field of activity.

To you who are about to begin the fascinating and engrossing study of medicine, the oppor-

tunities for personal satisfaction are greater than have ever before existed. On the clinical side opportunities exist as never before really to make a diagnosis and to do something rational and effective to cure the patient. The humanitarian yearning is therefore more easily satisfied now than it could have been even twenty-five years ago. The x-rays, our principal diagnostic agent, are less than fifty years old, and surgery, our most dramatic method of treatment, is scarcely any older in its modern sense.

## MANY NEW FIELDS

Scientific medicine is developing so rapidly and so many new fields of investigation are being discovered that almost any one with a good intellect and with proper training can make some new observation or discovery. If the discovery is considered by others to be important, the thrill cannot be equaled by the acquisition of wealth or by rewards generally sought after by those who, in other careers, are less fortunate than we votaries of medicine. The scientific view of disease is scarcely a century old. Before that time the study of medicine consisted largely of learning the dogmas of recognized authorities. Galen's writings were unchallenged for a thousand years. In our country almost up to the Civil War Benjamin Rush was considered an almost infallible authority. He assumed that there is fundamentally only one disease, albeit with different manifestations, and that one form of treatment, bleeding, sufficed for all disease. The medical student's work then was simple compared with that which we expect of you. At that time the student could inherit his books from his grandfather and still be up to date. Because of the tremendous pace at which medical knowledge is accumulating, some of the textbooks which you will purchase will be more or less obsolete by the time of your graduation. A few years ago Dr. Singer, Dr. Ballou and I were persuaded by a publishing house to write a book on chest surgery. This is the newest field of surgery and there was no adequate book on the subject. We undertook our work with enthusiasm but promptly found that no sooner had we completed and set aside one chapter to prepare the next than we had to go back again to the finished chapter to add new knowledge that was constantly being contributed in the literature of the world. There was a constant stream of new facts being added. It appeared as if we never could finish the book because of our inability to finish one chapter. We finally succeeded in completing the manuscript by agreeing that no literature after a certain date would be quoted. The book appeared three years ago but already it is obsolete. My own ideas of many aspects of chest surgery have so changed in this brief time



that I should prefer not to have any one read certain parts of the book today. This experience will convince you, I think, of how rapidly changing the knowledge of medicine is. In your clinics in the senior year, if you hear some physiology expounded which seems discordant to that which you learned as a sophomore, don't jump to the conclusion that we clinicians don't know our physiology. Give us a break by assuming that maybe in the two years that have elapsed the accepted concepts have changed.

You are now beginning the study of medicine, but you will never finish it. Even after graduation you must still be earnest and hard working students. You must acquire the habit of good reading. Do not confine yourselves to the perusal of advertisements of pharmaceutical firms but read regularly several journals which pertain to fields in which you have a special interest. Those who will become clinicians I would urge to read some journals outside the clinical field and a monograph now and then on some special aspect of medicine. Those who are not going to be clinicians I would likewise urge to read some good clinical journals. After all, clinical medicine is only applied anatomy, physiology, pathology and bacteriology. A good clinician must be reasonably well versed in those sciences, and if he is to be progressive he must keep abreast of their new developments. This may sound like an arduous task. On the contrary, one who is a true votary will have an unconquerable urge to try to keep abreast of the times. The strong hand of this jealous god will lead him to his reading as irresistibly as if he were being led by a ring in his nose.

#### A USE FOR USELESS KNOWLEDGE

I hope that you may remember some of these remarks during the next two years, because you will probably wonder what practical use some of the work expected of you can have. "How can the study of the reactions of a nerve in the hind leg of a frog have anything to do with curing a man of appendicitis?" you may ask. Well, there are fundamentals that every good doctor must know. A clinical picture of, say, appendicitis is built up on a structure of fundamentals of the medical sciences. A disease of any organ in the body is not confined to that organ but exerts its effects on the whole body. A knowledge of the fundamental reactions of the structures of the body is useful practical knowledge to the clinician. A child may fail to see the value to him of learning the multiplication table, but we elders know its value. Moreover, as Abraham Flexner has repeatedly emphasized, there is a use for useless knowledge. Faraday's discoveries in electricity at the time seemed to be merely additions to useless knowledge, but they created a new era of civilization. Could any one have predicted

that the Wright Brothers machine flown at Kitty Hawk, N. C., could in less than a lifetime threaten the security of Great Britain and in a sense annul the long accepted influence of sea power? These are examples of useless knowledge. The faculty of your school will endeavor to avoid as much as possible expecting you to learn things which can never possibly be useful to you. We feel, however, that probably we are better judges than you are of what should be taught in a medical school.

To be a well educated doctor, more than reading is necessary. Attendance at medical meetings is important. From hearing and seeing new work presented often far more inspiration is obtained than merely from reading reports. Inspiration is obtained also from the opportunities to see "in person" the great and to make the acquaintance of your colleagues. Travel to well known institutions and clinics is also a stimulating experience. One can always learn from the other fellow.

In stressing the importance of concentration on your medical work I have not meant to omit another desirable aspect of a doctor's education. The stress of modern civilization and the enormous expansion of medical knowledge have to some extent done something to make us as a class lose our general culture. It is shocking to find medical students who are not even well versed in their native language. Many cannot spell correctly in either written or spoken English. Doctors of medicine are a group who have probably devoted more years to their education than any other group. It would be a pity if the specialized education should drive out the general cultural education which at one time was supposed to be a prerequisite to the study of medicine. For your own satisfaction and recreation I would advise, in less busy moments, the cultivation of the muses. Read good literature, exercise your talents in art, music and poetry. Accomplishment in these fields will bring satisfaction and solace in many dark moments.

I should like to speak of some of the rewards of a medical career. From the time of the ancient Greeks the profession of medicine has been closely identified with that of teaching. Students flocked to the masters for instruction and thus medical knowledge was passed on from one generation to another. The medical school, as we think of it, is comparatively modern. To many an enormous satisfaction is obtained from watching the development of pupils and from the feeling that perhaps in some measure one has contributed to the inspiration of the successful ones. Medicine now offers opportunities in executive positions, in public health activities, in the army and navy, in editorial positions. There are opportunities for many to obtain the reward of

personal satisfaction even if their inclinations lead them out of the main tent into the side-shows

There are some who think that as a group successful clinicians are rich. This is a mistaken idea. The number of those who have become wealthy through the practice of medicine is a very small fraction of one per cent of the total, and some of those have indulged in questionable procedures in order to make their riches. The signs of the times would indicate that even less than in the past will opportunities arise for becoming wealthy in this profession. Those of you who have entered this career because of the financial returns would do well to turn about now before you realize too acutely the disappointment.

I should like briefly to state my own ideas of the great physician. First of all in the requirements are those qualities which are embraced in the word character—honesty, integrity and moral instincts. Nothing is more horrible than a dishonest doctor, one who advises an operation that is not necessary merely to obtain a fee, one who wilfully misrepresents the results of an examination or one who bears false witness against his colleagues. The great doctor must also have wisdom. He must have a natural

instinct to avoid saying the wrong thing or at least saying the wrong thing in the wrong way. He must avoid unnecessarily terrifying his worried patients or their families. The wise doctor usually can be thoroughly honest and at the same time assuage the fears and worries of his patient even in a hopeless case. The great doctor must also, in the words of Paul, have faith, hope and charity, faith that the patient has a chance to get well, and charity toward the unreasonableness of a patient and his family as well as toward the financial calamity which often the illness has been to the patient. If I were choosing a doctor for myself I should prefer one with slightly less intelligence but with unquestioned character than one who is brilliant but of questionable integrity. That crookedness can exist in this noble profession perhaps is a shock to you. The vast majority of the doctors of my acquaintance, and it is a large one, are thoroughly trustworthy, but in a group of 150,000 persons there will be all gradations.

Probably never before has the doctor been so much respected as he is now. This is due in no small part to the revolution in medical education which occurred in this country about twenty-five years ago.

## Correspondence

### THE ART OF DIAGNOSIS

*To the Editor*—Permit me to discuss the article by Mr. Frank Cook, F.R.C.S., published under Comments and Reviews in the Student Section January 28, page 376.

Mr. Cook apparently has been associated with one of the medical colleges which has always placed England in the foremost ranks of educators of doctors. He admits his close relationship to the senior students and decries the lack of diagnostic intuition in those just entering the clinical field. Surgeon Cook then criticizes the system of organized (if somewhat standardized) method of approach adopted by the well trained medical student in investigating the complaints of patients.

Mr. Cook refers to the carefully organized clinical investigation of every patient, regardless of his complaint, as emanating from America and as inclined to stultify a clinician's initiative and relegate him to the permanent role of "clinical clerk."

It is disappointing to read these words from one of academic rank. American medical education has its defects, but not one of them can be attributed to the lapses mentioned by the author. The very features stressed in our educational system (careful histories, routine investigations from every angle and differential reasoning) are those which have placed graduates of our approved medical colleges and hospitals on a plane unequalled by any country. Only by frequent repetition of these procedures and careful serial notations do "clinical clerks" acquire acumen which eventually accords them those much cherished but

sometimes doubtful qualities referred to in Mr. Cook's comments. What else is "inductive reasoning" but reasoning based on careful, painstaking examination of a patient combined with clinical experience? The latter requisition requires years of accretion of bits of clinical observations based on careful investigations.

Mr. Cook refers to the "endless series of irrelevant and uninspired" notations as indicative of some one contemplating the "writing of a paper" or the attempt at hiding lack of wits under a "cloak of pseudo-scientific enterprise." One wonders. Has Mr. Cook failed in his attempt to inspire medical students? Nothing is more inspirational than the methods adopted whereby "clinical clerks" follow their staffs from bed to bed discussing these "series of irrelevant and uninspired clinical investigations" and by discussions and deductions arrive at conclusions which they do not hesitate to note in the clinical records. Further, these same groups are courageous enough to verify their deductions either under the microscope or in the autopsy room. Are these methods conducive or not to the "scantiest notion of diagnostic values?" In answer to Mr. Cook, at least at the Medical College of the University of Cincinnati (Cincinnati General Hospital) we do "go the whole hog" whenever it is at all possible. We do have every "available body fluid examined with reference to every chemical constituent and micro-organism known to science." In this way frequently the conclusion "I do not know" is reached, but only after careful appraisal of every sign and symptom.

JULIEN E. BENJAMIN, M.D., Cincinnati

## Medical College News

*Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items to be considered for publication in the Student Section*

### Officers of Association of Medical Students

At the third annual meeting of the Association of Medical Students at Philadelphia, December 28-30, Mr Frawick H Stubbs, Emory University School of Medicine, Atlanta, and Mr David E Hepford, Temple University School of Medicine, Philadelphia, were elected co-presidents of the association for the ensuing year. The outgoing president was Mr William Dewey Davis, Division of Biological Sciences, University of Chicago. Mr Herbert K Abrams, University of Illinois College of Medicine, Chicago, was elected corresponding secretary, Miss Agnes Denholm, University of Illinois College of Medicine, Chicago, recording secretary, and Mr Alfred Russell Hurst, Division of Biological Sciences, University of Chicago, treasurer. The next annual meeting of the Association of Medical Students will be held at Wayne University School of Medicine, Detroit, in December 1939.

### Lectures to Students on Economics

A series of lectures on medical economics beginning January 27 will be given to the fourth year students at Louisiana State University School of Medicine, New Orleans. Dr Joseph Rigney D'Aunoy, dean of the school, announced that the first lecture dealing with life insurance was given by Mr Frank Limont, superintendent of agents of the Pan-American Life Insurance Company. Lectures will follow on systematic savings, bookkeeping, real estate as an investment, record and file systems and the income and distribution of physicians, given by Mr Fred Ellsworth of the Hibernia National Bank, Mr J Harry Rees of the Remington Rand Company, Mr Richard Foster of the Department of Public Welfare of New Orleans and Mr J E Blum Sr of the Louisiana Real Estate Board. Mrs Elizabeth Greenwald, record librarian of the Louisiana Charity Hospital, will give the final lecture on hospital records. The dean stated that these lectures were given for two reasons: first, the notorious inability of medical men to safeguard their own financial interests and, second, to link up the future physician's personal finances with the present widespread discussions of socialized medicine.

### Appointments at Tennessee

Dr Wilson L Williamson, associate professor of gynecology at the University of Tennessee College of Medicine, Memphis, has been appointed professor and head of the department to succeed the late Dr William T Black. Dr Williamson is a graduate of Tulane University of Louisiana School of Medicine, New Orleans, and a former president of the Tennessee State Medical Association. Dr Richmond McKinney, professor of otology, laryngology and rhinology in the college for many years, has resigned to devote all his time to private practice. His successor is Dr William Likely Simpson, associate professor of otology, laryngology and rhinology.

### College Cooperates with County Society

The dean of Wayne University College of Medicine, Detroit, in his last annual report stated that the school endeavors to cooperate in every possible way with the Wayne County Medical Society. The dean and members of the staff serve on various committees of the county organizations as well as the state medical

society. The faculty council includes many prominent members and officers of the society. It is recognized that the objectives of the society and the College of Medicine in relation to the improvement of medical education and medical service in the community are similar. There is therefore every reason for encouragement given to complete cooperation and understanding between the college and the society. Among the joint projects of the university and the society has been the establishment of a council or service for high school and college students who are interested in medicine as a career. The service will be under the direction of the division of student personnel of the university.

### Case Report Contest for Interns

The Allegheny County Medical Society, Pittsburgh, sponsors an annual case report contest which is open to all interns of any approved hospital in Allegheny County. The report should be of a case that has been under the care of the person submitting the report during his internship and should consist of not more than 1,000 words. The manuscript should bear an appropriate title for the report but nothing to indicate the identity of the writer. Attached to the manuscript should be a sealed envelope bearing the name of the writer, the hospital at which he is serving, the school and year of graduation and the initials or signature of the member of the staff in whose service the case was attended. The first prize will be \$25 and the second \$15. Manuscripts should be mailed prior to April 1, 1939, to the Secretary, Allegheny County Medical Society, Jenkins Arcade, Pittsburgh, marked "Case Report Contest."

### Woman's Medical College

Dr Winifred B Stewart, assistant clinical professor of neurology at Woman's Medical College of Pennsylvania, Philadelphia, has received an appointment to the psychopathic division of the department of neuropsychiatry of the Philadelphia General Hospital. —Mildred W S Schram, PhD, of the Donner International Cancer Foundation recently addressed the students of the Woman's Medical College of Pennsylvania on "Problems of Cancer Research." —Dr Catharine Macfarlane, professor of gynecology, addressed the Cancer Forum of the Lankenau Hospital Research Institute Nov 29, 1938, on "The Value of Periodic Pelvic Examinations."

### University of California

Dr George E Tucker, Los Angeles, recently lectured at the University of California Medical School, San Francisco, on "The Legal Aspects of the Practice of Medicine," "Medical Records and Their Legal Effect," "Medical Evidence in the Courts," "Malpractice Liabilities and Defenses and Other Civil Actions Against Physicians," "Medico-Legal Problems in Cases Involving Insurance," and "Medico-Legal Aspects of Workmen's Compensation." Only the senior class was required to attend these lectures, but they were attended by many members of the faculty and resident staff. —Dr James M D Olmsted, PhD, professor of physiology, who attended the recent sixteenth International Physiological Congress in Zurich, Switzerland, also engaged in research in France on the life of François Magendie, nineteenth century neurologist,

whose biography is now in preparation—Sherburne F Cook, Ph D, a Guggenheim Fellow, is in Mexico studying the influences of European civilization on the birth and death rates of the aboriginal population—Dr Stacy R Mettler, associate professor of medicine, is in England doing research on hematology in the laboratory of Dr L J Witts at the University of London

#### The Next Examination for the Army Medical Corps

The War Department has announced an examination, March 20-24, for the purpose of qualifying candidates for appointment as first lieutenants in the medical corps, regular army, to fill vacancies occurring during the next calendar year. The examination is open to all male graduates of acceptable medical schools who have completed one year's internship in an approved hospital or who will complete such an internship June 30 and who will not be over 32 years of age at the time it will be possible to tender a commission. Those doctors who do not complete their internships until June 30 will not be eligible for appointment until July 1. The examination will be conducted by boards of medical officers convened throughout the United States and will consist of a physical examination, a written examination in professional subjects and a determination of the candidates' adaptability for military service. Full information and application blanks will be furnished on request addressed to the Adjutant General, War Department, Washington, D C. Applications will not be considered after March 4.

#### Fiftieth Anniversary of Department of Biology

A dinner in celebration of the fiftieth anniversary of the founding of the department of biology at Western Reserve University and the fifty years of service there of Francis H Herrick, Ph D, now professor emeritus of biology, was held Dec 3, 1938. President Winfred G Leutner was toastmaster. Edwin G Conklin Ph D, executive vice president of the American Philosophical Society and professor emeritus of biology at Princeton University, gave the principal address.

#### National Board Questions in Pharmacology

Following are the questions used by the National Board of Medical Examiners in pharmacology and materia medica in part one of the examination held Sept 12-14, 1938:

Answer any six questions. 1. Discuss the action on the central nervous system of (a) caffeine citrate (b) atropine sulfate (c) digitalis and (d) picrotoxin. 2. State the sources of (a) theelin (estron), (b) prolan A and (c) prolan B. Discuss their actions. 3. Discuss the possible ways by which sulfanilamide may act as a germicidal agent. 4. State the symptoms of poisoning by (a) histamine (b) insulin and (c) carbon tetrachloride. 5. Discuss the difference in the action on metabolism of (a) thyroid extract and (b) dinitrophenol. 6. Explain the differences in the action on the uterus of (a) ergotamine and (b) an aqueous extract of ergot. 7. Discuss the arsenoxide theory of the action of arsenphenamine. 8. Explain the action on the coronary circulation of (a) nitroglycerin, (b) digitalis and (c) theobromine with sodium salicylate.

#### Intern Case Report Contest

The second annual intern case report contest for interns is open to all accredited east side hospitals in Detroit. Dr Cyril K Valade is chairman of the committee and Dr Ledru O Geib is honorary chairman. Other members of the committee are Drs George A Troester, William J Yott, Ralph A Johnson, William W MacGregor, Louis D Stern and Harold J F Kullman. The prizes are \$100, \$50 and \$25. The committee urges that the attending physicians at all the eligible hospitals encourage their interns to enter the contest and lend any necessary advice. The contest will close March 1.

#### Hutchings Hall Dedicated

A new building was dedicated Oct 5, 1938, at the Utica State Hospital, Utica, N Y, which bears the following inscription:

This building is named to commemorate the services of Richard Henry Hutchings, physician, teacher, administrator, superintendent of the Utica State Hospital, who has devoted his life to the welfare of the unfortunate.

At the dedication services were five upstate college presidents. The state of New York was represented by Dr William J Tiffany, Albany, commissioner, State Department of Mental Hygiene, and Dr Frederick W Parsons, New York, the former commissioner. John A DeCamp, superintendent of the Utica Public Schools, and Dr Herman G Weiskotten, dean and professor of pathology of the Syracuse University College of Medicine, also participated. In Hutchings Hall will be centered the educational and recreational activities which Dr Hutchings has developed in the administration of a great state hospital. Dr Hutchings graduated from the Bellevue Hospital Medical College, New York, in 1891, and has devoted thirty years of his service to the state of New York. He is now president of the American Psychiatric Association.

#### Student Clinic Day at Wayne University

The first Student Clinic Day at Wayne University School of Medicine, Detroit, was held Dec 15, 1938. Routine classes were dismissed so that students, faculty members and visiting alumni might participate in student-led discussions and demonstrations. The activities were in charge of the college chapter of the American Association of Medical Students.

The student council of the college held its semi-annual student-faculty-alumni reunion on the same day. The council correlated its reunion features with the day's program, serving a luncheon at the college and sponsoring a dinner and evening program at which awards were presented to recognize noteworthy work in the clinic.

#### Ohio Personals

Dr Tom D Spies, associate professor of medicine, University of Cincinnati College of Medicine, addressed the University of Wisconsin Medical Society, Madison, January 10 on "Recent Advances in the Study of Pellagra"—Associates of Dr Carl J Wiggers at Western Reserve University School of Medicine, Cleveland, gave a tea Nov 23, 1938, in honor of the twentieth anniversary of his appointment as professor of physiology. Dr Wiggers received a book of photographs and letters of appreciation from the president of the university, the dean of the school of medicine, members and former members of the staff of the department of physiology and students who have done special work under his tutelage.

#### Additions to Louisiana State University

About \$500,000 is to be expended on additions and alterations to the medical building of the Louisiana State University Medical Center, New Orleans, according to the dean, Dr Joseph Rigney D'Aunoy. The improvements are being financed jointly by the university and the PWA. The eighth floor of the building, which is now one third the size of the other floors, will be extended. The library space will be extended 90 by 50 feet. Quarters for experimental animals on the seventh floor are also being rebuilt, with its present space tripled. Complete overhauling of the heating system is included in the program, with individual controls installed for every classroom and laboratory. The distilled water, drainage and pumping systems will also be entirely overhauled.

## Ohio State Board Questions in Pathology

The following questions were used by the State Medical Board of Ohio in the examinations for licensure held at Columbus Dec 7-9, 1938

- 1 Discuss the use of vaccines for upper respiratory infections. How would you select or prepare the selected type?
- 2 What tests would you use in insuring the best results from urinary antiseptics, and why?
- 3 Describe the pathology of a tuberculous area in the lung.
- 4 Describe the changes that have taken place in a sclerotic artery.
- 5 Describe the microscopic picture of a well marked case of chronic glomerulonephritis.
- 6 What are the changes in a joint in hypertrophic arthritis?
- 7 What are the essential differences between benign and malignant tumors?
- 8 What frequent diseases are traceable to the milk supply and discuss the objectives of pasteurization.
- 9 Discuss the place of the family physician in cooperation with school authorities in an outbreak of diphtheria in a school in a small community.
- 10 Discuss the legal rights and restrictions in prescribing narcotic drugs.

## Nevada Personal

Russell Atkinson, president of the Nevada State Tuberculosis Association, spoke on community education on tuberculosis before students and faculty members at the University of Nevada recently under the auspices of a local chapter of Alpha Epsilon Delta, honorary premedical fraternity.

## Italian Chemist Comes to Wake Forest

Dr Camillo Artom, director of the physiologic institute of the University of Palermo in Sicily, has been appointed professor of biochemistry in the Wake Forest School of Medicine, Wake Forest, N C. He succeeds Herbert C Tidwell, Ph D, who resigned to go to Baylor University.

## Lectures on Pellagra

The second series of lectures under the John Wyckoff Lectureship at New York University College of Medicine, established by the Phi Delta Epsilon Fraternity, was presented Nov 21 and 22, 1938, by Dr Virgil P W Sydenstricker, professor of medicine, University of Georgia School of Medicine, Augusta. Dr Sydenstricker spoke on pellagra.

## Additions to Library at Loyola

More than 1,400 medical books and bound journals have been presented to Loyola University School of Medicine, Chicago, by Dr Henry Schmitz Sr and will form the nucleus of the new Memorial Library in the Mercy Hospital-Loyola University Clinics. Other additions to the library have been presented by Dr Carl F Schaub and Dr Abraham W Schram.

## Dr Banting Addresses Students

Sir Frederick G Banting, Toronto, discussed the value of research at a luncheon in Winnipeg, Man, Nov 29, 1938, under the auspices of the Winnipeg Medical Society. He also addressed students at the University of Manitoba Faculty of Medicine.

## Temple University

Under the auspices of the Association of Medical Students, Dr Eric M Matsner, New York, of the National Medical Council on Birth Control, addressed an open meeting in the Medical School Auditorium at Temple University, Philadelphia, January 26, on the subject "Control of Contraception and Preventive Medicine."

## South Carolina Personal

Dr Hillyer Rudisill Jr, professor of radiology at the Medical College of the State of South Carolina, Charleston, tendered his resignation effective February 1. Dr Rudisill has accepted a position as radiologist to the Piedmont Hospital, Atlanta, Ga. Dr Bernard S Kalypian, formerly assistant to Dr Rudisill, will succeed him.

## Officers of Alumni Association of Mayo Foundation

Dr Julius H P Gauss, Indianapolis, was elected president of the alumni association of the Mayo Foundation at the twentieth annual meeting held in Rochester, Minn. Other officers are Dr Lester D Powell of Des Moines, Iowa, first vice president, Dr George M Constans of Bismarck, N D, second vice president, Dr John Richards Aurelius of St Paul, reelected secretary, and Dr Duncan M Masson, Rochester, associate secretary and treasurer.

## Intern Alumni Day at Pawtucket

The Memorial Hospital, Pawtucket, held an intern alumni clinic day Nov 2, 1938. The morning was devoted to clinics by the staff. In the afternoon the following program was presented, with Dr John F Kenney, chief of the medical division, presiding:

- Dr Alexander Randall Philadelphia Obstructive Uropathy
- Dr William D Stroud Philadelphia Coronary Insufficiency
- Dr Harry Bond Wilmer Philadelphia Endocrine Therapy in the Treatment of Allergic Disorders
- Dr George M Piersol Philadelphia Acute Hepatic Cellular Disease

## New Building at Georgia

The new Classroom-Clinic Building at the University of Georgia School of Medicine, Augusta, was dedicated December 9. Dr Eugene E Murphey, professor of clinical medicine, was the principal speaker. Dr George Lombard Kelly, dean of the University of Georgia School of Medicine, presided.

## Promotions at New York University

The chancellor of New York University, Harry W Chase, LL D, announced recently the following promotions in the College of Medicine:

Dr Edward R Maloney to professor of dermatology and syphilology to succeed Dr Howard Fox, who retired to become professor emeritus. Dr Maloney has been a teacher at New York University for fifteen years.

Dr Clarence de la Chapelle to professor of medicine. Dr de la Chapelle, who has been on the faculty for thirteen years, received his education at Fordham University and at New York University and at present is acting director of the Third Medical Division at Bellevue Hospital, also chief of the cardiac clinic at Lenox Hill Hospital and consulting cardiologist at St Luke's Hospital, Newburgh.

- Dr Robert Gewanter, instructor in otorhinolaryngology
- Dr Stuart Z Hawkes, instructor in surgery
- Dr Irwin Edward Siris, assistant clinical professor of surgery
- Dr Leonard Goldwater, instructor in preventive medicine
- Dr T Campbell Hooton, assistant in anatomy
- Dr William Kaufmann, Dean W Horace Hoskins, fellow in comparative pathology

## Dr Howard T Karsner Honored

The associates and former pupils of Dr Howard T Karsner, director of the Institute of Pathology and for twenty-five years professor of pathology at Western Reserve University School of Medicine, Cleveland, commemorated his sixtieth birthday by presenting him with his portrait, painted by Rolf Stoll, head of the department of portraiture of the Cleveland School of Art. The event took place at a tea in honor of Dr and Mrs Karsner, January 6, at the Institute of Pathology. Preceding the tea, the faculty of the school of medicine gave a surprise luncheon at the Cleveland Club in honor of Dr Karsner.

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## FRACTURE OF THE NECK OF THE FEMUR

MARTIN B TINKER, M D

AND

MARTIN B TINKER JR, M D

WITH THE COLLABORATION OF A T KERR, M D, AND  
PROF W M SAWDON

ITHACA, N Y

Fracture of the neck of the femur has the highest death rate of any simple fracture of the long bones in advanced middle age or old age. Crippling and permanent disability from nonunion and stiff joints have afflicted nearly half those who survive. The high mortality and serious disability have led to trial of operative internal fixation for many years, with increasing frequency during the past few years.

### RELATIVE RESULTS OF CONSERVATIVE AND OPERATIVE TREATMENT

Expert opinion was sought as to the relative value of conservative and of operative treatment by consulting textbooks devoted entirely to fractures and the sections devoted to fractures in systems of surgery.<sup>1</sup> There is uniform pessimism concerning prognosis and results, especially with patients over 60 years of age or afflicted with medical complications. All authorities report infrequent bony union and considerable disability. The greater number recommend Whitman's abduction method as the treatment of choice. No comprehensive statistics are given. Speed classes this fracture as the "unsolved fracture."

Recent surgical literature gives a somewhat different picture. 2,074 cases were collected from various sources.<sup>2</sup> Of the patients, 1,094 were conservatively

treated, most of them by the Whitman method, with an average of 51 per cent of bony union. This figure practically agrees with that of Bohler of Vienna, a widely recognized authority on fractures.

There were 980 patients treated operatively, and all methods were used—bone pegging, open operation with the Smith-Petersen nail, blind nailing with the Smith-Petersen nail, multiple nailing, and screw and bolt fixation. The average percentage of bony union was 78. Obviously, 27 per cent shows a substantial gain in bony union in favor of internal fixation, but this is far less than that shown by the percentages of a few experts: Moore 96, Johansson 93, Mathieu 92, Watson-Jones 91 and Bohler 88. Bone pegs have poorer results than stainless steel or ordinary steel devices. This study seems to give a fair cross section of the results which might be expected, for some surgeons report as few as two cases of treatment by their special method. When the skill is acquired which many surgeons have with conservative methods, poor results should be mainly from aseptic necrosis of the head and preexisting medical complications.

Read before the Section on Surgery General and Abdominal at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 15, 1938.

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  - Seudder C L Treatment of Fractures ed 9 Philadelphia W B Saunders Company 1922 p 381
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- Charrier M Rochet C and Georget Bordeaux chir 8 22 (Jan) 1937
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- Fracture of the Neck of the Femur J A M A 107 105 (July 11) 1936
- Geckeler E O Am J Surg 37 396 (Sept) 1937
- George A W and Leonard R D Am J Roentgenol 31 433 (April) 1934
- Gill A B Ann Surg 96 1 (July) 1932
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- Jungling O Zentralbl f Chir 65 226 (Jan 29) 1938
- Kuntzsch Gerhard Zentralbl f Chir 64 66 (Jan 9) 1937
- Leadbetter G W J Bone & Joint Surg 15 931 (Oct) 1933 Am J Surg 38 612 (Dec) 1937 J Bone & Joint Surg 20 108 (Jan) 1938
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- McKenna Hugh Ann Surg 92 882 (Nov) 1930
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- Sherman W O Surg Gynec & Obst 68 353 (Feb No 2A) 1938
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Mortality is the question of first importance. Conservative methods give an average rate, taken from several sources, of approximately 25 per cent, while the average taken from 980 recent cases is only 9 per cent for blind nailing, a gain of 16 per cent. When it is remembered that cases for Whitman's abduction must

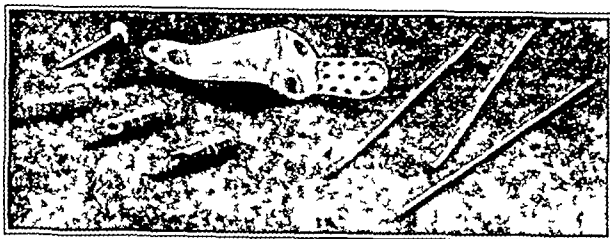


Fig 1—The templet disassembled with the nail which is used in the tail and three Moore pins

be carefully selected, with bad risks excluded, this figure becomes more significant, for no such careful selection is made by many advocates of internal fixation

#### FRACTURE OF THE NECK OF THE FEMUR IN SMALLER COMMUNITIES

Textbooks on fractures and the more important articles dealing with these injuries have all been based on the experience of fracture clinics in large cities and of orthopedic surgeons, specialists in bone and joint disease. At least one third of all fractures, however, must be treated by rural practitioners and small town surgeons, for transportation to the larger centers is impossible in many cases because of the serious general condition and the financial circumstances of the patient.

We have attempted to get an estimate from rural communities and the smaller cities by sending questionnaires to physicians within a radius of 100 miles from

#### Results of Treatment by Rural Practitioners and Surgeons in Small Cities

Form of Treatment	Good Results Without Use of Crutch or Cane Per centage	Fair Function With Crutch or Cane Per centage	Poor Function Patient About on Crutches Per centage	Patient Living Unable to Be About, Per centage	Patient Died Per centage
Fracture ignored	15.0	22.5	2.5	2.5	57.5
Sand bag	29.4	29.4	13.1	4.9	2.1
Buck's extension	6.8	23.8	3.9	2.7	12.8
Whitman's abduction	48.0	20.0	4.0	12.0	16.0
Anderson's splint	71.4	19.1			9.5
Smith-Petersen nail	23.5	14.2	14.2		42.8

Ithaca. These physicians are general practitioners and small town surgeons, whom we know personally, who have sent patients to us for various surgical operations, in more than one third of the instances either the physician or members of his family have been our patients. They are of better than average professional ability, as a group conscientious, and of wide general experience. The small town surgeons include some of exceptional education, training and experience, most of them lack the special experience of surgeons in large clinics and of orthopedists.

Reports of 573 cases have been received. All the physicians gave valuable information. Full data concerning results were given by 295. The forms of treatment and the percentage of good results in relation to

the number of patients treated by each method (not the total treated by all methods) are given in the accompanying table.

It will be noted that more than a third of the patients were treated by ignoring the fracture or using the sand bag because of their bad condition. These obviously makeshift methods of treatment cannot be expected to give satisfactory results. The death rate for these two methods (85.6) is very high, 57.5 per cent for disregard of the fracture and 28.1 per cent for treatment by sand bags. Even with these makeshift methods several recoveries with fair results are noted, there were 15 per cent of good results when the fracture was entirely ignored and 29.4 per cent when only sand bags were used. Several of the patients were over 80 years of age and in poor general health.

Buck's extension was the most commonly used procedure, nearly one third of the patients being treated by this method. Good results, walking without crutch or cane, were reported in 56 per cent of the cases, this percentage being approximately 9 per cent higher than that for the Whitman method in this series and also better than that usually reported. The death rate was approximately the same as that reported from large clinics, in spite of lack of facilities and nursing care in many cases. That the results of conservative methods are better than most reported from larger centers may be due in part to the sturdy character of the patients, most of whom were accustomed to hard work and plain living. Also it is fair to state that general practitioners of rural communities and the smaller cities generally give personal and faithful care to patients, in many instances better than that of an inexperienced intern.

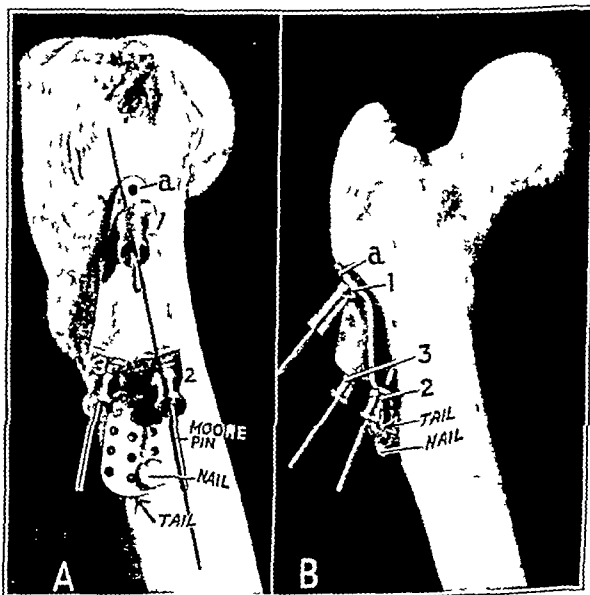


Fig 2—The templet in position in the right femur with Moore pins or nails already inserted through guide tubes. The straight line down the center of the outer side of the femur in A shows how guide tubes 1 and 2 must be aligned for a bone on the right side. B a lateral view of the templet in place shows the apex of the templet (a) hooking over or cupping the line of the vastus externus.

The results did not approach the average for internal fixation by experienced operators. Most small town surgeons are conscientious enough not to undertake a surgical procedure of major importance when they feel that they lack experience or facilities, which doubtless accounts for the small number of operations. The need for roentgenograms in both the anteroposterior and the

lateral position cannot be met by most rural practitioners. Internal fixation was used in two cases with excellent results by a man of surgical experience and ability. It seems evident that most of the unfortunate results were due to lack of study of methods and lack of general surgical experience on the part of those who

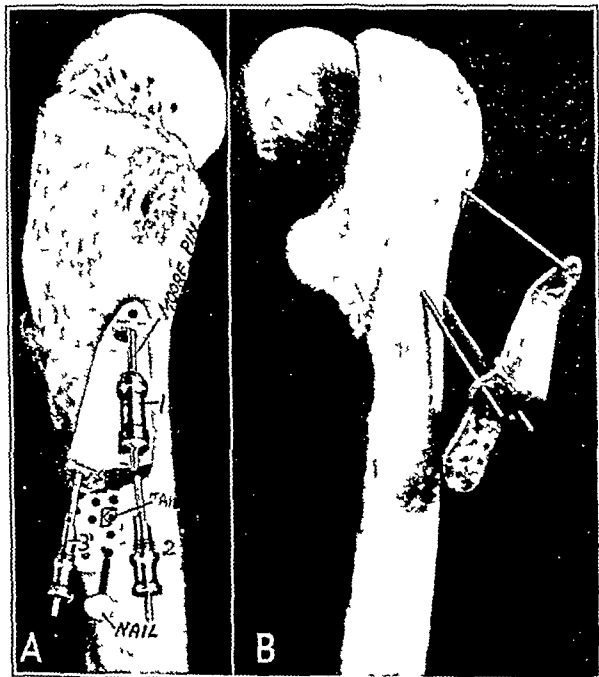


Fig 3—Right femur. A first stage in removal of templet nail in tail pulled out and guide tubes unscrewed. B templet coming off leaving pins in place.

used them. We believe that if the men of the smaller cities would cooperate and refer their work to a few who, through study, an effort to acquire experience and natural aptitude, are fitted for special work, it would be possible to reduce the death rate decidedly and to save a great deal of unnecessary suffering and expense.

We report on five patients treated by internal fixation, all of whom survived operation. Only one of the five could have been considered a good risk for a major surgical procedure. The others were all of advanced age, with general conditions which contraindicated such a procedure.

#### REPORT OF CASES

**CASE 1**—A woman aged 69, admitted Jan 26, 1938, the day of fracture, was discharged April 9, after ten weeks and three days of hospitalization. A roentgenogram taken January 27 showed an intertrochanteric fracture, with a split off of the lesser trochanter. Nailing was performed February 10. There were marked senility and decrepitude, with kyphosis of the spine. The patient sat up in a chair two days after operation and walked on crutches seventeen days after operation. She had had a temperature of from 101 to 103.2 F continuously before the nailing. She could walk without crutch or cane four months after operation.

**CASE 2**—A woman aged 75, admitted March 11, 1938, two weeks after fracture, was discharged April 14, after four weeks and two days of hospitalization. A roentgenogram taken March 11 showed a medial fracture of the neck of the femur on the right side. March 14 nailing was performed. March 17, the third day after operation, the patient sat in a chair, and March 20, the sixth day, she walked on crutches. She had high blood pressure, dyspnea, arteriosclerosis and obesity. She was very happy at the relief of pain. She was still on crutches three months after operation.

**CASE 3**—A man aged 72, admitted Feb 28, 1938, the day of fracture, had nailing performed March 4. He sat up in a chair March 7, the third day, and walked on crutches March 14, the tenth day. There were myocardial degeneration, diabetes and arteriosclerosis. The patient was still in the hospital, with boils and urticaria, and still on crutches three months after operation.

**CASE 4**—A woman aged 57, admitted Sept 18, 1937, the day of fracture, and discharged November 18, was operated on September 23. The fracture was a simple, complete, transverse fracture of the neck of the right femur near the head. The first roentgenogram was taken September 18. A roentgenogram first suggested bony union November 7. The patient sat up in bed September 26, the seventh day after operation, and in a wheel chair October 5. She went back to bed on the advice of the roentgenologist, and she sat up again November 11. She walked on crutches November 15. There was no complicating physical or mental ailment. She walked without a cane or crutches in six months.

**CASE 5**—A woman aged 65, injured Oct 11, 1937, was admitted October 12. The first roentgenogram was taken the day of admission, and the first operation, nailing, was performed October 13. The nails were shortened October 15. An operation performed October 25 was necessitated by failure of the roentgenologist to take a lateral view. There was no serious physical handicap except marked obesity. The cooperation was poor. March 30 it was seen that absorption of bone around the nails with shortening and atrophy due to disuse had permitted the nails to penetrate into the acetabulum. The roentgenologist was doubtful as to whether union had occurred, but weight bearing was advised. The patient sat up in a wheel chair October 20 and walked on crutches November 23. She died nine months after operation of agranulocytosis or agranulocytic angina in association with infection of the mouth.

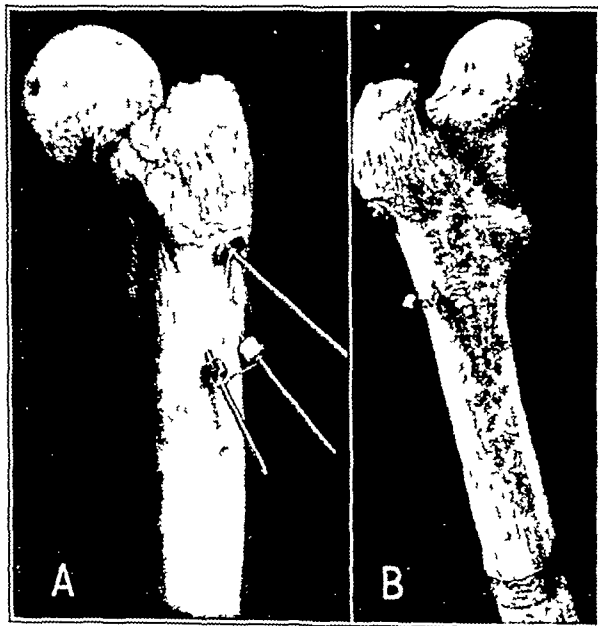


Fig 4—Left femur. A nuts screwed and wire applied to steady pins and prevent nuts from running off backward. B excess of pins cut off.

It seems evident that four of the five patients were of the class who generally, because of their serious condition, are treated by ignoring the fracture or at most are treated by sand bags and rest in bed.

#### A GUIDE (TEMPLET) FOR DIRECTING NAILS

The desirability of some appliance for directing nails, screws or other supporting devices so that they may be properly placed has been recognized by many surgeons. At least seven devices have been described, most of

which are too complicated and would be too expensive for the average surgeon of small city hospitals

Recognizing the importance of a simple appliance by means of which nails could be placed accurately, one of us (M B T Jr) devised a nail director, or templet. The one depicted is so constructed that it will guide three nails, as suggested by Austin Moore, by means of

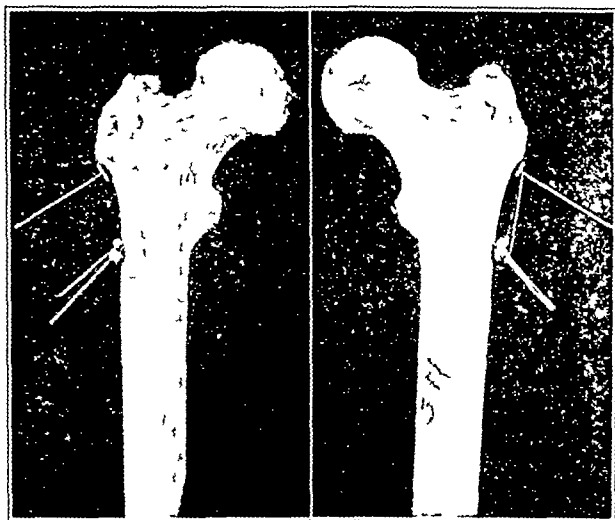


Fig 5.—Right and left femur same patient demonstrating the marked structural difference between the two and showing that the appliance is adaptable to either side and that due allowance has been made in figuring the angles of the guide tubes or templet to provide for the variation. Roentgenograms of these bones (figs 6 and 7) prove that the pins are in a satisfactory position

three tubes which can be removed after the nails are in position. A study of the femur by Gaenslen (*Journal of Bone and Joint Surgery*) shows that the cross section of the neck, the target to be aimed at, is roughly 1.8 by 2.5 cm in diameter. It has been found by experiment with a large number of femurs that individual differences are not great, the templet has been successful in all cases in which it has been tried experimentally. Furthermore, it can be adjusted for use on the right or left side. A modification for use with a single Smith-Petersen nail or two small-flanged nails, as satisfactorily employed by Louis A. Goldstein of Strong Memorial Hospital, University of Rochester, we believe could be readily made. Patent has been applied for by the maker of the templet, Lawrence Scott of Ithaca, N. Y.

It is understood that the fracture must first be properly reduced. In using the templet, right or left femur, the upper curved end hooks over the vastus line. Guide tube 1 should be placed exactly over the middle of the femur. The upper opening of tube 1 is about one-fourth inch below the vastus line.<sup>3</sup>

For the right femur one places the drill through the guide tube and drills through the compact bone with the drill parallel to the surface of the operating table (figs 2 and 3). The templet must be so adjusted that the line between the drill hole already made and tube 2 will be parallel to the table and in the center line of the femur. A drill hole is then made through one of the smaller holes in the "tail" of the templet, and a small ordinary nail or some similar object is placed in this hole to hold the templet in position and prevent side

slip. A drill hole is made through the compact tissue of the femur through tube 2, and nails ("nail" is used by Moore instead of "pin" as shown in the illustration) are entered in tubes 1 and 2 to hold them in place. A third hole is then drilled, through tube 3, and the nail is placed.

If the left femur is to be operated on, tubes 1 and 3 are placed parallel to the edge of the table and on the center line of the femur, the nail for tube 2 being placed last (fig 4). When the nails have been inserted the templet can be removed by unscrewing the guide tubes and removing the nail in the tail section. Nails should be inserted at a distance approximately three-fourths inch less than the length of the neck as shown by a roentgenogram taken in the anteroposterior position after reduction. This is because the x-ray image is a projected one, larger than the bone itself, as stated by Moore. Resistance of the bony cortex indicates that the head has been reached.

Roentgenograms should now be taken in the anteroposterior and lateral positions to determine the angle and depth of the nails. If these are correct, nuts should be screwed on and the nails cut off to approximately one-eighth inch. The fracture can be impacted by one or two fairly sharp blows on the nails. A wire about the nails (fig 4) holds them and keeps them from spreading or withdrawing.

#### EXPERIMENTAL STUDY OF METHODS OF INTERNAL FIXATION

Determination of the relative value of the flanged nail (the Smith-Petersen nail, its modifications and other similar nails), of multiple nailing and of the use of screws was attempted by testing experimentally fractured fresh bones fixed by these methods. Resistance to force in the weight-bearing position and torsion were estimated in testing machines of the Department of

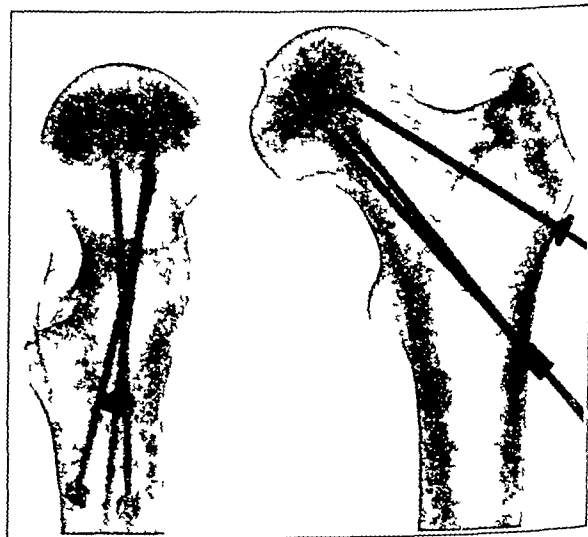


Fig 6.—Right femur pins in a satisfactory position

Experimental Engineering of Cornell University. A large amount of anatomic material furnished through Drs. A. T. Kerr and J. W. Papez of the Department of Anatomy, Cornell University, made this work possible. Tests of the strength of various methods of internal fixation were under the direction of Prof. Will Sawdon of the Department of Experimental Engineering. The

<sup>3</sup> Operative experience, after this paper was written, shows that nail number one would best be first placed and control of position made by x-ray examination. Then the templet is slipped over the nail and it will satisfactorily guide the other two nails.

placing of nails, screws, bolts and other appliances for internal fixation must be accurate, and results must be checked by roentgenograms in two planes. The neck of the femur was sawed through in an effort to determine how much the nails alone would hold, it is evident that when the bone is broken there are jagged points which when impacted act somewhat like the matching or dovetailing of wood. The Moore nails alone, with a sawed-smooth surface will carry a load of 100 pounds or more in some instances. Bones broken, nailed and

ratus and bed, which so frequently has led to fatal hypostatic pneumonia, (3) raising of the patient's morale, the relief from pain and the ability to move about freely greatly influencing the will to live as well as to recover function. These conditions have been met successfully by internal fixation in many cases by a number of surgeons.

#### ABSTRACT OF DISCUSSION

DR KELLOGG SPEED, Chicago. The scope of this paper, including as it does morbidity, mortality, choice of treatment and personal experience with internal fixation of fracture of the neck of the femur, makes it difficult to discuss. There seems no doubt that internal fixation has come to stay, that it will be practiced everywhere and that it is a godsend to many, in offering early freedom from pain and mental refuge in the faith in mechanical contrivance or fixation hopefully accepted by the patient, and often by the doctor, as a way out of an immediate difficulty. Ways and means of fixation are probably of secondary importance compared to these two factors, namely immediate relief of pain and restoration of confidence and mobility of varying degree for the patient. The choice of fixation lies with each physician who uses that type which may be employed best with the least disturbance of or trouble to the patient. Each agent flanged nail, metal pin, bone transplant, screw or other device, may be open to certain objections but at given distances throughout the country one should be able to find surgeons satisfactorily trained to use with reasonable safety one device or the other to alleviate human suffering in the presence of this frequently fatal fracture. Devices for directing the nail or pin are not fool proof, they have been in existence more than fifty years and are not yet universally adopted. The one essential, regardless of the agent of fixation or its method of introduction, is reduction of the fracture, controlled by the x-rays. The insertion of the internal agent must be done in conformity with strict aseptic principles and the final result as to bony union, viable head and freedom from secondary changes such as aseptic necrosis, flattening, loss of cartilage and ultimate painful coxitis, must lie in observation of the patient over a long period and a prolonged study of the condition and of retrieved specimens obtained after treatment. Internal fixation followed by early weight bearing seems to act at cross purposes. Some of the advocates of the method are now recanting their remarks on early weight bearing and restraining the patients for from sixteen to twenty-four weeks before allowing freedom in walking. A patient walking on crutches may be a long way from complete cure when bony union or the health of his bone is concerned, but at least he is alive and active. Study of clinical results, coupled with progressing pathologic study, will eventually give practitioners better control of this fracture.

DR E W CLEARY, San Francisco. The authors are to be complimented on the courage and determination with which they have pursued this investigation and on the ingenious device used for directing the Moore nails. Dr Austin Moore himself feels that no such device is necessary for directing the nails—that he can guide their introduction as he puts them in by feeling with the hand chuck that he uses. I have verified this observation. I agree with the authors that internal fixation is the great problem in dealing with this fracture today. The procedure falls into four different steps. I agree with Dr Speed that the first step is reduction. After reduction there must be some means of accurately localizing the position of the fractured bone as well as determining the extent of the reduction, and then there must be some means by which the surgeon can bring the information afforded by the localizing x-rays into his operating field in order that he may so place his fixation device as to be sure of its effectiveness. Some years ago I started to work on a device which would first of all hold the reduced fracture in a preferred position for x-ray localization and for the surgeon's subsequent fixation. The advantages of the flexed thigh position had already been emphasized. I found no adequate device for holding the leg in this position, and with a great deal of trial and hard work I have developed an accessory table which is an effective aid in the three last of

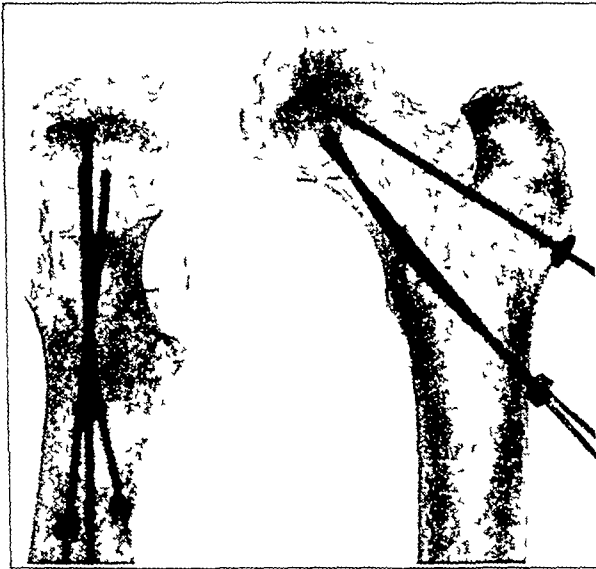


Fig 7—Left femur pins in a satisfactory position

impacted have carried much greater loads, up to 300 pounds. Smith-Petersen nailing carried about the same load as the least efficient Moore nailing.

The conclusions to be drawn from the experimental work, as summarized by Professor Sawdon, were as follows: 1. Repair of actual fracture with proper reduction gives much greater support than does repair with sawed or smooth surfaces. 2. Support rendered by cancellous bone is much greater than would be expected. 3. There is a distinct spring, or elastic property, to the Moore nails which tends to restore the fracture to the original position after compression. 4. There is a considerable load capacity to the Moore nails after apparent yielding of the fracture. 5. There is little elastic property in the Smith-Petersen nail, and consequently there is crushing or destruction of the cancellous bone and distinctly less recovery. 6. The exact position of the Moore nail is not of fundamental importance in determining its holding capacity. 7. The Moore nail has better contact-holding properties than the Smith-Petersen nail or, in other words, is better able to hold fractured fragments together, since the Smith-Petersen nail is easily withdrawn after the test. Pliers were required to extract the Moore nails in every case, even after vigorous testing, while the Smith-Petersen nail could be withdrawn easily with the thumb and forefinger.

In essence these conclusions signify that the Smith-Petersen nail does not hold the fractured surfaces in apposition as well as the Moore nail and hence does not provide the opportunity for union.

Important considerations related to recovery are (1) immediate relief from pain and surgical shock, (2) immediate freedom from confinement in fixation appa-

the four steps in dealing with this fracture. It fixes the patient and holds the reduced fracture firmly in position for the operation. It provides for standardized x-ray localization in two planes, and it provides by means of exact mechanical instruments, which may be sterilized, for the transfer of the exact x-ray localization into the aseptic field of operation, where it is utilized by the surgeon in directing the nail or fixation device of whatever character he may choose.

DR. WALTER G. STERN, Cleveland. Fifteen years ago Dr. Phil Kreuscher and I advocated the then rather new method advanced by Dr. Royal Whitman of New York, which consists in complete reduction of the deformity caused by the fracture by means of extension, internal rotation and abduction of the femur and fixation of the limb in this position until either union has taken place or nonunion has been found inevitable. These principles are as sound today as they were then, so that today only the method of fixation is being debated. To some of the members this "immolation in plaster" is a terrible thing. They never apply the casts themselves and do not have the mechanical apparatus to care for cases in which casts are required, or the family does not care to put a hook in the ceiling to lift the bed so that the patient can be standing up part of the time. Therefore they have gone back to something easier and more comfortable, internal fixation by means of metal devices. J. B. Murphy forty-five years ago advocated the use of the then new round wire nail, and I have roentgenograms of the second patient in whom he used a nail forty-four years ago. Nonunion was the result, and the man walked on that nonunited limb for twenty years and worked as a roller in a rolling mill until the nail got so badly bent that I had to take it out. Jones of Grass Valley, Calif., and Roger Anderson of Seattle have also worked on this problem of fixation by means of the "well leg traction" methods, and for a while some surgeons thought that this might be the solution, but the thing gets away from one, the reduced bones are not kept in position to heal and the method had to be abandoned. M. N. Smith-Petersen revived the old and discarded method of nailing the fragments together, with an ingenious three-flanged nail, the chief advantage of which lies in the fact that when it is well placed in a solid head it really prevents the rotation of the fragments on each other. I am going to issue a word of warning. Even under local anesthesia with old persons the introduction of pins or nails is a major operation. One of the major medical societies will soon come out with the results of a questionnaire on this subject in which it will be seen that the death rate from internal fixation in these cases is 9 per cent plus. A method which is rapidly becoming popular in Europe is the high Schanz osteotomy, sometimes called the Lorenz bifurcation or Watson-Jones subtrochanteric osteotomy.

DR. MARTIN B. TINKER, Ithaca, N. Y. I am much gratified by the active discussion which our paper has provoked. The careful preparation of all the discussions has added much to the value of the presentation. No surgical method is perfect, all have their weak points. With regard to the remarks of Dr. Stern, it seems to me that one is reverting when one contemplates subtrochanteric osteotomy. He mentioned the danger of shock even with local anesthesia, on account of the time required. What does one get into with subtrochanteric osteotomy? That is a major procedure to begin with, whereas in the hands of surgeons who properly qualify themselves this other operation need not last a long time and need not be associated with much shock. Moore operated in thirty-five minutes and has had no operative deaths in sixty-nine cases in which he has used his pins. Sven Johannsen of Sweden, who has reported more than a hundred cases in which he himself has used the Smith-Petersen nail, had a mortality of 9 per cent. It seems therefore that when all is said and done it is a question of the surgeon's preparation properly to perform this technic, whether it is with the Smith-Petersen nail or three nails or two screws or whatever agent of internal fixation appeals to one. It is necessary to work hard to do a lot of study and exercise great care if one is going to do work of this kind and have success. The work that my associates and I have presented is perhaps not the final solution, but certainly internal fixation is the best method available at the present time.

## INTRAVENOUS ALIMENTATION

WITH SPECIAL REFERENCE TO PROTEIN  
(AMINO ACID) METABOLISM

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AND

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ST. LOUIS

Intravenous (as a method of parenteral) alimentation becomes important whenever the nutritional needs of the body cannot be met by oral feeding; it becomes essential when death threatens because of nutritional deficiencies which can be remedied in no other way. These nutritional needs comprise six elements: water, salts, carbohydrate, protein, fat and vitamins. As far as water, salts and carbohydrate are concerned, intravenous alimentation is now a commonplace and extensively used procedure. For example, at the Barnes Hospital 125 liters and at the St. Louis City Hospital 200 liters of saline and dextrose solutions for subcutaneous and intravenous administration are used daily. Why have the remaining three nutritional elements been overlooked? If carbohydrate is important, why not protein, fat and vitamins? The answer lies partly in lack of information on the real needs for protein, fat and vitamins in patients more or less completely, though temporarily, unable to ingest any food by mouth. Another probable reason is the chemical complexity of these nutritional elements, which makes it difficult to prepare them for parenteral use. Fat, it is true, has been prepared in a fine emulsion for intravenous injection.<sup>1</sup> It is questionable, though, whether fat is really essential for maintenance, at least for short periods. Even for growth, fat has been shown to be dispensable, at least if one unsaturated fatty acid, linoleic acid, is provided.<sup>2</sup> It would seem that the other lipids can be manufactured from carbohydrate and protein. Vitamins, to be sure, are rapidly being isolated in pure form and several (B<sub>1</sub>, B<sub>2</sub>, C and nicotinic acid) can now be given intravenously. How important are they, however, for relatively short periods of nutritional deficiency? Since many of the vitamins are stored in the liver and elsewhere, these accessory food factors may perhaps be disregarded, unless of course prolonged parenteral alimentation becomes necessary. It must be admitted nevertheless, that with certain sick patients the need for one or more vitamins may be an important part of their nutritional needs. We shall be more concerned in this paper with the need for protein; it should be emphasized, however, that it is difficult if not impossible to consider one element independently, since each is closely related to the others in its metabolic behavior.

### INDICATIONS FOR INTRAVENOUS ALIMENTATION

In the case of water and salts the indications for parenteral administration are well known; they are most urgent when much water and salts are lost, for example in anhydremia (dehydration) from whatever

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<sup>1</sup> Holt, L. E., Jr., Tidwell, H. C. and Scott, T. F. M. *J. Pediatr.* 6: 151 (Feb.) 1935.

<sup>2</sup> Burr, G. O. and Burr, M. M. *J. Biol. Chem.* 82: 345 (May) 1929.

cause. Serious symptoms may rapidly develop and death may ensue unless water and salts are given. Since some disease usually prevents oral assimilation, the essential water and salts must be given intravenously. If this is promptly done a rapid improvement in the clinical condition occurs, accompanied by a return of the chemical composition of the blood to normal.

The common indications for parenteral carbohydrate alimentation are likewise generally accepted. But what of the need for protein? As will be mentioned in more detail subsequently, this need should be discussed in terms of amino acid or nitrogen metabolism. Thus nitrogen in the form of amino acids is constantly needed to form new proteins, to take care of the wear and tear of tissue and for other purposes, even when abundant calories are supplied. Since there are great stores of protein in the muscle (and elsewhere) it has been generally assumed that, as long as calories are supplied, one need not be concerned about the need for nitrogen. The supposition has been that muscle, being a relatively nonvital tissue, can easily be spared to supply by hydrolysis the amino acids necessary for nitrogen metabolism even for long periods.

One of the first evidences that muscle or other nonvital protein stores become inadequate during protein starvation was the observation of hypoproteinemia, which often results in nutritional edema. Since serum protein becomes depleted it is inevitable that other sources of protein are similarly affected and that muscle therefore is not the only tissue which is being autolyzed. It then becomes important to know what clinical manifestations are produced when, for example, the liver protein reaches a low level. What occurs when the various endocrine glands and the cardiac muscle find their protein drawn on? These questions cannot be answered until more careful study is made of patients suffering from protein starvation. It seems obvious, at any rate, that the skeletal muscle and liver (or any other more theoretical store of body protein) cannot always be depended on to satisfy nitrogen metabolism and that therefore the indications for parenteral protein alimentation are to that extent the same as those for carbohydrate. Briefly, they comprise conditions under which oral alimentation becomes defective or is contraindicated.

Oral alimentation fails in many circumstances besides the well known ones, e. g. when intestinal obstruction or repeated vomiting makes feeding impossible. Thus in cases of general peritonitis food can be given by mouth but only with deleterious results, even when vomiting does not occur. In cases of intestinal fistula or severe ulcerative colitis with diarrhea, food given by mouth may be either insufficiently digested or excreted before sufficient absorption can occur. Moreover, the hypermotility produced by the ingestion of food is said to be followed by an excessive loss of nitrogen in the urine and feces in many such cases. Intravenous alimentation not only supplies missing nutritional elements but permits the intestinal tract to be put completely at rest, a beneficial prerequisite to healing in many cases, especially when surgical procedures are necessary.

Perhaps the most clearcut indication for parenteral protein alimentation is the nutritional edema already mentioned, occurring because of hypoproteinemia. Especially important is the fact that the edema may involve the intestinal mucosa, interfere with absorption of food and lead to a vicious circle. In the past such

intestinal edema was probably present at the stoma in many cases of pyloric obstruction in which obstructive signs persisted even after an adequate passage was produced by gastro-enterostomy. This proved puzzling to the surgeon and often led to further and useless operations. Recent studies, especially the experiments of Mecray, Barden and Ravdin,<sup>3</sup> have shown in fact that with the relief of hypoproteinemia both the edema and the obstructive manifestations disappear. Some type of parenteral protein alimentation is obviously essential in such cases, at least for a short time, in order to break the vicious circle, transfusions have been especially recommended in order to bring the serum protein content to normal.

Plasma as a source of intravenous protein alimentation can maintain nitrogen balance, this has been demonstrated experimentally.<sup>4</sup> As a source of nitrogenous nourishment it has certain practical drawbacks. Thus it would be necessary to give two 500 cc transfusions a day in order to introduce 35 Gm of serum protein, an amount which is certainly at the lower level of the protein needs of a 70 Kg adult. Since the red cells are not needed, plasma should be separated from whole blood and given alone. A more serious defect in the use of plasma as a source of nitrogen nutrition is the fact that it supplies only one of the protein needs, i. e., the need for serum protein. In order to supply other tissues the protein must be first hydrolyzed by the body to amino acids, which then circulate in the blood and supply the various tissues, as illustrated in the accompanying chart. In a very sick patient this process may occur too slowly or perhaps not at all. This may be the reason that a transfusion for severe nutritional edema is sometimes ineffective (cases 2 and 8).

The indications for intravenous alimentation, finally, may become extended as more is learned about the various defects which occur in intestinal absorption. One example, due to hypoproteinemia, has already been mentioned. Recent observations by Groen<sup>5</sup> have shown a diminished intestinal absorption of dextrose in various deficiency diseases. Protein has many more hurdles to hop before it becomes available to the tissues. If digestion is defective or if absorption is impaired, an adequate supply of amino acids may not reach the tissues. The element of time may also be important, evidence will be presented subsequently<sup>6a</sup> suggesting that unless all the essential amino acids are present in the tissues at the same time synthesis may be impaired.

#### AMINO ACIDS FOR INTRAVENOUS PROTEIN ALIMENTATION

Protein as a source of parenteral alimentation can be given only in the form of amino acids, aside of course from the use of matched blood in a transfusion (or plasma alone), which has already been discussed. Amino acids represent the form in which protein food enters the blood stream from the intestinal tract after appropriate digestion and absorption, thus it has become customary to speak of the use of protein in terms of amino acid metabolism. Indeed, one may even speak of protein and amino acids in terms of nitrogen metab-

<sup>3</sup> Mecray P. M. Jr, Barden R. P. and Ravdin I. S. *Surgery* 53 (Jan.) 1937.  
<sup>4</sup> Holman R. L., Mahoney E. B. and Whipple G. H. *J. Exper. Med.* 59: 269 (March) 1934.  
<sup>5</sup> Groen Julia. *New England J. Med.* 218: 247 (Feb. 10) 1938.  
<sup>6a</sup> Elman Robert. *Proc. Soc. Exper. Biol. & Med.* to be published.



olism, as nitrogen metabolism can be maintained by the administration of an adequate supply of protein or amino acids of the right sort. Since amino acids in general are soluble and nontoxic (in ordinary amounts) they should be just as suitable for intravenous injection as dextrose.

Of the twenty-one or more amino acids which make up the usual protein foods, only nine (possibly ten) are essential<sup>6</sup>. Thus by supplying an adequate amount of these nine amino acids the nitrogenous needs of the body should be met. This has been done<sup>7</sup> for growing rats, undoubtedly it would also suffice for the less rigorous needs of maintenance. From the practical point of view, however, such an approach is unfeasible because of the high cost of pure amino acids. A much more economical method is to hydrolyze

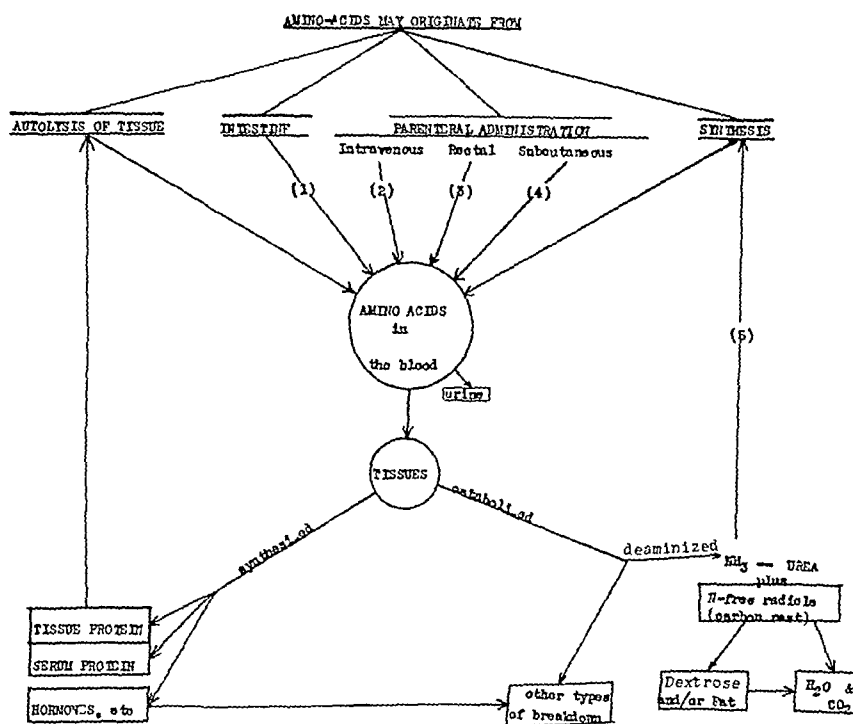
protein after hydrolysis would have the same composition. Quantitative analysis of the amino acids in such a mixture would be valuable in revealing its deficiencies, but it is hampered at present by the lack of satisfactory methods for the estimation of all the amino acids. For these reasons a simpler approach is to test the biologic maintenance value of a particular mixture of amino acids by direct experiment. One method is based on studies of nitrogen balance, another is based on the regeneration of serum protein, the only bodily protein which can be more or less readily and directly measured. Both methods were used in the present observations.

Previous observations on parenteral alimentation with amino acids are few, aside from the many experiments in which single injections were made for chemical studies, such as those of Van Slyke and Meyer,<sup>8</sup> who injected protein hydrolysates into anesthetized dogs and studied the distribution of the amino acids several hours later. Henrique and Andersen<sup>9</sup> carried out intravenous alimentation for one month on a single goat, they used digested meats as their source of nitrogen. The animal remained in nitrogen balance and gained weight. Rectal alimentation with hydrolyzed protein was described by Abderhalden, Frank and Schittenhelm<sup>10</sup> and later by Griesbach<sup>11</sup>. Their patients showed definite evidence of utilization. The cases herein reported are believed to be the first in which hydrolyzed protein has been injected intravenously into human beings.

#### EXPERIMENTAL OBSERVATIONS

The amino acids used in all the studies herein described were obtained from the acid hydrolysis of casein<sup>12</sup>. All the essential amino acids of casein were presumably present except tryptophan, which is destroyed during the hydrolysis. To make the mixture complete 2 per cent of this essential amino acid was added. Under these conditions the product supported normal growth in rats<sup>13</sup>. In many of our experiments 2 per cent of cystine (or methionine) was also added because of the low concentration of cystine in casein. The basic product (hereinafter called the incom-

plete mixture) without the added amino acids served excellently as a control in many experiments. Adult dogs were used exclusively. Chemical determinations were carefully checked by frequent duplicate analyses. In most experiments a macro-Kjeldahl method was used in determining nitrogen, in some, however, nesslerization was employed.



Probable paths involved in protein and amino acid metabolism. It should be noted that tissue protein and serum protein are not interchangeable directly; they must first be autolyzed and their amino acid constituents made available by the blood stream for synthesis by other tissues or cells. The numbers refer to the following considerations: 1. The amino acids from digested protein in the intestine are absorbed and enter the portal system slowly and at various rates and they reach the liver before the muscle. 2. In contrast by the intravenous route all amino acids reach the tissues at the same time; the liver receives them simultaneously with the muscle. 3. Rectal alimentation is subject to the vagaries of colonic absorption which apparently varies considerably. 4. Subcutaneous alimentation requires large volumes of solution since isotonicity must be maintained when edema is present absorption may be delayed. 5. This mode of amino acid synthesis is based partly on theoretical considerations; it probably occurs at least as far as the simpler amino acids are concerned by a combination of ammonia and lactic acid or pyruvic acid (Sherman H. C. *Chemistry of Food and Nutrition*, ed. 5, New York: Macmillan Company, 1937, pp. 223-224).

a relative pure protein until it is broken down into its constituent amino acids. If the protein selected contains all the essential amino acids in adequate proportions, the resulting product should be suitable, provided of course that none of the essential constituents are destroyed during the process. Obviously also such a hydrolysate must prove entirely nontoxic when given intravenously in ordinary amounts. Although Rose has determined the ideal formula of essential amino acids for growth,<sup>7</sup> it is unlikely that any easily available

6. Most of our recent knowledge of the nutritive significance of amino acids has been contributed by the extensive researches of W. C. Rose and his collaborators. Much of this data as well as an able review of the literature can be found in two recent papers by this author (*Science* 86: 298 [Oct. 1] 1937; *Physiol. Rev.* 18: 109 [Jan.] 1938).

7. Rose W. C. *Science* 86: 298 (Oct. 1) 1937.

8. Van Slyke D. D. and Meyer G. M. *J. Biol. Chem.* 16: 197 (1913).

9. Henrique V. and Andersen A. C. *Ztschr. f. physiol. Chem.* 88: 357 (1913).

10. Abderhalden E., Frank F. and Schittenhelm A. *Ztschr. f. physiol. Chem.* 63: 215 (1909).

11. Griesbach W. *Klin. Wchnschr.* 2: 1926 (1922).

12. This product was supplied by Mead Johnson & Co. of Evansville, Ind. The added tryptophan, cystine and methionine were obtained from the Eastman Kodak Company.

13. Kemmerer H. S. Personal communication to the authors.

Preliminary studies showed that the product was not anaphylactogenic for guinea pigs. By either the Folin colorimetric or the Van Slyke titrimetric method, 95 per cent of its nitrogen was in the form of amino acids. The product was easily soluble as a 10 per cent solution which was acid in reaction ( $pH$  5 to 6) and amber in color. An equal concentration of dextrose was always added not only because of its caloric value but also because there is considerable evidence that the utilization of amino acids is enhanced by the presence of carbohydrate. The rate of intravenous injection was important, a 10 Kg dog was likely to retch or vomit (sometimes with diarrhea) if more than 100 Mg of amino acids a minute or 6 Gm an hour was given, and considerable amounts of amino acids might be lost in the urine. However, this rate is very high, in most experiments only about 1 Gm of amino acids was injected an hour. Regardless of the rate of injection, it was found that the amino acids left the blood stream with great speed after even large intravenous doses.<sup>14</sup> In order to determine whether they were utilized, two types of experiment were carried out.

**Studies of Nitrogen Balance**—When amino acids enter the blood stream they are subject to three possible effects, as shown in the accompanying chart. They may be excreted in the urine as such, they may be deaminized (or broken down in other ways) and measured in the urine as nitrogen (largely urea and ammonia), they may be retained and synthesized. The first possibility was avoided by a slow rate of injection. Whether retention occurred was then evident by study of the nitrogen excretion. Such balance experiments showed that almost complete retention of the amino acid nitrogen occurred whenever the complete mixture of amino acids was injected, under these conditions immediate nitrogen balance was achieved. Such retention of nitrogen is supposed to mean actual synthesis. Ordinarily this assumption may not be justified because of the possibility that the retained amino acids may be simply stored as such and not synthesized into protein. For this reason a control experiment was carried out with the incomplete mixture of amino acids (tryptophan and cystine were not added). If the hydrolyzed casein was retained as such, the retention should have occurred whether or not a few milligrams of tryptophane and cystine was added. Yet in each experiment with the incomplete mixture, very slight retention occurred. Moreover, under such circumstances nitrogen balance was not achieved. The details of these experiments have been described elsewhere.<sup>15</sup>

In further experiments with the incomplete mixture of amino acids it was found that nitrogen balance was not achieved if the missing essential amino acids (tryptophan and cystine) were injected separately eight hours after the injection of the basic mixture.<sup>16</sup> It seemed therefore that retention and utilization of a mixture of amino acids required not only all the essential amino acids but that they be present at the same time. Thus when an incomplete mixture is injected, apparently deamination occurs rapidly and, if the missing essential amino acids appear on the scene too late, retention (and synthesis) do not occur. This phenomenon if confirmed would explain the relative superiority of intravenous over oral alimentation of protein when

intestinal function is defective, since in this case delays in absorption of essential amino acids may lead to excessive loss of nitrogen by deamination. Peters and Van Slyke<sup>17</sup> have discussed observations showing that deamination occurs soon after ingestion of protein, destruction of amino acids apparently does not wait until all the protein has been digested and absorbed. The present observations confirm this theory. Further observations are being made of this interesting phenomenon.

**Regeneration of Serum Protein**—There are many experiments recorded in the literature on the regeneration of serum protein reduced either by repeated plasmapheresis or by a long-continued nonprotein diet. In the present experiments a simpler and shorter procedure was used. In fasting dogs a reduction in serum protein was produced by a severe hemorrhage. In the controls no regeneration occurred in six hours and but little in twenty-four hours. If amino acids were injected intravenously, however, definite evidence of an increase in serum protein was obtained within six hours. These experiments have been described elsewhere.<sup>17</sup>

In another series of observations hypoproteinemia was produced by a nonprotein diet similar to that described by Weech, Goettsch, and Reeves.<sup>18</sup> In many of the dogs obvious nutritional edema appeared, they all showed a fall in the level of serum protein, usually within a few weeks. After the intravenous injection of a complete mixture of amino acids there was striking diminution of the edema, often within a few hours and always in twenty-four hours. The serum protein changes were far less striking. Nevertheless, in several experiments definite alleviation of the hypoproteinemia was achieved as compared with controls in which an incomplete mixture was used.

**Histologic Studies**—All dogs receiving amino acids intravenously were eventually examined post mortem. The liver and kidneys in no case showed any evidence of change referable to the injected amino acids, even when large or long-repeated doses had been given.

#### CLINICAL OBSERVATIONS

Our first concern in giving hydrolyzed casein to patients was, of course, the possibility of untoward reactions, even though none had occurred in dogs. At first small doses were injected, they produced no demonstrable effect, so that eventually we administered what was thought to be a full daily quota of amino acids, i. e., from 0.5 to 2 Gm per kilogram of body weight.

The hydrolyzed casein was generally made up as a 10 per cent solution and tryptophan and methionine (or cystine) added. It was then passed through a sterile Seitz filter and poured directly into 5 or 10 per cent dextrose solution as ordinarily prepared for routine use. In this way sterility was achieved without the danger of breaking up any of the amino acids through autoclaving. Usually each liter contained about 20 Gm of amino acids to 80 Gm of dextrose. If given slowly over the course of at least two hours the 20 Gm of amino acids did not spill over into the urine and produced no objective reaction, there was no elevation

<sup>14</sup> Elman Robert Proc. Soc. Exper. Biol. & Med. 37: 437 (Dec. 1937)

<sup>15</sup> Elman Robert Proc. Soc. Exper. Biol. & Med. 37: 610 (Jan. 1938)

<sup>16</sup> Peters J. P. and Van Slyke D. D. Quantitative Clinical Chemistry, Baltimore, Williams and Wilkins Company, 1931, vol. 1, p. 394.

<sup>17</sup> Elman Robert Proc. Soc. Exper. Biol. & Med. 36: 867 (June 1937)

<sup>18</sup> Weech A. A., Goettsch E. and Reeves E. B. J. Exper. Med. 61: 299 (March) 1935.

of temperature or pulse rate. Subjectively some patients noticed a sense of warmth, which was evident in a slight peripheral vasodilatation. One patient stated that he felt slightly chilly, but no chill occurred and the temperature remained normal, one child had a transient rash after one injection and vomited once.

About a score of patients were given amino acids intravenously, but to only eight were large amounts given for more than one or two days, their clinical summaries are given later. Complete chemical measurements were not carried out in many cases, so that the observations herein recorded are presented as preliminary studies. The results have been sufficiently promising to justify the hope that further use will produce added evidence that this method of alimentation not only is harmless but results in active and rapid synthesis of tissue and other protein. Both Kjeldahl and nesslerization methods were used in the determination of nitrogen. The albumin and globulin portions of serum were separated by Howe's method.

#### REPORT OF CASES

CASE 1—W C, a man aged 55, a patient at the St. Louis City Hospital, had an extensive inoperable carcinoma of the stomach, with complete obstruction at the cardia, so that he could ingest no nourishment and was rapidly deteriorating in spite of intravenous and subcutaneous administration of dextrose and saline solutions. For one month he received continuous venoclysis, consisting each day of 4,000 cc of 10 per cent dextrose containing 20 Gm of hydrolyzed casein with added tryptophan and cystine and 750 cc of physiologic solution of sodium chloride. No reaction occurred and no subjective manifestations were apparent, the general condition, which was rapidly going downhill, was improved so that the patient seemed stronger and was able to read and smoke. The nitrogen output in the urine varied between 3 and 4 Gm a day. Nitrogen balance was achieved whenever the dose of amino acids was increased to a point above this level. However, if tryptophan and cystine were omitted from the mixture the output of urinary nitrogen rose to 5 and 6 Gm a day. The serum protein content at the beginning of the experiment was 4.31 Gm per hundred cubic centimeters and at the end 5.52 Gm, this increase was mostly in the albumin fraction, which rose from 2.35 to 3.16 Gm per hundred cubic centimeters. That this increase was probably not due to concentration (decrease of plasma volume) was suggested by the red cell count, which remained at about 3,000,000 during the entire period.

CASE 2—I H, a man aged 51, a patient at the St. Louis City Hospital, after resection of the intestine for volvulus two months before had had a stormy course. When first seen he was emaciated and exhibited a pronounced nutritional edema in spite of fifteen transfusions. Although enterostomy had produced a functioning opening, frequent stools were passed, food was eaten, but obviously little if any was assimilated. The serum protein content was 3.54 Gm per hundred cubic centimeters, equally divided between albumin and globulin. On two successive days 500 cc of blood was given without affecting the edema. A reaction followed one of the transfusions. Acacia was also given without effect. Nov. 16, 1937, 20 Gm of amino acids was given in 750 cc of 10 per cent dextrose solution without reaction. The following day the edema was definitely better, and 3,000 cc of urine had been excreted, the patient stated that he felt better. There was no immediate change in the serum protein. On other occasions transfusions of whole blood as well as of plasma alone were given to this patient without influencing the edema, each time amino acids were injected a reduction of edema occurred. The serum protein value eventually rose to 5.01 Gm per hundred cubic centimeters but fell again on cessation of intravenous alimentation, which finally became impossible because of thrombosis of the existing veins. The patient, who at all times was on the verge of nutritional collapse, finally died of pneumonia. It was felt

that a shorter and more intensive regimen of dextrose and amino acids alone might have saved his life.

The influence of rapid changes in plasma volume on the concentration of serum protein was observed several times in this patient. On one morning the serum protein content was 4.29 Gm per hundred cubic centimeters, in the evening, after intravenous administration of fluid, it was 3.11 Gm, that this was due largely to dilution of the blood was shown by a fall in the hematocrit reading (cell volume) from 48 to 40 per cent and of the red cell count from 5.5 to 4.5 million. On another occasion the serum protein content fell from 4.06 to 3.51 Gm after administration of fluids. Also the hematocrit reading (cell volume) fell from 50 to 40 per cent and the red cell count from 5.18 to 4.4 million.

CASE 3—R B, a woman aged 67, a patient at the St. Louis City Hospital, had an inoperable carcinoma of the stomach and could take nothing by mouth. Intravenous alimentation with dextrose and saline solutions was carried out until the urinary output of nitrogen reached a level of about 4 Gm a day. On three successive days 4.5 Gm of nitrogen as amino acids was added to the dextrose solution, only slightly increasing the output of nitrogen. It was concluded that almost complete retention of the injected amino acids occurred. No reaction whatever accompanied this experiment.

CASE 4—W W, a man aged 75, a patient at the St. Louis City Hospital, had an obstructing carcinoma of the esophagus but refused gastrostomy and agreed to intravenous alimentation. The nitrogen output of the urine was measured daily. When the complete mixture of amino acids with dextrose was injected, little change in nitrogen output occurred and the patient achieved nitrogen balance at once. When the incomplete mixture was used, a large increase in urinary nitrogen appeared, thus confirming for human beings the observations already mentioned for dogs. No reaction was observed after the injections. This patient showed wide variations in the concentration of serum protein, often but not always explainable by changes in plasma volume as revealed by the hematocrit.

CASE 5—N O, a woman aged 69, a patient at the St. Louis City Hospital, had severe septicemia and was comatose for most of her clinical course until she died. Because nutritional edema with hypoproteinemia developed, amino acids were added for three days to the intravenous drip of dextrose and saline solutions. The urinary output of nitrogen was level at about 4 Gm a day. Although the daily quota of injected nitrogen as amino acids was 5.16 Gm, the urinary nitrogen increased only to 4.5 Gm indicating achievement of a definitely positive nitrogen balance. The serum protein content increased from 4.89 to 6.06 Gm during this period, while the hematocrit reading remained unchanged.

CASE 6—R P, a boy aged 8 months, a patient at the St. Louis Children's Hospital, who was in the hospital for two months before he died, entered with an infection of the upper part of the respiratory tract which required myringotomy and eventually bilateral mastoid antrostomy. There then developed severe persistent dysentery (Hiss-Russell), which failed to respond to any form of therapy. Many transfusions were given. The general condition grew steadily worse, and his weight fell from 6,200 to less than 4,500 Gm. At autopsy the only abnormality found was pronounced shaggy ulcerative colitis involving the entire colon.

At the suggestion of Dr. A. F. Hartmann a continuous intravenous drip was instituted, this was done during the most critical period of the baby's illness. For ten days 50 Gm of dextrose and 10 Gm of amino acids in 500 cc of half strength Ringer's solution was given daily. Under this regimen the clinical condition of the baby improved, and the stools became less frequent and more nearly normal. Eventually all the veins were used and no further venoclysis was possible. There was no evidence of reaction during the period of intravenous alimentation. Chemical studies of the blood showed a surprising fall in the concentration of serum protein from 4.76 to 3.53 Gm per hundred cubic centimeters. However, the hematocrit reading (cell volume) fell even more, i. e., from 44 to 22 per cent indicating a rise in the relative plasma volume and therefore an increase rather than a decrease in the total plasma

protein The baby showed no edema in spite of the hypoproteinemia Death occurred suddenly several days after the intravenous therapy had ended

It is of interest to note that although this baby received over 2 Gm of amino acids per kilogram of body weight a day for ten days, histologic study of the liver, kidney and spleen at autopsy revealed no changes

CASE 7—J C, a boy aged 2 years, a patient at the St. Louis Children's Hospital, had chronic nephrosis with hypoproteinemia and edema At the suggestion of Dr A F Hartmann he was given intravenously each day for three days 15 Gm of amino acids and 35 Gm of dextrose in 350 cc of Ringer's solution, divided in two equal doses, each injection lasting two hours There was no reaction except that on the third day a transient macular rash developed and he vomited once Study of the serum protein showed a slight increase from 3.92 to 4.51 Gm per hundred cubic centimeters, largely due to the albumin fraction, which increased from 1.5 to 1.88 Gm The hematocrit reading (cell volume) during this period changed but little (34 to 36 per cent)

CASE 8—C T, a man aged 67, a patient at the Barnes Hospital was seen in consultation with Dr N A Womack, who suggested the use of amino acids He was already emaciated when enterostomy was performed for intestinal obstruction After operation severe nutritional edema developed The serum protein content was first 4.9 Gm per hundred cubic centimeters, in spite of a transfusion one week later it had fallen to 3.4 Gm There was no corresponding change in the red cell count Acacia was also used, but the edema increased and the general condition grew worse, vomiting and distention developed, requiring continuous gastric suction Hypertonic sucrose solution was also used without apparent effect Twice each day he had been receiving 1,000 cc of 10 per cent dextrose intravenously on four successive days amino acids were added to the dextrose, so that he received 40 Gm of the hydrolyzed casein daily (the patient's weight was estimated at 40 Kg) No reaction occurred the only subjective sensation being a sense of warmth during the injection and once a feeling of momentary chilliness afterward Twenty-four hours after the start of the injections a definite decrease in the edema was obvious, this improvement continued until the edema was entirely gone several days later Vomiting ceased, and the patient started to eat There was definite diuresis much fluid was also lost through the enterostomy opening The general condition improved, and bowel movements soon appeared by rectum The serum protein content rose to 3.9 and then to 4.7 Gm per hundred cubic centimeters several days after cessation of the intravenous therapy The red cell count remained constant at about 3.9 million, suggesting that there was no change in relative plasma volume

All patients coming to autopsy were especially examined for any parenchymatous changes in the liver or kidney which might be indicative of a toxic effect of the injected amino acids No such evidence was found This was especially significant in case 6 in which over 2 Gm per kilogram a day had been given for ten consecutive days

#### COMMENT

Only a few of the many aspects of intravenous alimentation have been considered in the present paper The observations recorded, however, seem to indicate that the nitrogen needs of the body can be supplied by the intravenous administration of an appropriate mixture of amino acids Such a mixture can be prepared by the acid hydrolysis of casein, it was given intravenously to dogs and to human beings with no evidence of toxic reaction either clinically or anatomically Unfortunately such a product lacks tryptophan which must be added before the mixture will support nitrogen metabolism, this is an important defect from the practical point of view because tryptophan is one of the most

expensive of the many amino acids Other preparations of hydrolyzed protein are now being studied It is probable that a complete as well as inexpensive mixture will soon become available for clinical trial

The experimental and clinical results herein presented constitute definite evidence that the injected amino acids are actually utilized by the body to supply its nitrogen needs Much of this evidence consists of observations on nitrogen balance Although these studies involve the assumption that retention of the injected amino acids means synthesis, control experiments tended to justify this assumption The most dramatic effect of the injection of amino acids occurred in the relief of nutritional edema and in the apparent improvement in the general condition of several very sick patients There was, it is true, an occasional failure to correlate these clinical effects with a prompt elevation of the serum protein content It should be stated, however, that in many studies of hypoproteinemia by others considerable lag has been noted between the appearance (and disappearance) of nutritional edema and the changes in the serum protein This lack of exact parallelism between serum protein concentration and nutritional edema may be due to other factors which influence edema, retention of salt immediately comes to mind In the present study salt edema was not present One must also consider the effect of rapid changes in the plasma volume on the serum protein concentration, which is especially shown in case 2 On the other hand, when a rapid fall in serum protein content was produced by a severe hemorrhage, definite evidence of regeneration was observed to follow rapidly the administration of amino acids<sup>17</sup>

With regard to the quantity of dextrose and amino acids needed for intravenous alimentation, a rough estimate should be made For a 70 Kg adult certainly 1,600 calories should be given, and more if fever is present Thus at least 400 Gm of dextrose and amino acids should be injected Of the latter, sufficient should be given to keep the patient in positive nitrogen balance From the various statements in the literature at least 0.5 Gm per kilogram should be adequate In the adult patients observed by us in which the excretion of nitrogen was studied for a long period, 5 Gm a day was the usual maximum output This corresponds to an amino acid intake of over 30 Gm, which is just about the 0.5 Gm per kilogram just mentioned In other patients the nitrogen needs are probably much greater Ringer's solution meets the need for electrolyte, though a note of warning should be uttered with regard to the danger of giving too much salt Ordinarily from 7 to 10 Gm of sodium chloride a day should be sufficient If this amount is exceeded, the kidneys may not be able to excrete all of it and retention of salt may follow, this salt may gather in the tissues and rapidly produce a salt edema One liter of physiologic solution of sodium chloride (or Ringer's solution) is usually ample, except of course in the case of anhydremia, when much more is required at the beginning at least to relieve the hypochloremia

The remaining requirements for complete intravenous alimentation, namely vitamins and fat, obviously call for extensive study Doubtless in a few patients utilization of dextrose and amino acids is impaired because of missing vitamins These accessory food factors are much more than antidisease substances, their primary effects are metabolic and are even now being carefully

studied by many workers. It may be that most patients in whom intravenous alimentation is indicated do not have significant vitamin deficiency, so that for them the injection of these food factors is not needed. As for fat, it seems likely that for maintenance it may be dispensed with. On the other hand, from the practical point of view fat has a great advantage in parenteral alimentation. The mechanical problem of injecting enough calories would be simplified by the availability of fat, since it produces two and one-half times as many calories per gram as dextrose or amino acids.

## SUMMARY

For the first time, it is believed, a mixture of amino acids has been given intravenously to human beings for parenteral protein alimentation. The mixture was obtained by the acid hydrolysis of casein to which was added 2 per cent tryptophan and cystine (or methionine). No evidence of toxicity either clinically or histologically was observed when the injection was given slowly, even though as much as 2 Gm per kilogram a day was injected. Experimental and clinical observations have indicated that the injected amino acids are rapidly utilized, this was shown by nitrogen balance studies, by regeneration of serum protein and by reduction of nutritional edema.

## ABSTRACT OF DISCUSSION

DR THEODORE L. ALTHAUSEN, San Francisco. I didn't intend to discuss the work of Drs. Elman and Weiner, but a paper which offers something new should not go without discussion. After intravenous administration of dextrose came into general use, various investigators began to cast about for means of similarly administering fats and proteins, especially in cases in which parenteral alimentation has to be carried on for longer periods. Dr. Emmett Holt Jr. devised a successful method of administering intravenously emulsions of fat to children. Another investigator has experimentally used protein hydrolysates for nutrient enemata with apparent success. The authors are the first to come out officially with their work in the field of parenteral administration of amino acids. From my own work I am very much interested in the important part which dextrose plays in the metabolism of fats and in practical application of this, for instance in the treatment of ketosis. It was interesting to hear that dextrose is also necessary for the utilization of amino acids.

DR THOMAS T. MACKIE, New York. The development of a nutritionally complete diet which may be administered intravenously would constitute an exceedingly important contribution to the therapy of many conditions. Present limitations of parenteral and intrarectal feeding inevitably induce malnutrition if continued for more than brief periods. This in its turn implies an added hazard to the patient. If further studies confirm the authors' preliminary results this work may constitute one of the most important contributions to therapy of recent years.

**Servetus**—It was in 1546 that Servetus discovered the lesser circulation of the blood. Cesalpinus (1524-1603) discovered the greater circulation in 1569, and Sylvius (1478-1555) and Fabricius of Aquapendente (1537-1619) discovered the valves in the veins before 1574 thus antedating even the birth of Harvey by four years. Servetus, in his book on the Trinity, had fearlessly announced that Galen was wrong in his ideas of the circulation of the blood. He showed for the first time that there was no communication between the two sides of the heart, and that the blood flowed from its right side to the lungs, and returned to its left side to be sent to all parts of the body. Harvey, who somewhat later studied in Italy and France, also knew these facts but he dared not publish them in England during the reign of his kings, James I and Charles I.—Hurd-Mead, Kate Campbell. *A History of Women in Medicine*, Haddam Press 1938.

CHRONIC ADHESIVE SPINAL  
ARACHNOIDITIS

## A CLINICAL AND PATHOLOGIC STUDY

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Chronic fibrotic or adhesive changes in the spinal arachnoid have been described for more than forty years. Designated as meningitis, or more often as arachnoiditis, these changes have been characterized as serous, fibrous, adhesive or cystic and as diffuse, disseminated or circumscribed. The first report was that of Schwarz,<sup>1</sup> who in 1897 described the clinical and pathologic features in a case supposedly of syphilitic origin, with sclerotic and cystic meninges and focal areas of softening and cavitation in the spinal cord. Schwarz's article is one of the few containing detailed pathologic descriptions and has never received the attention it deserves. Circumscribed cysts of the arachnoid are especially apt to simulate tumors, as shown in the first report from America, in 1903, by Spiller. Numerous later reports, such as those by Horsley, Munro,<sup>8</sup> Schuster,<sup>7</sup> Mauss and Kruger,<sup>6</sup> Stookey, Barre,<sup>9</sup> Elkington,<sup>9</sup> and Selmsky<sup>10</sup> and particularly the extensive monographs by Metzger<sup>11</sup> and Paulian and Turnesco,<sup>12</sup> contributed to our clinical knowledge of the various types of spinal arachnoiditis without, however, completely solving the diagnostic difficulty. Even today the condition is rarely differentiated preoperatively from cord tumor if a manometric block is present and if a block is absent the disease is often missed entirely and left buried in such doubtful clinical categories as "lateral sclerosis" or "paraplegic multiple sclerosis." In some cases it is mistaken for subacute combined degeneration of the cord and in others for amyotrophic lateral sclerosis.

The pathologic characteristics of spinal arachnoiditis have been described by a few workers, but chiefly with regard to the state of the arachnoid rather than the cord. Schwarz's report,<sup>1</sup> the first is one of the best. Horsley<sup>3</sup> gave brief descriptions of the gross changes, pointing out the tendency toward degeneration of the white matter around the margins of the spinal cord underlying the pia. The pathologic studies of Schuster,<sup>7</sup>

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Geistmann,<sup>13</sup> Bonhoeffer,<sup>14</sup> Pette,<sup>15</sup> Harbitz and Lossius,<sup>16</sup> Brouwer,<sup>17</sup> Maimesco and his associates<sup>18</sup> and Yasuda<sup>19</sup> have added much to our knowledge of the alterations in the spinal cord. None of this pathologic study on the cord has been done in America, and little of the literature is available in English. Grinker's<sup>20</sup> observations were made in a case in which the spinal cord was largely spared.

#### ARACHNOIDITIS FOLLOWING ACUTE MENINGITIS

**CASE 1—***Acute (meningococcic?) meningitis followed after five weeks by generalized pains paraplegia with muscular twitching, painful spasms and atrophy, unequal reflexes, extensor plantar responses and subarachnoid spinal block, operation, death, chronic adhesive arachnoiditis with extensive focal softening of the cord.*

**History and Examination—**L. S., an unmarried white man aged 24, a laborer, was admitted to the service of Dr. LeRoy Sloan at the Illinois Central Hospital, Chicago, Sept. 28, 1934. Three years previously an attack of acute otitis media had subsided after paracentesis. Beginning August 15 he was critically ill for five weeks with a purulent form of meningitis in which no organism could be identified in the small hospital where he was a patient. Treatment included only symptomatic measures and frequent spinal punctures. Although his general condition improved, weakness of the lower extremities with urinary incontinence appeared soon and grew progressively worse. Headache persisted and pains appeared in the neck, back and legs with transient attacks of 'numbness' in the arms.

Examination on admission in the sixth week of illness revealed extreme flaccid weakness of the lower extremities including the flexors of the hips. Gross fascicular muscle twitches were seen in the thighs and calves. Superficial sensibility was normal except for a small perianal area of hypesthesia and somewhat delayed responses below the umbilicus. Vibration and position sense was abolished in the lower extremities. In the right leg the tendon reflexes were exaggerated; in the left the patellar and internal hamstring reflexes were absent, while the Achilles and external hamstring reflexes were reduced. The abdominal reflexes were normal, but the Babinski response was strong on both sides. There was urinary and fecal incontinence.

Lumbar puncture produced only one drop of yellow viscid fluid, but cisternal puncture revealed normal fluid with normal dynamic responses. Iodized oil introduced into the cisterna magna was arrested in irregular masses scattered between the first and fourth cervical vertebrae. Roentgen examination of the mastoids and lungs gave negative results, the sputum contained numerous leukocytes and pneumococci, Wassermann and Kahn tests of the blood and cisternal fluid were negative. The urine was normal except for many erythrocytes, a few leukocytes and a trace of albumin.

**Course—**The patient's temperature and pulse remained normal, but headache and pains in the neck, back and extremities persisted. Gradually some weakness appeared in the arms and a small decubitus ulcer over the sacrum.

**Operation—**At St. Luke's Hospital, October 23, Dr. Eric Oldberg performed a midcervical laminectomy and found a greatly thickened dura and an exceedingly dense vascular

arachnoid membrane which was adherent to the cord. Some of the adhesions were broken up, the iodized oil was aspirated, and the wound was closed.

**Postoperative Course—**Troublesome headache and pains in the spine and extremities persisted. Motor weakness increased in all extremities, and painful muscle spasms began. Atrophy appeared in the shoulders, arms and legs and advanced slowly. Priapism and urinary and fecal incontinence were distressing. Superficial sensibility was but little disturbed but vibration and joint sense remained absent in the lower extremities. Death occurred December 3 of respiratory failure.

**Autopsy—**Postmortem examination, done in the department of Dr. H. Gideon Wells of the University of Chicago, revealed marked generalized emaciation, pressure necrosis over the sacrum, hemorrhagic cystitis with hypertrophy of the urinary bladder and multiple renal abscesses. There was also questionable early bronchopneumonia.

Gross examination of the nervous system disclosed a few meningeal adhesions over the base of the brain and diffuse meningeal fibrosis throughout the spinal canal. In the cervical and lumbar regions numerous small cystic cavities were found in the subarachnoid space, filled with a gelatinous substance, but in the thoracic region a simple dense fibrosis surrounded the cord.

Microscopically the meninges were the seat of a diffuse chronic inflammatory process, with infiltration by lymphocytes



Fig. 1 (case 1).—Fibrosis infiltration and cyst formation in the lepto meninges, secondary degeneration in the fasciculus gracilis, focal softening with demyelination especially in the periphery of the white matter and degeneration of the gray substance with cavitation. Weigert-Pal stain counterstained with van Gieson stain, reduced from a photomicrograph with a magnification of 8 diameters.

and plasma cells and marked collagenous fibrosis (fig. 1). No polymorphonuclear leukocytes or bacteria were found. These hyperplastic meninges were very vascular and the numerous vessels showed intimal and medial thickening, with occasional occlusion and hyalinization (fig. 2). Normal vessels were few. In many areas cystic cavities were found in the meshes of the fibrosed arachnoid, but none were large enough to have produced compression of the spinal cord. These cavities were lined by flattened or cuboidal epithelial cells, which were heaped up into several layers in some localities (fig. 3). Spinal nerve roots passing through these inflamed tissues were often remarkably free of changes, but some particularly dorsal roots, were definitely degenerating and exhibited hyperplasia of the endoneurium.

The spinal cord itself showed extensive changes. In Weigert-Pal preparations the dorsal columns exhibited secondary or Wallerian degeneration due to the destruction of the dorsal roots by the inflammation and sclerosis in the meninges (fig. 1). In the cervical segments this process was almost restricted to the fasciculus gracilis. Scarlet red stains showed great amounts of fat in this region, most of them lying free in the tissues

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Moderate astrocytic gliosis was found in the dorsal columns, proportionate to the degree of degeneration.

The most striking changes in the spinal cord, however, were the focal areas of softening which occurred in both white and gray matter. In the myelin sheath stains, any portion of the white substance seemed liable to this focal destruction, but the marginal or subpial regions were especially affected (fig 1). In this manner the *randdegeneration* of the German observers was presented. Where necrosis was severe, all tissue elements had suffered, both parenchymatous and glial, and scarlet red stains revealed enormous amounts of fat lying free in the tissues. In the less acutely degenerated regions, there was reactive astrocytic gliosis. Numerous fat-granule (gitter) cells were found under the pia and about blood vessels.

In many areas the gray matter had undergone almost complete liquefaction with cavitation (fig 1). There was no tissue response, glial or collagenous, in such regions. In other locali-



Fig 2 (case 1)—Fibrosis and mononuclear infiltration in the leptomeninges; thickening of vascular walls with occlusion; status spongiosus in white matter. Weigert Pal and van Gieson stains slightly reduced from a photomicrograph with a magnification of 160 diameters.

ties the gray matter was less severely involved, but the ventral horn cells were sharply reduced in number. The remaining ganglion cells were deformed, shrunken and hyperchromatic, or swollen and chromatolytic, with eccentric, pale nuclei (fig 4). Such cells were studded with fat droplets when suitably stained. Satellitosis and neuronophagia were strikingly absent, however.

Blood vessel walls in the areas of focal necrosis were thickened in all three layers and the lumen sometimes obliterated. Round cell infiltration was occasionally seen about these vessels. Compensatory formation of new vessels led to increased vascularity throughout the whole cord.

Emphasis from a clinical standpoint in this case should be placed on the purulent, possibly meningococcic, meningitis, which gradually gave place to progressive paraplegia with widely disseminated "root pains," paresthesias, painful involuntary muscle spasms, eventually disseminated atrophy and loss of deep sensibility but relative preservation of superficial sensibility. The spinal subarachnoid block and characteristic arrest

of iodized oil at multiple levels clinched the diagnosis. The unsatisfactory surgical results were due to the impossibility of attacking so intense and diffuse a process. The most significant pathologic features were (1) the intense fibrosis and vascularization of the arachnoid with the formation of arachnoid cysts lined with epithelium, (2) the tendency to vascular thickening and occlusion in both the pia-arachnoid and spinal cord and (3) the focal softening of both the white and the gray matter of the cord. One cannot speak here of a myelitis secondary to the meningitis, since evidences of inflammation in the cord were practically absent. It was rather a gradual process of ischemic necrosis.

CASE 2—F. S., a white woman aged 45, experienced sudden and complete paraplegia in February 1935. There was a history of "influenza and meningitis" without spinal puncture in 1918, an illness from which she apparently recovered except for occasional back pains during the intervening sixteen years. Examination revealed paralysis with atrophy in the lower extremities and anesthesia below the first lumbar dermatome. The patellar reflexes were absent, the achilles exaggerated bilaterally. Spinal puncture revealed a complete block and 1,310 mg of total protein per hundred cubic centimeters of spinal fluid. Disregard of the history of meningitis led to a mistaken diagnosis of spinal cord tumor. At operation Dr. Eric Oldberg found an opaque, densely fibrotic and vascular arachnoid membrane which was impregnated with large calcified flakes (fig 5). Surgical attack was not possible. A year and a half later no improvement had occurred, and severe back pains persisted. In this case the sudden onset of paraplegia was probably due to vascular occlusion in the cord.

CASE 3—E. P., a Negro girl aged 13, had had acute meningitis of unknown type when 21 months old. Five years later she had begun to have severe disseminated root pains and progressive spastic paraplegia with atrophy. Examination revealed in addition irregular sensory disturbances below the first thoracic dermatome with a tendency to dissociation of pain and temperature senses. There were complete spinal block and scattered arrest of iodized oil at the third cervical and fourth and fifth thoracic vertebrae. At operation Dr. Eric Oldberg found a greatly thickened, opaque and vascularized arachnoid membrane, with two elongated arachnoid cysts. There had been no improvement two and one-half years later.

#### ARACHNOIDITIS ARISING SPONTANEOUSLY

CASE 4—Disseminated pains, paresthesias and progressive spastic paraplegia for three years; minimal superficial sensory loss, no spinal block, operation, death; advanced fibrosis and vascularization of arachnoid, with focal softening of cord.

**Clinical Abstract**—Mrs. G. B., a white woman aged 40, gave a history in March 1932 of disseminated pains, paresthesias and progressive weakness in the lower extremities for three years without significant antecedent phenomena. Examination revealed marked spastic paraplegia with only slightly diminished superficial sensibility but greatly reduced vibration and position sense in the lower extremities. The Babinski response was present on both sides. Painful spasms occurred in both legs. There was no block of the spinal fluid, the protein content was normal and the gold curve 2223221000. The spinal fluid Wassermann reaction was negative. At operation, Feb. 20, 1933, Dr. Eric Oldberg found the spinal arachnoid opaque, tough and vascular, and adherent to the cord. Nevertheless much of the membrane was dissected free. The patient's condition failed to improve and she died of an infection of the operative wound on the twenty-sixth day after operation.

**Autopsy**—The whole spinal arachnoid was thick and fibrotic and there were multiple foci of degeneration in the cord. Microscopically the arachnoid membrane consisted of almost solid collagenous connective tissue with no definite cystic areas and no infiltration except for occasional small mononuclear cells (fig 6). The fibrotic meninges were markedly vascularized and the vessel walls thickened often to complete occlusion of the lumen. The endothelial lining of the subarachnoid spaces

was hyperplastic wherever not overrun by fibrous tissue. Some of the spinal roots traversing the sclerotic meninges showed degeneration of both myelin and axis cylinders, with proliferation of the endoneurium.

In the spinal cord (fig 6) there was secondary degeneration of the fasciculus gracilis with marked reactive gliosis. In addition there was subpial degeneration leading at some levels to status spongiosus around the periphery of the section. Focal areas of degeneration were scattered elsewhere throughout the cord and varied in diameter from less than a millimeter to half the cross section of the cord. Some of these were old and gliotic, others were areas of recent softening, with equal degeneration of glia and white and gray parenchyma, without noticeable reaction. Ganglion cells in these regions had disappeared or degenerated without satellitosis or neuronophagia. Some were small and hyperchromatic, others swollen and pale with eccentric or broken-down nuclei. There was no cavitation or liquefaction. Blood vessels in the cord, like those in the meninges, were increased in number and their walls thickened, sometimes with occlusion of the lumen. There was no perivascular infiltration, but small recent hemorrhages were occasionally seen.

The clinical differences between this and the preceding cases lie in the absence of any history of antecedent acute meningitis and in the absence of signs of subarachnoid block. In other respects the syndrome was almost identical in all four cases. Pathologically, the resemblance to the appearances in case 1 is extremely close.

CASE 5—A D, a white man aged 39 fell and injured his right shoulder and knee in January 1932 with subsequent paresthesias for a few days in the lower extremities followed by progressive paraplegia, both sharp and aching leg pains, painful leg cramps, and eventually incontinence of urine and feces. Examination in May 1932 revealed advanced spastic paraplegia without atrophy or fibrillation. Abdominal reflexes were absent and the Babinski reaction was positive on both sides. All forms of sensation were normal. There was no subarachnoid block but the spinal fluid contained 56 mg of total protein per hundred cubic centimeters. Evidences of old



Fig 3 (case 1)—Cyst lined by epithelium in the fibrotic pia arachnoid. Van Gieson stain, reduced from a photomicrograph with a magnification of 60 diameters.

spondylitis were seen in roentgenograms of the spine. At operation, May 21, 1932, Dr Eric Oldberg found a thick, tough arachnoid membrane, adherent to the spinal cord. A few adhesions were broken down. Six months later weakness and atrophy were found in the left hand. Five years later he had greatly improved but still had a spastic gait, a positive Babinski reaction on both sides, and normal spinal fluid without a block. The achilles reflexes were now absent.

There is a suggestion that trauma may have played a part in this case. No history of meningitis was present. Again, as in case 4, no subarachnoid block was present. The diagnostic features consisted of the diffuse paresthesias and pains with cramps, the eventual presence of atrophy in the hands and the loss of the

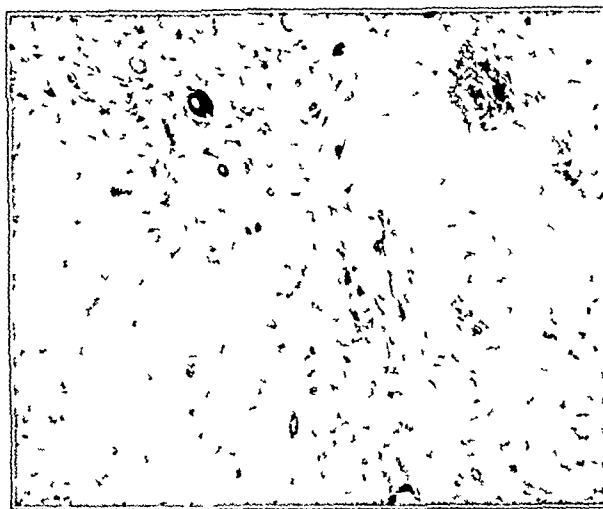


Fig 4 (case 1)—Ventral horn with destruction of many ganglion cells and pyknosis of others; note proliferation of adventitia and hemorrhage about vessels. Toluidine blue, reduced from a photomicrograph with a magnification of 60 diameters.

previously exaggerated achilles reflexes. In this case alone, of the five reported, operation was followed by improvement.

#### COMMENT

**Etiology**—In three of the five cases reported the arachnoiditis appeared to result from some form of acute meningitis. The organism was probably the meningococcus, although such an opinion is hypothetical. In the last two cases the condition arose apparently de novo, a circumstance often recorded in the literature. In general the literature on the etiology of chronic adhesive spinal arachnoiditis indicates three possibilities. The first is infection, which may be meningococcal,<sup>21</sup> pyogenic,<sup>22</sup> syphilitic,<sup>23</sup> influenzal,<sup>24</sup> gonorrheal,<sup>25</sup> herpetic,<sup>26</sup> typhoid<sup>27</sup> or even tuberculous.<sup>13</sup> Cases have been reported of arachnoiditis following

21 Batten F E Paraplegia Following Cerebrospinal Meningitis Laminectomy, *Proc Roy Soc Med (Neurol Sect)* 9 63 (March 30) 1916. Barré J A Leriche R and Morin P Troubles radiculo-médullaires par arachnoidite fœtée et kystique de la région dorsale. *Rev Neurol* 32 604 618 (May) 1925. Schaeffer Henri and de Martel T Arachnoidite spinale circonscrite Intervention opératoire. *Guerison* *ibid* 37 413 420 (March) 1930. Guillemin Georges and Sigwald J Arachnoidites spinales consécutives à la méningite cérébrospinale à meningo-*ibid* 39 516 521 (March) 1932. Elkington<sup>28</sup> Brouwer<sup>27</sup>.

22 Roger Henri and Alliez Joseph Dix cas d'arachnoidite spinale aigue ou subaigue kystique ou fœtée primitive ou secondaire. *Rev Neurol* 40 974 983 (June) 1933.

23 Pette H Weitere klinische und pathologische anatomische Beiträge zum Kapitel der Frühleues des Zentralnervensystems. *Ztschr f d ges Neurol u Psychiat* 92 346 378 1924. Clarke Norman E Localized Meningitis with the Syndrome of Froin in the Spinal Fluid. *Arch Neurol & Psychiat* 12 173 186 (Aug) 1924. Alajouanine T Horner T and André A Le feuillage arachnoïdien postérieur dans les lésions syphilitiques de la moelle (tabes sclérose combinée myélite). *Rev Neurol* 65 266 276 (Feb) 1936. Schwarz<sup>29</sup> Munro<sup>30</sup> Elkington<sup>28</sup>.

24 Vincent Clovis Peuch Pierre and David Marcel Sur le diagnostic le traitement chirurgical le pronostic des arachnoidites spinales. *Rev Neurol* 37 577 595 (April) 1930. Kikuchi Iwao Nachtrag von drei Fällen der mit Laminectomie ganz erfolgreich behandelten Meningitis spinalis circumscripta chronica. *Ztschr d japan chirurg Gesellsch* 36 126 127 1935. Horsley<sup>31</sup> Brouwer<sup>27</sup>.

25 Horsley<sup>31</sup> Elkington<sup>28</sup>.

26 Paulian D Demetrescu J R and Cardas Zona et arachnoidite Bull et mem Soc med d hup de Paris 1 255 258 (Feb 16) 1934. Romay Ramon Soto and Dassen Rodolfo Meningo-radiculo-neuritis y arachnoiditis espinal fibro-adhesiva y quística zosteriana. *Semana med* 44 663 669 (March 4) 1937.

27 Urechia and Jacobovici Sur quelques cas d'arachnoidite spinale. *Paris med* 2 145 148 (Aug 12) 1933.

so-called lymphocytic meningitis<sup>28</sup> and various forms of meningo-myo-encephalitis. In an article on the latter disease, Biernond<sup>29</sup> has contributed from Brouwer's clinic an interesting pathologic description of an acute form of meningo-myelitis with extensive inflammatory and necrotic changes in the cord. The second etiologic possibility is trauma, of which numerous examples have been recorded.<sup>30</sup> Mauss and Kruger<sup>9</sup> recorded twenty-three cases of arachnoiditis resulting from war injuries to the spine, and Elkington<sup>9</sup> reported nine instances, in six of which trauma was the sole cause. As pointed out by Paulhan, Fortunesco and Tudor,<sup>30</sup> fracture of the vertebrae is not necessary in the production of post-traumatic arachnoid adhesions. In many cases mere concussion of the spine suffices. The third type of arachnoiditis is that secondary to other pathologic changes in the cord or spine. Arachnoid adhesions are commonly seen in the neighborhood of tumors of the spinal cord or meninges. Spondylitis is said to be one cause of secondary arachnoiditis.<sup>31</sup> In recent years French investigators have emphasized arachnoid adhesions arising as a reaction to various diseases of the spinal cord, such as multiple sclerosis,<sup>31</sup> syringomyelia<sup>32</sup> and Friedreich's ataxia.<sup>33</sup> In view of the changes in the cord in cases of severe arachnoiditis, this theory must be doubted

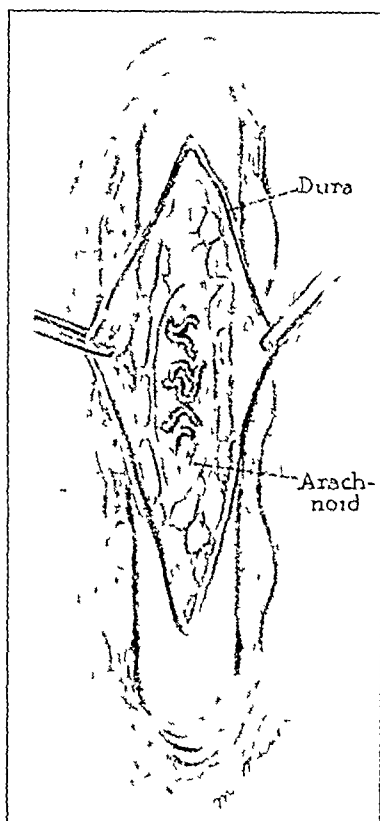


Fig. 5 (case 2).—Operative appearance. The thickened arachnoid contained gelatinous substance and was very vascular. The spinal cord was almost invisible beneath tortuous vessels. Plaques of calcium on arachnoid.

and the possibility kept in mind that the arachnoiditis may be the primary factor and the cord changes secondary.

**Clinical Features**—Clinically, chronic spinal arachnoiditis closely resembles extramedullary tumor of the spinal cord, especially when the arachnoiditis is limited to the formation of a single arachnoid cyst. The two conditions have in common radicular pain, slowly progressive weakness and spasticity of the extremities, impaired sensibility, exaggeration of tendon reflexes, pathologic plantar responses, and impairment of sphincteric function. In addition, the spinal fluid formula is often the same for the two conditions, consisting essentially of From's syndrome with a block on Queckenstedt's maneuver. Because of these striking similarities, chronic arachnoiditis is often mistaken for tumor until operation. However, an analysis of the cases here presented reveals certain differential characteristics.

In the first place, if the chronic phase follows immediately after acute meningitis, there can be little chance of a mistaken diagnosis. If the onset of the chronic phase is delayed for years after the acute disease, or if no history can be obtained of an acute stage, differentiation can often be based on the evidences of diffuse involvement of the spinal cord and roots in arachnoiditis. The pains and paresthesias in spinal arachnoiditis are widespread rather than focal and change in character and location from time to time. This feature was noted in cases 1, 3, 4 and 5 and less definitely in case 2. Sometimes the pain is poorly localized by the patient, who speaks of it as deep, aching or diffuse. Again the superficial sensory disturbances found at examination are often vague, bizarre or inconsistent in distribution and may be absent. Only in case 2 was there a marked sensory loss with a sharp level such as one expects to find with spinal cord tumor. Deep sensibility, on the other hand, and especially vibration sense, was markedly reduced or absent in the lower extremities in all but one case.

The paraplegia due to chronic adhesive arachnoiditis is not always of the spastic type, having been flaccid in cases 1 and 2 of this group. Atrophy appeared late in all five cases and was not located in a single myotome but was scattered and irregular, indicating widespread involvement of the lower motor fibers. Fibrillary twitches were not seen, but large fascicular contractions were noted in a few instances. Not infrequently, painful gross muscle spasms were a troublesome symptom, occurring in cases 1, 4 and 5. Tendon reflexes were not uniformly exaggerated, as they usually are in cases of spinal cord tumor, but were often inconsistent, some being reduced and others increased in the same case. This reduction of some of the deep reflexes, like the scattered muscular atrophy, suggests the involvement of some of the lower motor fibers as they pass the meninges.

Spinal fluid block, a sign nearly always present in paraplegia due to extramedullary cord tumor, is some times not found in cases of chronic adhesive arachnoiditis. No such block was found in cases 4 and 5 of this group, viz those in which there had been no acute meningitic onset. When there is no block, the total protein content of the spinal fluid is not increased. Finally, when an injection of iodized oil is made, roentgenograms of the spine may reveal an arrest of the oil at multiple levels, as in two cases in this series.

**Pathology**—The two cases studied pathologically illustrate two etiologically different types of chronic adhesive spinal arachnoiditis. The pathologic charac-

28 Birker, Lewellys F. and Ford, Frank R. Chronic Arachnoiditis Obiterating the Spinal Subarachnoid Space. *J. A. M. A.* 109: 785-786 (Sept. 4) 1937.

29 Biernond, A. Ueber die Meningo radiculo neuritis (Guillain Barre) und die Meningo myelo encephalitis betrachtet als Krankheiten bei denen das Agens primar im Meningealraum angreift. *Deutsche Zeitschr. f. Nervenh.* 143: 172-198, 1937.

30 Krause, Fedor. Zur Kenntnis der Meningitis serosa spinalis. *Berlin Wehnschr.* 43: 827-832 (June 18) 1906. Bliss, M. A. Cysts Within the Spinal Canal. *J. A. M. A.* 52: 885-886 (March 13) 1909. Sahlgren, Ernst. Ein Fall von Rückenmarkskompression durch circumscripte seröse Meningitis. *Zentralbl. f. d. ges. Neurol. u. Psychiat.* 31: 369, 1922. Pette, Brouwer, case 7. Kikuchi, Paulhan, D. Fortunesco, C. and Tudor, M. Les suites immédiates et tardives des traumatismes vertébraux. L'arachnoidite post-traumatique. *Bull. d. Soc. de Psychiat. de Bucarest.* 1: 76-77, 1936. Yasuda, Munro.

31 Alajouanine, T. Horner, T. and Andre, R. Le feuillage arachnoidien postérieur dans la sclérose en plaques et quelques infections du nerf. *Rev. neurol.* 64: 903-911 (Dec.) 1935.

32 Alajouanine, T. Horner, T. Thurel, R. and Andre, R. Le feuillage arachnoidien postérieur dans la syringomyelie (sa place dans la pathologie des leptomeninges). *Rev. neurol.* 64: 91-98 (July) 1935.

33 Alajouanine, T. Horner, T. and Andre, R. Le feuillage arachnoidien postérieur dans la maladie de Friedreich et l'héréditaire cerebelleuse. *Rev. neurol.* 65: 816-818 (April) 1936.

teristics, however, were almost identical in the two cases, both in the meninges and in the spinal cord itself. The tissue reactions therefore seem more or less stereotyped, regardless of differences in cause.

The meningeal changes in both cases consisted of chronic inflammation, with some mononuclear infiltration but chiefly with marked fibrosis, thickening and extensive vascularization of the pia-arachnoid. The walls of the new vessels in the sclerotic arachnoid had undergone progressive thickening both of the adventitia and of the intima, many eventually becoming occluded. The meshes of the arachnoid were cystic and lined with arachnoid epithelium. Many roots of the spinal cord passing through these sclerotic meninges had degenerated.

The most important lesions, however, were those in the spinal cord itself, and these were unquestionably due to vascular occlusion. Such occlusive vascular changes in the spinal meninges as were seen in these cases must reduce the blood supply to the cord through the small penetrating vessels which supply the outer portions of the white matter. Thus arises the random degeneration reported previously and present in my two cases. This subpial degeneration was not a diffuse process in these cases but was made up of discrete and confluent focal areas of degeneration produced by the occlusion of varying numbers of the penetrating arteries. This tendency to vascular occlusion also affected the anterior spinal artery and its anterior fissural branches to the gray matter and central portions of the cord.

The exact neuropathologic characteristics of such areas of degeneration, whether in gray matter or white, seem to depend largely on the suddenness of vascular occlusion. All such regions are undergoing what is essentially anemic necrosis, but gradual chronic occlusion apparently leads to parenchymatous degeneration with secondary gliosis. In the white matter this process leads to a form of status spongiosus and rich proliferation of glia, in the gray matter slow anemic necrosis leads to a degeneration of the ganglion cells, with some gliosis, but not to neuronophagia. Sudden vascular occlusion leads to rapid softening, with death of glial as well as parenchymatous tissues and massive production of fat and little or no reaction—an anemic infarct, in short. These ischemic areas of degeneration in the cord, whether of sudden or gradual occurrence, constitute a disseminated type of focal destruction which may superficially resemble multiple sclerosis but which differs pathologically in its tendency to involve gray and white matter indiscriminately and, when acute, in the relative absence of gliosis.

Inflammatory changes were strikingly absent in the spinal cord in both case 1 and case 4. There was in no sense a myelitis, and the infection appeared to be restricted to the meninges. Neither were the changes attributable to mechanical injury to a cord fixed by adhesions in a mobile spine, as Stookey suggested.<sup>34</sup> Cavitation in the central regions of the cord in chronic arachnoiditis has been recorded by other workers.<sup>34</sup> It is a condition easily mistaken pathologically for syringomyelia (primary ependymal gliosis and cavitation). The theory that syringomyelia is primarily a degenerative disease may have been based erroneously on the observation of such cavitation.<sup>35</sup> In any event, cavi-

tion of the cord may occur as a result of chronic arachnoiditis, and future studies on "syringomyelia" must take this into account.

**Therapy**—In view of the pathologic conditions present, the treatment of chronic arachnoiditis is necessarily difficult. The only rational therapy would seem to be an attempt to break up the adhesions, evacuate cystic collections of fluid and remove the sub-arachnoid block if possible. But the arachnoid adhesions are often so widespread and vascular that surgical attack is almost impossible. Furthermore, the blood supply to the cord tangled in the thickened pia-arachnoid, is apt to be impaired by dissection. Operation was performed in all five of my cases. Two patients died, two were unimproved and only one was clinically benefited. With the last, the operation was performed early, before the changes were marked. The advantages of surgical intervention are thus limited. Nevertheless, many good results have been reported from operation<sup>36</sup> which would seem most valuable in early stages and when there are only localized arachnoid cysts. With more advanced lesions the surgeon should restrict his efforts to evacuating cysts and attempting to relieve sub-arachnoid block without disturbing the blood vessels.



Fig. 6 (case 4).—Fibrotic thickening and infiltration of arachnoid, partial demyelination of spinal roots and of subpial white matter, light secondary degeneration in dorsal columns and focal softening in dorsal horn and lateral column. Weigert-Pal and van Gieson stain, reduced from a photomicrograph with a magnification of 7 diameter.

Efforts to clear out widespread dense or vascular adhesions will result in serious operative hemorrhage or extensive infarction in the cord.

Medical treatment should include specific measures when the cause is syphilis. Roentgen therapy, recommended by Selinsky and Harris<sup>37</sup> has a doubtful rationale but may be tried.

#### SUMMARY AND CONCLUSIONS

In three of the five cases of chronic adhesive spinal arachnoiditis reported the condition was secondary to acute meningitis, and in the others it apparently arose spontaneously. Autopsy was carried out in two cases.

Clinically, such cases differ from those of extramedullary tumor of the spinal cord in the evidences of a diffuse disturbance of the spinal cord and roots, such as widely scattered paresthesias and pains, irregular and inconstant sensory disturbances, muscular atrophy and large fascicular twitches, painful muscular spasms, a mixture of exaggerated and diminished tendon reflexes and arrest of iodized oil at multiple levels. Spinal sub-arachnoid block may be absent.

Pathologically there are chronic adhesive or cystic fibrosis and vascularization of the spinal leptomeninges, with injury to the roots and secondary degeneration of

36 Metzger<sup>31</sup>, Batten<sup>32</sup>, Schaeffer and de Martel<sup>33</sup>, Urechia and Jacobovici<sup>34</sup>, Kikuchi<sup>35</sup>.

34 Schwarz<sup>31</sup>, Pette<sup>32</sup>, Harbitz and Lossius<sup>33</sup>, Yasuda<sup>34</sup>.  
35 Hassin, G. B. Histopathology of the Peripheral and Central Nervous Systems. Baltimore: William Wood & Co. 1933, p. 126.

37 Selinsky, Herman and Harris. Radiotherapy in Disseminated Spinal Arachnoiditis. New York State J. Med. 34: 85-87 (Feb. 1) 1934.

the dorsal columns. Thickening and occlusion of the blood vessels occur in both the meninges and the cord with marginal degeneration of the white matter nearest the pia, and focal areas of softening in the cord, which may lead to cavitation.

Surgical intervention is of value in early stages, with only localized arachnoid cysts, but may be harmful in advanced stages with diffuse adhesions.

#### ABSTRACT OF DISCUSSION

DR JOHN B DOYLE, Los Angeles. Dr Mackay has made a valuable contribution to the subject of chronic adhesive spinal arachnoiditis. There has been a dearth of reports of careful studies at necropsy, by which it will be possible to reach an understanding of the pathogenesis of this condition and the mechanisms of production of symptoms and to establish a sound basis for prognosis. This presentation serves to dispel certain assumptions that have crept into the literature and to provide a more inclusive clinical picture of this entity. Dr Mackay has shown that the clinical course may be a matter of a few weeks or of several years. When the damage to the vascular supply of the spinal cord involves not only the subpial vessels but the anterior spinal artery, one may encounter paraplegia, profound sensory changes and disturbance of the vesical and anal sphincters. In certain instances many of the symptoms and signs are attributable to direct damage to the posterior spinal nerve roots. When complete spinal subarachnoid block obtains, From's syndrome may be present. There may or may not be associated pleocytosis. Dr Mackay has emphasized the importance of trauma in a restricted group of cases. Keschner, Davison and Selmsky described an unusual case in which the picture developed after laminectomy for removal of a tumor of the spinal cord. In the majority of instances, however, the essential etiologic factor appears to be purulent or nonpurulent infection of the meninges. Frequently the initial meningeal process seems to have been subclinical or asymptomatic. Obviously the prognosis must be poor when there is evidence of extensive damage to the spinal cord or cauda equina. The severity and the extent of the process may be so great as to preclude successful surgical intervention.

DR J. M. NIELSEN, Los Angeles. Dr Mackay has made an important contribution. Frequently one observes an irregular picture of subacute combined degeneration or atypical amyotrophic lateral sclerosis and is not satisfied with the diagnosis. In 1924 I saw a patient who had been ill for a year with what was diagnosed as epidemic encephalitis. He came from the Philippine Islands. When I saw him he had symptoms referable to the spinal cord, with evidence of block, sphincteric disturbance and weakness of the lower extremities. I did a spinal puncture between the fifth lumbar and the first sacral vertebra and got 2 or 3 cc of spinal fluid. Then I went up one space and got 2 or 3 cc again and moved up one more space and got the same amount, I never could get any free flow, there was a complete block. I felt that nothing could be done. Then I saw a man who had spinal meningitis or leptomeningitis following skull fracture, and spinal punctures showed a thick, purulent fluid due to *Bacillus mucosus capsulatus*. With spinal drainage and application of mercuriochrome, which was in vogue at that time, he was cured. Six years later I was called into court to testify in the case. The patient had recovered and had been back at work all those years, but he had been jarred slightly in a street car in Los Angeles. He was suing the street car company because he found that his spine was stiff and his neck a little rigid, and he could not move his lower extremities easily.

DR R. P. MACKAY, Chicago. I will add only that chronic adhesive spinal arachnoiditis should be kept in mind in cases of so-called paraplegic multiple sclerosis. In such cases, without real evidences of disseminated lesions the diagnosis has always struck me as doubtful. I am convinced that multiple sclerosis is frequently diagnosed clinically on inadequate grounds, and in a certain proportion of these cases arachnoiditis may play a role.

## EXTRARECTAL METASTATIC GROWTHS FROM UPPER ABDOMINAL AND MAMMARY CANCER

REPORT OF SEVENTEEN CASES

HARRY E. BACON, M.D.

PHILADELPHIA

The relative frequency with which extrarectal metastatic deposits are encountered, the realization that the condition is seldom recognized and the fact that the condition has been confused with and incorrectly diagnosed as primary rectal carcinoma prompt a brief discussion of this entity, since it invades many fields of scientific medicine.

Seventeen cases that have come under my observation during a comparatively short period are reported here.

CASE 1—J. W., a Negro aged 49, admitted to the hospital April 3, 1937, because of abdominal pain, had been in good health until the previous January, when pain was experienced in the pit of his stomach immediately after eating. During the past two weeks difficulty, as well as frequency, and a burning sensation on urination had been noted. Bowel movements had been associated with straining for the past month, the stools had been tarry for several weeks. The patient said that he had lost 15 pounds (6.8 Kg.) in three weeks. The family history was irrelevant. On physical examination a mass the size of a walnut was palpated in the right upper quadrant at the edge of the rectus. By rectum a large irregular mass was felt anterior to the wall, which was thought to be a malignant growth on the prostate. The urine was yellow and alkaline, the specific gravity was 1.022, there was no albumin or sugar, and occasional epithelial cells were seen. A blood count showed 4,040,000 erythrocytes, 78 per cent (12 Gm.) of hemoglobin and 13,700 leukocytes, with 64 per cent polymorphonuclears, 25 per cent lymphocytes, 4 per cent monocytes, 6 per cent eosinophils and 1 per cent basophils. The Wassermann and Kahn tests of the blood were negative. Chemical analysis of the blood showed 82 mg of sugar, 11 mg of urea, 118 mg of cholesterol and 78 mg (66 per cent) of cholesterol esters per hundred cubic centimeters. The icterus index was 7. The total protein content was 6.62 mg per hundred cubic centimeters, the albumin making up 4.19 mg and the globulin 2.43 mg. The feces showed no parasites or ova. Gastric analysis showed no free hydrochloric acid, 12 units of total acid, a trace of occult blood and no starch. Cystoscopic examination April 6 disclosed no residual urine, moderate generalized cystitis, distortion of the vesical neck and no evidence of intravesical malignant growth. X-ray examination April 20 showed the stomach normal in outline, size and position, marked evidence of hyperperistalsis and hypermotility and no defects along the walls or curvatures. A normal duodenal cap was outlined. There was no six hour gastric retention, barium sulfate was present from the terminal portion of the ileum to the middle of the descending colon. An opaque enema showed no pathologic lesion of the rectum or large intestine. X-ray examination April 26 revealed no evidence of metastases to the lumbar vertebrae or the bones of the pelvis. No biliary calculi could be demonstrated on the flat film. The liver was seen but was not enlarged. In cholecystograms made April 29 the gallbladder showed no function. No calculi could be demonstrated. A flat plate of the right kidney and a retrograde pyelogram May 9 showed that both kidneys were apparently functioning, though at no time was much dye evident. The dye was seen better in the right kidney, and there was no evidence of hydronephrosis. The flat film showed no evidence of calculi. Neither kidney was mobile.

With the provisional diagnosis of primary malignant growth of the gallbladder or prostate and partial intestinal obstruction the patient was transferred to the radiologic department.

From the Radiologic Department of the Philadelphia General Hospital and the Proctologic Department of the Temple University Hospital. Read before the Section on Gastro-Enterology and Proctology at the Fifty-Ninth Annual Session of the American Medical Association, San Francisco, June 17, 1938.

Examination of the rectum showed it to be almost completely obstructed by a large extrinsic horseshoe-like mass on the anterior and both lateral aspects. The process was hard, nodular, asymmetric and distinctly outside the rectal wall. The mucous membrane was movable. Between the lower edge of the extrarectal mass and the smooth dome of the prostate a horizontal crevice could be noted by the examining finger.

May 28 an exploratory laparotomy was performed, which showed carcinoma of the head of the pancreas, with metastasis to the parietal peritoneum, omentum and mesosigmoid. The rectovesical pouch was literally filled by a large nodular growth. The patient died, but autopsy was not permitted.

CASE 2—F D, a white man aged 60, admitted to the hospital Aug 2, 1937, because of "bowel trouble," stated that he had been fairly constipated for the past year and during the past four months had been compelled to take increasing amounts of various laxatives. The stools were watery. The abdomen appeared normal, but rectal examination August 3 revealed a large, hard nodular mass located in Blumer's shelf. There was no palpable or visible evidence of an intrinsic process. The diagnosis was extramural malignant growth from some upper intestinal site. X-ray examination August 7 disclosed a large filling defect at the pars media of the stomach, extending to the pyloric end. The irregularity and defect were seen fluoroscopically and on all films. There was no six hour gastric retention. The diagnosis was malignant growth of the stomach. This patient was discharged after receiving high voltage roentgen therapy and died at his home one month later.

CASE 3—J L, a white man aged 48, admitted to the hospital Oct 9, 1936, because of pain in the right costal region and loss of weight, had been well until the previous April, when he noticed a sharp pain under the ribs on the right side. This had been more or less constant but worse at night. There was no relation between the pain and eating. He had been constipated for many years, there had been no tarry stools. He had lost 27 pounds (12.2 Kg) in six months. Physical examination of the abdomen gave negative results, by rectum a stony-hard fixed mass, approximately the size of a large orange anterior to and encroaching on the rectal wall was palpated. The lumen of the rectum was almost entirely occluded. An exploratory laparotomy November 4 showed generalized carcinomatosis, the omentum being infiltrated with small mucoid nodular growths. Biopsy showed carcinoma mucoid variety, secondary in the omentum. The patient was discharged but returned to the radiologic service, where high voltage roentgen therapy was given. Necropsy March 5, 1937, disclosed primary adenocarcinoma of the ascending colon type 3, mucoid variety, secondary carcinoma of the lymph nodes and a large metastatic deposit in the rectovesical pouch, causing partial obstruction.

CASE 4—N F, a white man aged 55 admitted Oct 28, 1937, because of intermittent constipation and diarrhea and pain in the lower part of the abdomen, stated that for four months he was compelled to take laxatives and enemas, after which the diarrhea became a more or less prominent feature. The abdomen was found to be tense, with dullness in the flank. By rectum a firm constriction, which would not permit passage of the finger, was felt approximately 2 inches above the ano-rectal line. The process was more marked on the anterior wall, the mucous membrane was nonulcerated and movable over the mass. The diagnosis of primary carcinoma of the rectum was made. Biopsy showed chronic inflammatory tissue, so that another diagnosis was made of primary carcinoma of the prostate. Cystoscopic examination showed no evidence of a malignant process. X-ray examination October 29 disclosed an abnormal contour of the rectum; an opaque enema showed no other evidence of a pathologic lesion. Exploratory laparotomy was performed December 20 at which time carcinoma of the ascending colon with widespread intra abdominal metastases was found. Biopsy showed adenocarcinoma secondary in the mesentery, an extensive collar-like nodular mass was found impinging on and completely encircling the rectum. The patient died December 22, autopsy was not permitted.

CASE 5—J O H, a white man aged 70, admitted to the hospital March 3, 1936, because of pain in the stomach, stated that the pain was dull and continuous but worse after meals and radiated to the right arm. There was no vomiting. He

had lost 10 pounds (4.5 Kg) in six weeks. In the past history "stomach trouble" for thirty years was cited. Physical examination gave negative results except to reveal a firm irregular mass the size of an egg, 4 cm above the anal margin. The patient was transferred to the radiologic department, with the provisional diagnosis of carcinoma of the rectum. Examination of the rectum March 5, 1938, showed a fixed nodular growth anterior to the rectal wall. The mucosa was freely movable and devoid of ulcerative change. There was extrarectal metastatic malignant growth. The patient was too weak to be studied. Necropsy March 15 showed adenocarcinoma type 3 of the head of the pancreas, with multiple intra-abdominal metastases, especially in the rectovesical pouch.

CASE 6—D McC, a white man aged 50, admitted to the hospital Feb 8, 1937, because of pain in the stomach, had been in apparent good health until three weeks before, when he became conscious of pain in the right lower quadrant, not severe but constant. He had lost about 10 pounds (4.5 Kg) in six months. Through the right anterior part of the abdominal wall a hard, fixed mass was palpable. By rectum a large nodular growth was felt anteriorly, approximately 3 inches above the anal margin. A diagnosis of primary malig-

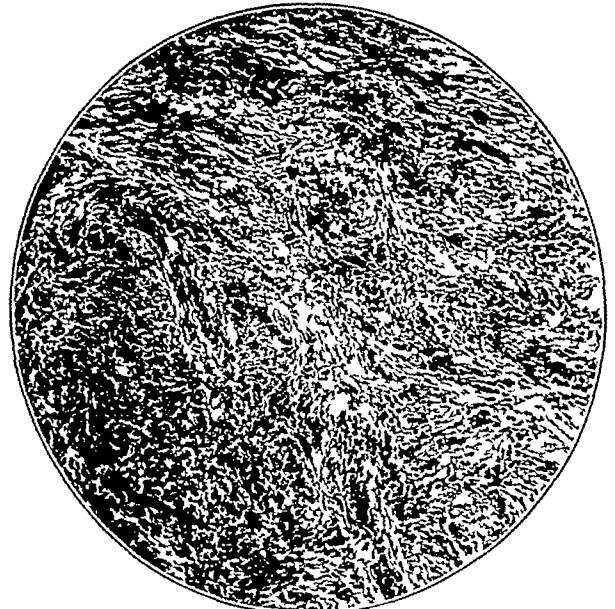


Fig 1 (case 7) —Metastatic lesion showing a similar picture with more marked stromal reaction. The cells again occur in strands and singly for the most part rather than in any organoid arrangement.

nant tumor of the rectum was made. X-ray examination following a barium sulfate enema February 14 demonstrated a defect in the ascending colon just distal to the cecum. Reexamination March 8 confirmed the presence of a filling defect. An exploratory operation was done March 15 at which time an extensive carcinoma of the ascending colon was found. A nodular mass was palpated in the rectovesical pouch. Biopsy of the parietal peritoneum and omentum showed adenocarcinoma type 4 of the colon. The patient died March 30, but autopsy was not permitted.

CASE 7—A G, a white man aged 39, admitted to the hospital Sept 22, 1937, because of abdominal pain and difficulty in swallowing, had been apparently well until May 1937, when he noticed a dull gnawing pain in the right upper quadrant of the abdomen which occurred immediately after eating. X-ray examination by Dr Holmes October 20 showed marked contraction of the entire stomach. Fluoroscopically there was so much contraction of the pars media and the pyloric end of the stomach as to permit little barium sulfate to pass through into the duodenum.

As evidenced by rectal examination, two hard masses approximately the size of a small walnut were palpable anterior to and outside the rectal wall. The mucosa was freely movable over the metastatic deposits. The abdomen was explored October 27 during nitrous oxide anesthesia, and an extensive



carcinoma of the stomach with evidence of widespread metastasis and nodules in the rectovesical pouch was seen. Biopsy of the stomach showed adenocarcinoma grade 4, the growth in the culdesac showed metastatic carcinoma. The patient died March 13 1938. Autopsy showed scirrhous adenocarcinoma of the stomach. The right pelvic wall presented firm white lumps which surrounded the ureter and compressed it just proximal to the bladder. White pinpoint nodules were scattered along the pelvic wall in front and at the sides of the rectum.

CASE 8—M C, a Negress aged 58, admitted to the hospital in April 1938 because of abdominal pain, being extremely ill had difficulty in relating past events, but a relative stated that severe abdominal pain radiating to the back had been experienced for two months. No nausea or vomiting was present, the loss of weight was considerable, with progressive constipation. Examination showed the liver to be somewhat enlarged and the abdomen distended. Chemical analysis of the blood showed 112 mg of sugar, 70 mg of urea, 19 mg of phosphatase, 85 mg of calcium, 37 mg of phosphorus, 416 mg of cholesterol and 74 mg of cholesterol esters per hundred cubic centimeters. The icterus index was 218. The blood count showed

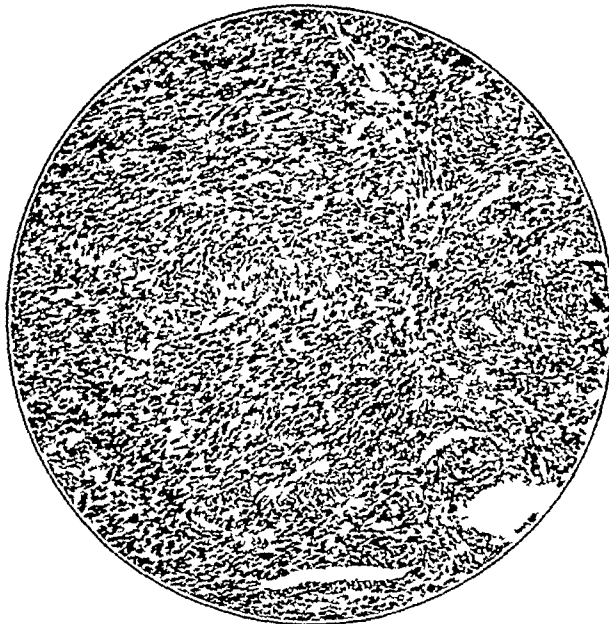


Fig 2 (case 10)—Retroperitoneal fibrosarcoma made up of interlacing bundles of young fibroblasts showing considerable pleomorphism anaplasia and a moderate number of mitotic figures. The tumor is highly vascular. Metastatic lesion showing similar structure but with evidence of greater malignancy. The cells are more irregular in size and shape, the nuclei are much more hyperchromatic. There is considerable necrosis.

5 440 000 erythrocytes, 91 per cent (14 Gm) of hemoglobin and a differential count of 72 per cent polymorphonuclears, 24 per cent lymphocytes and 4 per cent small lymphocytes. Autopsy May 8 disclosed primary carcinoma of the common bile duct, with generalized carcinomatosis. There were numerous metastatic nodules in the culdesac.

CASE 9—W C, a Negro aged 67, was admitted to the hospital April 28 1937, complaining of soreness about the umbilicus. This had begun three months before, after he had lifted a concrete block, since that time he had experienced frequent attacks of pain radiating through the abdomen. Weakness and loss of weight (60 pounds [27.2 Kg]) in six months were cited. The abdominal wall below the umbilicus was tender to the touch and small hard nodules were palpable beneath the skin. By rectum a slightly movable nodular mass, approximately the size of a tangerine, was found anterior to and encroaching on the rectal wall. The mucosa was freely movable over the growth and not ulcerated. The diagnosis was extrarectal metastatic malignant growth. Necropsy June 4 showed primary adenocarcinoma of the stomach type 3 and secondary carcinoma of the liver, gallbladder, spleen, pancreas, umbilicus and intra-abdominal lymph nodes. The rectovesical pouch was the site

of a few small implants and one large growth approximately the size of an orange.

CASE 10—E S, a Negress aged 53, admitted to the hospital June 21, 1937, with a mass in the abdomen, could not furnish a history because of an apparent toxic psychosis. Examination revealed a large mass involving the entire upper part of the abdomen. It was firm, nontender and immovable. Immediately above the pubis a hard subcutaneous nodule about the size of a walnut was palpated. By rectum a large hard nodular mass was felt anterior to the wall. X-ray examination June 1 disclosed that in the supine position the stomach was elongated and barium sulfate incompletely filled the stomach, owing to extrinsic pressure along the lesser curvature. The mucosal rugae in the pars media were clearly visualized, and the pylorus appeared to be flattened as a result of the enlarged liver. Autopsy July 5 disclosed retroperitoneal tumor and neurogenic sarcoma with involvement of the heart, lungs, liver, adrenals and retroperitoneal lymph nodes. Beneath the peritoneum and anterior to the rectum a large metastatic process was found.

CASE 11—W H, a white man aged 62, admitted to the hospital Jan 31, 1938, because of pain in the stomach, stated that he had been well until ten weeks before, when there developed pain in the epigastrium after meals and gaseous distention. Physical examination showed some rigidity in the upper midepigastrium. Gastric analysis showed no free hydrochloric acid, 30 units of total hydrochloric acid and some occult blood. Gastrointestinal study revealed that the stomach was small, contracted and somewhat fixed. Rectal examination showed three palpable nodular masses in the rectovesical pouch. All were immovable and hard. An exploratory laparotomy February 21 showed an extensive carcinoma of the stomach with generalized visceral and parietal peritoneal metastases. A nodule removed at operation was reported to show adenocarcinoma of the stomach, secondary in the peritoneum. At autopsy February 22 primary scirrhous carcinoma of the stomach was seen, with implantation carcinoma of the intestine and peritoneum. The abdominal lymph nodes showed metastatic carcinoma and numerous implantations of carcinoma in the region of the sigmoid flexure and in the rectovesical pouch.

CASE 12—H G, a white woman aged 37, admitted Jan 5 1934, to the Philadelphia General Hospital because of swelling in the breast, stated that in April 1933 she had noticed three small lumps in the left breast. She had been operated on at another hospital after three months, during which period the lumps had become egg sized, only the masses were removed. The following September nodules developed throughout the left breast and axilla. Roentgen therapy was then administered. She now complained of pain in the left shoulder and lumbar region, as well as shortness of breath. Physical examination showed an oblique scar representing left radical mastectomy, numerous small glands in the left supraclavicular region and a tumor mass occupying the entire right breast, with large glands in the right axilla. X-ray examination January 16 by Dr H W Ostrum showed metastatic carcinoma of the lungs. Autopsy March 3 showed adenocarcinoma type 4 secondary carcinoma in the lungs and shaggy masses in Douglas pouch. Nodules varying in size from that of a pea to that of a pinhead were scattered all over the peritoneum. In Douglas pouch they were confluent.

CASE 13—A B, a white man aged 43, admitted to the hospital Dec 15, 1936, because of pain in the stomach, described the pain as dull, worse after meals and associated with some vomiting. He had passed tarry stools mixed with some bright red blood for eight months. The report from another hospital showed that he had been operated on one year previously for gastric ulcer. There was a questionable mass in the upper right quadrant of the abdomen and a circumferential extrinsic narrowing of the rectum. The mucosa was nonulcerated and movable over the mass. Gastrointestinal study by Dr H W Ostrum December 18 with the patient erect showed a large filling defect of the lesser curvature involving a greater portion of the pars media and pars pylorica. There were moderate deformity of the pyloric end of the stomach and flattening of the duodenum especially of the first portion. In two hours there was approximately 30 per cent retention. The diagnosis

was carcinoma of the lesser curvature involving the pars media and pars pylorica. Punch biopsy of material taken from the extrarectal growth through the rectum showed metastatic adenocarcinoma. Extensive high voltage roentgen therapy was given. To my knowledge the patient is still living, in another state.

CASE 14—M St P, a white woman aged 47, admitted to the hospital April 19, 1937, complaining of pain in the abdomen, stated that she had felt a mass in the abdomen the previous December and that she vomited after eating any type of solid food. The remainder of the history was irrelevant. Physical examination showed an emaciated woman with a hard nodule in the left supraclavicular fossa and a definite hard nodular mass in the left side of the hypochondrium, extending along and under the costal margin. The latter nodule, approximately the size of a lemon, was movable. By rectum a large hard nodular growth anterior to and outside the wall of the rectum was palpated. The mucosa was freely movable. X-ray examination April 14 disclosed marked narrowing and fixation of the cardiac end of the stomach and pars media. There was irregularity along the lesser curvature. Autopsy showed primary adenocarcinoma of the stomach with widespread metastasis. A large metastatic deposit was seen in the recto uterine pouch.

CASE 15—J C, a white man aged 47, admitted to the hospital Dec 3, 1937, because of pain in the epigastrium, stated that he had been well until two months before, when he noticed pain in the shoulder and in the ribs. The patient was given medication, but he said that it seemed to aggravate the discomfort. Finally he was unable to eat because of the pain, there was no nausea or vomiting. He had been markedly constipated during this period and had lost considerable weight. The lower edge of the liver was palpable. A mass the size of a fist was felt in the upper quadrant, slightly to the right of the midline. There was considerable ascitic fluid. By rectum a large smooth fist-sized mass was palpable anterior to the rectum and encroaching on it. The mucous membrane was freely movable. Autopsy showed primary type 4 adenocarcinoma of the stomach with generalized carcinomatosis. The rectovesical pouch was readily filled with numerous small and one large metastatic growth.

CASE 16—C F, a white woman aged 63, admitted to the hospital Jan 24, 1937, because of pain in the head, had noticed a lump in the left breast for which she was treated with ultraviolet rays early in 1936. In the spring of the same year she noticed stiffness of the neck and pain in the head, arms and legs. She had lost considerable weight. An increase in constipation was experienced. Examination showed the left breast to be hard and fixed, with definite retraction of the nipple. There was no axillary or supraclavicular adenopathy. X-ray examination January 24 disclosed extensive carcinomatous metastasis to the skull, jawbones and cervical and dorsal vertebrae. Some of the ribs were involved. There was possible involvement of the acromion process. Extensive high voltage roentgen therapy was given. She returned to the radiologic clinic April 21, 1938. At this time she complained of pain in the abdomen, pain at defecation and increasing constipation. Multiple hard nodules were felt through the anterior part of the abdominal wall. By rectum a hard irregular collar-like mass partially encircling the anterior portion was palpable. The mucous membrane was movable over the extrinsic constriction. The patient is still living.

CASE 17—C O, a white man aged 55 was admitted to the hospital in January 1938 because of intermittent pain in the right lower quadrant of eight months' duration, dyspnea and loss of 15 pounds (68 Kg). Examination disclosed a hard fixed mass in the right upper abdominal quadrant ascites and, by rectum a hard nodular constricting process extrinsic to the wall. Autopsy May 22 revealed primary adenocarcinoma of the right kidney with generalized carcinomatosis and a rectovesical pouch obliterated by metastatic deposits encroaching on and constricting the rectum.

In the presentation of such a subject as this certain phases warrant some discussion. What is the historical background of this peculiar phenomenon? What is

understood by the "rectal shelf"? What is its significance? Where is the usual site of the primary growth? What is the mode of spread? From what is it to be distinguished? What is its prognostic value, and, finally, what form of treatment can be prescribed?

The earliest reference I have found is that by Strauss,<sup>1</sup> who some forty odd years ago reported a case of gastric carcinoma with metastasis to the pouch of Douglas. Four years later this investigator<sup>2</sup> cited two additional cases and mentioned that such metastasis not only may be early but may be the only manifestation. Schnitzler<sup>3</sup> in 1908 reported eleven cases, in one of which the pancreas and in all others the stomach was the primary site. Worthy of mention is this quotation from the original German: "The important feature was that all these patients consulted the doctor for symptoms produced by the metastasis, without having the slightest suspicion of the presence of the

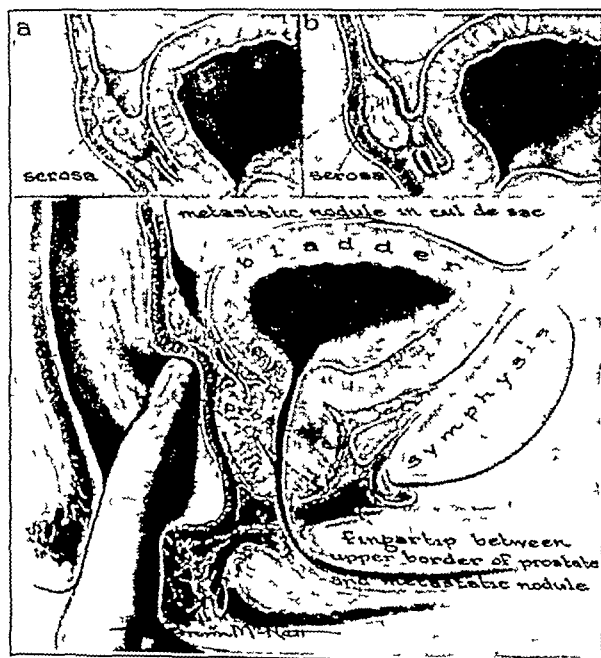


Fig 3—Sagittal section showing the tip of the finger between the prostate and a growth on the culdesac: a supraserosal mass and b subserosal mass.

primary growth'. In his report Schnitzler mentioned that in one case he mistook the tumor for a primary rectal growth and performed a radical sacral extirpation. Further examination of the patient, who survived six months, revealed a gastric carcinoma of long latency. Payr<sup>4</sup> described a case in which he performed a colostomy for rectal stenosis due to periproctitic and parametric induration. The patient died of peritonitis, autopsy revealed a gastric carcinoma and the presence of perirectal metastasis of the infiltrative type. Additional cases were reported by Toyosumi,<sup>5</sup> Chiari,<sup>6</sup>

<sup>1</sup> Strauss Hermann. Ueber die Abhängigkeit der Milchsäuregärung vom HCl Gehalt des Magensaftes. Ztschr f klin Med 28 584 1895.

<sup>2</sup> Strauss Hermann. Nebst Bemerkungen über die Bedeutung des Befundes von Eiter und Blut im Magen sowie gewisser wenig beobachteter Krebs Metastasen die Diagnose des Magencarcinoms. Berl klin Wchnschr 36 872 1899.

<sup>3</sup> Schnitzler J. Ueber eine typische lokalisierte Metastase des Magencarcinoma. Med u Chir 10 205 1908.

<sup>4</sup> Payr E. Ueber gleichzeitige Stenose von Pylorus und Darm. Arch f klin Chir 75 291 1904 1905.

<sup>5</sup> Toyosumi H. Ein Fall von Stenose des Rectum durch metastatischen Karzinom bei gleichzeitigen metastasierendem Myelom. Virchows Arch f path Anat 191 70 1908.

<sup>6</sup> Chiari H. Zur Kenntnis der hamatogenen Geschwulstmetastasen im weiblichen Genitalapparate. Prag med Wchnschr 30 17 (April) 1905.

Orth,<sup>7</sup> Kappeler,<sup>8</sup> Kelling,<sup>9</sup> Kaufmann,<sup>10</sup> Brosch<sup>11</sup> and Bensaude and Okenczyk<sup>12</sup> Blumer<sup>13</sup> in 1909 reviewed the literature at hand in addition to reporting two cases, in one the primary site was the gallbladder and in the other the stomach. By virtue of his excellent description this extrarectal site has been referred to frequently as Blumer's shelf. Since that time few reports have been published,<sup>14</sup> although several quotations or reviews are to be found.<sup>15</sup>

Metastatic deposits in the culdesac under ordinary circumstances can be palpated through the anterior or anterolateral wall of the rectum according to their anatomic distribution. Growths the size of a pea may be felt occasionally, although it has been my experience that the size estimated by digital examination of the rectum is not always verified by operation or necropsy. Coalescence of these deposits, which vary in shape, size and number, produces a ledge spoken of as the rectal shelf.<sup>1</sup> In such a case digital examination of the rectum elicits a nodule or growth anterior or anterolateral to the rectal wall approximately 2 to 4 inches above the anal margin in the female or one-half inch above the prostate in the male. As would be expected, it is hard and not tender. Ordinarily a sulcus can be felt between the upper rounded border of the prostate and the mass. The mucosa of the rectum, being uninvolved, is freely movable over the growth, this, it should be remembered, is the main feature distinguishing it from primary carcinoma of the rectum. Increase in size and extent may readily cause impingement on the anterior rectal wall, in which case the examining finger encounters backward displacement of the rectum by a mass anterior to and outside its wall. Occasionally the metastatic process encircles the rectum so as to cause occlusion, either partial, as in cases 1, 4, 13, 15, 16 and 17, or complete, as in that reported by Chiari.<sup>6</sup> In each case the mucosa was freely movable over the growth. Of course it is possible, as reported by Kappeler,<sup>8</sup> for the process to infiltrate the rectal wall proper and cause fixation of the mucous membrane, under which circumstance it would not be unlikely that the resultant proliferating changes might be confused with primary carcinoma, yet in my series of cases, even those of almost complete obstruction, the mucosa was movable and free from ulceration. This condition is significant

in that patients may consult the physician because of symptoms produced by the metastasis without the slightest suspicion of an existing primary growth elsewhere. Such growths in themselves may direct attention to the primary malignant process in another site. That such metastatic deposits may cause narrowing of the rectal lumen, even to the point of complete obstruction, and that these tumors may be mistaken for primary rectal carcinoma are factors only too significant.

Judging from the available literature at hand as well as my own series of cases, the stomach is by far the most common primary site. Feldner<sup>16</sup> said that metastasis to Douglas' pouch occurs in 20 per cent of cases of gastric carcinoma and in 18 per cent of cases of carcinoma of the gallbladder. Such frequency I have been unable to confirm. The only cited case of involvement of the gallbladder is that of Blumer.<sup>13</sup> Schnitzler,<sup>3</sup> it will be recalled, reported involvement of the pancreas in one case and of the stomach in ten cases. Melchior<sup>17</sup> reported three cases, the stomach, esophagus and the breast were the sites. Both Handley<sup>18</sup> and Carnett<sup>19</sup> described three cases of carcinoma of the breast with metastasis to the culdesac. The sites in the reported cases are shown in table 2.

In referring to cancer of the breast the words of Handley<sup>18</sup> may be recalled. "It must never be forgotten that the first sign of epigastric invasion may be found not in the epigastric region, but in the pelvis." Eusterman and Balfour<sup>20</sup> have said "Although the gastrocolic and greater omentum are favorite sites, the most common situation is the pelvic peritoneum."

The question arises as to the manner in which the culdesac is invaded. While there is no conclusive proof as to the mode of spread, it seems pertinent to review briefly the opinions and investigations of various workers. By metastasis is understood the dissemination of a malignant growth either by continuous extension or by tumor cell emboli. Many writers lean toward dissemination by the hematogenic route, which, it is agreed, is the usual means of spread in the case of sarcoma (case 10). As I have previously stated,<sup>1</sup> it is recognized that an implantation type of cancer does exist, and several authentic cases have been reported. Carcinomatous implants in the abdomen, especially in cases of advanced disease, are not uncommon. The explanation first mentioned by Schnitzler is today almost universally accepted, in that pelvic involvement occurs by gravitation of fragments of cancerous tissue to the pouch, for it will be recalled that he attributed the relative frequency of the disease in males and rarity in females to malignant cells' reaching the rectovesical space in the former whereas they were caught by or

7 Orth Johannes Compendium der pathologisch-anatomischen Diagnostik ed 6, Berlin A Hirschwald 1900 p 483

8 Kappeler Otto Meine Erfahrungen über Magenresektion wegen Carcinom Ztschr f Chir 64 247 1902

9 Kelling G Zur Resektion des carcinomatösen Magens Arch f klin Chir 75 229 1905

10 Kaufmann C Lehrb der spez path Anat 2 385 1901

11 Brosch O Ein seltener Fall von multiplen karzinomatösen Strikturen des Darmes Arch f klin Med 57 606 1896

12 Bensaude R and Okenczyk C Retrecissements cancéreux multiples de la partie sous diaphragmatique du tube digestif Arch de med exper et anat path 18 526 1906

13 Blumer G The Rectal Shelf A Neglected Rectal Sign of Value in the Diagnosis and Prognosis of Obscure Malignant and Inflammatory Disease Within the Abdomen Albany M Ann 30 361 (May) 1909

14 Keith A R Clinical Significance of So-Called Rectal Shelf Tr Am Proc Soc 28 46 1928 and discussion by R W Jackson p 50 Melchior<sup>17</sup> Handley<sup>18</sup> Carnett<sup>19</sup> Carnett<sup>19</sup>

15 These include

Babcock W W Textbook of Surgery ed 2 Philadelphia W B Saunders Company 1935 p 975

Bacon H E Metastatic Growths to Rectal Shelf Report of Seven Cases read before the Proctologic Society Graduate Hospital of the University of Pennsylvania March 1937

Earle S T Report of Proctologic Literature Tr Am Proct Soc 1910 p 22

Irsigler F J Die Röntgenuntersuchung beim Mastdarmkrebs insbesondere beim Krebs des hohen Rektums Beitr z klin Chir 165 530 1937

Livingston E M A Clinical Study of the Abdominal Cavity and Peritoneum New York Paul B Hoeber Inc 1932 p 48

Schofield J D Verbal communication to the author December 1937

Yeomans F C in Blumer George Bedside Diagnosis, Philadelphia W B Saunders Company 1929 vol 1 pp 798 and 836

Yeomans F C Proctology New York D Appleton Century Company 1936 p 505

Feldner<sup>16</sup> Eusterman and Balfour<sup>20</sup>

16 Feldner cited by Yeomans F C Proctology New York D Appleton Century Company 1936 p 505

17 Melchior L Perirectal Carcinoma Ugeskr f Lager 82 231 (Feb 12) 1920

18 Handley W S Cancer of the Breast ed 2 New York Paul B Hoeber Inc 1922 p 234

19 Carnett J B Scirrhus Carcinoma of Breast with Extensive Metastases S Chin North America 7 7 (Feb) 1927

20 Eusterman G B, and Balfour D C The Stomach and Duodenum, Philadelphia W B Saunders Company 1935 p 103

21 Bacon H E Multiple Primary Malignancy of the Anus Rectum and Sigmoid Colon Report of Six Cases read before the American Proctologic Society San Francisco June 1938 The Anus Rectum and Sigmoid Colon Philadelphia J B Lippincott Company 1938 Bacon H E and Gilbert P D Sites of Metastases from Carcinoma of the Anus Rectum and Sigmoid Colon in a Series of 318 Cases read before the Proctologic Society Graduate Hospital of the University of Pennsylvania May 9 1938

22 Borrmann R Statistik und Casuistik über 290 histologisch untersuchte Hautcarcinome, Deutsche Ztschr f Chir 76 404 1905 Fenger Christian Double Carcinoma of the Colon J A M A 11 606 (Oct 27) 1888 Hoche L Du cancer gastrique secondaire Presse med 1 67 1901 Mangot R Multiple Carcinomata of the Rectum Tr N Soc London 50 121 1927

became engrafted on the ovaries in the latter Eusterman and Balfour<sup>20</sup> have said that apparently when the tumor reaches the gastric serosal layer, carcinoma cells are mechanically carried to the pelvis and there occasionally take root. This, however, while possible and highly probable, does not explain entirely the occurrence of an isolated metastatic pelvic deposit in the absence of other visible and palpable implants. In two instances sections of the smaller retroperitoneal lymphatic vessels in the lower dorsal and lumbar regions presented evidence of malignant invasion. Some investigators contend that lymphatic embolism and continuous permeation are commonly associated. Ewing<sup>23</sup> called it probable that the rapidly growing epidermoid and glandular carcinomas disseminate chiefly by lymphatic embolism, while the slowly growing and recurrent tumors often extend by continuous permeation. Retrograde flow through lymphatic and blood channels is a subject that always invites discussion. Organs in which there is a normal venous pulse or in which violent expiration or increase of intrathoracic pressure occurs

view that lymphatic permeation is a common process in the liver and that in other parts, especially the deeper or pelvic parts of the abdomen, lymphatic permeation may begin around implanted nodules. He differed, however, in expressing the belief that widespread lymphatic permeation may occur in the abdomen in the absence of implants.

A number of conditions may simulate a metastatic growth in the culdesac, and from these it must be differentiated. Among them should be mentioned adherent coils of small intestine and omentum encountered in certain types of peritonitis, especially the diffuse tuberculous variety, scybala in the small bowel, subperitoneal myoma, carcinoma of the sigmoid flexure prolapsing into the pouch, and chronic inspissated, partially encapsulated pelvic abscess in the process of organization, carcinoma of the upper pole of the prostate or of the posterior bladder wall infiltrating the rectum, loculated pelvirectal abscess, hypertrophied valve of Houston, endometriosis of the rectovaginal septum or distal part of the sigmoid flexure and extension from an ovarian or uterine malignant growth. No difficulty should arise in distinguishing primary rectal carcinoma except in rare instances in which the metastatic process infiltrates the rectal wall.

So far as prognosis and treatment are concerned, this sequence is of utmost importance in that it represents an advanced stage of the disease for which radical surgical measures are contraindicated. A palliative procedure, however, such as some type of enterostomy, may be performed according to the individual case.

#### SUMMARY AND CONCLUSIONS

Of seventeen patients with extrarectal metastatic malignant growth from remote sites, twelve were men and five women, thirteen were white persons and four Negroes. The ages ranged between 37 and 70, averaging 53 years. The stomach was the most frequent site of primary growth. As to type, sixteen tumors were adenocarcinomas and one was a sarcoma. Grading of the tumor was made in eight cases, four were of grade 4 and four of grade 3. In four cases the symptoms were suggestive of disturbance of the lower bowel.

In six instances the extrarectal metastatic process was diagnosed as a primary growth of either the rectum or the prostate. In five cases there was definite constriction of the rectum. In all seventeen cases the mucosa was devoid of fixation and ulceration.

Whereas in all cases in this series the disease was advanced, it must be realized that such metastasis may occur early and be the only extension. The condition is of importance in that it is not extremely rare, the symptoms may not direct attention to the primary site and the extrarectal process may be incorrectly diagnosed.

As a routine procedure careful palpation and visualization of the rectum in every case of suspected malignant growth are advocated.

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#### ABSTRACT OF DISCUSSION

DR. NEWTON D. SMITH, Rochester, Minn. On reviewing Dr. Bacon's paper one notes that many efforts have been made to explain the occurrence of the so called rectal shelf in cases in which the primary lesion is in some distant part of the body. Yet none have been universally accepted or demonstrated. An unsolved problem has been offered. The mechanical, physiologic and pathologic aspects of this problem are worthy of further study. The element of diagnostic error in this series of cases

#### Cases in the Literature

Author	Primary Site	No of Cases
Strauss (footnotes 1 and 2)	Stomach	3
Blumer <sup>13</sup>	Stomach	2
	Gallbladder	1
Orth <sup>7</sup>	Stomach	1
Kelly, H. A. and Burnam, C. F. Diseases of the Kidneys, Ureters and Bladder. New York: D. Appleton & Co. 1922 vol. 2 p. 264	Kidney	1
Schnitzler <sup>2</sup>	Stomach	10
	Pancreas	1
Kelling <sup>9</sup>	Stomach	1
Kappeler <sup>6</sup>	Stomach	5
Payr <sup>4</sup>	Stomach	1
Chiari <sup>8</sup>	Stomach	1
Handley <sup>18</sup> (p. 140)	Breast	3
Jackson <sup>14</sup>	Stomach	1
Carnett <sup>19</sup>	Breast	3
Keith <sup>24</sup>	Stomach	1
Toyosumi <sup>6</sup>	Stomach	1
Irving <sup>1</sup>	Stomach	1
Schofield <sup>15</sup>	Stomach	1
Meischor <sup>17</sup>	Esophagus	1
	Stomach	1
	Breast	1
		41

would be the most common sites. Occlusion of the main lymphatic or venous channels gives rise to disordered function, as a result of which retrograde flow, even though a slow process may supervene. Examples of retrograde venous and lymphatic flow have been cited by Heller, Bonome, Arnold, Ernst and von Recklinghausen, Vogel, Poncet, Most and Troisier.

Walther<sup>24</sup> believes that a large number of cases of alleged retrograde lymph node metastasis are instances of continuous dissemination, because in the majority of his cases he was able to demonstrate that diseased lymph nodes not in the vicinity of the primary growth represented regional metastases of an organ that had become involved by the hematogenic route.

Regarding carcinoma of the breast, Handley maintained that in nearly every case dissemination to the abdominal cavity occurs by transcelomic spread, the secondary deposits arising from gravitations of cancerous particles into the pelvis and that in the late stage the whole pelvis may be filled with cancer and its contents matted together. Carnett<sup>25</sup> concurred in the

<sup>23</sup> Ewing, James. Neoplastic Diseases. Philadelphia: W. B. Saunders Company, 1919, p. 77.

<sup>24</sup> Walther, H. E. Investigations on Cancer Metastasis. Ztschr. f. Krebsforsch. 46: 334 (Sept. 30), 1937.

<sup>25</sup> Carnett, J. B. (a) Malignant Metastasis Other Than to the Regional Lymph Nodes. Arch. Surg. 18: 811 (March) 1929. (b) Carcinoma of the Breast with Metastases to Lymph Nodes, Skin, Epicardium and Bones. S. Clin. North America (pt. 2) 7: 283 (April) 1927.

is a severe criticism. In more than 34 per cent there was an error in the early diagnosis. This error consisted of discovering the primary lesion and overlooking the rectal shelf or, conversely, discovering the rectal shelf and, assuming it to be a primary lesion, failing to search further for the real source. The importance of an extrarectal metastatic growth as a factor in determining prognosis and treatment seems undeniable in view of the cases reported by Dr Bacon. If this were not so evident, my second point would assume only academic importance. The seventeen cases reported reveal that the life expectancy of the patient in whom a rectal shelf is discovered on examination is usually not more than several months. Assuredly, with this evidence radical or curative surgical procedures are contraindicated and only that surgery should be attempted which is necessitated by the physician's effort to prolong life or relieve actual suffering.

DR WILLIAM H DANIEL, Los Angeles. These extrarectal metastases or implantations present definite problems as to diagnosis because in the majority of cases the rectal lesion is the first noticed and the symptoms from the primary lesion are so mild that they are overlooked by the patient. When the rectum is constricted by an annular or localized mass and the mucosa is not involved and cancer of the cervix or prostate is ruled out, carcinoma in the upper part of the abdomen must be considered. Of twelve cases of this type that I have seen, eight were diagnosed as of remote origin six of which were confirmed at operation and one was confirmed by x-ray examination of the stomach, two were discovered at operation, one was discovered at autopsy and one patient with only a tentative diagnosis died without confirmation. The primary lesion in ten cases was located in the stomach in two, the pancreas in two, the adrenal gland in one, the sigmoid in three and the ovary in two. One of the early cases (a man in his fifties) had been in the hands of several very good men. The patient's only symptom was mild intestinal and urinary disturbance. Primary carcinoma had been diagnosed by a cancer specialist and radium therapy was advised. Examination of tissue from the rectal wall and prostate was negative for carcinoma. At autopsy a small scirrhous carcinoma was found in the stomach. In a man of 21 the rectum was practically occluded by a large mass protruding into the anterior rectal wall. At operation implants were found from the bladder to the diaphragm. Tissue examination revealed teratoma of the adrenal. As a rule, biopsy from the rectal tissue does not show carcinoma, because only the superficial tissue is obtained. In ten of the twelve cases the infiltration of the rectal wall was annular and in two cases localized. In one of the cases of primary ovarian carcinoma a polyp at 4 inches in the rectum showed adenocarcinoma. Although these lesions are not of frequent occurrence, probably more would be found if a rectal examination were made in all cases of carcinoma of the abdomen. In my own experience only twelve secondary or extrarectal growths have been found as compared to 437 primary carcinomas. Treatment in these cases is at best only palliative.

DR HENRY L BOCKUS, Philadelphia. I am sorry that the audience has not been greater to hear Dr Bacon's paper, because I feel that there are a good many of us who are not familiar with Blumer's shelf. I say that advisedly, coming in contact with students from all over the country, very few of whom have heard of Blumer's shelf when they arrive. It is a rather important thing to know that in carcinoma of the upper part of the abdomen there are a few locations that one should go over rather carefully for the possibility of metastases. It is my routine to feel above the left clavicle, in the left axilla, not forgetting to go deep under the pectoralis muscle, where the so-called Irish node is located, carefully palpate the umbilicus for any suggestion of a malignant growth, feel along the margin of the right rib to eliminate a malignant condition of the liver and feel the rectum on the anterior wall for a nodule or hard fibrotic shelf with a soft velvety mucosa over it. That is a Blumer shelf and in 95 per cent of the cases that means malignant infiltration. Dr Bacon didn't mention another cause for such a shelf. I have reference to abdominal tuberculosis with secondary inflammatory changes and fibrosis. The incidence of Blumer's shelf in a malignant condition in the upper part of the abdomen is comparatively rare. I believe there are not more

than two or three in a graduate hospital each year, but in a service at the Philadelphia Hospital, which I believe Dr Bacon has, I believe many more would be found, because in the last stage of this condition Blumer's shelf is not too infrequent. I should like to mention another fact and that is that Blumer's shelf may constitute the first lead to a correct diagnosis. Any patient in whom a malignant growth is suspected should have a careful rectal examination to eliminate Blumer's shelf. Most of my patients in whom a shelf was palpated through the rectal wall have come with a diagnosis of cancer of the rectum.

DR A H AARON, Buffalo. When one realizes that about 60 per cent of all the malignant lesions of the large intestine are within the reach of the examining finger and there is no field of malignancy that offers such great prognostic value as to cure it is evident that this should be a routine measure in physical examinations. As to the various metastatic nodes, such as the Ewald node in the left supraclavicular region, Irish's node in the axilla and Straus's shelf (Blumer) in the pelvic floor, a better term can be applied, they are sentinel nodes, outposts demonstrating the presence of a malignant condition elsewhere in the body.

DR HARRY E BACON, Philadelphia. I am appreciative of this discussion. Dr Bockus is quite right in saying that Blumer's shelf is found invariably in the late cases. Age, however, does not seem to play a great part.

## A NEW AND FUNCTION-RESTORING OPERATION FOR BILATERAL ABDUCTOR CORD PARALYSIS

PRELIMINARY REPORT

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In presenting a new operation for the relief of bilateral cord paralysis, it seems fitting first to discuss the general principles involved in operations previously done for that purpose. All previous attempts to relieve the condition can be classified under four general headings.

This discussion is limited to a consideration of those bilateral recurrent nerve paralyses which follow operations for goiter. I have made no study of postdiaphragmatic paralyses or those that occur as a part of the picture of progressive bulbar paralysis.

1 Permanent tracheotomy with insertion of a tube or with suture of the skin to the incised edges of the trachea so as to leave a permanent opening.

2 Nerve suture. The following nerves have been anastomosed to the distal portion of the injured recurrent nerve: (a) the proximal portion of the recurrent nerve, (b) the descendens noni, (c) the roots of the spinal accessory nerve and (d) the phrenic nerve.

3 Cordotomy or cordectomy either by punch operation or by laryngotomy with excision of one cord. This group of operations includes ventriculocordectomies, of which there are many modifications.

4 Cord displacements. These include all operations which are designed to displace one cord in a fixed outward position. Attempts have been made to split the thyroid cartilage and separate the anterior ends of the vocal cords by interposition of a piece of bone or cartilage. Others seat the anterior end of one cord in an outward position on the thyroid cartilage. Another creates a fixed outward displacement of one arytenoid cartilage.

No one of these operations has been productive of satisfactory results. The object of any operation should be to restore the functions of phonation and respiration.

Many of those devised were doomed to defeat in one or both of these objectives because of the very nature of the method chosen for attacking the problem. A brief discussion of the foregoing groups of operations will aid in a better understanding of the one subsequently described.

Tracheotomy has functioned more uniformly and satisfactorily than any other method. No one wants to wear a piece of plumbing in his windpipe, and at best a tracheotomy tube is a nuisance, though many patients are grateful for the relief so obtained. The desire to get away from the tracheotomy tube has been the father of all operations devised for the relief of bilateral abductor cord paralysis. That holds for the one herein described.

Nerve anastomosis would be ideal were it possible of success, as it would restore the functions of both phonation and respiration. Charles H. Frazier,<sup>1</sup> Sir Charles Ballance,<sup>2</sup> Frank H. Lahey<sup>3</sup> and others have written on the subject, but so far the results reported do not justify the adoption of that method of treatment as a standard procedure. For reasons later to be discussed, nerve suture will probably fail to secure good functional results even though nerve pathways are reestablished.

Cordotomies, cordectomies and cord displacements all have the same objections. It is not possible to alter permanently the position or physical structure of a vocal cord without creating a permanent change in the tone and quality of the voice. One might as reasonably remove the strings from a violin and replace them with hemp rope and expect it to produce the same tone and quality of sound as to cut out a vocal cord and expect the patient so deprived to speak in a normal manner. Sufficient air may be gained, though it is of necessity gained at the expense of the voice.

The operation I have developed is a new approach to the subject. The idea was borrowed from the procedures and practices of orthopedic surgeons. In principle it is based on the methods they use in dealing with motor nerve paralyses, whether they are of traumatic, toxic or infectious origin. I saw such surgeons transpose the tendons of functioning muscles to replace those of paralyzed muscles in the feet of children who were the victims of infantile paralysis. Some of those children were greatly benefited. The idea occurred to me that the same principle might be applied to the paralyzed vocal cords. This new approach is simple in its mechanics, physiologic in principle, and, furthermore, has worked with the patients operated on.

In order to understand it comprehensively, one must have a general knowledge of the mechanics of the larynx, its anatomy and all its functions as to both respiration and phonation, plus a knowledge of its action during deglutition.

The suprahyoid and infrahyoid groups of muscles are intimately concerned in all the functions of the larynx. Therefore a knowledge of them, their actions and their nerve and blood supply is also important. (Negus's<sup>4</sup> monograph more comprehensively covers

laryngeal function than anything else in medical literature.) Briefly, the suprahyoid muscles pull the larynx upward during the act of swallowing. These muscles are the digastric, geniohyoid, geniohyoglossus, mylohyoid, stylohyoid and middle constrictor of the pharynx. Opposing that group is the infrahyoid group, comprising the sternohyoid, sternothyroid, thyrohyoid and omohyoid. Their function is to counter the action of the suprahyoid group and to pull the larynx downward, partly as an aid in swallowing after the food bolus has entered the esophagus. Also they hold the larynx down and slightly depress it during inspiration. The mechanism of the larynx, which prevents foreign substances from entering it during swallowing, operates simultaneously with the suprahyoid group.

It is interesting that the suprahyoid and infrahyoid groups of muscles are both voluntary and involuntary in their actions. One swallows and breathes voluntarily, one also swallows and breathes involuntarily.

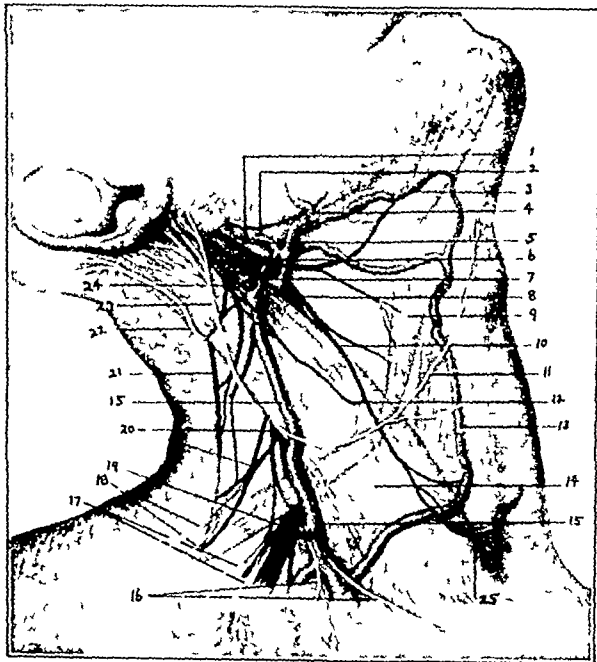


Fig. 1—Nerve supply to the omohyoid muscle. (Figures 1 and 2 are reproduced from Callandar C. L. *Surgical Anatomy* Philadelphia, W. B. Saunders Company, 1933.) 1 ramus marginalis mandibulae nervi facialis 2 vena facialis posterior 3 ramus submentalialis 4 vena facialis anterior 5 nervus hypoglossus 6 vena auricularis posterior 7, vena facialis communis 8, vena jugularis interna 9 musculus omohyoideus 10 ramus descendens nervi hypoglossi 11 nervus cutaneus colli 12 nervus ansa hypoglossi 13 vena jugularis anterior 14 musculus sternocleidomastoideus 15, vena jugularis externa 16 nervi supraclaviculares anteriores 17 nervi supraclaviculares medii 18 nervi supraclaviculares posteriores 19 plexus brachialis 20 trunks of supraclavicular nerves 21, ramus externus nervi accessorii 22 nervus occipitalis minor 23 nervus auricularis magnus 24 nervus cervicalis III 25 arcus venosus jugularis

The function of the omohyoid muscle is opposition to the suprahyoid group. This muscle also assists in depressing the hyoid bone and larynx on inspiration. It therefore contracts automatically on inspiration as a part of its involuntary function. Gray<sup>5</sup> stated that "the omohyoidei not only depress the hyoid bone, but carry it backward and to one or the other side. They are concerned especially in prolonged inspiratory efforts."

The success of the operation herein described is primarily due to the previously developed habit of this muscle to contract automatically during inspiration.

5 Gray, Henry. *Anatomy of the Human Body*. Philadelphia: Lea & Febiger, 1924.

1 Frazier, Charles H. *Anastomosis of the Recurrent Laryngeal Nerve with the Descendens Nervi*. J. A. M. A. 83: 1637 (Nov. 22) 1924.

2 Ballance, Sir Charles and Barnes, E. B. *Anastomosis of Recurrent Laryngeal Nerves to Phrenic Nerves. Some Recovery of Function*. Brit. M. J. 2: 158 (July 30) 1927. Ballance, Sir Charles. *Results Obtained in Some Experiments in Which the Facial and Recurrent Laryngeal Nerves Were Anastomosed with Other Nerves*. Brit. M. J. 2: 349 (Aug. 30) 1924.

3 Lahey, Frank H. and Hoover, Walter B. *Injury to Recurrent Laryngeal Nerve in Thyroid Operations*. Ann. Surg. 108: 545 (Oct.) 1938.

4 Negus, V. E. *The Mechanism of the Larynx*. St. Louis: C. V. Mosby Company, 1929.





there is danger of injury to the internal division of the superior laryngeal nerve. At the inferior cornu there is danger of injury to the external division of the same nerve. Along the border of the thyroid cartilage are to be found the attachments of the inferior constrictor of the pharynx. These fibers must be cut. The esophagus is then exposed. The wall of the esophagus in the region immediately behind the larynx does not appear to contain either circular or longitudinal fibers, and care must therefore be exercised in separating it from the posterior surface of the cricoid cartilage.

The arytenoid cartilages articulate with the cricoid on its posterior and outer borders. They, with the cartilages of Wrisberg and Santorini, act like corset stays in a rather thin wall that separates the openings of the larynx and esophagus. The arytenoid cartilages sit on a facet-like joint and extend upward for about one-half inch. The esophagus must be separated from the posterior spinous border of the arytenoid cartilage. In this dissection, one must be careful to avoid making an opening into either the esophagus or the larynx. The muscular process of the arytenoid cartilage will be exposed in this maneuver. Immediately beneath the muscular process is the facet-like joint. This, like any joint that has been immobilized for years, is stiff and its ligamentous capsule contracted. I have found it advisable to mobilize the arytenoid cartilage by cutting the ligamentous capsule of its joint on three sides, the mesial, the outer and the posterior, the last of which also divides the atrophic fibers of the crico-arytenoideus posticus muscle.

The posterior border of the arytenoid cartilage is then scraped clean and the cuffed end of the omohyoid attached to it by silk sutures which pass through both the muscle and the arytenoid cartilage. In the aged, the cartilages of the larynx become ossified, rendering it difficult to pass a needle through the arytenoid without fracturing the cartilage. This occurred in the second case here reported. It is interesting to note that this patient secured the best result of any on whom the operation has been performed.

The cut fibers of the inferior constrictor of the pharynx are then sutured. This leaves the omohyoid passing through an aperture in the inferior constrictor. The platysma is closed with two or three interrupted catgut sutures and the skin with clips.

#### COMMENT

When the idea of this operation was first conceived, I thought that it should be applied to only one cord. This conclusion was based on the fact that patients with one cord paralyzed generally do not suffer much disability in either phonation or respiration. The paralyzed cord usually comes to rest in or near the midline position, which is the position of phonation. The opposite cord is thus able to approximate it on phonation and also open the larynx on respiration. If sufficient airway has been obtained by operating on one cord, there is no occasion to repeat the operation on the opposite cord. If for any reason the desired result is not secured in a given case there can be no objection to operating on the opposite side.

Examinations of the second patient on whom this operation was performed revealed some very interesting results. The operation was done on the left side. Two weeks later the left cord was observed to open automatically on inspiration. Furthermore, there was some capacity to adduct the cord at that time. At the end

of seven weeks there was sufficient abduction of the cord to permit the removal of the tracheotomy tube. The patient can adduct the cord as well as the normal person. It is more than three months since the omohyoid was transposed to the arytenoid cartilage. The tracheotomy wound has been closed for a month. The patient can talk and breathe practically as well as the normal person, has gained 16 pounds (7 Kg) and states that she can now comfortably eat and breathe at the same time. Her cords are easily visualized with a laryngeal mirror.

It is easy to understand her capacity to open the cord, but the ability to adduct it is a point about which there may arise a difference of opinion. I am of the

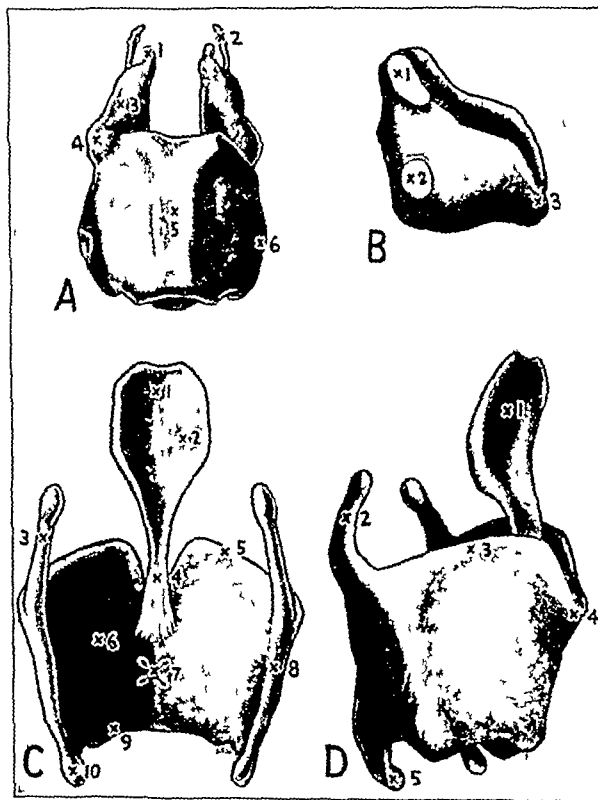


Fig. 4.—A posterior view of cricoid and arytenoid cartilages. 1 cornu late cartilage, 2 cuneiform cartilage, 3 arytenoid cartilage, 4 muscular process of arytenoid cartilage, 5 median ridge posterior surface of cricoid cartilage, 6 lateral view of cricoid cartilage. B lateral view of cricoid cartilage (note wide posterior portion making a completed ring). 1 facet for articulation with arytenoid cartilage, 2 facet for articulation with lower horn of thyroid cartilage, 3 anterior part of cricoid ring, 4 thyroid cartilage from behind showing interior surface, 5 epiglottis, 6 pits for glands in epiglottis, 7 superior cornu of thyroid cartilage, 8 ligament of epiglottis, 9 superior rim, 10 inferior surface of thyroid cartilage, 11 site for anterior attachment of true and false vocal cords. C posterior margin of cartilage, 9 inferior margin, 10 inferior cornu. D, lateral view of thyroid cartilage. 1 epiglottis, 2 superior cornu, 3 superior margin, 4 notch of thyroid cartilage, 5 inferior horn.

opinion that neither the interarytenoideus muscles nor the intrinsic muscles of the cord are necessary to produce adduction and tension of the cord under the conditions prevailing in this case. Evidently the faculties of adduction and tension of the cord are produced in this instance by the cricothyroid muscles, which are supplied by the superior laryngeal nerves, plus the contracted interarytenoideus fascia. However, the cricothyroid muscles are not capable of producing adduction or tension of a cord that has recently been paralyzed. This difference in action is presumably due to the fact that with recent nerve injury the cord is flaccid while with an old injury it is taut and contracted, so that when the cricoid cartilage is tilted backward,

further tension on the cord shifts it into the midline (fig 3) Stridor, which was pronounced in this case prior to operation, is entirely absent, even on deep inspiration The patient's family states that prior to the operation during sleep she disturbed the entire household with the most terrifying choking noises and that she now sleeps without noise

Patients who are wearing tracheotomy tubes are in one sense ideal for the operation of muscle transposition, as the presence of the tracheotomy tube eliminates the first stage For reasons to be mentioned later, long-standing bilateral paralysis presents a different problem from recent paralysis In recent paralysis the cords are in an outward position, with the arytenoid cartilages widely separated This state prevails only for from three to six months In long-standing paralysis, the cords are contracted and shortened The interarytenoid muscles and fascia have become contracted and the arytenoid cartilages drawn much closer together than in recent paralysis

I have not seen an adequate or accurate description of the composite picture of the glottis the larynx, the aryepiglottic folds, the arytenoid cartilages and the vocal

in comparison with normal larynges It is apparent by the simple observations made with an ordinary laryngeal mirror There is considerable variation in normal human larynges For example, the male adult larynx is from 8 to 10 mm greater in its average anteroposterior diameter than the adult female larynx

With the idea of trying to get a better composite picture of all the changes that occur in the larynx after

bilateral recurrent nerve paralysis, I recently examined the larynges of five patients There is an apparent narrowing of the lateral diameter of the larynx The arytenoid cartilages are fixed in close approximation and lean more forward than normal The entire glottic opening seems more oval than in the normal larynx The sphincteric mechanisms of the larynx (the component parts of the mechanism of the so-called epiglottic reflex) are all seen to be in a contracted state This mechanism is made up of the epiglottis, the aryepiglottic folds, the arytenoid cartilages, and the interarytenoid fascia and muscles, combined

with the false and true cords These structures act as a sort of elastic cuff surrounding the opening of the larynx They are a portion of the defensive mechanism which protects the larynx against the entrance of foreign substances In conjunction with the suprahyoid muscles, which draw the larynx up behind the base of the tongue, they act to close the larynx during deglutition The epiglottis does not close the larynx like a trap door It is only one of several structures that protect the larynx during the act of swallowing

Thinking in terms of what happens in motor nerve paralysis of the extremities, one has only to go back to the initial symptoms of bilateral recurrent nerve paralysis in order to predict accurately what is ultimately going to develop in the larynx

The initial symptoms of bilateral recurrent nerve paralysis are loss of voice and loss of epiglottic reflex The former means paralysis of the muscles of phonation and the latter paralysis of the muscles of the defensive mechanism of the larynx The patient can only whisper, and any effort to swallow fluids results in a portion of the fluid entering the larynx, it is immediately expelled and effort to swallow is temporarily abandoned



Fig 6—Posterior view of larynx and upper part of trachea Some of the intrinsic muscles are shown A study of these muscles their attachments and the laryngeal cartilages will give a good understanding of the muscular function 1 epiglottis running downward and backward from which on either side is the ary epiglottic ligament (the little swellings on this ligament indicate the position of the cuneiform and corniculate cartilages) 2 superior cornu of thyroid cartilage 3 inner surface of thyroid cartilage 4 4 cricothyroid muscle showing different direction of its fibers 5 posterior surface of cricoid cartilage 6 cricoarytenoid muscle 7 upper tracheal rings



Fig 5—Anteroposterior section of larynx showing left half Mucosa has been removed from muscles The superior and recurrent laryngeal nerves are shown supplying the internal muscles 1 superior laryngeal nerve 2 external branch 3 internal branch 4 superior horn of thyroid cartilage 5 main branch of internal laryngeal nerve 6 epiglottis 7 8 corniculate cartilage 9 cut edge of thyroid cartilage midline 10 10 cricothyroid muscle 11 branch of recurrent nerve entering arytenoid muscle 12 section of esophagus behind cricoid cartilage 13 13 rings posterior 14 recurrent laryngeal nerve A branch of recurrent laryngeal nerve is shown entering cricoarytenoid muscle Immediately above the cricoarytenoid muscle the recurrent nerve enters the thyroarytenoid muscle and just above the latter it enters the thyroarytenoid muscle Only the external branch (2) of the superior laryngeal nerve enters any muscle All other branches go to the mucosa and are cut off as shown The recurrent nerve (14) supplies all the intrinsic muscles except the cricothyroid (10)

cords such as exists in cases of long-standing bilateral recurrent nerve paralysis It can readily be demonstrated by motion pictures of the larynges in such cases

If a patient dies in the first few days following such injury, death is usually due to drowning in his own secretions or to pneumonia of a foreign substance type. The defensive mechanism of the larynx returns to function more quickly than that of phonation. It is more primitive in origin and also is aided by the suprahyoid group of muscles, which are not affected.

These symptoms can have only two interpretations. 1 There is paralysis of the muscles of phonation. 2 There is paralysis of the laryngeal defensive mechanism, the inevitable consequences of which are (a) flaccid paralysis, (b) atrophy, (c) fibrosis and (d) contractures. That is exactly what happens in both the vocal and the defensive mechanisms and that is why the term bilateral abductor cord paralysis does not fit the situation.

The arytenoid cartilages are the gates that open and close the larynx. They act as sliding doors in the cleft that surrounds the laryngeal orifice. Furthermore, they have attached to them the vocal cords, which open and close with the gates. If one thinks of this sliding door effect as operating on a circular base like a roll top desk, the picture becomes more clear. In long-standing bilateral nerve paralysis, they have become locked together by the interarytenoid muscles and fascia, which have become contracted as a part of the general contractures that take place in all the elements of the sphincteric mechanism of the larynx. Not only that, but the base on which the sliding doors operate has become rusted and frozen, so to speak.

As a result of this locking together of the arytenoid cartilages, I have noticed a tendency in the first and third patients operated on for both cartilages and both vocal cords to be drawn to the same side by the pull of the omohyoid muscle. This condition of affairs presented a problem that I had not foreseen. Incidentally, it is a problem that the advocates of nerve suture have not foreseen. Even if nerve regeneration were to take

This is a purely mechanical problem and one that must be solved by purely mechanical principles. With long-standing paralysis one must consider doing a reconstruction of the glottic opening. If the sliding gates of a barnyard are tied together with rope, the simplest method of dealing with the problem is to cut the rope. The same thing can be done with the interarytenoid muscles and fascia. If the track on which

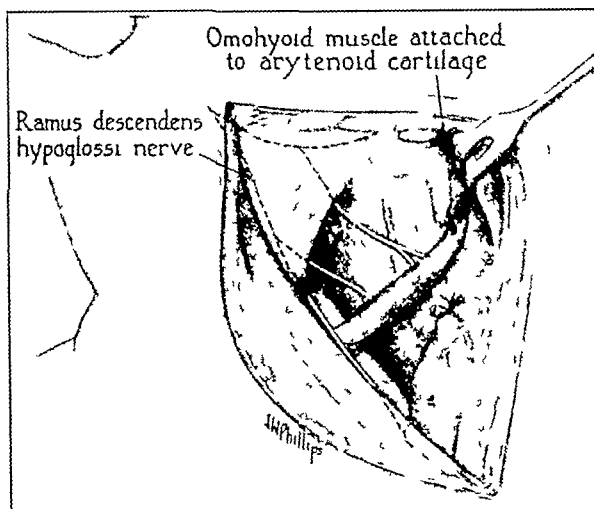


Fig 8—The omohyoid muscle attached to the arytenoid cartilage

those gates slide has become rusty and the wheels are frozen, it must be cleaned and oiled. If the capsule surrounding the crico-arytenoid joint has become contracted and the joint frozen, it must be divided to permit the cartilage to slide outward.

After the interarytenoid muscle and fascia have been divided and the joint capsule severed, it would seem important to displace temporarily the arytenoid cartilage outward as a means of preventing the recurrence of contracture by new-formed scar tissue. This can be accomplished by drilling a hole in the posterior border of the thyroid cartilage at the proper level and then passing a chronic catgut suture through this hole and through the arytenoid cartilage. When this suture is tied, it will temporarily anchor the arytenoid cartilage in an outward position. During the period required for the absorption of the catgut suture, opportunity is provided for the omohyoid to take over the task of future abductions of the cartilage. The operation of the foregoing ideas is somewhat speculative. If proper care is exercised in putting these suggestions into effect, no harm can be done. I believe it quite possible that better results may be obtained by following them. The omohyoid is a much stronger muscle than the crico-arytenoid posticus and therefore can exert more powerful pulls on the cartilage.

In cases of recent recurrent nerve paralysis, the arytenoid cartilage is found to be in an outward position. The cord is also in an outward position, and the sphincteric mechanism of the glottis has not become contracted. If the foregoing reasoning is rational, it would seem that the ideal time for muscle transposition is as early as possible. The idea is to get the omohyoid into operation before contracture has taken place. In cases of peripheral nerve lesions, orthopedic surgeons begin at once to apply counter measures to prevent contractures. Those methods are splinting in positions of function and passive motion. There is no conceivable means of applying splinting or passive motion to the

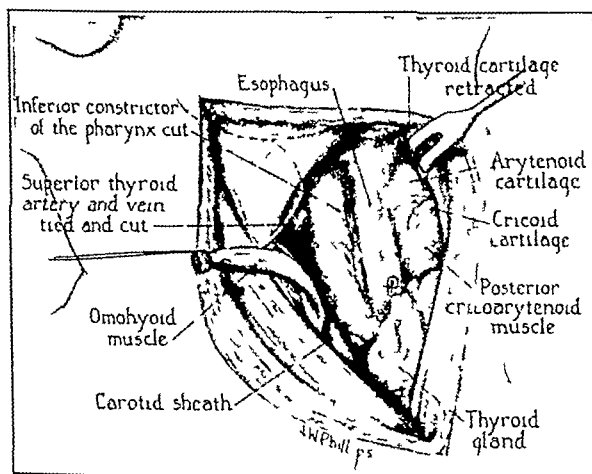


Fig 7—The inferior constrictor of the pharynx cut and the superior thyroid artery and vein tied and cut

place following nerve anastomosis, this problem would still be present, and it is improbable that the crico-arytenoid posticus muscles could develop strength enough to deal effectively with it. Nerve regeneration could not be expected to take place in less than six months and probably would not occur in less than one year. It is in that period that the fatal contractures enumerated take place.

muscles of the larynx. Therefore the question of time becomes tremendously important in dealing with motor nerve injury to the larynx. Motor nerve injury to the muscles of the larynx is no different in fundamental principle from motor nerve injury to the muscles of the arm, leg or other part. The principles that have proved helpful in the one should be beneficial in the other.

Every surgeon is familiar with the course of events following peripheral motor nerve paralysis. It is the

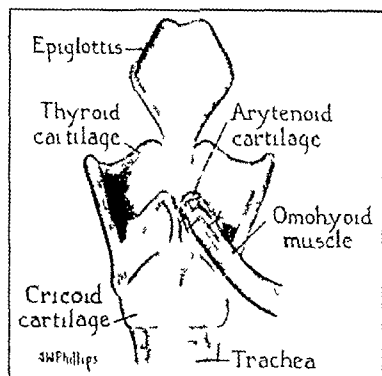


Fig. 9—Procedure in cases of early involvement reconstruction features omitted

same in all motor nerve paralyzes. At first there is flaccid paralysis of the muscles and loss of power to contract and then atrophy, fibrosis and contracture. This is exactly what happens in the larynx. The term bilateral abductor cord paralysis is in reality a misnomer. It does not describe the conditions prevail-

ing in the larynx. The surgeon has been accustomed to examining the vocal cords while forgetting the other structures in the larynx.

In the operation I have devised, effort has been made to follow as closely as possible recognized orthopedic procedures for the treatment of peripheral motor nerve paralysis. In the proposed plan of reconstructing the larynx in cases of long-standing paralysis and contractures, the methods of orthopedic surgeons have been modified only to fit different circumstances. In cases of old or neglected paralysis they divide stiff joint capsules, forcibly stretch others, cut contracting bands of fibrous tissue and splint extremities in positions of best function.

In dividing the crico-arytenoid joint capsule and in cutting the contracted interarytenoid muscles and fascia, the same methods are used. In drilling a hole in the border of the thyroid cartilage and passing a catgut suture through it and through the arytenoid cartilage and tying it tightly enough to displace the cartilage outward, I am simply applying a temporary splint which will suffice to hold it in a position of respiratory function while the omohyoid is becoming attached in such a position that it will exert passive motion with each inspiration as long as the patient survives. The splint is absorbed in two weeks.

Immediate nerve suture is recognized as a correct course in cases of severed peripheral motor nerves. For the reasons previously mentioned, for the reason that complete restoration of function is seldom or never obtained, for the reason that the recurrent nerve is small, difficult to find and difficult to suture and for the additional reason that the recurrent nerve is supposed to carry adductor and abductor fibers in two separate cords within its sheath, proper hook-up of neurons is a remote possibility. Undoubtedly in these reasons is to be found the answer to the high percentage of failures following nerve suture.

In a case of recent bilateral nerve paralysis, what should be done? In the past the surgeon has sat on the sidelines and hoped and prayed a sort of sick-at-the-stomach prayer that in a few days or weeks everything

would be all right. He has been delighted when in a few weeks the patient's voice began to return, only to sink to the depths of despondency when faced with the full facts of what has taken place.

From observations on the patients for whom muscle transposition has been done, I believe that the earlier it is done the better chance there is for a satisfactory result. It should require only a few days to determine whether or not real injury has occurred to both recurrent nerves. Just as soon as a decision can be made, a tracheotomy tube should be placed in the trachea, and as soon thereafter as is feasible muscle transposition should be effected. If the operation is done within the first three or four months following paralysis, reconstructive features should not be necessary, as contractures of a serious nature will not have developed. The omohyoid does not have to be trained to contract during inspiration. It does so automatically.

Occasionally nerve paralysis is only temporary. If, however, it is bilateral and has not cleared in two or three weeks and if stridor is present, the probability of recovery's taking place is quite remote. An experienced laryngologist could, in a majority of instances, predict with considerable accuracy what the course would be. Thus unnecessary operations could be avoided. Many operations for paralysis of the vocal cords must be performed in order for the surgeon to perfect a technic. Each case must be studied carefully prior to operation. The plan herein proposed for relatively recent involvement, plus the reconstructive features, should be applicable to all.

No one should undertake this operation without first acquiring an accurate knowledge of the anatomy involved. I suggest that any one who wishes to undertake it first go to an anatomic laboratory and do it, not once but several times. Don't send an assistant to the laboratory to learn the anatomy for you unless you plan to let the assistant perform the operation. No substitute for normal anatomy can be expected to function as well as normal anatomic structures. As a general

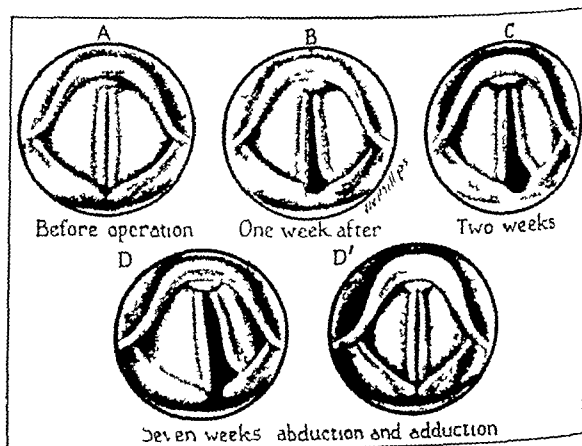


Fig. 10 (case 2)—The vocal cords in action

rule, in doing reconstructive operations the closer one approaches normal functions the better are the results obtained.

I have studied about twenty cases of bilateral recurrent nerve paralysis but have not had an opportunity to follow any case from its inception. I examined one patient the day following bilateral nerve injury. She died the following day from diabetes and hyperthyroid crisis. The cords were in the cadaveric position. The

arytenoid cartilages were widely separated and yet she had stridor and loss of function of the defensive mechanism of the larynx.

Prior to examination in the other cases, the paralysis had existed from six months to seventeen years. The twenty patients will be grouped into three classes on the basis of what I have seen, not what I have read.

1 A group in whom the cords are so contracted and closely approximated that tracheotomy has been necessary in order to prevent suffocation.

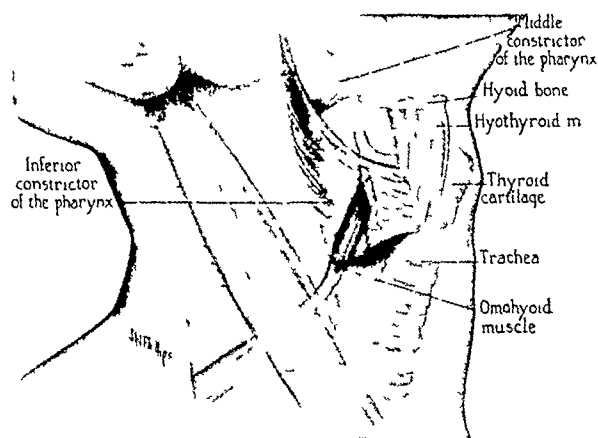


Fig 11—The new position of the omohyoid at the close of the operation

2 A group in whom the cords are also closely approximated but who are able to survive by leading very inactive lives.

3 A group in whom the cords do not come to rest in a midline position but about halfway between the positions of phonation and respiration.

In the third group, I have seen two patients. They could speak fairly well. The voice was a bit husky and monotonous. They could get sufficient air for ordinary activities. It is probable that some laryngologists would classify their condition as partial paralysis. Both have sufficient airway to lead ordinarily active lives, and both have very slight adduction and abduction of the cords. Both have stridor and also respiratory embarrassment on exertion. Both had thyroidectomy followed by the usual symptoms of bilateral nerve paralysis, namely, complete loss of voice, inspiratory stridor and loss of epiglottic reflex, there was gradual improvement in the voice after several weeks, and as the voice improved dyspnea and stridor became more pronounced. It is difficult for me to conceive of an equal degree of bilateral partial nerve paralysis occurring as the result of surgical trauma. Therefore I classify them as having complete paralysis without the usual degree of contractures.

I am of the opinion that the entire conus elasticus is immediately involved in the flaccid state that follows the injury. The opinion is based on observations on the only patient I have seen within forty-eight hours after paralysis occurred. Her stridor was of a different quality from that in cases of old involvement. It was more fluttery, a sort of flapping in the breeze, so to speak, and not the high-pitched crowing sound that is present with old involvement. With a mirror, the cords were observed to be flaccid and widely separated and the entire lining of the larynx seemed to vibrate on inspiration.

This opinion is supported by the fact that the muscular fibers of the conus elasticus are derived from

external division of the thyro-arytenoideus muscle, as are the muscular fibers of the membrana quadrangularis (fig 12), as shown by Negus.<sup>4</sup> It follows that the conus and membrana quadrangularis are involved in the flaccid state. The muscular fibers of these structures, being offshoots from the thyro-arytenoideus, are likewise supplied by the recurrent nerves.

It is probable that in the instances in which obstructive dyspnea has developed on the operating table immediately after bilateral paralysis, it has been due to the relaxed conus folding on itself, a sort of modified intussusception during strong inspiratory effort, rather than to contractures of the cords. The latter could not take place.

The musculus aryepiglotticus (fig 13) are offshoots of the interarytenoideus muscle. They contract in unison or as a part of the contractures of that muscle during both deglutition and phonation. These muscles are likewise supplied by the recurrent nerves. It is thus apparent that all the muscular structures of the larynx that are concerned in the acts of phonation and deglutition will be involved in, first, the flaccid state and, ultimately, the contracted state which follows bilateral recurrent nerve paralysis.

#### REPORT OF CASES

Three patients have been operated on with the method described. The complete technique of laryngeal reconstruction has not been used in any case, although a rather close approach to it was used in the second case. It has been worked out on the cadaver and will be tried and the results will be reported at a future time.

CASE 1—Sister B, aged 42, who was operated on for exophthalmic goiter in 1921, had a loss of voice, which lasted a few months, and then shortness of breath and stridor, which persisted. Exercise caused marked respiratory embarrassment. She lost weight, and eating was difficult because of shortness of breath.

In 1933 she had a recurrence of the goiter, which was removed. She did not gain satisfactorily after the operation.

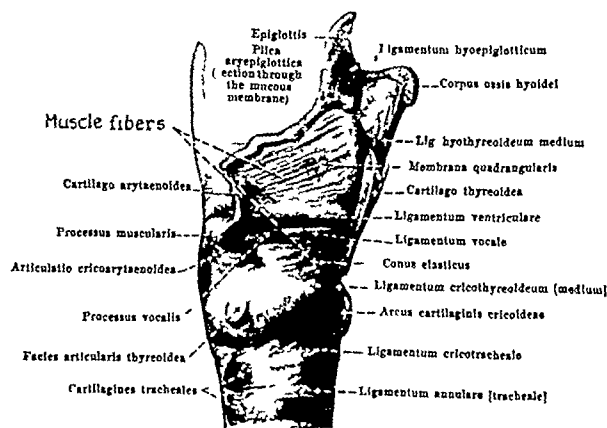


Fig 12—Note particularly the muscle fibers of conus elasticus and membrana quadrangularis. In recent paralysis these membranes are flaccid later they are involved in the contractures. (Figures 12 and 13 are from Spalteholz, Werner, Hand Atlas of Human Anatomy Philadelphia J. B. Lippincott Company, vol. 3.)

and in the past two years dyspnea had increased and stridor become more pronounced. Stridor was pronounced during sleep.

The patient was small, weighing 100 pounds (45 Kg). The pulse rate was 84, the heart and lungs were normal and the blood pressure was 132/76. The vocal cords were difficult to examine but were fixed in the midline position. Stridor was pronounced on inspiration. Physical examination revealed no other abnormalities.



Operation was performed July 20. One-fourth grain (0.016 Gm) of morphine and  $\frac{1}{150}$  grain (0.0004 Gm) of atropine were given one hour before operation. Nitrous oxide and oxygen anesthesia was used. The patient's condition immediately became so alarming, stridor so pronounced and cyanosis so marked that the trachea was exposed for the purpose of inserting a tube. The patient's condition improved somewhat, and tracheotomy was postponed for the last step, as opening

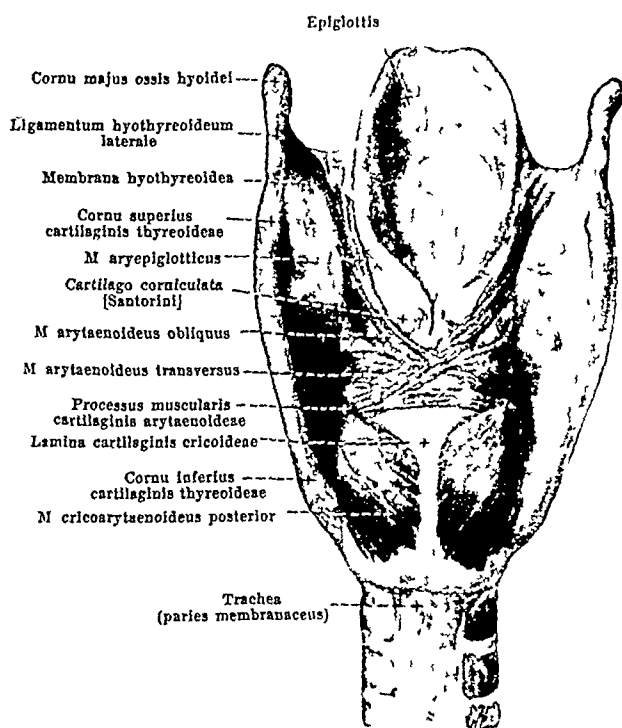


Fig. 13—Note that the musculus aryepiglotticus is an offshoot of the interarytenoid muscle.

the trachea would increase the chances of infection in the wound. At the close of the operation, the trachea was opened and a number five tube inserted.

For two reasons this was not a satisfactory surgical experience. 1. Inhalation anesthesia had proved dangerous and unsatisfactory. 2. The tracheotomy wound naturally became infected and exposed the adjacent wound to infection. It was therefore decided to seek a more satisfactory type of anesthesia and that no other patient would be operated on without a preliminary tracheotomy.

In the two subsequent operations, pentothal sodium (sodium ethyl [1 methyl butyl] thiobarbiturate) was used intravenously. It produced satisfactory surgical anesthesia. It has an additional advantage in that the anesthetist's equipment is far removed from the operative field. I have considered using local anesthesia. It would offer opportunity to observe the action of the omohyoid muscle on the arytenoid cartilage. It is a most intriguing thought. I have been afraid to undertake its use because of fear that the manipulations of the larynx would set up paroxysms of coughing, under which circumstance one could not work. Also I fear the possibility of a blowout in the uncovered portion of the esophagus during such paroxysm.

The postoperative course of this patient was uneventful. Six weeks after operation she expressed a desire to be rid of the tracheotomy tube, stating that when she placed her finger over the opening in the tube she could breathe through her mouth much more easily than prior to the operation. The tube was removed, and the wound closed in a few days. She taught school half days during November and December 1938. On the

opening of school in 1939 she took a full day's work in a grade school. She has gained 9 pounds (4 Kg), can go for a two hour walk without fatigue or respiratory embarrassment, has a good speaking voice, and except for a slight inspiratory stridor, which still persists, one would not casually be aware of any abnormality.

On account of an extremely sensitive gagging reflex, it has been difficult to examine her cords satisfactorily. By training this difficulty has been overcome to a degree where the opening and closing of her left cord can be observed (the omohyoid was attached to the left arytenoid cartilage). More symptomatic improvement has occurred during the month of December than in any other month following the operation.

CASE 2—Mrs. S., aged 73, who was operated on for goiter eleven years before, had lost her voice except for a whisper for several months. When it began to return, difficulty in getting her breath developed. As the voice became stronger, respiration became more difficult. For the past ten years she had been more or less of an invalid. Going upstairs or up a slight grade was a laborious task on account of shortness of breath, and during the past year the symptoms had become worse. She had gradually lost 32 pounds (14 Kg) and stated that it was difficult to eat and breathe at the same time.

The patient was of poor color and poor nutrition. The eyes were normal, the teeth artificial and the tonsils normal. A pyramidal lobe  $1\frac{1}{2}$  inches long and one half inch wide, freely movable and extending up to the hyoid bone, was present. Pulsations in the carotid vessels were normal. In breathing there was the typical sound made by tracheal obstruction. The heart and lungs were normal. There was no tremor. The vocal cords were fixed in the midline position. The blood pressure was 142/70. Fortunately the vocal cords were easily visualized. They were contracted to almost complete approximation in the resting state and separated by a very narrow aperture on inspiration. She had marked stridor.

She was admitted to the hospital June 30, 1938. July 2 at 7 a. m. she was given one-fourth grain (0.016 Gm) of morphine and  $\frac{1}{150}$  grain (0.0004 Gm) of atropine hypodermically. She arrived in the operating room at 8 a. m. in such an extreme state of respiratory embarrassment with cyanosis and pronounced increase in stridor that tracheotomy was immediately done with local anesthesia and she was returned to her room. She went home on the fourth day. In two months she returned, her weight having increased from 113 to 129 pounds (51 Kg to 58 Kg) simply because she was able to eat and breathe at the same time.

The steps as previously described were carried out. Her arytenoid cartilage had become ossified and in an attempt to pass a needle through it the upright portion was fractured.

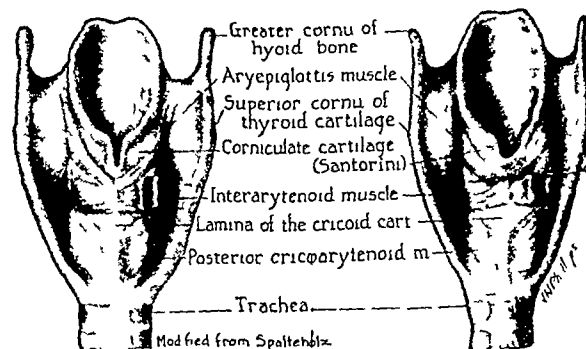


Fig. 14—Severing the interarytenoid muscle and fascia and anchoring the arytenoid temporarily to the thyroid cartilage.

It was a disturbing experience and I thought one calculated to defeat the purpose of the operation. However, a second suture was placed through the distal fragment and the muscle sutured to it.

A temperature of 102 F developed on the fourth postoperative day, rising to 103.2 F on the fifth day and the patient showed signs of bronchopneumonia. On the following day the temperature dropped to 99 F, with a subsidence of symptoms and recovery was speedy and uneventful.

These first two patients operated on belonged to group 2 of the preceding classification, the third belonged in group 1

CASE 3—Mrs J, aged 63, who had been operated on ten years previously for goiter with a loss of voice and gradual return, had the usual stridor and dyspnea. At the end of eight months dyspnea had become pronounced, several choking spells had occurred, during which she had become cyanotic and unconscious. Tracheotomy was performed at that time, and she had worn a tube for nine years.

The results of physical examination were unimportant except in two particulars. Her cords were unusually tense and closely approximated. She was wearing the largest tracheotomy tube I have ever seen. By placing the finger over the opening of the tube, one immediately realized that she could not survive on the air intake through the larynx.

Operation was performed Dec 2 1938. The muscle was transposed in the manner previously described. The postoperative course was uneventful and she was discharged in one week.

At the end of two weeks she reported that she could note no improvement. Examination of her cords revealed no change in position, there was no movement and moderate edema was present at the base of the left arytenoid cartilage. In three weeks she returned very happy and said that she had been able to smell food being cooked for the first time in nine years. She was also able to blow out a lighted match or a candle, which she had not previously been able to do. This meant, of course, that she was getting more air through the nose and mouth. (It is interesting that the first improvement noted by the second patient occurred at the end of two weeks, when she was able to blow her nose for the first time in eleven years.) At the end of five weeks, motion was developing in the left cord, but not sufficient to permit removal of the tube.

#### POSTOPERATIVE OBSERVATIONS

The difference between the margin of space separating the vocal cords that is sufficient to sustain life and that which is sufficient to sustain a person at ordinary activities is not great. Patients 1 and 2 have sufficient airway to sustain them at ordinary activities. Patient 3 has a good voice but as yet not sufficient airway. If in three or four months she has not been able to stretch the contractures so as to permit wide enough opening of the left cord for removal of the tracheotomy tube, the right omohyoid will be transposed and the contracted interarytenoideus muscle and fascia divided.

It was only after observing the progress in these cases and collecting others and comparing the larynges with normal ones that I realized that laryngeal reconstruction must accompany muscle transposition in order to succeed satisfactorily in all cases of long-standing involvement.

The operation in the second case was more successful than the others. In fact the patient has practically perfect restoration of the functions of phonation and respiration. Interestingly, a major portion of the atrophic fibers of the interarytenoideus muscle and fascia were separated from the left arytenoid cartilage in that case. No effort at such separation was made in the other two.

#### CONCLUSIONS

1 Transposition of the omohyoid muscle to the arytenoid cartilage in cases of recent bilateral recurrent nerve paralysis plus laryngeal reconstruction in cases of old involvement with contracture presents an entirely new approach to the solution of this perplexing problem.

2 Motor nerve paralysis of the larynx is not different in fundamental principle and pathologic changes from peripheral motor nerve paralysis in other parts of the body.

3 Recognized orthopedic and surgical procedures for peripheral motor nerve paralysis have proved beneficial in the treatment of laryngeal paralysis.

4 An accurate knowledge of laryngeal anatomy and function is necessary for success in these procedures. Bungle operations in this region are sure to bring both the operation and the operator into disrepute.

5 It is probable that persons now wearing tracheotomy tubes because of bilateral recurrent nerve paralysis can be relieved of that necessity and that others may be restored to active and comfortable lives.

6 Once a chordectomy, always a chordectomy. Therefore I believe chordectomies should be discontinued until the merits of muscle transposition and laryngeal reconstruction can be adequately evaluated.

7 It is too early to know what the final outcome of these operative procedures will be. It is not possible to draw final or statistical conclusions from three cases. The results so far justify their application to a sufficient number of patients for proper assay of the values. If in the future other patients are benefited to the same degree as the patients here reported on, the nightmare of bilateral nerve paralysis will have been plucked of most of her gray hairs.

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### FATAL GRANULOCYTOPENIA FOLLOWING ADMINISTRATION OF SULFANILAMIDE

H A SHECKET, M D

AND

A E PRICE, M D

ELOISE, MICH

Nine cases of fatal granulocytopenia due to sulfanilamide preparations have been reported. Four of these cases came to autopsy and in two instances the bone marrow was studied. An additional fatality with conditions found at autopsy and on study of the bone marrow is here presented.

#### REPORT OF CASE

J D, a white man aged 45, was admitted to the William J Seymour Hospital May 31, 1938, because of a recurrent left inguinal hernia which had been present for twenty-five years, pain in the left groin of one year's duration, and a chronic cough productive of whitish sputum for fifteen years. A chancre twenty-five years before was followed by treatment with numerous injections of arsphenamine and mercury. The admission diagnosis was left indirect inguinal hernia, postoperative herniorrhaphy adhesions, chronic bronchitis and latent syphilis.

June 15 the patient was operated on for a left indirect inguinal hernia. The postoperative course was uneventful until June 25, when the patient experienced sudden, severe, knifelike pain in the right side of the chest anteriorly, associated with difficulty in breathing. Physical examination revealed a diminution of breath sounds over the left base and right lower lobe and impairment of the percussion note over the right base posteriorly. The temperature was 100 F, the pulse rate 110 and the respiratory rate 20. The following diagnoses were considered: early pneumonia, pulmonary infarction and pulmonary atelectasis. The following day the temperature rose to 102 F and the sputum was positive for pneumococcus type II. Sulfanilamide 120 grains (8 Gm) was given followed by 20

From the Departments of Pathology and Medicine, Dr William J Seymour Hospital.

The pathologic studies and diagnoses were made with the assistance and confirmation of Dr S E Gould, chief of the department of pathology of Eloise and Seymour hospital.

grams (13 Gm) every four hours. The next day, June 27, the sulfanilamide level of the blood reached 136 mg per hundred cubic centimeters. Culture of the blood yielded negative results. Films made on a portable x-ray machine showed no consolidation.

The patient's condition showed no change until July 2, when his temperature rose to 104 F, the pulse rate to 120 and the respiratory rate to 50. On this date the sulfanilamide level was 56 mg per hundred cubic centimeters of blood. The following day the patient appeared critically ill with dyspnea, cyanosis, stupor and profuse sweating. Breath sounds were diminished and tactile fremitus increased at both bases posteriorly. July 5 the patient was put in an oxygen tent. The blood count showed a hemoglobin content of 11.5 Gm, erythrocytes 4,010,000, leukocytes 13,450, polymorphonuclear leukocytes 77 per cent, lymphocytes 16 per cent and monocytes 7 per cent. July 7, med-

seen), monocytes 4 per cent, and eosinophils 2 per cent. Capillary fragility (tourniquet) test produced no petechiae. A smear of aspirated sternal bone marrow showed lymphocytes 49 per cent, eosinophils 1 per cent, basophils 1 per cent, eosinophilic myelocytes 1 per cent, blast forms 1 per cent, normoblasts 43 per cent, megaloblasts 4 per cent and polymorphonuclear leukocytes 0.2 per cent. The patient was given 10 cc of pentnucleotide and 2 cc of liver extract twice a day and in addition a transfusion of 600 cc of citrated blood was given. Two days later administration of pentnucleotide (10 cc) was increased to three times a day. Blood transfusions were given daily. July 16 a small ulcerative lesion was first noticed on the tip of the tongue. This lesion spread to the mid region of the tongue the next day. The patient died the morning of July 18 with a temperature of 107.8 F, a pulse rate of 140 and a respiratory rate of 50.

TABLE 1—Blood Counts and Free Sulfanilamide Blood Values

Date 1938	Hemo globin	Red Blood Cells	White Blood Cells	Platelets	Poly morpho nuclears	Fila mentous	Nonfila mentous	Lym pho cytes	Mono cytes	Baso phils	Eosino phils	Blood Sulf anilamide Mg per 100 Cc	Comment
6/1	14.5	4.0	6,300		77	62	13	10	13				
6/2	15.5	4.95	13,200										
6/26													
6/27	15.5	5.08	9,800									13.6	Sulfanilamide started
6/28												10.2	
6/29	11.0	4.04	13,450		78	64	14	14	6		1	8.8	
6/30	14.0	4.58	15,000		73	51	21	12	12	2	1	6.9	
7/1	13.0	4.40	12,300		70	62	13	22	1		2	8.0	
7/2												5.6	
7/4													
7/5	11.5	4.01	13,400		77	62	20	16	7			4.2	Cyanosis dyspnea
7/6													
7/7	10.8	3.39	16,000		87	63	24	9	4			0.8	Nausea vomiting
7/8	10.8	3.98	14,000		87	59	28	8	4		1	2.8	
7/9	11.0	3.57	12,500		84	72	12	10	4		2	5.0	
7/11	9.5	2.97	8,500									4.8	Macular rash of chest and abdomen
7/12	10.0	3.10	5,300		36	44	12	38	4		2		Sulfanilamide discontinued
7/13	9.5	3.03	1,900		12	10	2	82	4		2		Sternal marrow polymorphonuclears 82%
7/14	8.0	2.61	50	548,500	1			97		1	1	0.0	Jaundice blood transfusion started
7/15	8.5	3.04	700		4	3	1	91		4			
7/16	8.5	2.800	450					99		1			
7/17	8.3	2.98	850		5	3	2	90					Ulcer of tongue
7/18													Patient died

ication could not be administered by mouth because of nausea and vomiting. The sulfanilamide level had now fallen to 0.8 mg per hundred cubic centimeters. Sulfanilamide 30 grains (2 Gm) in 300 cc of water subcutaneously twice a day was prescribed.

July 8 another roentgenogram of the chest, made on a portable machine, showed no consolidation. July 9, reexamination of the sputum revealed group IV pneumococci. A faint erythematous macular rash was seen over the upper abdominal and chest regions. The sulfanilamide level of the blood on this date was 4.8 mg per hundred cubic centimeters. Hemoglobin was 11 Gm, erythrocytes numbered 3,570,000 and leukocytes 13,550, with polymorphonuclears 84 per cent, lymphocytes 10 per cent, monocytes 4 per cent and eosinophils 2 per cent.

Sulfanilamide was discontinued July 11 because there was no improvement in the patient's condition and toxicity caused by the drug was feared. At this time the hemoglobin content had fallen to 9.5 Gm, the erythrocytes to 2,970,000, leukocytes to 8,500 and the sulfanilamide level to 4.8 mg per hundred cubic centimeters of blood. The next day the temperature, pulse and respiration rate dropped to 99, 96 and 30 respectively, although there was no appreciable change in the clinical appearance of the patient. That day, July 12, the blood picture first revealed a neutropenia with hemoglobin of 10 Gm, erythrocytes 3,100,000, leukocytes, 5,300, polymorphonuclears 56 per cent, lymphocytes 38 per cent, monocytes 4 per cent and eosinophils 2 per cent. July 13, however, there was another sharp rise in temperature to 104 and a mild jaundice of the scleras and skin developed. The blood picture showed leukocytes 1,900, polymorphonuclears 12 per cent, lymphocytes 82 per cent (some young lymphocytes

seen), monocytes 4 per cent, and eosinophils 2 per cent. Capillary fragility (tourniquet) test produced no petechiae. A smear of aspirated sternal bone marrow showed lymphocytes 49 per cent, eosinophils 1 per cent, basophils 1 per cent, eosinophilic myelocytes 1 per cent, blast forms 1 per cent, normoblasts 43 per cent, megaloblasts 4 per cent and polymorphonuclear leukocytes 0.2 per cent. The patient was given 10 cc of pentnucleotide and 2 cc of liver extract twice a day and in addition a transfusion of 600 cc of citrated blood was given. Two days later administration of pentnucleotide (10 cc) was increased to three times a day. Blood transfusions were given daily. July 16 a small ulcerative lesion was first noticed on the tip of the tongue. This lesion spread to the mid region of the tongue the next day. The patient died the morning of July 18 with a temperature of 107.8 F, a pulse rate of 140 and a respiratory rate of 50.

TABLE 2—Summary of Reported Fatal Cases of Granulocytopenia Following Sulfanilamide

	Amount of Drug Gm	Number of Days	Death (Days After Discontinued)
Borst *	50	25	5
Young *	54	18	5
Model *	54	18	3
Plumer *	45.2	30	5
Berg and Holtzman *	38	33	3
Schwartz Garvin and Koletsky *	50.6	21	5
O Connell *	24.3*	7	3
Mitchell and Trachsler *	?	?	?
Bernstein *	34.8	26	8
Authors case	64	15	7
Average	50	27	4.8

\* Believed to have taken an additional unknown amount of sulfanilamide over three more weeks.

Jaundice was present two days after sulfanilamide had been stopped. Although the hemoglobin and red blood cell count showed a progressive fall from early in the course of the acute illness, the leukopenia and neutropenia were not manifest until the day after the drug was discontinued. The patient died seven days after the withdrawal of the drug. In an attempt to

stimulate hemopoiesis 110 cc of pentnucleotide, 4 cc of liver extract and five transfusions, totaling 1,550 cc of citrated whole blood were administered in four days. The sulfanilamide used was prontylin (Winthrop) by mouth and sulfanilamide (Abbott) subcutaneously. During his hospital stay the only other drugs administered were codeine sulfate, phenobarbital, pitressin and acetylsalicylic acid.

**Necropsy**—Postmortem examination was performed four hours after death. The positive observations are presented



Fig 1—Superficial mucosal ulceration of tongue. Note colonies of bacteria in submucosal and muscular layers, scattered round cell infiltration and absence of polymorphonuclear leukocytes. Slightly reduced from a photomicrograph with a magnification of 50 diameters.

here. In the right pleural cavity there was 75 cc of clear straw-colored fluid. The upper and middle lobes of the right lung were a dark purple and edematous. The lower 4 cm of the right lower lobe showed a sharply delimited, slightly raised area of consolidation covered by a fibrinous pleural exudate. The consolidation measured 6 by 4 by 4 cm. On section this area was seen to be a reddish gray. A firm grayish-white partially organized thrombus was found in the lower branch of the right pulmonary artery. The thrombus was intimately adherent to the wall of the vessel. Microscopic examination showed extensive edema and congestion, with large areas of necrosis containing many colonies of bacteria but without associated inflammatory cell reaction. The few cells found were of the mononuclear (histiocytic) type.

The tongue showed a shallow ulceration with a dirty gray base which extended from the tip to the midportion of the organ. Microscopically a superficial loss of epithelium was seen. Many colonies of bacteria were present in the submucosal and muscular layers of this section. The inflammatory reaction was mild, characterized by a scattered infiltration of lymphocytes, plasma cells and histiocytes. Edema and congestion also were seen.

The cardiac portion of the esophagus presented several shallow ulcerations of the mucosa and scattered small yellow plaques. The microscopic picture was that of patchy necrosis and hemorrhagic extravasation in the mucosa. The remainder of the section showed edema and congestion with a mild infiltration of mononuclear cells.

The liver was larger and heavier than usual and weighed 2,400 Gm. The organ was a diffuse dark red and was engorged with blood. Sections showed hepatic congestion and edema with a moderate perlobular lymphocytic infiltration. A good deal of iron-containing pigment was demonstrated by the prussian blue stain. The iron pigment was present in clumps and in scattered Kupffer cells.

The spleen was larger and heavier than normal and weighed 250 Gm. This organ was also dark red, cut with increased

resistance to reveal a severely congested tissue. Microscopic sections showed hyperemia and quantities of iron-bearing pigment.

The kidneys were large and congested, with depressed scarred areas beneath their capsules. Microscopic examination revealed scattered hyalinized glomeruli, cloudy swelling of the tubules, aggregates of lymphocytes in the interstitial tissue, sclerosis with narrowing of the larger arteries and engorgement of all the blood vessels.

The bone marrow at the ends of the humerus and femur as well as of the vertebrae appeared yellow and fatty. Microscopic examination of the bone marrow from the end of the femur showed almost no cellular elements. The bone marrow from the end of the humerus showed moderate cellularity with a differential count of primitive cells 4 per cent, blast forms 40 per cent, myelocytes 6 per cent, lymphocytes and plasma cells 30 per cent, megaloblasts 5 per cent and normoblasts 15 per cent.

The gross pathologic diagnoses were embolism of the lower branch of the right pulmonary artery with infarction in the right lower lobe, acute hyperemia of the liver, spleen, kidneys and stomach, mucosal ulcerations of the tongue and esophagus, arterial nephrosclerosis, chronic cholecystitis. The microscopic diagnoses were pulmonary infarction, necrotizing bronchopneumonia, mucosal ulceration of the tongue and the esophagus with general edema and congestion, edema and congestion of the liver and walls of the stomach, hemosiderosis of the liver and spleen, arterial nephrosclerosis, chronic pyelonephritis, benign corticorenal adenoma, myeloblastic arrest of the cells of the bone marrow and granulocytopenia.

#### REVIEW OF REPORTED CASES

A review of fatal granulocytopenia included nine cases reported in American and English journals.

In Borst's<sup>2</sup> case more than 50 Gm of prontosil (the disodium salt of 4-sulfamido-phenyl-2'-azo-7' acetyl-amino-1'-hydroxynaphthalene-3,6' disulfonic acid) in

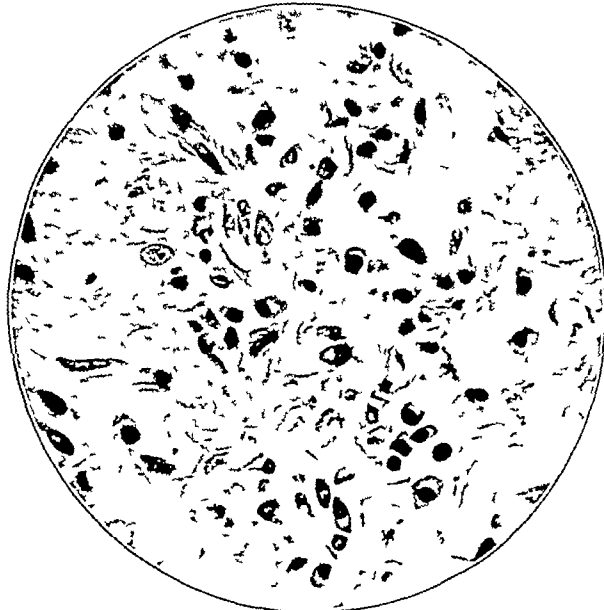


Fig 2—Submucosa of esophagus beneath an area of ulceration. Note inflammatory reaction consisting chiefly of lymphocytes, plasma cells and tissue monocytes and almost complete absence of polymorphonuclear leukocytes. Slightly reduced from a photomicrograph with a magnification of 500 diameters.

twenty-eight days was given to a white woman, aged 61, with *Escherichia coli* pyelocystitis. The first symptoms of toxicity were those of general discomfort and mild fever. The drug was discontinued the next day. Sore throat was noticed the following day, when the blood count showed leukocytes 1,225, polymorpho-

1 Footnote deleted on proof.

2 Borst J G G. *Lancet* 1: 1519 (June 26) 1937.

nuclear leukocytes 5 per cent, hemoglobin 70 per cent, erythrocytes 3,300,000. The patient died two days after therapy was discontinued, on which day the count was leukocytes 960 and polymorphonuclear leukocytes 1 per cent. Atelectasis of the left lower lobe was the only finding reported from the postmortem examination.

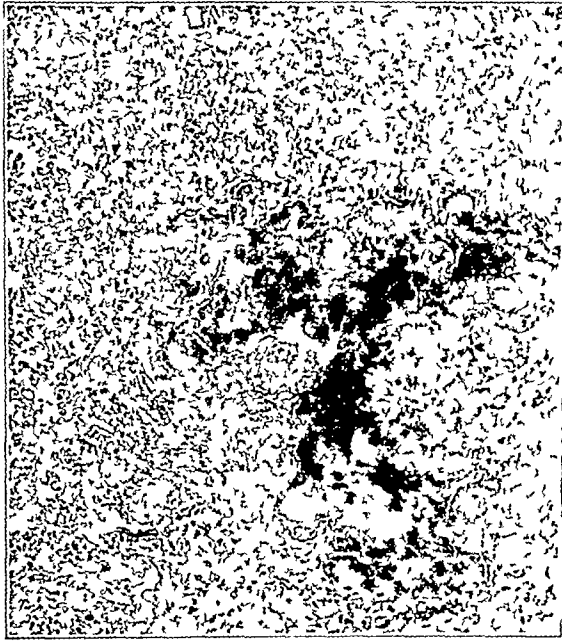


Fig 3—Necrotizing pneumonia with large colonies of bacteria, edema, hyperemia and little inflammatory reaction.  $\times 50$ .

In the Young<sup>3</sup> case 54 Gm of sulfanilamide was administered in eighteen days to a man aged 53 with acute articular rheumatism. A cutaneous rash was noted during treatment. One day before the drug was discontinued the white cells numbered 7,800 with 73 per cent polymorphonuclear leukocytes. Four days after the sulfanilamide was stopped the white cells numbered 1,800 with no polymorphonuclear cells. Death occurred five days after the cessation of the drug. Postmortem examination revealed a grayish membranous exudate over the pharynx with no polymorphonuclears seen microscopically. The liver weighed 1,555 Gm, the spleen 175 Gm. The bone marrow was aplastic and contained no granulocytes. Lymphocytes, megakaryocytes and nucleated red cells were seen.

In Model's<sup>4</sup> case 54 Gm of para-aminobenzene sulfonamide (proseptasine May and Baker) was given in eighteen days to a man aged 20 with acute rheumatic fever. Two days after the drug was discontinued the blood count was hemoglobin 45 per cent, erythrocytes 2,900,000 and leukocytes 600, gray spots in the pharynx were noted for the first time. Death occurred the following day.

Plumer<sup>5</sup> presented a case of subacute bacterial endocarditis in a woman aged 54 who during thirty-five days was treated with 45.3 Gm of sulfanilamide. After this time nausea and vomiting developed and the drug was discontinued. Three days after the sulfanilamide was stopped the erythrocytes numbered 3,580,000, the leukocytes 400 with no polymorphonuclear leukocytes. The following day a gangrenous infection of the mouth

and pharynx was noted. The leukocyte count was 1,600. The patient died five days after the drug was discontinued.

In the Berg and Holtzman<sup>6</sup> case 58 Gm of sulfanilamide in thirty-three days was given to a man aged 22 with acute gonorrhea. Treatment was continued despite numerous toxic reactions. The last blood count recorded hemoglobin 60 per cent, erythrocytes 2,600,000, leukocytes 1,600 with no polymorphonuclear leukocytes.

Bernstein's<sup>7</sup> patient, an infant aged 6 months, had bronchopneumonia, otitis media and erysipelas. She was treated for fourteen days, receiving 94 Gm of sulfanilamide orally and 35 cc of prontosil intramuscularly. After an interval of thirteen days treatment was resumed over a period of twelve days, the patient receiving 8 Gm of sulfanilamide orally and 35 cc of prontosil intramuscularly. Two days after resumption of treatment jaundice developed. Granulocytopenia was first observed three days after the final cessation of therapy.

Schwartz, Koletsky and Garvin<sup>8</sup> reported the case of a man aged 32 who received 566 Gm of sulfanilamide in twenty-one days of treatment for a penile ulcer—a possible chancroid. August 13 a blood count of 3,900 leukocytes and 4,140,000 erythrocytes was noted with no subjective complaints. August 16, the day the drug was stopped, the blood report was leukocytes 2,000 with no polymorphonuclear leukocytes and 3,410,000 erythrocytes, still with no subjective complaints. Typhoid bacilli (20 million) were given the following day to stimulate development of leukocytes. Following the typhoid treatment the temperature rose

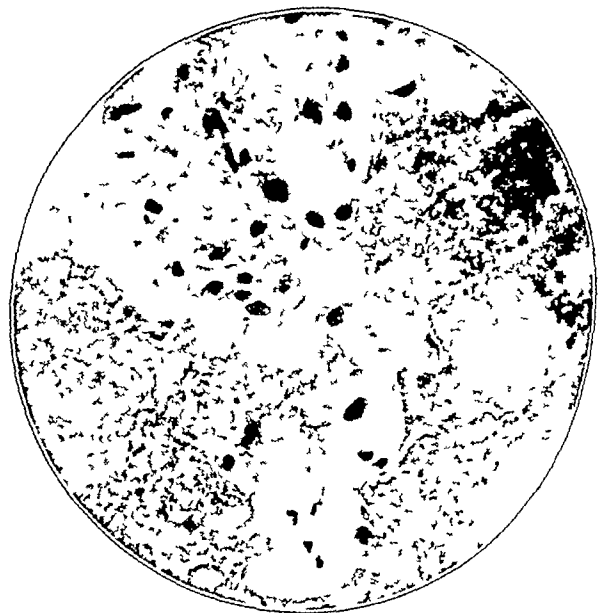


Fig 4—Mononuclear cell reaction about a colony of bacteria in the lung. Note virtual absence of polymorphonuclear leukocytes. Slightly reduced from a photomicrograph with a magnification of 500 diameters.

from normal to 104.9 F and persisted. Four days after the drug was withdrawn sore throat and difficulty in swallowing were reported. Examination revealed a

3 Young C J Brit M J 2 105 (July 17) 1937

4 Model Alfred Brit M J 2 295 (Aug 7) 1937

5 Plumer H E New England J Med 216 711 (April 22) 1937

6 Berg Samuel and Holtzman Michael Fatal Granulocytopenia Following Sulfanilamide Therapy J A M A 110 370 (Jan. 29) 1938

7 Bernstein S S J Pediat 11 198 (Aug) 1937

8 Schwartz W F Garvin C F and Koletsky Simon Fatal Granulocytopenia from Sulfanilamide J A M A 110 368 (Jan 29) 1938

necrotic ulceration of the mucosa in the tonsillar region. The scleras were icteric and the liver edge was palpable 3 cm below the costal margin. The patient died five days after sulfanilamide was discontinued.

The postmortem examination revealed hyperemia and edema of the larynx with a lymphocytic infiltration. The lungs, liver and spleen were hyperemic with

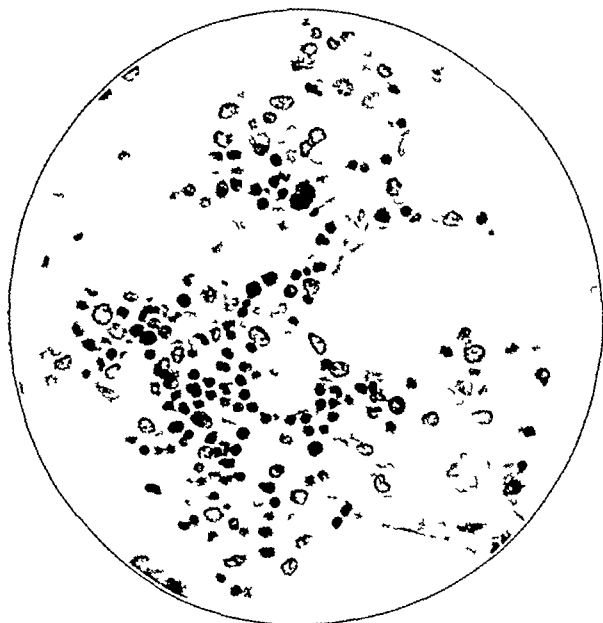


Fig 5—Bone marrow of the humerus. In addition to normoblasts there are leukoblasts, myelocytes, lymphocytes and plasma cells but no polymorphonuclear leukocytes. Slightly reduced from a photomicrograph with a magnification of 500 diameters.

large quantities of iron-bearing pigment. The cellular picture of the hemopoietic tissue was within normal limits. The differential count was myeloblasts 55 per cent, lymphocytes 35 per cent (with occasional plasma cells) and nucleated red cells 15 per cent.

O'Connell<sup>9</sup> reported the case of a seaman treated for chronic gonorrhea with 24.3 Gm of sulfanilamide over a period of seven days. Treatment was discontinued because of "acute catarrhal fever." Three weeks later the patient returned to the hospital with symptoms of granulocytopenia. Death occurred three days after onset of his acute illness. After death a partially filled bottle of sulfanilamide tablets was found among his effects. The changes found at autopsy were reported as agranulocytosis and edema of the glottis.

Mitchell and Trachsler<sup>10</sup> presented a case seen by them in which large doses of sulfanilamide were employed over a long period of time in the treatment of chronic infectious arthritis. A severe anemia, neutropenia and necrotic stomatitis developed and the patient died. The condition found at autopsy was not reported.

#### COMMENT AND SUMMARY

The pathologic changes in our case agree with those of the few postmortem examinations which have been made. The fundamental picture is that of a toxic granulocytopenia with arrest of the maturation of the blast forms of the myeloid series such as has been reported for other toxic drugs. The jaundice, the quantities of hemosiderin in the liver and spleen as

well as the bone marrow count support the impression that the anemia was of a hemolytic nature due to the toxic action of the sulfanilamide. We cannot agree with the opinion of some writers that this action on the bone marrow is due to specific idiosyncrasy. The quantity and the prolonged use of the drug we feel are the significant factors.

In these ten cases of fatal granulocytopenia, the doses of sulfanilamide preparations ranged from 35 to 64 Gm with an average of 50 Gm. The length of time that the drug was administered ranged from fifteen to thirty days with an average of twenty-seven days of therapy. Thus in all these cases large doses of the drug were administered over long periods of time. It is the impression of clinicians<sup>11</sup> who have had large institutional experience with the drug that the efficacy of sulfanilamide in a given condition should be demonstrable after from four to seven days. If no improvement is noted within that period the continued use of the drug is of doubtful value.

All the reviewed cases except that of Schwartz and his associates<sup>8</sup> showed toxic symptoms during the use of sulfanilamide. Toxic symptoms are very common during this therapy. Certain of these reactions, however, should be considered as warning signals, i.e., cutaneous eruptions, hyperpyrexia, jaundice, gradual fall in red blood cells and hemoglobin and an abrupt rise or fall in white blood cells. As has been suggested by Bannick and his associates,<sup>12</sup> if mild to moderate toxic symptoms appear decrease in dosage or cessation of the drug for a few days is advisable. If symptoms persist

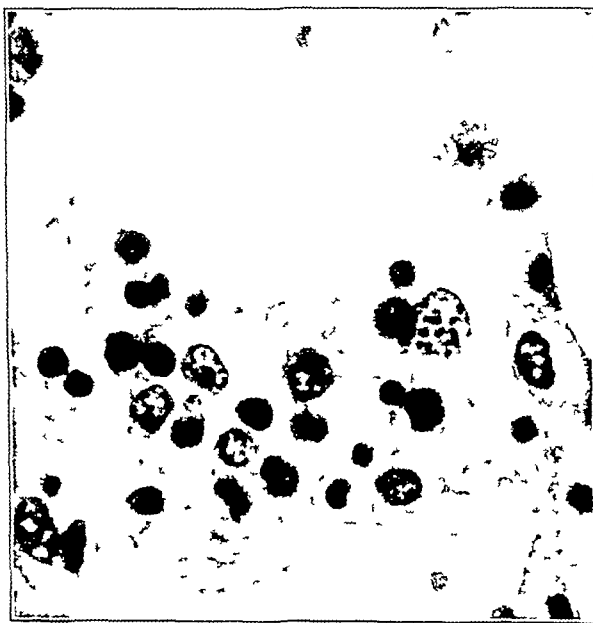


Fig 6—Bone marrow of the humerus. Same as figure 5.  $\times 1000$ .

or recur after decrease or on resumption of the drug, permanent discontinuance of the therapy is indicated.

A close check on the blood picture was not made in most of these fatalities. Blood counts were not done frequently. Three cases were not brought under the care of the reporting authors until the granulocytopenic

11 Price A E and Myers G B. Unpublished data.

12 Bannick E G, Brown A E and Foster F P. Therapeutic Effectiveness and Toxicity of Sulfanilamide, *J. A. M. A.* 111: 770 (Aug 27) 1938.

9 O'Connell J T, U S Nav M Bull 36: 61 (Jan.) 1938.  
10 Mitchell, A. G. and Trachsler W H. *J. Pediat.* 11: 183 (Aug) 1937.



state had been reached. The patients had been treated on the outside or had practiced self medication. Careful daily blood studies are indicated when sulfanilamide is used for any length of time.

Granulocytopenia was not manifest in six of the reported cases until from one to four days after the drug was stopped. In Young's case, in which blood counts were taken frequently, one day before the drug was discontinued the white cells numbered 7,800 with 73 per cent polymorphonuclears. In our case, two days before sulfanilamide was stopped leukocytes numbered 12,550 with 84 per cent polymorphonuclears, the day of discontinuance the white cell count was 8,500. Blood studies for a few days after cessation of therapy would seem to be a valuable procedure.

Sulfanilamide is an exceedingly valuable drug which is being widely used, yet, there have been relatively few fatalities reported. The drug should be administered only under careful supervision. The use of sulfanilamide in conditions in which its value is not established should be reserved for cases under institutional direction. Legislation is necessary to prevent dispensing the drug without prescription.

## STRONGYLOIDIASIS

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LOUISVILLE, KY

The title of this paper describes an abnormal condition resulting from a parasitic invasion of the human body. It has been sixty-two years since Normand<sup>1</sup> chronicled his observations of the condition in the French soldiers returning from Cochin China (1876), but little has appeared in medical literature since. Bavy in the same year observed a large number of infested workers in the St Gothard tunnel and attempted some description of the parasite. In the United States the pioneer observer was Strong

### PATHOGENICITY

Debate continues to rage around the query "Are the parasites pathogenic?" So far as the animal experimental work may aid conclusion, it appears that Sandground<sup>2</sup> has demonstrated that they can cause symptoms. The failure to convict *Strongyloides* in the case of Cochin China diarrhea has perhaps been a factor in the rather general thought that the parasite causes no symptoms. Yet cases are found in the literature in which the symptoms are as definite as may be observed with infestation by other members of the nematode family. Likewise, reports of relief from such symptoms after the eradication of the larvae from the stools would appear as legitimate evidence of pathogenicity. Eosinophilia appears to be present in a percentage comparable to that in infestations by other nematodes. This argues an allergic response. This allergy shows some peculiarities. Sandground showed that the host organism produces no antigen against the filariform larvae themselves except when they undergo certain functional changes, such as maturation. When Rhabditis larvae are used as antigen, complement fixation is more uniform.

Pathogenicity of the parasite is often dismissed with the statement that "it usually produces little harm." This is in contrast to the opinion of Barlow, who classified the stages of strongyloidiasis as (1) a period of pruriginous cutaneous lesions, the result of larval invasion, (2) a latent period, (3) a period characterized by diarrhea and (4) a period of neurasthenia.

Ginsburg's<sup>3</sup> patient had been ill but three weeks when admitted to the hospital and died one month later. While necropsy was not performed, no other cause was found clinically to explain the death. In one of the most recent articles on the parasite Hinman<sup>4</sup> called inevitable the conclusion that the parasite is pathogenic.

### DISTRIBUTION

De Rivas<sup>5</sup> said that the parasite may be found in the "territories where the hookworm is prevalent." Since hookworm is found in 33 per cent of the population of eleven Southern states, according to Rhoads,<sup>6</sup> one may well wonder why strongyloidiasis is not more frequently reported.

De Rivas's observation does not parallel that of Keller,<sup>7</sup> who studied fifty-two counties in Tennessee and found hookworm in forty-three, with an incidence of 74 per cent. Several other intestinal parasites were noted, but not *Strongyloides*. Cadham<sup>8</sup> reported a case from Winnipeg and commented on the rarity of this parasite in Canada. It was estimated by Faust that 6 per cent of the clinic population of New Orleans was infested. Thonnard-Neumann<sup>9</sup> ranked the parasite in order of its frequency with other parasites as follows: Endamoeba twenty-eight cases, Uncinaria twenty-three, Trichocephalus twenty-two, *Strongyloides* seven and *Ascaris* four. Eusterman and Balfour<sup>10</sup> expressed the belief that infestation is not as rare as clinical reports would indicate and is widespread in the Southern states. Ginsburg reported the case of a woman who was born and had lived all her life in western Pennsylvania. Manson Bahr<sup>11</sup> expressed the opinion that the parasite has a worldwide distribution. Faust reported a 4 per cent incidence among the inpatient and outpatient hospital population in New Orleans, the incidence among the city population was stated to be much less, but no estimate was made. Faust and his associates<sup>12</sup> found a 4.6 per cent incidence in Puerto Rico in 1934 and expressed the belief that the distribution of *Strongyloides* approximated that of hookworm. Byrd<sup>13</sup> reported 0.37 per cent infestation in Athens, Ga., in 1936. Headlee and

3 Ginsburg Louis. *Strongyloides Intestinalis* Infestation. J A M A 75 1137 (Oct 23) 1920.

4 Hinman E H. Clinical Aspects of *Strongyloides Stercoralis* Infection. Rev Gastroenterol 5 24 (March) 1938.

5 De Rivas Damaso. Parasites in Piersol G M, Bortz E L, and others. *Cyclopedia of Medicine*. Philadelphia: F A Davis Company 1934 vol 9 p 634.

6 Rhoads C P. Hook Worm Disease in *Cyclopedia of Medicine* vol 9 p 614.

7 Keller A E. Field Studies of Human Intestinal Parasites in Tennessee. South M J 24 336 (April) 1931.

8 Cadham Fred T. Infestation with *Strongyloides Stercoralis* Associated with Severe Symptoms. Canad M A J 29 18 (July) 1933.

9 Thonnard Neumann Ernst. Treatment with Di Hydranol of Intestinal Protozoal and Helminthic Infections in Man. A Preliminary Report. Twentieth Annual Report 122 1931. United Fruit Company Medical Department.

10 Eusterman G R and Balfour D C. The Stomach and Duodenum. Philadelphia: W B Saunders Company 1935 p 425.

11 Manson Bahr P H. *Manson's Tropical Diseases* ed 10. New York: William Wood & Co 1936.

12 Faust E C, Hoffman W A, Jones C A and Janer J L. A Survey of Intestinal Parasites in Endemic Schistosomiasis Areas in Puerto Rico. Puerto Rico J Pub Health & Trop Med 9 447 (June) 1934.

13 Byrd E E. On the Incidence of Intestinal Parasites in 537 Individuals on the Relief Rolls in the City of Athens, Georgia and Vicinity. Am J Trop Med 16 39 (Jan) 1936.

Read before the Section on Gastroenterology and Proctology at the Eighty-Ninth Annual Session of the American Medical Association, San Francisco, June 17, 1938.

1 Normand A. Sur la maladie dite diarrhée de Cochin Chine. Compt rend Acad d sc 5 316 1876.

2 Sandground J H. The Role of *Strongyloides Stercoralis* in the Causation of Diarrhea. Am J Trop Med 6 421 (Nov) 1926.

Cable<sup>14</sup> examined 514 students of the junior high school and of Berea College, Berea, Ky., in 1936 and found infestation with helminths in 31.9 per cent. *Strongyloides* had a percentage incidence of 2.7. The students came from fifteen states and a few from foreign countries. Forty-eight of 120 counties of Kentucky were represented. Hinman<sup>15</sup> found eighty-five cases of infestation in Louisiana in 1937. No extensive study of cross sections of the population of the Northern states has been made, but it is not probable that the incidence is as high as in the Southern states. Cordi and Otto<sup>16</sup> attempted to explain this difference on the basis of a poor adaptability of both eggs and larvae to changes in temperature.

#### LIFE HISTORY OF THE PARASITE

The usual story is that *Strongyloides stercoralis* invades the human being much after the manner of the hookworm. 1. The skin or mucosa is penetrated by the filariform larvae, which pass into the venous circulation through the heart and enter the alveoli of the lungs, whence they migrate to the epiglottis and on to the intestinal tract. 2. They may enter the digestive tract direct and attach themselves to the mucosa of the duodenum or jejunum or enter the crypts and develop into adult worms. They exist as male and female.

The most common method of development, however, is the hatching of the eggs in the intestine and their passage from the canal as rhabditiform larvae, after which they enter the filariform, infective stage. On the other hand, the larvae may become transformed into male and female worms and the eggs from these females hatch as rhabditiform larvae, which molt after a few days and become the infective filariform larvae.

The life history of this parasite then offers two phases of development, (a) a parasitic or intestinal form and (b) a free-living or fecal form. The first is represented by the female worm only, which is one-twelfth inch long and reproduces parthenogenetically. The worm is translucent and hence may easily be overlooked when one is examining the intestine at autopsy with a hand lens. It is most easily found by scraping the mucosa and studying the material under the microscope with a two-thirds inch lens. Only actively motile embryos are found in the feces. Eggs are found only when the stool is obtained by catharsis. Keeping this fact in mind helps to differentiate hookworm from *Strongyloides* eggs. Stitt<sup>17</sup> dogmatically says "In fresh feces one finds hookworm eggs and *Strongyloides* embryos." When kept at a high temperature the embryos develop in the free-living or fecal form. The parasites are now found living as male and female and reproduce the larvae, which are capable of starting a parasitic generation in the original host or a new one by ingestion. Failing to reach the intestinal canal of some mammal, they die.

The adult worms are found in greatest numbers in the duodenum, and the number lessens in succeeding divisions of the small bowel; they are rarely found in the large bowel. The head of the female pushes into the crypts of the glands of Lieberkuhn, eggs are found

there as well as between epithelial cells and even as deep as the basement membrane. When the eggs hatch, the larvae may encyst and be found in intraglandular lymphoid tissue, even as far as the lymphatic follicles of the submucous coat. Adult worms have been found in the stomach at autopsy, and Ophuls<sup>18</sup> observed ova and rhabditiform larvae there as well. Eusterman and Balfour say that when infestation is heavy larvae may be found in large numbers.

#### CLINICAL PICTURE

Since the parasite has a bizarre career in the human body, making its domicile with equal adaptability in the stomach, duodenum, biliary passages, pancreatic ducts, ileum, jejunum, cecum, colon, cutaneous blood vessels, lungs and trachea, a description of a clinical syndrome becomes difficult. When the entry has been through the skin a reactionary erythema begins within twenty-four hours at the site of entrance. This increases in degree for another twenty-four or forty-eight hours and is made more annoying by itching. These symptoms appear to be much aggravated in sensitized persons. Varying degrees of irritation, even inflammation, in lung tissues appear, while a low grade infestation may cause no clinical phenomena. In the digestive tract, whether reached by the skin-lung route or by direct conveyance to the stomach and bowel, the clinical picture varies from no disturbance or a negligible one to severe, even fatal diarrhea. Wagner<sup>19</sup> reported a case in which bloody diarrhea was present and superficial ulcers were seen proctoscopically some 6 inches above the anal sphincter. Colitis may be caused by the penetration of the colonic mucosa by the filariform parasites.

In de Langen's<sup>20</sup> group leukocytosis, a low hemoglobin content, epigastric pain, intermittent diarrhea, low grade pyrexia and bronchopneumonia were listed. Faust's group showed a much less severe syndrome, alternating diarrhea and constipation appeared as the most common symptoms.

Urticaria is rather frequently noted in strongyloidiasis. Whenever it occurs it is thought to be the result of direct irritation by the larvae as they penetrate the skin. In the case reported by Cadham intermittent diarrhea, recurring urticaria and neurasthenia with edema, emaciation and progressive anemia were interesting features.

Obstructive jaundice resulting from *Strongyloides* larvae was reported by Nisbet.<sup>21</sup> The larvae were found in the feces and also recovered by transduodenal drainage. A convalescent period of three months was recorded. In the chronic states emaciation and anemia supervene, and edema may follow in their wake. Death may ensue from a massive infestation. As long ago as 1876 Normand reported five deaths in Cochinchina. Ophuls observed fatalities in temperate zones. Ginsburg has reported similar observations.

Hinman found abdominal pain to be the chief complaint in a group of eighty-five cases reported in 1937; it varied in intensity, location and character. Abdominal tenderness alone was described in twenty-nine and was localized in the right lower quadrant in eight, in only three was it diffuse. A tentative diagnosis of appendi-

14 Hendlee W. H. and Cable R. M. Studies of Intestinal Parasite Infections of Students of Berea College, Kentucky. *J. Parasitol.* 22: 530 (Dec.) 1936.

15 Hinman E. H. A Study of Eighty-Five Cases of *Strongyloides Stercoralis* Infection with Special Reference to Abdominal Pain. *Tr. Roy. Soc. Trop. Med. & Hyg.* 30: 531 (March) 1937.

16 Cordi J. M. and Otto G. F. The Effect of Various Temperatures on the Eggs and Larvae of *Strongyloides*. *Am. J. Hyg.* 19: 103 (Jan.) 1934.

17 Stitt E. R. Practical Bacteriology, Blood Work and Animal Parasitology. ed. 8. Philadelphia: P. Blakiston's Son & Co. 1927. p. 477.

18 Ophuls W. A Fatal Case of Strongyloidosis in Man, *Arch. Path.* 8: 1 (July) 1929.

19 Wagner Jerome. A Case of Bloody Diarrhoea Due to *Strongyloides Intestinalis*. *Internat. J. Surg.* 34: 398 (Nov.) 1921.

20 de Langen C. D. Anguillulosis and the Syndrome of the Idiopathic Hypereosinophilia. *Mededeel. v. d. dienst. d. volksgezondh. in Nederl. Indie* 27: 515 1928.

21 Nisbet D. H. Obstructive Jaundice Due to Strongyloid Larvae. *South. Med. & Surg.* 94: 785 (Dec.) 1932.

citis was made in five. In twenty-six diarrhea was noted, the stools were bloody in fourteen. The average loss of weight was 14½ pounds (6.7 Kg). In only nineteen cases was the finding of *Strongyloides* incidental to admission to the hospital.

The diagnosis of strongyloidiasis, however, must be made through laboratory studies, interesting as clinical phenomena may be. Reasoning from analogy, one would expect an increase in the eosinophils, but it is interesting to note that Hensen<sup>22</sup> reported a series of cases of intestinal infestation of several varieties, but none of strongyloidiasis, in which there was no eosinophilia. By the same yardstick one is prepared for an absence of eosinophils in strongyloidiasis. Wagner<sup>23</sup> expressed the belief that a value of 50 per cent is not uncommon. Hensen reported a value of 82 per cent in another series. In Levin's<sup>24</sup> group of eleven cases the highest eosinophil count was thirteen, and in five the count was five or less. Hinman expressed the opinion that eosinophilia is more frequent with infestations by *Strongyloides* than with those by other helminths, except *Trichinella*. Both of these invade tissues rather constantly, and hence a more significant eosinophilia is expected.

Perhaps the question was best summed up by Faust<sup>2</sup> when he stated that there is marked eosinophilia as well as leukocytosis during the period of invasion, incubation and early oviposition, and that both decrease as the infestation becomes chronic.

Complement fixation tests have been studied by Cosack and Schmidt<sup>25</sup> and stated to be of little value. Cutaneous sensitization tests may be suggestive in a small percentage of cases. Study of feces is the easiest approach and when larvae are demonstrated suffices. The larvae are very motile. Care must be exercised in studying specimens, as vegetable fibers may be mistaken unless motion is observed. When the stool is formed the larvae will best be found by making a dent in the fecal mass, filling this with water and keeping it in an incubator for twenty-four hours. The larvae gravitate into this pool and are easily found under the microscope with a 16 mm objective (Kolmer and Boerner<sup>2</sup>).

Hookworm infestation is most likely to be confused with strongyloidiasis. The embryos of hookworm are usually found in the unhatched eggs. The parasite is easily found in the feces, the contrary being true of *Strongyloides*. But when one reflects that in the majority of cases the stools will be normal unless obtained by purgation, some other procedures must usually be followed. As it is known that the duodenum harbors the major number of the parasites, a simpler and surer way is a study of duodenal fluid obtained by transduodenal drainage. In every case that I have studied parasites have been found in the duodenum. This method should be followed in every case in which parasitic infestation is suspected. It serves as usefully in evaluating the efficacy of therapy. Relief should not be assumed from study of the feces alone. Until both feces and duodenal contents are normal, conclusion of eradication is unwarranted. In this detail it is well to remember the injunction of Cordi and Otto<sup>16</sup> that

intestinal specimens should not be stored in an ice box for as long as ten hours before examination for *Strongyloides*.

#### TREATMENT

The lack of appreciation of the pathogenic nature of strongyloidiasis exerted of course an influence on the interest in its therapeutics. Then, too, additional factor served to perpetuate a desultory concern with remedial measures. 1 Since the agent was a worm and the pharmacologies of the day listed a goodly number of vermifuges and vermicides said to be worth while, why search for a new one? 2 Though its habitat came to be known rather early disappearance of ova and larvae from the feces continued to be regarded as a measure of the efficiency of the drug used.

Thymol came to be used for this purpose, and in a single case reported in 1921 Wagner<sup>19</sup> described rather spectacular results. So enthusiastic was he that he described in considerable detail his method. He starved the patient for twenty-four hours and gave 30 grains (2 Gm) of thymol at the next bedtime, 8 ounces (236 cc) of magnesium citrate was given the following morning, and two hours later a second dose of thymol was administered. Food was permitted the following day. This procedure was repeated twice on the third succeeding days. Administration of a total of 120 grains (8 Gm) thus constituted the course of treatment, and the diarrhea was reported as having ceased in three days after the second course of treatment. Twelve years later Cadham,<sup>8</sup> impressed by the comparatively few reports in the literature of treatment with thymol, tried it on his patient and added him to the list of successes.

Thonnard-Neumann<sup>9</sup> reported the use of dihydranol (heptylresorcinol) in a series of thirty-one cases of helminthiasis, seventeen of infestation by *Strongyloides*, in all relief followed. The drug was administered in increasing doses, beginning with 0.9 Gm daily increasing to 1.8 Gm by the third day of treatment and continuing at this level for a varying period, apparently determined by results. Each daily dose was dissolved in olive oil, divided into three capsules and given one after each meal. The author concluded that the drug has a negligible toxicity and no so-called cumulative effects were noted up to a total dose of 17.5 Gm in a single series.

Gentian violet as a bactericidal agent was emphasized by Churchman in 1912. Its role as a helminthocidal agent was stressed by Faust<sup>28</sup> in 1929. His first observations were with the Chinese liver fluke, and the drug was given both orally and intravenously. He and his associates found that the drug was tolerated up to 35 mg per kilogram of body weight by both human beings and experimental animals. In 1930 he treated a series of patients under 10 years of age at Tulane University, the drug being given orally in doses of 0.5 Gm in enteric-coated tablets three times daily. The parasites were eradicated in the series with one exception and remained absent for three months. In 1932<sup>29</sup> he recommended a dose of 0.03 Gm (one-half grain) three times daily for ten doses. With a knowledge of some 200 patients who were treated with gentian violet, he had examined forty-seven after treatment and found all but two free from parasites. Only four had needed two courses of treatment. In a paper presented in 1937

22 Hensen N. *Deutsche med. Wchnschr.* 49: 83, 1923 (trans.)  
23 Wagner E. A. *Strongyloides Stercoralis*. Ohio State M. J. 32: 826 (Sept.) 1936.

24 Levin A. L. *The Problem of Eradication of Strongyloides Intestinalis*. Am. J. Trop. Med. 10: 353 (Sept.) 1930.

25 Faust E. C. *Human Strongyloidiasis in Panama*. Am. J. Hyg. 14: 203 (July) 1931.

26 Cosack, Gert and Schmidt Gertrude. *Ueber Anguillulosis (Strongyloides Stercoralis)*. Jahrb. f. Kinderh. 143: 208 (Oct.) 1934.

27 Kolmer John A. and Boerner Fred. *Approved Laboratory Technique*. New York: D. Appleton Century Company, Inc. 1931. p. 220.

28 Faust E. C. cited in *Gentian Violet Therapy for Strongyloides Infection*. editorial Internat. M. Digest. 17: 57 (July) 1930.  
29 Faust, E. C. *The Symptomatology, Diagnosis and Treatment of Strongyloides Infection*. J. A. M. A. 95: 2276 (June 25) 1932.

he<sup>30</sup> listed as the most important chemotherapeutic agents for removing intestinal nematodes thymol, beta-naphthol, oil of chenopodium, carbon tetrachloride, tetrachlorethylene, santonin, hexylresorcinol and gentian violet medicinal. Of this group of anthelmintics admitted to the nobility, he classed gentian violet as a specific. He recommended that it be given in an enteric-coated pill in 0.06 Gm doses three times daily before meals for sixteen and two-thirds days. The implied virtue of the odd two thirds of a day remained unexplained. After stating that the drug is the only one found to be specific, he modestly concluded that it "frequently eradicates the organism." He stated that no satisfactory method of treating pulmonary strongyloidiasis had been devised.

In 1928 de Langen<sup>30</sup> had tied the drug in treating Strongyloides infestation in a dose of one-sixth to one-half grain (0.01 to 0.03 Gm) three or four times daily. The symptoms and eosinophilia promptly disappeared, but no mention was made in the translation concerning the disappearance of parasites from the stool.

Santonin, oil of chenopodium, glycerin and felicitis maris were all used in turn, with failure, by Kwa Tjaon Sioe<sup>31</sup>. Even a reduction in number of the larvae in the feces was not observed. Sioe observed that these drugs, together with emetine, antimony and potassium tartrate, methylene blue, eosin and gentian violet, did not rapidly kill larvae in cover slip specimens. He gave gentian violet orally and reported success. In his summary he wrote "The action of gentian violet is probably direct on the worms and in vitro it has not more effect than other drugs against the larvae." One finds it difficult to understand how a clinician can harmonize similar observations.

Cosack and Schmidt<sup>26</sup> reported a series of nine cases in which thymol, picric acid and oil of chenopodium were used with failure. Gentian violet was credited with favorable results in five of these. On analysis, however, the term favorable loses significance, as they said "Practically all the specimens were free from larvae" and again that "larvae were present in small numbers."

One may feel justified in concluding that unless a drug frees the canal of adult parasites, ova and larvae, it scarcely merits the confidence implied by the term favorable.

There appears to be no especial contraindication to the use of gentian violet. Nausea and vomiting are rather rare. Violet discoloration of the urine is still more rarely reported. It is claimed that the adult parasitic worm is very susceptible to its toxic effects, loses its attachment to the mucosa and passes in the feces. Singularly, the eggs and young larvae are more resistant. Yet more singularly, it appears that small amounts of the dye modify the indirect type of the parasite into the direct type, which may be said to minimize materially the likelihood of infestation before the parasites are actually killed. The dye stains the mucosa of the intestine a brilliant hue, this is thought to be a vital cytoplasmic reaction.

In 1926 De Rivas<sup>32</sup> described an intra-intestinal thermal method of ridding the intestine of parasites. The method consisted of flushing the bowel with a 30 per cent solution of magnesium sulfate introduced through an ordinary duodenal tube, this was followed by the

introduction of 500 cc of saline solution at a temperature of 46 C and in ten minutes by a second injection of magnesium sulfate solution. This procedure was to be repeated twice. The rationale of the procedure rested on the fact that intestinal parasites detach themselves from the intestinal wall and frequently are killed by an exposure of from five to ten minutes to a temperature of from 45 to 47 C (113 to 116.6 F). De Rivas<sup>32</sup> later described a modification of the method, in which he added an equal amount of glycerin to the preliminary sulfate solution. The added feature of dehydration was claimed to kill the parasites in a shorter period (from two to ten minutes).

Chopra and Chandler<sup>33</sup> said that no treatment known can be relied on for the relief of Strongyloides infestation. Levin<sup>24</sup> spoke of Strongyloides as deserving special mention because it had successfully eluded efforts at eradication. He expressed no doubt as to the pathogenicity of certain members of the family and stated that the digestive tract is more often the avenue of entrance than the skin. I did not read Levin's paper until some three months ago, during the preparation of this paper, and I was surprised to learn that he had found that the larvae can be killed almost instantly in vitro by "95 per cent alcohol, kerosene, glycerin and Gram's iodine solution." However, after trying kerosene and other agents he concluded that "no form of treatment has any permanent value."

Kudicke<sup>34</sup> tested a large number of dyes with a view to determining their chemical and pharmacologic effects on various parasites, including the larvae of Strongyloides. The concentrations necessary to produce toxic effects on the parasites precluded his carrying the tests into the field of observation on animals and human beings.

With such of the aforementioned information as was available up to 1936, the series of cases on which this report is based came under observation. Nine patients have been treated by the method to be described. Since there were no features of especial interest other than the treatment, only one case, the first of the series, will be detailed. Some patients responded promptly, with no recurrence, a result not obtained in the case reported.

The technic developed consisted in the following details. A saline purgative was administered one hour before supper. This was expected to act before the patient's bedtime. Breakfast was withheld the following morning. A transduodenal tube equipped with a Lyon metal bulb was introduced, the stomach irrigated and the tube allowed to pass into the duodenum. The duodenal contents were aspirated for the twofold purpose of securing a specimen for laboratory examination for parasites and to remove contents, thus lessening the dilution of the drug to be introduced into the bowel.

Compound solution of iodine was then introduced into the duodenum and the tube withdrawn. The dose finally fixed was 60 minims (4 cc) and was given on alternate days until neither the duodenal contents nor the feces showed ova, parasites or larvae. After two weeks the duodenal contents and feces were examined. If the results were negative, the patient was instructed to return in one month for another laboratory study.

The riddance of infestation by the drug given by mouth is believed possible but the results would surely

<sup>30</sup> Faust, E. C. The Use of Anthelmintics. J. A. M. A. 108: 386 (Jan. 30) 1937.

<sup>31</sup> Sioe, Kwa Tjaon. Strongyloidosis and Its Treatment with Gentian Violet. Far East A. Trop. Med. Tr. Seventy Cong. 3: 200 1930.

<sup>32</sup> De Rivas, Damaso. Treatment of Intestinal Parasites by Intra-intestinal Thermal Method. Am. J. Trop. Med. 6: 47 (Jan.) 1926.

<sup>33</sup> Chopra, R. N. and Chandler, A. C. Diuresis, Anthelmintics and Their Uses. Baltimore: Williams & Wilkins Company, 1928, p. 22.

<sup>34</sup> Kudicke, R. New Methods of Investigation and Trial of Anthelmintics. Experimental Cytoecurus and Strongyloides Larvae. Abstr. Trop. Dis. Bull. 23: 242 1925.